



CONFERENCE PROCEEDINGS

PERFORMANCE MANAGEMENT:
DESIGNING THE HIGH-PERFORMING ORGANIZATION
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The Crippled Bottom Line - Measuring Sustainability

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0001

THE END OF PERFORMANCE MANAGEMENT (AS WE KNOW IT)

WHY MORE SELFREGULATION IS NEEDED AND HOW
BEYOND BUDGETING CAN HELP

BJARTE BOGSNES

The End of Performance Management (as we know it)

- why more self-regulation is needed and how Beyond Budgeting can help

Traditional performance management struggles big time in today's business environment, where we are exposed to ever increasing doses of what the military calls VUCA (Volatility, Uncertainty, Complexity, Ambiguity), and where we face employees with much higher and different expectations to employment and leadership. All of this has significant implications for how we design and practice performance management. It even raises the question of whether performance really can, or should be, "managed" at all? Do we need to think radically different?

I have a background in Finance, but I have also headed up HR. I have been in different leadership roles for more than 20 years. I designed and preached traditional performance management for years before my own practice and experience as a manager made me question my own messages. By now, I have lost my faith in most of such management, including traditional budgets, individual incentives, KPIs and targets as the answer to any business or organizational issue, and the calendar year as the standard cycle for running it all.

My journey started with abolishing budgets in a large European company in the mid-nineties, followed by a similar effort in an even larger company, a journey which is still on-going. *Self-regulation* has become an increasingly important aspect of this journey, not as a goal in itself, but as a necessary and great way of getting even better performance in our organisations.

Let's move to traffic as a metaphor. Most of us would define good performance in traffic as a safe and smooth flow, especially at intersections. *Traffic lights* are frequently used to achieve this. Those making decisions here are however not in the intersection together with you (there's nobody inside that pole as far as I know!), and their programming is based on historical trends and forecast, which, for obvious reasons, is somewhat outdated as you are waiting for that green light (no sensors or other hi-tech in this scenario!).

In a *roundabout*, things are very different. Those deciding are the drivers themselves, and they base their decisions on fresh, real time information. The result is normally better performance. Fresh information and authority to act on it is however not sufficient. We are also dependent on a positive set of values. There has to be a common purpose of wanting traffic to flow well. Drivers have to interact, make their own intentions visible and interpret others. "Me first" is seldom a problem in front of a red light, but a big one in the roundabout.

What about a policeman, waving and whistling in the middle of the intersection? Doesn't he also have access to fresh information and authority to act? Absolutely, but who needs that middle manager when the roundabout can do the job just as well and much cheaper?

The ice rink is another example. People sort it out in wonderful ways as they move around without the need for anyone to plan and manage their moves.

These are examples of more self-regulating ways of achieving performance, with very little performance management actually taking place. With the traffic light, authorities are definitely managing performance. The roundabout, however, is more about *creating conditions* for great performance to take place. Roundabouts achieve smooth flow by delegating decision authority in combination with a simple recommendation of “every other car”; less of a rule and more a principle which only works with the right values in place.

Back to business. With all the VUCA around us and all the knowledge workers among us, we need more self-regulation. We simply have no choice. It might feel uncomfortable, even scary to “let go”, but we have no choice. We need to shift our thinking from managing performance to creating conditions for great performance to take place. We need to revisit our definition of control and get rid of all the illusions of control. Maybe we even need a new label for performance management?

How, then, can we make our management models more self-regulating? The Beyond Budgeting philosophy provides help and guidance. Beyond Budgeting emerged as a coherent, comprehensive and tested model ten years ago. The name is actually misleading. The purpose is not necessarily to get rid of budgets, but to create more agile and human organisations. That requires significant change in traditional management, where the budget sits as a cornerstone.

Self-regulation is a key theme in Beyond Budgeting. In addition to abolishing the annual, detailed traditional budget, here are five tangible recommendations for self-regulation.

1. **Abolish the calendar year.** January to December is an artificial construct from a pure business point of view. Run performance activities like target setting, forecasting and resource allocation as separate processes and on natural frequencies and time horizons, driven by business rhythms and events.
2. **Introduce more relative KPIs.** Use more unit cost targets; you can spend more if you produce more and vice versa. Benchmark vs. internal or external peers where possible.
3. **Introduce more transparency.** Transparency is a great social control mechanism. When Swiss Roche introduced full transparency on travel cost in a pilot, cost went down compared to the rest of the company.
4. **Align through translation, not cascading.** Let local teams translate messages from above on direction and ambition into what this should mean for them. The result is common understanding, ownership and commitment - invaluable things often killed in a mechanical and detailed top down cascading.
5. **Introduce a holistic performance evaluation.** Don't tie performance to a narrow number set in stone. Make evaluations more holistic, fair and robust by allowing for hindsight insights, headwind or tailwind, values and “how”, and to sustainability of results. Those who stretch and don't fully make it should be praised, not punished.

Scary? Probably. Risky? No. The old way isn't further away than tomorrow if it doesn't work. Nobody will have forgotten! Compare that negligible downside risk with the upside potential if (or when) it works, as it has done in almost every organisation embarking on a Beyond Budgeting journey. Bon voyage!

0002

MEASURING SOCIAL ISSUES IN SUSTAINABLE SUPPLY CHAINS

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Measuring social issues in sustainable supply chains

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Measuring social issues in sustainable supply chains

Abstract

Purpose: The purpose of this paper is to identify the metrics used in the literature to measure social issues in sustainable supply chains.

Methodology: A systematic research literature review was conducted in order to identify peer-reviewed articles containing metrics pertaining to social issues in the supply chain. A structured content analysis of each identified article was conducted in order to extract the metrics. This analysis provided a basis for a frequency analysis to determine how often the various metrics appeared in the literature. The metrics were also analyzed to determine whether they: (1) simultaneously addressed the other areas of the triple bottom line, namely environmental and/or economic issues, (2) were quantitative or qualitative metrics, and (3) could be classified as absolute, relative, or context-based metrics.

Findings: A total of 53 unique metrics were identified. The analysis of the results showed that a limited number of environmental (3 metrics) and economic (11 metrics) issues were addressed by the metrics as well. A combination of quantitative (39.6%) and qualitative (60.4%) measurements were used. The vast majority of the metrics (90.6%) were further classified as absolute metrics.

Originality: This paper presents one of the first in-depth analyses of metrics used to measure social issues in supply chains. This is important because social issues are often overlooked in research focused on performance measurement in sustainable supply chains.

Keywords: *Metrics; Indicators; Performance measures; Sustainability; Sustainable supply chain management; Green supply chain management; Social issues; Safety; Welfare; Community*

Article Classification: Literature review

1. Introduction

The study of business performance measurement is well-established in the literature. Measuring performance is generally deemed to be a vital element of effective planning, control, and decision-making in today's globally competitive environment. While much of the early literature on measuring business performance focused on a focal firm (e.g., Neely, 1998), there is growing attention to extending the measurement of business performance beyond single organizations to focus on the measurement of supply chain performance (Seuring and Gold, 2013). A supply chain contemplates "all the activities involved in delivering a product from raw material through to the customer, including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer, and the information systems necessary to monitor all of these activities" (Lummus et al., 2001, p. 428). Performance measurement of supply chains is thus a challenging undertaking.

A number of authors have reviewed the literature on measuring performance in supply chains (e.g., Gunasekaran et al., 2004; Gunasekaran and Kobu, 2007). Recent research on supply chain performance measurement has increasingly focused on expanding the scope to include environmental and social considerations, in addition to the traditional economic considerations (Seuring and Muller, 2008). This has given rise to research focused on sustainable supply chain management (SSCM). SSCM may be defined as "The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term" (Ahi and Searcy, 2013, p. 339). Other widely used definitions of SSCM are provided by Seuring and Muller (2008) and Carter and Rogers (2008), among others (Ahi and Searcy, 2013).

Measuring performance in sustainable supply chains remains in a relatively early developmental stage. Although several papers have been published in this area, much of the work is conceptual in nature and there are few tangible outputs (Ashby et al., 2012). The need for additional research on sustainable supply chains has already been established (Hassini et al., 2012). Of particular interest is the development of performance measures that address the social aspect of SSCM. A number of authors have highlighted that social issues tend to receive less attention than environmental and economic issues in performance measurement of sustainable supply chains (e.g., Hutchins and Sutherland, 2008; Seuring, 2013; Brandenburg et al., 2014). There is a need to better understand the research that has been completed in this area in order to provide a foundation for future work. A study of the published metrics that address social issues in sustainable supply chains would help highlight the extent to which these issues have been addressed.

The purpose of this paper is to identify the metrics used in the literature to measure social issues in sustainable supply chains. For the purposes of this paper, social issues in the supply chain are defined as: *“product- or process-related aspects of operations that affect human safety, welfare and community development”* (Klassen and Vereecke, 2012, p. 103). The key contribution of the paper is that it provides the first comprehensive review of supply chain performance metrics that address safety, welfare, and community-related issues. As noted earlier, although there is a growing body of research on sustainable supply chains, much of the emphasis in the literature is on environmental issues (Seuring and Muller, 2008). Social issues are often overlooked, particularly in research focused on performance measurement in sustainable supply chains. The remainder of the paper is organized as follows. A brief review of the approach used in the research is provided in the next section. The results and analysis are presented in Section 3. The paper finishes with a brief conclusion and discussion of future research possibilities in Section 4.

2. Research Approach

A systematic research literature review was conducted in order to identify published metrics pertaining to social issues in the supply chain. The Scopus database was selected as the basis for the review due to its broad coverage of journals in management, engineering, and environmental science. The search focused on the keyword “sustainable supply chain management” and the

closely-related term of “green supply chain management”. Other keywords included “metrics”, “indicators”, and “performance measures”. The metrics were identified based on a structured content analysis of all the relevant peer-reviewed articles in English published up to the end of the year 2012. Conference papers and reviews were excluded from the search. Conducting keyword analysis and systematically reviewing the literature through a structured content analysis are common approaches for data collection and evaluation purposes (e.g., Seuring and Muller, 2008; Seuring and Gold, 2012).

A total of 445 articles were identified based on the search criteria, though only 39 contained metrics related to social issues that explicitly used the terms “safety”, “welfare”, or “community”. The definition of social issues provided earlier was thus interpreted in a relatively narrow way to capture metrics that unquestionably addressed the definition. Figure 1 shows the yearly distribution of the articles that contained the identified social metrics. This figure shows an increasing momentum for the number of articles highlighting safety, welfare, and community-related metrics over time, with nearly half of the articles being published in the final year of publications analyzed (i.e., 2012).

A structured content analysis of each identified article was conducted in order to extract the metrics. Each of the identified metrics were analyzed using a word-for-word content analysis (Seuring and Gold, 2012; Krippendorff, 2004) to determine if they explicitly met the criteria in the definition of social issues in the supply chain provided earlier. This analysis provided a basis for a frequency analysis to determine how often the various metrics appeared in the literature. This yields a greater comprehension of the popularity and use of the metrics cited.

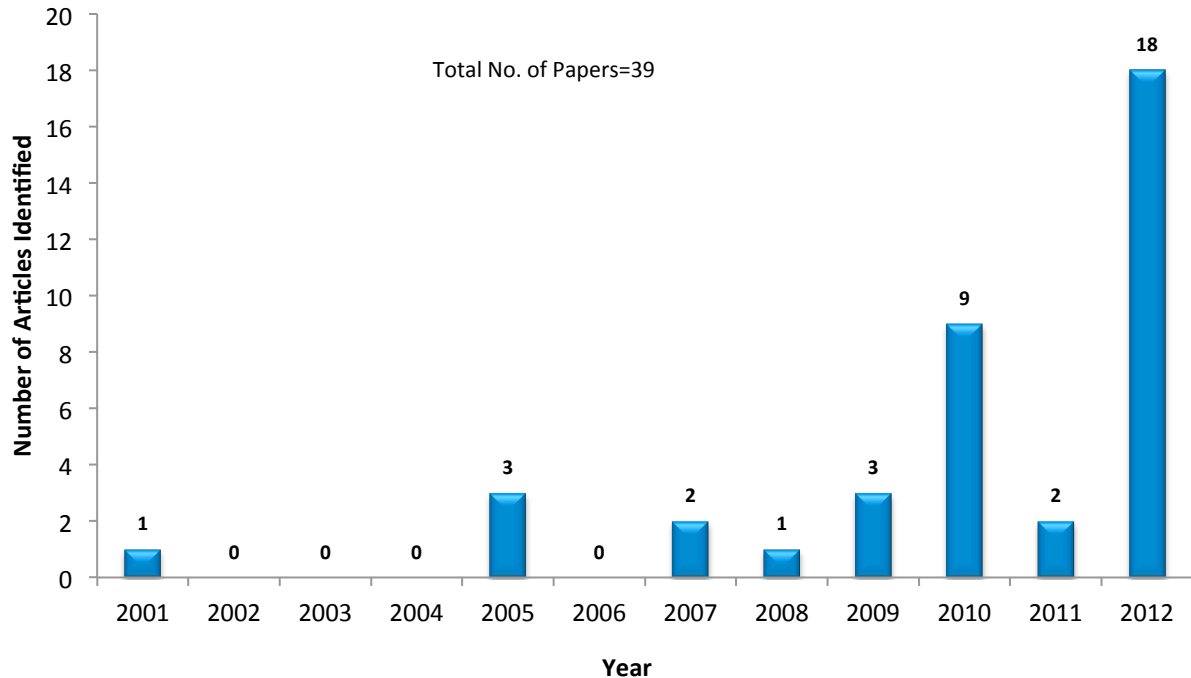


Figure 1: Yearly distribution of the articles addressing metrics pertaining to social issues

Additionally, each metric was individually examined against the two other features of the triple bottom line sustainability perspective to identify whether it addressed any issues related to the environmental and/or economic dimensions of sustainability. This provided a greater understanding of the extent to which the metrics addressed multiple dimensions of sustainability. Finally, all of the metrics identified in the literature search were also classified according to the following categories: (1) quantitative or qualitative metrics and (2) absolute, relative, or context-based metrics. For the purposes of this paper, the definitions of these metric classifications are:

- Quantitative metrics: Quantified and verifiable information used for quantitative assessment of measuring, comparing, or tracking performance of sustainability issues and objectives (Olsthoorn et al., 2001).
- Qualitative metrics: Information used to evaluate perceptions, attitudes, and strategies that motivate progress toward sustainability objectives covering narrative description of important sustainability issues (Tanzil and Beloff, 2006).

- Absolute metrics: “Express operational performance in terms of what overall levels of performance are in specific areas of interest (e.g., water use) for an organization as a whole” (McElroy and van Engelen, 2012, p. 62).
- Relative metrics: “Express operational performance in terms of how performance in one area (e.g., water use) correlates to performance in another area (e.g., revenue or total production)” (McElroy and van Engelen, 2012, p. 63).
- Context-based metrics: “Express organizational performance in terms of impacts on vital capitals, relative to norms, standards or thresholds for what such impact ought to be (for specific periods of time) in order to be sustainable (e.g., total water consumed per employee per year compared with a fair or equitable allocation of available renewable supplies)” (McElroy and van Engelen, 2012, p. 65).

It should be noted that the data utilized in this paper is extracted from a wider review of metrics in sustainable supply chains (Ahi and Searcy, 2014). The methodology reported in the two papers is therefore similar. A more in-depth discussion of the methodology used in the wider review of metrics is available in Ahi and Searcy (2014). However, both the data and analysis presented in this paper differ from that review. As explained above, this paper specifically focuses on metrics that narrowly address safety, welfare, and community-related issues. These issues were not explored in the wider review presented in Ahi and Searcy (2014). There is therefore minimal overlap in the metrics reported in the two papers.

3. Results and Analysis

This section presents a brief summary and analysis of the results. In the first sub-section, the metrics identified in the review are presented. A frequency analysis is provided, as well as a brief discussion of the classification of the metrics into the quantitative, qualitative, relative, absolute, and context-based categories. In the second sub-section, a thematic analysis of the metrics from a triple bottom line perspective is provided.

3.1 Frequency Analysis

A total of 53 unique metrics that addressed the definition of social issues provided above were identified. Among the metrics identified, 21 addressed safety, 5 addressed welfare, and 27

addressed community-related issues. The frequency of use of the social-related metrics is summarized in Figure 2.

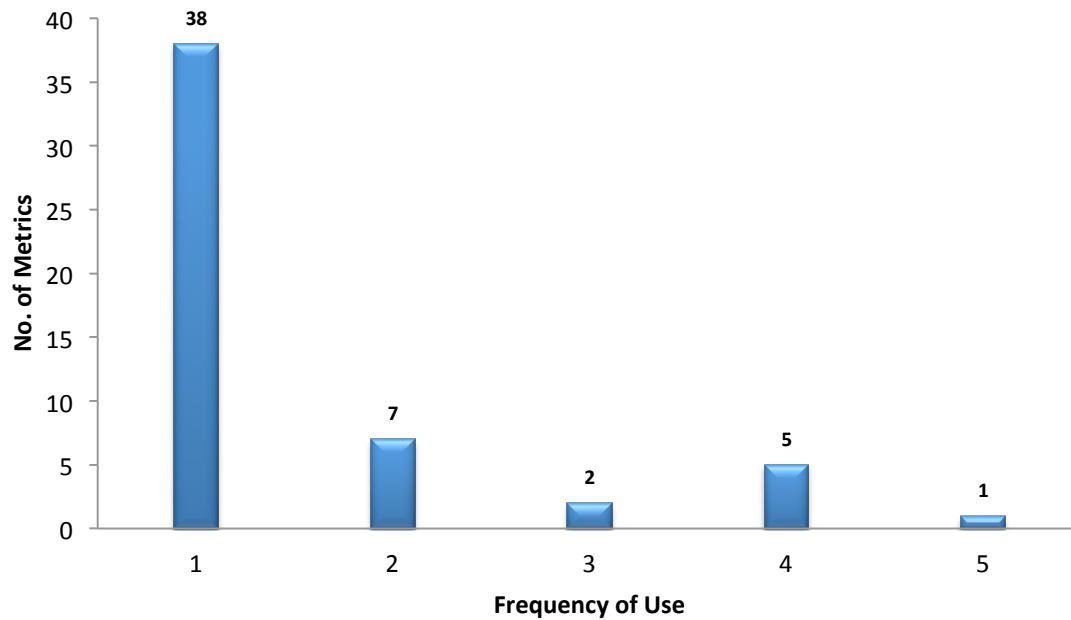


Figure 2: Frequency of use of social metrics

As highlighted in Figure 2, approximately 72% of the identified metrics were used only once, 13.2% of the metrics were used twice, and 3.8% of the identified metrics were used 3 times. A further 9.4% were used on 4 occasions. The most frequently used metric (i.e., “health and safety incidents”) was used 5 times in the reviewed articles. The complete list of metrics pertaining to safety, welfare and community issues in sustainable supply chains are presented in Table 1.

Table 1: Identified metrics pertaining to safety, welfare, and community issues in the literature on sustainable supply chains

Metrics	Frequency Rate	Types					Sustainability Dimensions		
		Quantitative	Qualitative	Absolute	Relative	Context-base	Economic	Environmental	Social
Health and safety incidents	5	√		√					√
Health and safety practices	4		√	√					√
Health and safety	4		√	√					√
Product safety	4		√	√					√
Economic welfare and growth	4	√		√			√		√
Supporting community projects	4		√	√			√		√
# Community complaints	3	√		√					√
Community initiatives	3		√	√					√
Work safety and labor health	2		√	√					√
Economic welfare	2	√		√			√		√
Percent of employment sourced from local communities	2	√			√				√
Investment in community outreach	2	√		√			√		√
In-kind contributions to community and other local programs	2	√		√			√		√
Benefits shared with affected communities	2		√	√			√		√
Community capital	2	√		√			√		√
Treat hazardous materials safely	1	√		√				√	√
Raw material used which poses health, safety or environmental hazard	1	√		√				√	√
Reduced health and safety costs	1	√		√			√		√
Safety	1		√	√					√
Worker health and safety	1		√	√					√
Involvement in health and safety committees	1		√	√					√

Metrics	Frequency Rate	Types					Sustainability Dimensions		
		Quantitative	Qualitative	Absolute	Relative	Context-base	Economic	Environmental	Social
Health and safety performance measurement systems	1		√	√					√
Employees' health and safety	1		√	√					√
Improvement of community health and safety	1		√	√					√
Reduced safety incidence	1	√		√					√
Health and safety results	1		√	√					√
Improved health and safety standards	1		√	√					√
Supplier and certifiable safety standard	1		√		√				√
Standardized health & safety conditions	1		√	√					√
Safety of workers	1		√	√					√
Safe treatment rate of domestic rubbish	1	√			√			√	√
Welfare	1	√		√					√
Social welfare	1		√	√					√
Human welfare	1		√	√					√
Community stakeholders	1		√	√					√
Improvement in community relations and corporation image	1		√	√					√
Community ideology	1		√	√					√
Construction of community style and features	1		√	√					√
Community connection	1		√	√					√
Community network	1		√	√					√
Funding, donations, sponsorship and community investments	1	√		√			√		√
Value added and community benefits	1	√		√			√		√
Community donations as % of domestic pre-tax profits	1	√			√		√		√

Metrics	Frequency Rate	Types					Sustainability Dimensions		
		Quantitative	Qualitative	Absolute	Relative	Context-base	Economic	Environmental	Social
Complaints from community	1		√	√					√
Pressure of complaints from neighboring communities	1		√	√					√
Reduction of the impact of products, services, and activities on the local community	1	√		√					√
Firm's community development efforts	1		√	√					√
Support by communities	1		√	√					√
Community impact rate	1	√			√				√
Community engagement	1		√	√					√
Significant improvement in relations with community stakeholders, e.g., Nongovernmental organizations (NGO) and community activists	1		√	√					√
Contribution to community	1	√		√					√
Economic linkages with communities	1	√		√					√

Table 1 also provides a breakdown of the metrics according to the quantitative, qualitative, relative, absolute, and context-based classifications of measurement. The table shows that a combination of quantitative (39.6%) and qualitative (60.4%) metrics were used. Numerous examples of both quantitative and qualitative metrics are available in Table 1. Analysis of the results also shows that approximately 91% of the metrics (i.e., 48 metrics) are classified as absolute and only about 9% (5 metrics) categorized as relative metrics. No context-based metric was found to address any of the safety, welfare or community-related issues. Examples of absolute and relative metrics identified are also available in Table 1.

The wide variety of metrics utilized and the relative lack of overlap amongst them indicates a general lack of agreement on how social issues in the supply chain should be measured. This finding aligns with that of the larger study by Ahi and Searcy (2014) in there was little overlap among the reported sustainability metrics in that paper as well. The identification of the metrics in this paper focused quite narrowly on only three key areas (i.e., safety, welfare, and community-related issues). However, within these areas, a number of different metrics were published. This may be due to the fact that the measurement of social issues in supply chains is still a relatively new area of research (as indicated by the review of published literature).

Arguments regarding the embryonic nature of research in this area are supported by the high percentages of qualitative and absolute metrics used. In any case, the large number of metrics published in the literature provides many options for those looking to measure progress in these areas. It is clear, however, that widely-cited standardized metrics have yet to be developed. This could raise issues for those looking to compare the performance of different supply chains.

Finally, the fact that no context-based metrics have been developed in this area indicates that the published metrics have yet to address the linkages between supply chains and the broader local, regional, and global contexts that they operate in.

3.2 Thematic Analysis

Based on the definition provided earlier, safety, welfare, and community matters are categorized as social issues in supply chains. However, it is recognized that any individual metric may address multiple dimensions of sustainability. As indicated in Table 1 and summarized in Figure

3, each of the identified metrics were therefore analyzed to determine whether they addressed the economic and/or environmental dimensions of sustainability, in addition to the social dimension. The results show that only 3 of the metrics (5.7% of the total) addressed both environmentally- and socially-related issues. These metrics were: “Treat hazardous materials safely”, “Raw material used which poses health, safety or environmental hazard”, and “Safe treatment rate of domestic rubbish”. Each of these metrics appeared only once in the articles reviewed. Table 1 and Figure 3 also show that 11 metrics (representing 20.8% of the total) addressed both of the economic and social dimensions of sustainability. Examples of these metrics include: “Economic welfare and growth” (4 times), “Community capital” (2), and “Reduced health and safety costs” (1). The remainder of the metrics (i.e., 39 representing 73.5% of the total) focused exclusively on the social dimension of sustainability. None of the 53 metrics identified addressed all three dimensions of sustainability.

The overwhelming emphasis on metrics that addressed socially-focused issues is unsurprising given the focus of the review undertaken in this paper. However, the relatively small number of cross-cutting metrics is still noteworthy. Given the emphasis of the sustainability concept on promoting interrelationships between its three dimensions, one would expect to see a greater number of cross-cutting metrics. The fact that there was relatively little development in this area may provide further evidence that the measurement of social issues in supply chains is still in its nascent stages.

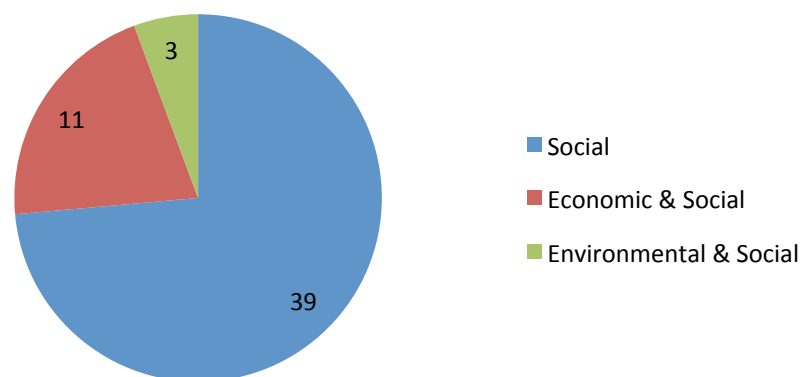


Figure 3: Distribution of sustainability dimensions addressed by the identified social metrics

4. Conclusions

Performance measurement in sustainable supply chains requires metrics that address the economic, environmental, and social dimensions of sustainability. However, as is clear from the peer-reviewed literature, the measurement of the social dimension of sustainable supply chains has received considerably less attention than the economic and environmental dimensions. To shed further light on this issue, this paper presented an analysis of the published metrics that address safety, welfare, and community-related issues. A total of 53 unique metrics were identified based on a systematic research literature review.

The paper provides a baseline for future research on measuring social issues in supply chains. It provides the first comprehensive inventory of metrics that explicitly address safety, welfare, and community-related issues. The paper shows that a wide variety of metrics have been used to address these issues. Moreover, there is little overlap among the metrics reported in the literature. The paper highlights that the emphasis to date has been on the development of qualitative metrics and that little to no research has focused on linking measurements of supply chain performance to the broader economic, environmental, or social context in the local, regional, and global regions where they operate. It also underscores that few cross-cutting metrics that explicitly link social issues to the other dimensions of sustainability have been published. Collectively, these findings support previous arguments in the literature that efforts to measure social issues in supply chains are in their relatively early stages.

It is recognized that there are several limitations to the analysis presented in this paper. First, a relatively narrow interpretation of the definition of social issues in the supply chain was applied in this paper. Only metrics that contained explicit reference to safety, welfare, or community-related issues were included in the paper. This was done to ensure that all of the metrics analyzed undoubtedly addressed these areas. However, it is recognized that these issues could be more broadly interpreted, which would lead to a greater number of metrics that address social issues in supply chains. Second, this study limited its search for the relevant metrics to the Scopus database. Although Scopus covers a large number of journals, it does not include all credible peer-reviewed journals. Broadening the number of databases searched would also lead to the identification of additional relevant metrics.

Notwithstanding these limitations, the paper provides important insight into the potential avenues for future research. In particular, it underscores the need for research on developing quantitative metrics that address multiple dimensions of sustainability. There is also a clear need to develop metrics that link social issues in supply chains to the broader sustainability context. These developments would help raise the prominence of social issues in supply chains and reduce the likelihood that they will be overlooked going forward.

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0003

DEVELOPING A BUSINESS PERFORMANCE MANAGEMENT MODEL FOR PALTEL GROUP - PALESTINE

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DEVELOPING A BUSINESS PERFORMANCE MANAGEMENT MODEL FOR PALTEL GROUP – PALESTINE

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ABSTRACT

Dynamic environment of telecommunication industry, high-level of competition and increased customers' expectations have made necessity of getting awareness of attaining a comprehensive performance management model, confident, trustable and flexible.

Business Performance Management (BPM) is an incredible method as it helps organizations to plan, monitor, analyze, and manage business more effectively by providing a comprehensive view for enterprise.

This study contributes to providing decision makers with a systematic approach for establishing a visual strategy map with a consideration of the involved causal relationships among Key Performance Indicators (KPI's). Performance Management Committee (PMC) from Paltel Group in cooperation with the researchers reviewed and formulated Paltel Group strategy to identify business strategy and construct Balance Scorecard (BSC), also, build strategy map to measure financial and non-financial indicators.

A proposed framework in this study would be a useful and valuable reference to measure actual performance against target values, and facilitate review and divide results to understand the post actions taken resulting in the current position.

This study proposes a model based on the Analytical Hierarchy Process (AHP) and BSC for evaluating the performance of Paltel Group. The analytic hierarchy is structured by the four major perspectives of the BSC including financial, customer, internal process, and learning and growth, followed by performance indicators.

Keywords: Telecommunication industry, Business Performance Management(BPM), Key Performance Indicators (KPI's), Strategy Formulation, Balance Scorecard (BSC), Analytical Hierarchy Process (AHP).

Article Classification: Case Study

1. Introduction

Over the last few decades, the telecommunication industry has proven itself not only as an emerging economic sector but as a rapidly growing sector with a huge chain of economic and social impact.

As a result, several telecommunications companies were introduced and started to compete within this current market. Such competition presents challenges that affect the business performance of the various telecommunication industries. Among these industries is Palestine Telecommunications Company (Paltel Group) which is the telecommunications leader in Palestine; The Group launched its operations in 1997 as a public shareholding company. It provides fixed line, cellular and data services, making it the most integrated service provider and one of the largest companies operating in Palestine in terms of sales volume, market value and financial stability. The market capitalization of Paltel

Group's Stock, the leading share among the listed companies on the Palestine Exchange, represents 33.2% of the total market cap on the Exchange as end of 2013. Reliability and consistency in dividends' distribution over the past years with an upward trend to reach 50% dividends percentage of the par value distributed for 2013, As end of 2013, the Group's subscriber base in all telecom services reached 3.25 million customers with a 2.7% subscriber growth rate compared to end of 2012. (PALTEL annual report, 2008-2013).

The lack of strategic and communication mechanisms among the company vertically and horizontally, excluding staff members from the decision-making processes, poor coordination among business units and functional groups, and an evident gap between strategy and execution, have put Paltel Group under pressure from shareholders, stakeholders, executives, and staff, to achieve standards of corporate governance.

Paltel group pursues for performance evaluation, confident, trustable and flexible, which take advantage of scientific methods with a shared purpose, a consistent data model, real-time information, easy-to-use tools, and streamlined processes, to align operational procedures with strategy. And through increased insight, make faster decisions and boost performance to achieve business goals. This study bridges the existing gaps between strategy and then execution that impair achieving strategic goals, by having a structured business performance model. The model is endeavoring to achieve the improved communication by providing executives an effective mechanism for communicating strategy and expectations to managers and staff at all levels of the organization via planning models and performance metrics joined to corporate goals and objectives; improved collaboration and exchange of ideas and information, both vertically between levels within an organization and horizontally among departments and groups which manage a shared activity; improved control by enabling staff to continuously adjust plans and fix or improve operations in a timely manner by providing them with up-to-date information about market conditions and the status of operational processes and improved coordination among business units and functional groups that otherwise might act as independent segments, conflicting rather than sharing resources and information.

In accordance with the above, the proposed research must answer the following questions:

- What are the expected changes if a company implements BPM?
- How does BPM help organizations to align strategy with execution?
- How to identify and document the strategic KPIs, which ultimately determine the success of Paltel Group?
- Does Balance scorecard proper method to align measure financial and non-financial performance.
- Does AHP proper method to prioritize strategic objectives and KPI's.

2. Literature Review

BPM coincides with the concept of Corporate Performance Management (CPM) and Enterprise Performance Management (EPM). These concepts provide a system perspective for optimizing the execution of business strategy, (Ballard, White, McDonald, Myllymaki, McDowell, Goerlich, and Neroda, 2005; Clark, Jones, and Armstrong, 2007). The concept of BPM was introduced to business in the 1990s by information technology research firms and software vendors (Cokins, 2009; Pritchard, 2008). BPM is misunderstood by many companies as being a new category to describe multiple applications including planning, budgeting, financial consolidation and reporting, forecasting and scenario modeling, score carding or dashboards, business intelligence, and key performance indicators (KPIs) reports. Eckerson (2004) argues that BPM is a common strategic and technical framework that pulls these applications together in a cohesive and concerted manner with a view to drive the whole organization toward achievement of strategic goals. Therefore, BPM is a much broader and bigger concept than planning, budgeting, forecasting, reporting, score carding, or business intelligence. These latter concepts are all tools underlying the business performance management concept.

BPM defines and refines strategies, and manages them in order to enhance performance. It bridges the gap between strategy and execution by means of improved communication, collaboration, control, and coordination (Eckerson, 2004; Ballard et al., 2005). BPM enables organizations to enhance the capabilities of business intelligence systems for better monitoring, measurement, and management of business performance (Clark et al., 2007). Eckerson posits that BPM improves (1) communication of strategy and expectations to all levels of the organization through planning models and performance metrics that are tied to strategic goals, (2) collaboration across organization through two-way exchange of ideas and information, (3) control to continuously adjust plans and improve operations through dissemination of up-to-date information about market conditions and operational processes, and (4) coordination among business units and functional groups. Eckerson also suggests that BPM helps organizations better exploit opportunities as well as detect and rectify operational problems before they grow out of control.

To enhance the understanding of BPM, the framework will be exploded. Figure (1) depicts the framework which covers the four phases.

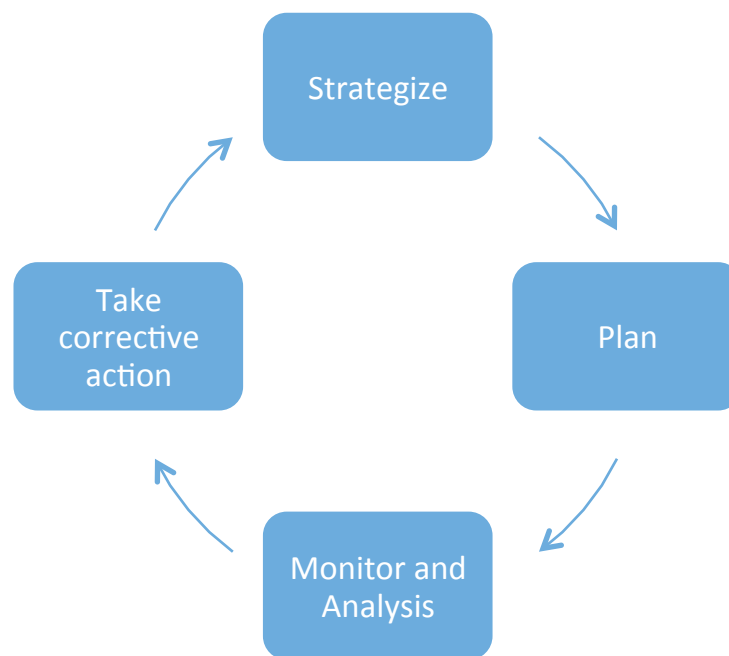


Figure (1): Business Performance Management Framework

Source: Adapted from Frolick and Ariyachandra, (2006:43)

3. Objectives

This study aims to achieve the following objectives:

Review of current performance management processes to identify gaps, then suggest more efficient and effective processes for performance management, conduct a comprehensive investigation on Balanced Scorecard and strategy map practices in telecom industry to map the strategy for Paltel Group, recommend a methodology to prioritize Paltel Group strategic objectives which achieve high level of consensus and consistency, determine how the proposed BPM model improves the group decision-making process and business outcomes, and plan to develop a performance measurement model which can be applied in telecom industry in group level, estimate the group accomplishments, and discover the causal-effect relationship among objectives and perspectives.

4. Methodology

Paltel Group has implemented business scorecard approach to manage both financial and non-financial perspectives due to the increase in complexity of systems and organizational structures and

continuously changing external factors while rapidly expanding its business globally through acquisitions, joint-ventures, and partnerships. Its key four strategies are clearly developed in line with the vision and its own environments, and they are definitely decomposed into each of strategic objectives. Relevant KPIs have been subsequently defined and reported both internally and externally. However, most of measures are associated with the financial perspective and also the absolute values and some other KPIs like ratios not measure in appropriate way. In addition, most of strategic not communicated and aligned with strategies and the absentees for monitoring and controlling for the KPIs and set the suitable weight for each strategy and KPI, Paltel Group does not define clearly the level of local stakeholder involvement in the performance measurement. Moreover, Paltel Group has many documents describing business processes and procedures on a detailed level but processes are not centralized and distributed that affect missing company-wide management of business processes that combined with a structured approach for updates and continuous improvement is missing.

Based on intensive analysis for internal, external and Porter five forces, Paltel Group sought to achieve its objectives by leading the telecommunications and Information Technology (IT) sector. In addition, the Group's commitment to develop its IT infrastructure and introduce the latest global technologies in the service lines; mobile, fixed, and ADSL services. The Group also worked on the development of value added services in order to satisfy all the subscribers' needs and desires. It also worked through its special offers to commensurate with the nature of its subscribers in order to maintain the subscribers base and increase their loyalty on one hand and attract new subscribers and to fulfill their needs on the other. The Group maintains core investment in the IT sector by enriching it with world-class experiences and expertise to remain the leader of this sector. Moreover, Paltel Group remains committed to building the future of technology in Palestine in an effort to place Palestine on the global digital map. Thus, the Group worked hard to enhance its technical performance and broadband services and to provide the latest applications while maintaining the highest levels of security and privacy. In the same context, the Group continued its devotion towards the community and public sector by launching creative initiatives and sustainable development programs ranging from more widespread environmental technology and Internet access to computer literacy. In addition to its social responsibility, the Group has empowered marginalized groups in an aim to have them look ahead for a future filled with all the needed resources to sustain a decent life.

Performance Management Committee (PMC) in cooperation with the researchers studied the current situation and select significant KPI's that affect overall performance and can be measured through information system in the group, and distribute these KPI's into each perspective of BSC. Table (1) describes each perspective and the KPI's.

5. Model Analysis

Considering the number of stakeholders in Paltel Group, performance management committee was formulated heading by CEO, to analyze the current situation and to cooperate with researcher to develop the proposed model. The researcher worked with the committee to identify strategic goals through BSC to measure the overall performance. The committee consisted of 15 employees, three general managers, six directors, four managers and two officers. The committee met to prioritize each perspective of BSC, and KPI's using AHP methodology.

The study makes an extensive use of both primary and secondary sources of information from the committee of Paltel Group. The primary sources of data include information which were gathered from the field. The secondary sources of data include Paltel Group's annual reports and brochures. Data on the profile and operations of the Paltel Group, resource base of the company, technological advancement as well as operational challenges and administrative responses of the company were gathered from management and staff of Paltel Group. The proposed methodological framework for conducting the study could be summarized by literature review, Data Collection Techniques, Interviews, Observations, Focus groups, Empirical Survey a questionnaire is designed with a conventional AHP questionnaire format (nine-point scale and pairwise comparison) based on the hierarchy. Fifteen questionnaires were distributed to performance management committee of Paltel Group.

Analytical Hierarchy Process

The Analytic Hierarchy Process (AHP) is a methodology for structuring, measurement and synthesis. The AHP has been applied to a wide range of problem situations: selecting among competing alternatives in a multi-objective environment, the allocation of scarce resources, and forecasting. Although it has wide applicability, the axiomatic foundation of the AHP carefully delimits the scope of the problem environment (Saaty 1986). It is based on the well-defined mathematical structure of consistent matrices and their associated right-eigenvector's ability to generate true or approximate weights, Mirkin (1979), Saaty (1980, 1994). It is our belief that the real essence of the AHP is not generally understood. The AHP is more than just a methodology for choice situations. It is not just another analysis tool. The best way we can explain the AHP is to describe its three basic functions: (1) structuring complexity, (2) measuring on a ratio scale, and (3) synthesizing. We also discuss some of the controversy about the AHP that has appeared in the academic literature. Saaty (1980) and Forman and Selly (1999).

Data analysis was done by using AHP method using Excel sheet developed by Klaus D. Goepel, <http://bpmmsg.com>. The weight for calculation in AHP method is attained from the questionnaires that have been filled by respondents.

The procedures of AHP to measure business performance involve six essential steps Cheng, 1999; Lee, Kang, and Wang, 2006; Lee, in press; Murtaza, 2003; Zahedi, 1986):

Step1: Define the unstructured problem and state clearly the objectives and outcomes.

Identify criteria that are absolutely necessary to adequately define all relevant and important aspects of the goal. Then, we define KPI's for each cluster based on its inherit perspective, as described in the Table (1):

Table (1): BSC Perspectives and KPI's

Goal: Measure Paltel Group business performance

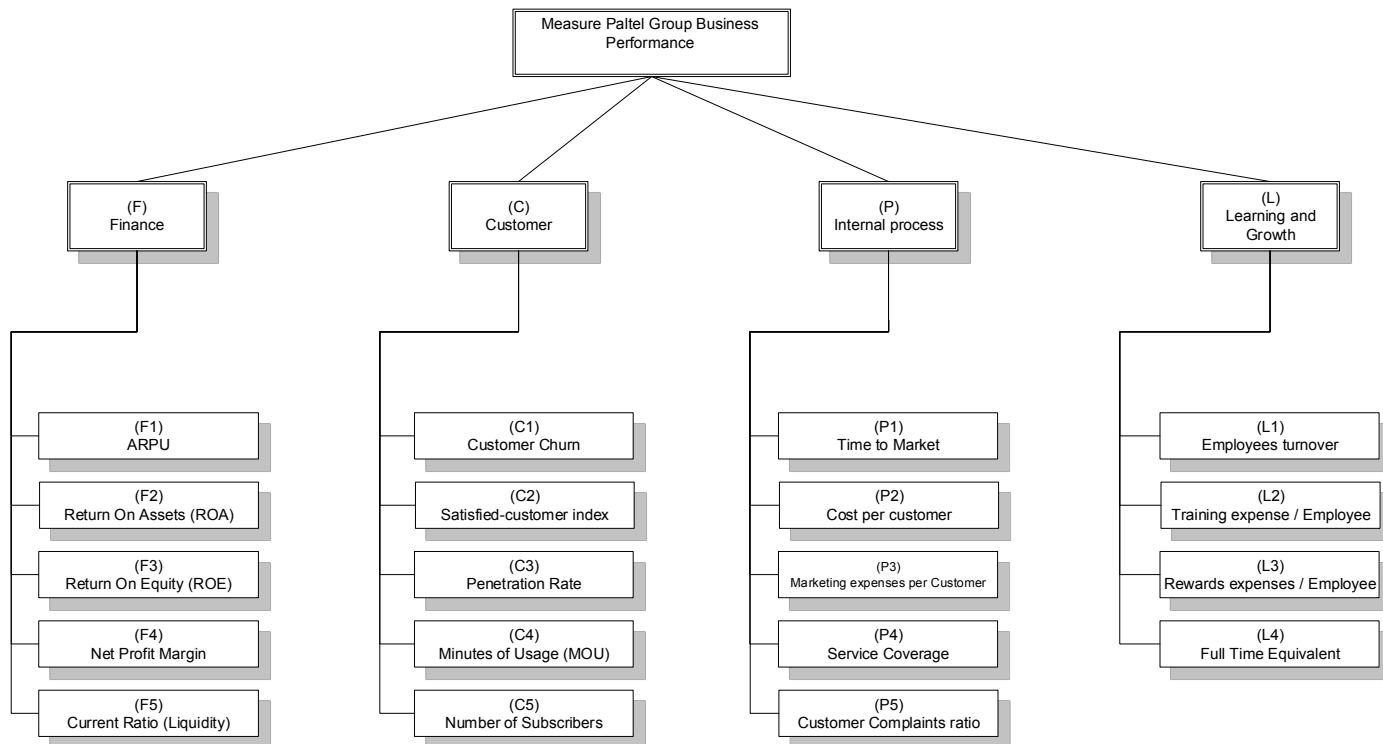
F Financial perspective	F1	Annual Revenue Per User (ARPU)
	F2	Return On assets (ROA)
	F3	Return On Equity (ROE)
	F4	Net Profit Margin (NPM)
	F5	Current Ratio (CR)
C Customer Perspective	C1	Customer Churn
	C2	Satisfied Customer Index
	C3	Penetration Rate
	C4	Minutes of Usage
	C5	Number of Subscribers
P Internal Process Perspective	P1	Time to Market
	P2	Cost per customer
	P3	Market expense per customer
	P4	Service coverage
	P5	Customer complaint ratio
L Learning and Growth Perspective	L1	Employees turnover
	L2	Training expense per employee
	L3	Rewards expense per employee
	L4	Full Time Equivalent

Step2: Decompose the problem into a hierarchical structure with decision elements (e.g., criteria and alternatives).

Construction of the hierarchy is the most critical aspect in the AHP, with the hierarchy of the problem, appropriately decomposed into actionable elements linked to the highest level goals, it is necessary to gather information as to the impact of the relationships between the various levels. This action performed by PMC through focus groups with the researcher which aims of prioritization

matrix which represent the importance values of organization drivers and relationship matrix that gives the mapping between the actionable items in different levels of the decomposition hierarchy.

Figure (4): AHP levels for Paltel Group



Step3: Employ pairwise comparisons among decision elements and form comparison matrices.

The judgment in AHP is to define which element is more important in each pair of criteria. The committee using scale for pairwise comparisons shown in Table (2).

For instance, comparing element A against element B, this is the judgment: “How strongly important is element A than element B?”.

The ratio assessment is the activity conducted in the second stage, which is done by acquiring opinions from PMC to compare each key performance indicator that has been measured by giving the score 1–9, Table (2). The result from respondents’ opinion is then analyze by using the AHP method.

Table (2): AHP fundamental scale

<i>Intensity of Importance</i>	<i>Definition</i>	<i>Explanation</i>
1	<i>Equal Importance</i>	<i>Two activities contribute equally to the objective</i>
3	<i>Moderate Importance</i>	<i>Experience and judgment slightly favor one activity over another</i>
5	<i>Strong Importance</i>	<i>Experience and judgment strongly favor one activity over another</i>
7	<i>Very Strong Importance</i>	<i>An activity is favored very strongly over another; its dominance demonstrated in practice.</i>
9	<i>Extreme Importance</i>	<i>The evidence favoring one activity over another is of the highest possible order of affirmation</i>
2, 4, 6, 8	<i>For compromise between the above values</i>	<i>Sometimes one needs to interpolate a compromise judgment numerically because there is no good word to describe it.</i>

Pairwise comparison for Balance Scorecard perspective:

The committee met to prioritize each perspective of BSC and KPI's, and the result were as shown in Table (3). The consolidated decision matrix combines all k participants' inputs to get the aggregated group result. We use the weighted geometric mean of the decision matrices elements $a_{ij,k}$, using the individual decision maker's weight w_k as given in equation below:

$$c_{ij} = \exp \frac{\sum_{k=1}^N w_k \ln a_{ij(k)}}{\sum_{k=1}^N w_k}$$

Table (3): Consolidated Pairwise comparison for Balance scorecard

		Finance	Customer	Internal Process	Learning and Growth
		1	2	3	4
Finance	1		1.09	1.4	1.69
Customer	2	0.91		1.14	1.81
Internal Process	3	0.72	0.88		1.6
Learning and Growth	4	0.59	0.55	0.63	

Step4: Use the eigenvalue method to estimate the relative weights of the decision elements.

Priorities p_i in each input sheet are calculated using the row geometric mean method (RGMM). With the pairwise $N \times N$ comparison matrix $A = a_{ij}$

Calculated By:
$$r_i = \exp \left[\frac{1}{N} \sum_{j=1}^N \ln(a_{ij}) \right] = \left(\prod_{i=1}^N a_{ij} \right)^{1/N}$$

Normalized By:
$$p_i = r_i / \sum_{i=1}^N r_i$$

Table (4): Consolidated Eigenvalue Balance scorecard

<i>Balance scorecard Perspective</i>	<i>Weight</i>	<i>Rank</i>
Finance	30.8	1
Customer	28.4	2
Internal Process	24.4	3
Learning and Growth	16.4	4

Step5: Check the consistency property of matrices to ensure that the judgments of decision makers are consistent.

The consistency of a set of pairwise comparisons considered before we accept the weights generated by this process. Consider the situation proposed earlier where the committee assessed factor one as four times as important as factor two. If the decision maker considered factor two twice as important

as factor three, then factor one should be preferred eight times over factor three. This is an example of perfect consistency with respect to strength of preference, but perfect consistency is not guaranteed due to the human aspect of the process.

According to Taylor III (2002: 379), Consistency Index (CI) can be calculated by using below formula:

$$CI = \frac{\lambda_{\max} - n}{n - 1}.$$

This is a suitable equation for measuring the accuracy for two reasons. First, small changes to non-diagonal elements in a positive reciprocal matrix will lead to only small changes in the eigenvalues. Second, the n eigenvalues of an n × n matrix with diagonal entries of one will always sum to n. Thus, the more consistent a matrix is, the less the a_{ij} entries will deviate from their actual values and the closer will be to n. For different values of n, Saaty and others have computed the Consistency Index for a large number of matrices with random entries and averaged these results to produce the Random Index (RI). Saaty defines the consistency ratio for a matrix as equation below:

$$CR = \frac{CI}{RI}$$

A matrix with a CR value less than 0.1 is considered by Saaty to have acceptable consistency.

Random Consistency Index (RI) can be observed in Table (5) as follows:

Table (5): Random Consistency Index

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49
CGI			0.31	0.35	0.37	0.37	0.37	0.37	0.37	0.37

Source: <http://www.people.revoledu.com/kardi/tutorial/AHP/index.html>

If CR ≥ 10%, the data acquired is inconsistent

If CR < 10%, the data acquired is consistent

The test of consistency result will be very useful in the AHP method. If the test result is inconsistent (CR ≥ 10%), then the result from the AHP method will be of no use in decision making.

Geometric consistency index GCI is calculated using below equation:

$$GCI = \frac{2 \sum_{i < j} \ln a_{ij} - \ln \frac{p_i}{p_j}}{(N - 1)(N - 2)}$$

Table (6): Consistency ratio Balance scorecard and perspectives

	<i>α</i>	<i>Lambda</i>	<i>GCI</i>	<i>CR</i>
Balance scorecard	0.1	4.007	0.01	0.3
Finance	0.1	5.043	0.04	1.0
Customer	0.1	5.019	0.02	0.4
Internal Process	0.1	5.036	0.03	0.8
Learning and Growth	0.1	4.028	0.04	1.0

Step6: Aggregate the relative weights of decision elements to obtain an overall rating for the alternatives.

BPM dashboard designed to enable senior executives to execute strategy, manage performance, and drive new or optimal behaviors across the group. They are primarily designed to facilitate monthly strategic review or operational planning sessions and help executives collaborate on ways to fix problems or exploit opportunities. BPM dashboard focuses on helping Paltel Group to chart a new strategic direction.

The final weights and priorities obtained from the above application for the selected indicators have been provided in the Table (7). In addition, based on the obtained results from this study, the ranking of BSC perspectives are presented in Table (7). The results of the main criteria in BSC - ranking indicates the first rank for the "Finance perspective" with 30.8%, the second for "Customer perspective" with 28.4%, the third rank for "Internal process perspective" with 24.4% and the fourth rank is "Learning and growth perspective" with 16.4%.

We aggregate all values for all indicators and perspectives to calculate the overall performance value for Paltel Group and then the business performance index is: 91.34%. Therefore, by using the proposed model group, can identify the achievements level for each perspective, in Table (7) Paltel Group's achieved in finance, customer, internal process and Learning and Growth perspectives for each by order, 93.5%, 91.96%, 87.91%, and 91.33% respectively.

Table (7): Business Performance Management dashboard for Paltel Group

Goal: Measure Paltel Group business performance

<i>Main criteria</i>	<i>Global Weight</i>	<i>Sign</i>	<i>Sub criteria</i>	<i>Local Weight</i>	<i>Final weight</i>	<i>Rank</i>	<i>Target</i>	<i>Actual</i>	<i>Performance Result</i>	<i>Achievement</i>
F Financial perspective	30.8%	F1	Annual Revenue Per User (ARPU)	0.223	6.85%	3	100	94	6.46%	94.00%
		F2	Return On assets (ROA)	0.201	6.17%	7	0.187	0.15	4.97%	80.21%
		F3	Return On Equity (ROE)	0.239	7.34%	2	0.25	0.238	7.01%	95.20%
		F4	Net Profit Margin (NPM)	0.211	6.48%	4	0.23	0.2204	6.23%	95.83%
		F5	Current Ratio (CR)	0.126	3.87%	16	1.5	1.6	4.14%	106.67%
Finance performance Index is:									28.80%	93.50%
C Customer Perspective	28.4%	C1	Customer Churn	0.188	5.34%	9	0.29	0.34	4.55%	85.29%
		C2	Satisfied Customer Index	0.228	6.48%	5	0.7	0.65	6.01%	92.86%
		C3	Penetration Rate	0.260	7.38%	1	0.72	0.7	7.18%	97.22%
		C4	Minutes of Usage	0.128	3.64%	17	0.8	0.64	2.91%	80.00%
		C5	Number of Subscribers	0.196	5.57%	8	2.7	2.65	5.46%	98.15%
Customer performance Index is:									26.12%	91.96%
P Internal Process Perspective	24.4%	P1	Time to Market	0.264	6.44%	6	136	142	6.17%	95.77%
		P2	Cost per customer	0.213	5.20%	11	99	124	4.15%	79.84%
		P3	Market expense per customer	0.185	4.51%	13	41	52	3.56%	78.85%
		P4	Service coverage	0.160	3.90%	15	0.95	0.95	3.90%	100.00%
		P5	Customer complaint ratio	0.178	4.34%	14	0.072	0.0608	3.67%	84.44%
Internal Process performance Index is:									21.45%	87.91%
L Learning and Growth Perspective	16.4%	L1	Employees turnover	0.205	3.38%	18	0.04	0.037	3.63%	108.11%
		L2	Training expense per employee	0.185	3.05%	19	800	731	2.77%	91.38%
		L3	Reward expense per employee	0.324	5.37%	10	20452	19650	5.53%	104.08%
		L4	Full Time Equivalent	0.286	4.72%	12	210	324	3.04%	64.81%
Learning and Growth performance Index is:									14.98%	91.33%
Paltel Group business performance Index is:									91.34%	

6. Conclusions

This study found BPM incredible method as it helps organizations to plan, monitor, analyze, and manage business more effectively by providing a comprehensive view for enterprise. With a shared purpose, a consistent data model, real-time information, easy-to-use tools, and streamlined processes, it's much simpler to align operational procedures with strategy. And through increased insight, make faster decisions and boost performance to achieve business goals.

This study has contributed to providing decision makers with a systematic approach for establishing a visual strategy map with a consideration of the involved causal relationships among KPIs. The BSC strategy map construction framework proposed in this study would be a useful and valuable reference for other organizations, as BSC vary from organization to organization. Strategic analysis is performed to create logical links between the KPIs based on the content of the BSC evaluation criteria that are most appropriate for telecom industry performance.

Based on our study, we can see that strategy map which we built will solve some problems which have been existing in Paltel Group. Therefore we think BSC and strategy map should work together to help company to achieve the strategy goals, and use them in a complementary way.

This study proposes an approach based on the AHP and BSC for evaluating the performance of Paltel Group, The analytic hierarchy is structured by the four major perspectives of the BSC including financial, customer, internal business process, and learning and growth, followed by performance indicators. Because human decision-making process usually contains fuzziness and vagueness, the AHP is adopted to solve the problem.

In this study we recommend to establish Business Performance Management Office, which actively guide Paltel Group of strategy management or in organizing strategic planning activities, and in developing plans, objectives and performance measures to ensure execution. The main responsibility of this office is to prepare and animate strategic planning workshops, accounting for and managing the expectations of multiple stakeholders involved in the planning process, while ensuring alignment of Paltel Group's direction with business sector and support unit priorities, identifying strategic objectives, key performance indicators, targets, and developing performance dashboards, Effectively monitoring the integrity of results reported, and Preparing and presenting performance dashboards and other strategic performance communications tools, both internally and externally.

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SURVIVE & THRIVE

SUSTAINABLE ENTERPRISE EXCELLENCE,
RESILIENCE & ROBUSTNESS

RICK EDGEMAN

Survive and Thrive: Sustainable Enterprise Excellence, Resilience & Robustness

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ABSTRACT

PURPOSE: The *sustainability* of an enterprise is its capacity to create and maintain social, economic, and environmental value for itself, its stakeholders and society at large so that in both the near and long terms an enterprise's sustainability is its survival capacity. If sustainability connotes survival, then *excellence* is the capacity to thrive across an array of critical performance domains. Enter *resilience* and *robustness* where *resilience* is enterprise ability to self-renew through innovation and hence change and reinvent itself by adapting its responses to political, social, economic and other shocks or challenges in its competitive domain. In comparison, *robustness* is resistance or immunity gained principally through formation and execution of an array of enterprise strategies, policies, partnerships, and practices that maintain or advance enterprise competitive position in the face of such shocks or challenges.

APPROACH: A model and associated assessment regime capable of advancing sustainable enterprise excellence, resilience and robustness (SEER2) are proposed. *Sustainable Enterprise Excellence, Resilience and Robustness* (SEER2) integrates principles, methodologies, and standards common to the enterprise excellence and sustainability movements as a means of subsequent joint optimization of enterprise performance across the TBL people, planet, and profit (3P) domains.

FINDINGS: A Springboard to SEER2 Model that blends simplicity and usability and is intended for use by a wide range of enterprises is introduced. Key model elements include data analytics and intelligence, human ecology, and social-ecological innovation. The Springboard is augmented by a straightforward assessment regime composed of narrative maturity scales, performance dashboard technologies and SWOT plot narratives that produce actionable feedback and foresight, thus informing next generation strategy, activities and performance that support identification and implementation of best and *next* best practices and sources of competitive advantage.

PRACTICAL & SOCIAL IMPLICATIONS: The Springboard to SEER2 delivers insight and foresight that enable the enterprise to deliver environmental, societal, and economic benefits.

ORIGINALITY: A first model and assessment regimen integrating sustainable enterprise excellence, resilience and robustness with critical calculus and physics concepts is introduced.

KEY WORDS & PHRASES: Corporate Sustainability, Corporate Social Responsibility, Enterprise Self-Assessment, Social-Ecological Innovation, Springboard Modeling.

Introduction

Surviving and thriving: one a necessity and the other an aspiration or privilege. Enterprise resilience and robustness are strongly related to survivability, excellence to prosperity or thriving, and sustainability to both survival and prosperity. At the organic level enterprise excellence, sustainability, resilience, and robustness are tightly entwined, often moving in like directions. At atomistic levels however, these are not wholly consonant in the sense that the set of strategy, policies, partnerships, and practices optimizing one of these is unlikely to optimize the others. This suggests the desirability of a holistic methodology that simultaneously explores and leverages synergies and reconciles dissonances among these, leading to an integrated or aligned approach such as the one provided herein.

Enterprise Resilience and Robustness

Fundamentally, resilience is the ability of an enterprise to self-renew and thus rebound from social, ecological, political, supply chain, or other shocks or challenges in its environment, whereas robustness is enterprise resistance or immunity to shocks. Innovation (Contu, 2002; Reinmoeller & Van Baardwijk, 2005), effective development and use of enterprise analytics (Kiron & Shockley, 2011; McAfee & Brynjolfsson, 2012), supply chain proficiency (Closs et al, 2011), and enterprise human ecology (Lozano, 2011) are included foremost among enablers of – not only resilience and robustness – but also of enterprise excellence and sustainability.

An analytic philosophy (Stroll, 2000) of enterprise resilience and robustness that springs from the scientific roots of Isaac Newton's coefficient of reciprocity and Leonardo da Vinci's coefficient of friction can be devised. This philosophy motivates a conceptual hybrid referred to as the *coefficient of enterprise resilience and robustness*, $CER^2(\alpha, \beta)$. In this formulation α is a vector of primarily internal elements largely controllable by the enterprise and β is a vector of stochastic elements in the external environment over which the enterprise has no or very limited influence.

It is in the best interest of the enterprise and its stakeholders to identify and pursue a set of strategies, policies, partnerships and processes that will optimize $CER^2(\alpha, \beta)$ over a given time span, $\Delta\tau$ (Edgeman and Williams, 2014). In this quest it is possible that alternative solution sets leading to similar values of $CER^2(\alpha, \beta)$ will exist. Equally, it is possible that one or more solution sets leading to a lesser value of $CER^2(\alpha, \beta)$ may prove preferable to a solution set yielding an "optimal" value of $CER^2(\alpha, \beta)$ – an approach referred to as satisficing (Bendor et al., 2009). From a game-theoretic perspective this implies that there is a dominant selection of strategies, processes, partnerships, and policies spanning (α, β) and that the intersection of (α, β) element-by-element strategies, processes, partnerships and policies is itself a deficient Pareto-suboptimal equilibrium (Hodgson, 2013). This situation arises for multiple reasons, not the least being that $CER^2(\alpha, \beta)$ cannot fully elaborate all issues in which the enterprise must exercise judgment in its strategic and operational decision-making processes. This is especially true in softer, less quantitative areas where senior enterprise leadership and governance must consider tradeoffs and relative priorities among sustainability, excellence, and varied intangible components (Edgeman, 2013a; Elkington, 2006).

Multi-criteria conceptual analogs to minimax regret (Manski, 2007) and steepest ascent and descent methods (Goldfeld et al., 1966) are of value in choosing among alternative solution sets. In the present context, the objective of such approaches is to deliver real-time organizational resilience and robustness through selection of an ideal solution set of strategies, policies, partnerships and practices – that is, to optimize organizational agility (McCann et al., 2009; Sherehiy et al., 2007). The relative impossibility of this task is evident at many levels in light of longer-term supplier relationships that contractually bind an enterprise, various compliance requirements, collective bargaining or other labor agreements, technology commitments, and any number of other constraints that generally serve to limit organizational agility. This is of course a multi-faceted issue ripe with competing interests, for

example supplier agreements can positively contribute to supply chain sustainability and security (Hassini et al., 2012).

Enterprise Sustainability and Excellence

Sustainability is intimately connected to the triple bottom line (Elkington, 1997) or TBL that stresses a blend of societal, ecological, and economic benefits, yet the focus of many of TBL advocates is inherently social-ecological, dedicating scant attention to the economic performance dimension that is cornerstone to enterprise excellence. Similarly, enterprise excellence adherents have historically devaluated the TBL's social and environmental dimensions.

That said, there are key principles that each can absorb from the other, and there are of course important co-enablers of sustainability and enterprise excellence. As one example, enterprise excellence models are highly consistent with the adage that “the proof is in the pudding” in that they stress documented enterprise performance and impact (McNulty & Canty, 1995) and the notion that performance and impact proceed from strategy and governance that are deployed via processes, partnerships, policies and people. Similarly it is widely accepted that innovation is critical to organizational relevance, success, and longevity (Burgelman & Grove, 2007) – but it is also acknowledged that sustainability is the key driver of enterprise engagement in social-ecological innovation (Nidumolu et al., 2009). These two examples suggest that integration of sustainability and excellence should emphasize triple top line strategy (TTL) with innovation central to its fulfillment that is reflected in superior TBL performance and impact. Triple top line (TTL) strategy mandates that enterprise leadership and governance should drive socially equitable and ecologically responsible impact and financially sound performance (McDonough & Braungart, 2002).

Rather than full integration of sustainability and excellence to yield sustainable enterprise excellence or SEE (Edgeman & Eskildsen, 2014a), prior attempts to wed sustainability and enterprise excellence have primarily focused on addition of sustainability modules or perspectives to established excellence models. While such efforts acknowledge sustainability, they have generally marginalized its importance and have only poorly leveraged synergies, reconciled dissonances, or prioritized sustainability performance.

Many of the models and principles that have influenced this effort have generally been extensively vetted and have systematically evolved through numerous iterations (He et al., 2011). Among social-ecological sustainability standards and principles are the 10 Principles of the United Nations Global Compact (Kell, 2012), ISO 26000 Social Responsibility Standard (Helms et al., 2012), ISO 14000 Environmental Management Standard (King et al., 2005), United Nations Millennium Development Goals (Sachs, 2012), and the Global Reporting Initiative (Scherer and Palazzo, 2011). Familiar enterprise excellence models include the balanced scorecard (Kaplan & Norton, 1992) and those supporting America's Baldrige National Quality Award the European Quality Award (Bou-Llusar et al., 2009).

Connecting the Dots: Sustainable Enterprise Excellence, Resilience and Robustness (SEER2)

Enterprise excellence, sustainability, resilience and robustness are interrelated elements critical to organizational vitality, yet they are often treated as distinct, leading to failure to understand their complementary and competing aspects. This leads to failure to coalesce them in ways that reduce dissonance and exploit synergies among them as a means of enriching enterprise performance. The approach taken herein is a maximin one (Diekmann, 1985) that aims to maximize synergies and minimize dissonance among sustainability, enterprise excellence, resilience, and robustness in order to simultaneously advance these and in the process generate societal (Faaij et al., 2013; Porter & Kramer, 2006), ecological (Boons & Wagner, 2009), and economic benefits (Al-Najjar & Anfimiadou, 2012; Guenster et al., 2011).

This approach requires identification of their joint enablers, among which are enterprise human ecology, governance, big and small data analytics (Chen et al., 2012; Malhotra et al., 2013), and general and social-ecological innovation with the latter element resulting from embedding innovation for sustainability (Hall & Vredenburg, 2012; Lenssen et al., 2013) in a culture of sustainable innovation (Arnaud & Sekerka, 2010; Nill & Kemp, 2009). An enterprise culture supportive of sustainable innovation is one in which innovation is persistently, rigorously, and systematically pursued, is systemic throughout the enterprise, and is of strategic importance to the enterprise's performance and impact. Innovation for sustainability implies that a critical subset of enterprise innovation activities are societally and ecologically focused or, at minimum, consciously consider social or environmental implications of innovation (Edgeman & Eskildsen, 2014b) as acts of eco-preneurship (Dixon & Clifford, 2007).

We next present the fundamentals of the designated approach: a springboard (basic) model and associated self-assessment criteria, that proceed from the following definition:

Sustainable enterprise excellence, resilience and robustness balance complementary and competing interests of key stakeholders, society, and the natural environment in order to increase the likelihood of superior and sustainable competitive positioning and hence long-term enterprise success. SEER2 presupposes continuously relevant and responsible governance, strategy, actions, performance, and subsequent impact. SEER2 is pursued through ethical, efficient and effective (E3) enterprise governance and strategy and is enabled by superior organization design & function, innovation, enterprise intelligence & analytics, operational and supply chain proficiency, and human ecology. SEER2 leads to superior customer-related, human capital, financial, marketplace, societal, and environmental performance and impact.

Springboard to SEER2: Model, Criteria and Maturity Assessment

Having previously identified select SEER2 enablers, a Springboard model and associated assessment regime can now be presented. This approach requires comprehensive review or self-assessment enterprise of all *relevant* enterprise strategies, activities, and performance, the objective of which is to deliver insight into recent organizational performance, including operational, performance, and strategic successes and failures as well as areas where performance differed significantly from projections in either form or magnitude. Use of the term *relevant* is understood to mean that such models do not access everything but rather focus on whatever is “relevant to whatever the model seeks to discover” so, whereas *comprehensive* implies thorough, regular, and precise examination and discovery of intelligence relevant to areas assessed by the model.

Such intelligence is of limited enterprise value unless it provides *actionable* feedback and foresight in areas that include competitive, market, societal, political, and environmental conditions and trends that subsequently informs strategy, and stimulates improvement. Armed with this information, the enterprise is able deliver environmental, societal, and economic benefit while delivering best and *next* best practices and sources of competitive advantage, thereby advancing enterprise process toward SEER2.

Production of a SEER2 model and assessment regimen is approached through adaptation and extension of the *Springboard to SEE Model* (Edgeman and Eskildsen, 2014a) and associated assessment strategies and tools that include maturity measurement, *SWOT Plot Narratives*, *SEE NEWS Compasses*, performance dashboard technology, and the *SEE NEWS Report*. The *Springboard to SEER2* is conceptually similar to many enterprise excellence models in promoting enterprise governance, executive leadership and strategy as providing policies and priorities that are transformed into performance results through people, partnerships and processes and it is these three primary divisions that form the blocks of the Springboard to SEER2 model.

Figure 1 reveals six primary areas of the *Springboard to SEER2* that are subject to assessment: Triple Top Line Strategy & Governance (1), Process Implementation, Translation & Execution (2), and the four performance and impact areas of the Triple Bottom Line Performance & Refinement block – Financial & Marketplace Performance & Impact (3), Sustainability Performance & Impact (4), Human Ecology & Capital Performance & Impact (5), and Innovation and Continuous Improvement Performance & Impact (6). The assessment of each area is comprised of a graphical representation referred to as a *NEWS Compass*, and an accompanying *SWOT Plot Narrative* similar to that provided in Figure 2 citing relevant strengths, weaknesses, opportunities and threats.

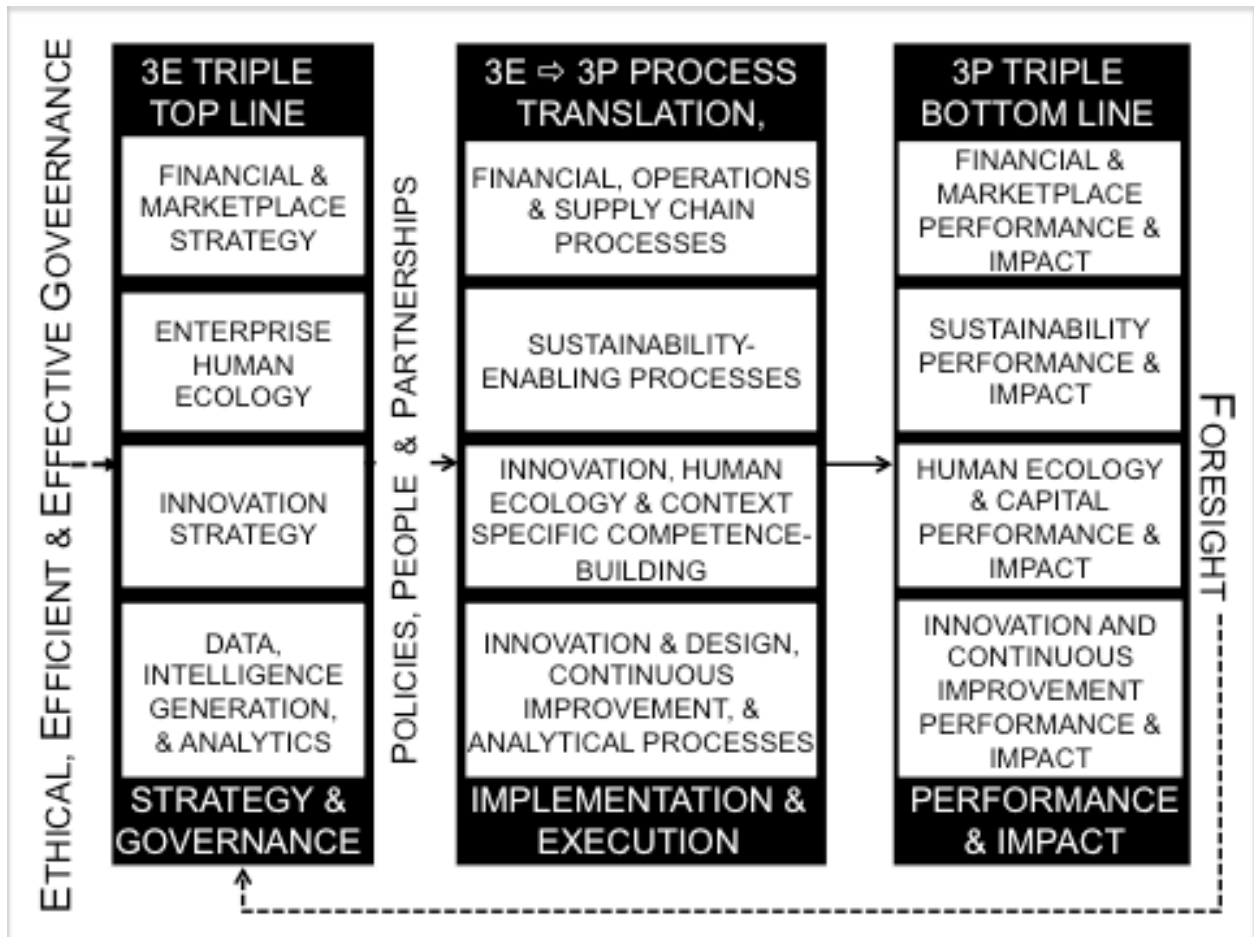


Figure 1. Springboard to SEER2 Model

The Springboard to SEER2 self-assessment approach assesses four main aspects or perspectives for each of the six primary assessment areas and designates these perspectives as N, E, W, S. The acronym NEWS is intentionally *double entendre* as it intends to connote both direction (North, East, West, South) in which the organization may move to improve its performance and impact, and intelligence or “news” concerning enterprise health and the way forward with respect to *Sustainable Enterprise Excellence, Resilience and Robustness*. These perspectives are cited in Table 1.

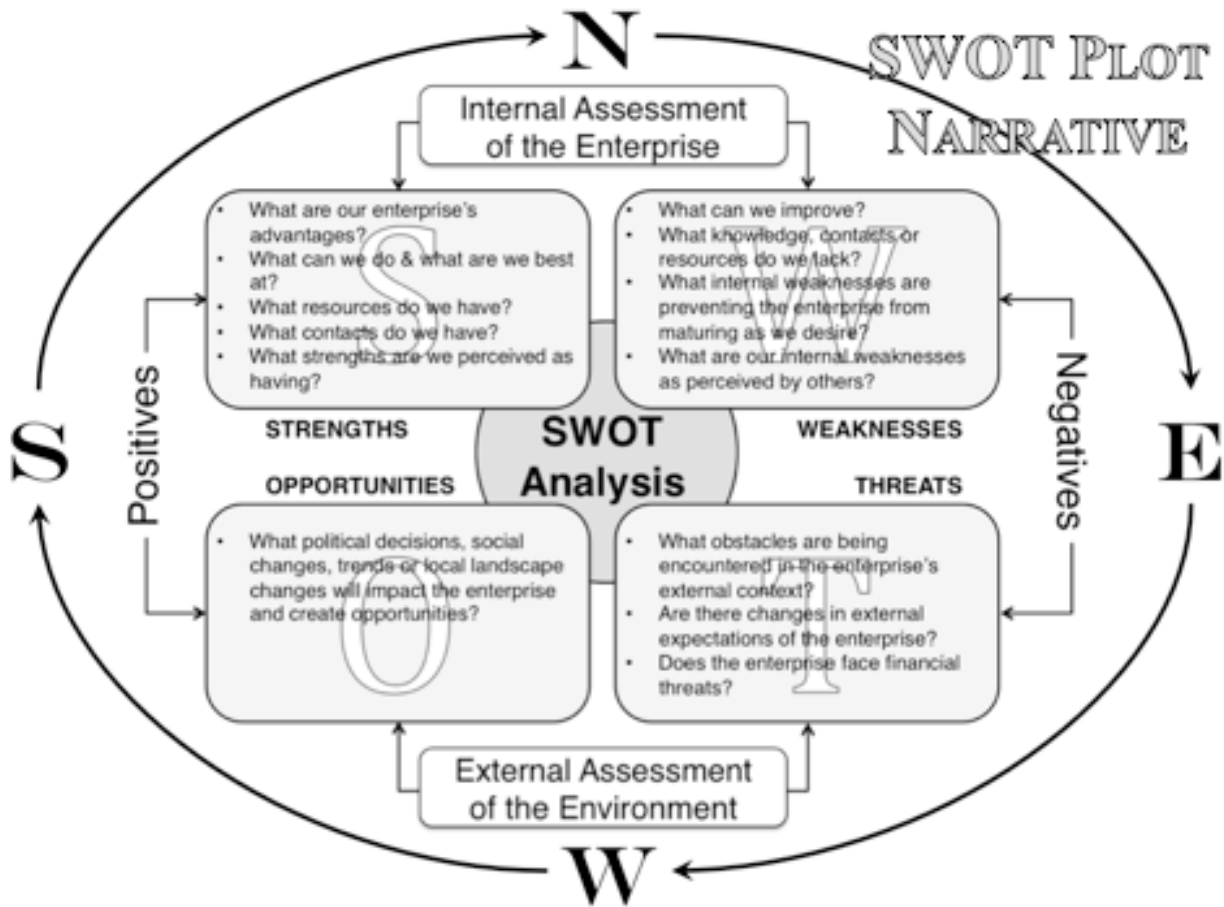


Figure 2. Generic SWOT Plot Narrative

It may be debated whether the ideal number of perspectives for each compass is four or should be more, less or variable. Equally, other modelers might select alternative perspectives or describe the provided ones differently. Similarly, the Springboard employs 0-to-10 maturity scale differentiation for each perspective assessed and other modelers may describe maturity differently or select a different scheme. The scale is divided into five highly descriptive and progressive categories, with the possibility in each category of some discretion by an expert assessor. The categorical maturity ranges and labels are: (0-1) very low maturity, (2-3) low maturity, (4, 5, 6) moderate maturity, (7-8) high maturity, and (9-10) very high maturity. Maturity values for each N-E-W-S perspective are plotted on the appropriate dial of the *Springboard to SEER² NEWS Compass Dashboard* portrayed in Figure 3. The top dial in the dashboard has six axes rather than four (N-E-W-S) with each axis corresponding to one of the six primary assessment areas delineated in Table 1. A *SWOT Plot Narrative Dashboard* identical in construct to the Springboard to SEER² NEWS Compass Dashboard of Figure 3 will accompany the NEWS Compass Dashboard and, taken together these will comprise the overall SEER² assessment that may be referred to as the *Springboard to SEER² NEWS Report*.

N-E-W-S perspectives associated with a given dial may be weighted, with preference for weightings that reflect the competitive context where, of course, non-negative weights must sum to 1.00 (100%) within each primary assessment area as well as for the six axes of the summary “compass” positioned at the top dial of the dashboard. Any weighting should be reflected in associated SWOT Plot Narratives. Similar assessment approaches may be employed to assess corporate social responsibility, sustainability, enterprise excellence, resilience, robustness, innovation capacity, or another area of interest.

Table 1. Springboard to SEER² NEWS Compass Point Elements

NEWS Perspective	Compass Areas	
TRIPLE TOP LINE STRATEGY & GOVERNANCE (1)		
N	Financial & Marketplace Strategy for SEER ² & Supply Chain Strategy	
E	The Enterprise & Human Ecology Strategy	
W	Social-Ecological Innovation (SEI) and General Innovation Strategy	
S	Big Data, Intelligence Generation, and Analytics Strategy	
PROCESS IMPLEMENTATION, TRANSLATION & EXECUTION (2)		
N	Financial, Operations & Supply Chain Processes for SEER ²	
E	Human Ecology, and Context Specific Competence-Building	
W	SEI / Innovation, Design & Continuous Improvement Processes & Execution	
S	Big Data, Intelligence Generation, and Analytics Processes & Execution	
FINANCIAL & MARKETPLACE PERFORMANCE (3)		
N	Financial & Marketplace Results Traceable to Supply Chain Performance	
E	Financial & Marketplace Results Traceable to Human Capital Investment	
W	ROI & Reinvestment in Innovation, Design & Continuous Improvement: R&D	
S	Financial & Marketplace Results Traceable to Big Data, Intelligence Generation, and Analytics	
SUSTAINABILITY (SEER²) PERFORMANCE W/ EMBEDDED ECONOMIC, INNOVATION, AND ANALYTIC IMPACT (4)		
N	Sustainability Results Traceable to Supply Chain Performance & Analytics	
E	Sustainability Results Traceable to Human Capital Engagement & Analytics	
W	Environmental Sustainability Results & Refinement and Analytics	
S	Societal Sustainability Results & Refinement and Analytics	
HUMAN ECOLOGY & CAPITAL PERFORMANCE (5)		
N	Impact of Human Ecology & Capital on the Supply Chain	
E	Impact of Human Ecology & Capital on Trajectory, Agility and Velocity	
W	Impact of Human Ecology & Capital on Innovation Capacity	
S	Impact of Human Ecology & Capital on Organization Design	
SEI & GENERAL INNOVATION, DESIGN, AND CONTINUOUS IMPROVEMENT PERFORMANCE (CI) (6)		
N	Impact of Innovation, Design & CI Across and In the Supply Chain on SEER ²	
E	Impact & Interaction of Innovation, Design & CI with Human Ecology & Capital on SEER ²	
W	Impact of Innovation, Design & CI on Other Non-Financials & Intangibles	
S	Impact and Interaction of Big Data, Intelligence Generation, and Analytics with and on Innovation, Design & CI Relative to SEER ²	

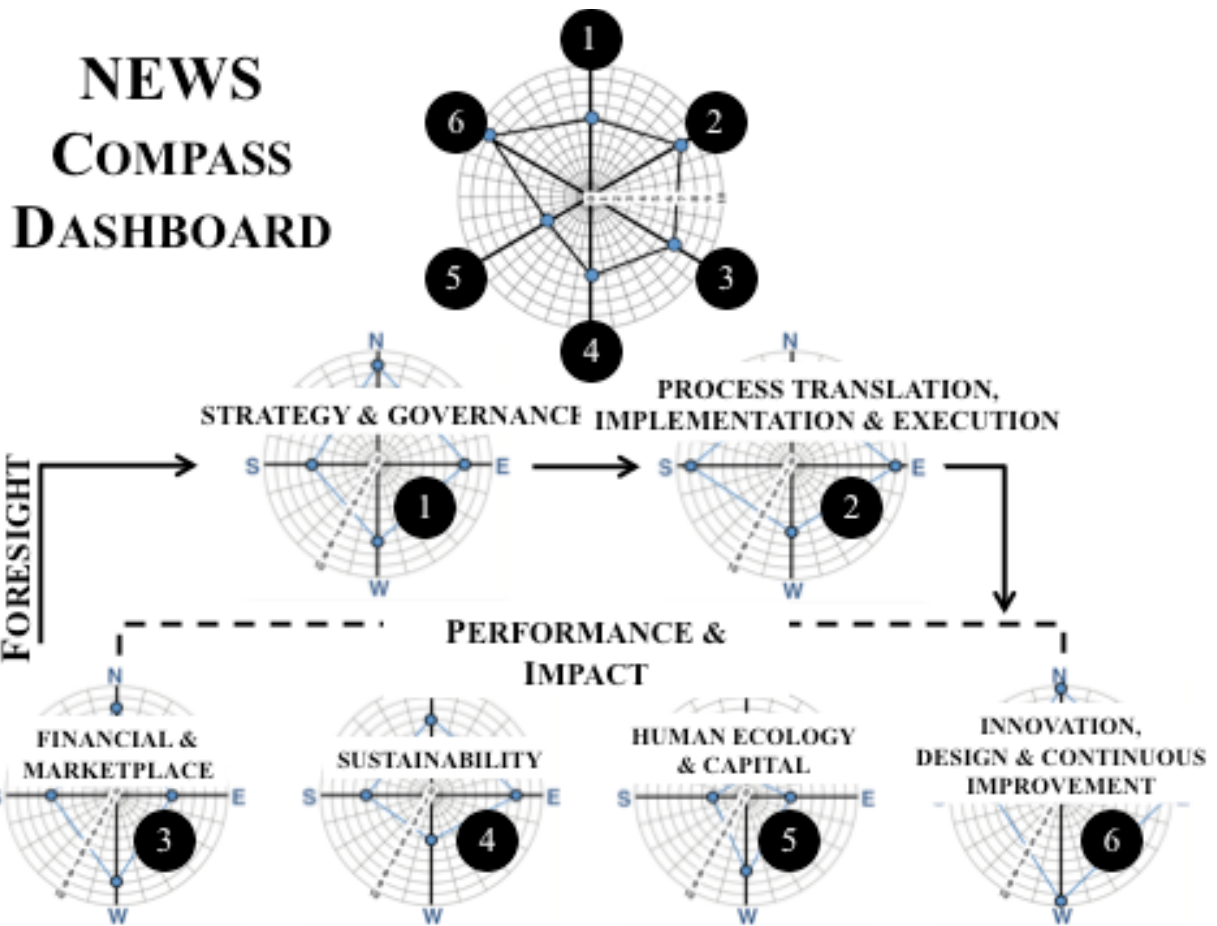


Figure 3. Springboard to SEER2 NEWS Compass Dashboard.

Summary and Conclusions

Focus has herein been trained on provision of a strategic and operational definition of *Sustainable Enterprise Excellence, Resilience, and Robustness* (SEER2), elaboration of key SEER2 enablers, and development of an intentionally simple and easy to use Springboard to SEER2 model and associated assessment regimen. Key enablers include superior triple top line enterprise strategy and governance; big and small data analytics and intelligence; enterprise human ecology; and innovation in general and social-ecological innovation in particular – all of which are deployed via exemplary process identification, implementation, and execution that together generate superior triple bottom line performance and impact.

Sustainable enterprise excellence, resilience and robustness are hallmarks of high-performing organizations that survive by successfully navigating turbulent times and conditions and thrive in good times – all while pursuing continuously relevant and responsible strategies, activities, performance and impacts. This requires rigorous enterprise self-assessment relative to SEER2. While assessment provides an enterprise health review, it is generally acknowledged that the primary expectation of enterprise self-assessment is that it should provide ample and *actionable* foresight. Translation: assessment aims to improve enterprise performance with particularly astute enterprises able to attain significant improvement and implement best and next best practices, strengthening existing or identifying new sources of competitive advantage. Central to this effort is the ability to meaningfully estimate enterprise maturity with respect to each N-E-W-S perspective for each primary assessment area cited in Table 1.

Superior enterprise performance relative to SEER2 is critical to long-term (sustainable) enterprise viability and financial success – elements that are satisfying and motivating to most enterprise stakeholders. Equally compelling is the contribution of SEER2 to positive societal and ecological performance (Reinhardt & Stavins, 2010).

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THE BENEFITS OF TAKING A RADICAL APPROACH TO CONTINUOUS INNOVATION

JACOB BRIX, LOIS PETERS



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The benefits of taking a radical approach to continuous innovation

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Abstract

Purpose: this study inquires into the question: *to what extent does the process of establishing radical innovation proposals identify new potential for improved performance?* The goal is to determine the types of early-stage concepts that are developed, their *potential* performance impact on the existing business and their *potential* value to the organization *ex ante* realization/implementation.

Design/methodology/approach: we apply a participatory case study approach combined with a content analysis of data from an idea management system that was utilized by the case organization. We seek to build new empirically based theory on the direct and indirect value that emerges by creating new potential concepts to the innovation stream of an existing company.

Findings: we conclude that three types of performance improving activities are developed to be exploited during opportunity recognition and concept development, when working disciplined with a radical innovation project. These concern existing products and production, as well as the conceptualization of new products to the organization, market and world.

Implications: approaching high uncertainty projects in a disciplined manner *can be beneficial* to an organization on both a long term *and* a short term basis, since knowledge that is directly exploitable is identified during the exploration process. In short: it is a win-win approach to innovation.

Originality/value: our paper is original since we treat the study of innovation as an independent variable. We apply a theory-building approach based on empirical evidence that was collected in a real life setting and not in a business school setup. Our findings are novel because we examine the potential value of radical innovation processes *ex ante* realization and decision-making. Hence, we examine what happens before the archetypical performance measurements of realized innovation projects can be utilized to verdict the success or failure.

Paper type: Case study

Keywords: Performance management; radical innovation; measuring innovation performance; innovation stream; case study; product innovation.

1. Introduction

Does it make sense to work with small-scale improvements for innovation? The short answer is ‘no!’ In this case study we demonstrate that rather ambitious large-scale innovations which inspire small-scale improvements work better when searching proactively for new inputs to the organizational innovation stream (Tushman et al. 2010).

When it comes to the question of evaluating performance impact of innovation projects, conventional research has been conducted by focusing on the tangible outcome measurements of finalized projects (Adams, Bessant and Phelps, 2006). Here variables such those published in the economics of innovation (Battisti and Iona, 2009), data from the Community Innovation Survey (Hashi and Stojcic, 2013), or the ‘hard’ technological measures described in the Oslo Manual (OECD, 2005) have been scrutinized. Research in this tradition investigates the value of patents (Bloom and Van Reenen, 2002; Hall et al., 2005), new product development (Schultz, Salomo and Talke, 2013; Atuahene-Gima, Li, and De Luca, 2006), optimization of business processes (Harry and Schroeder 2006), new business models (Osterwalder and Pigneur 2010; Zott, Amit and Massa, 2012), and more recently service innovation (Mina, Bascavusoglu-Moreau and Hughues, in press). These important but narrowly focused studies on innovation outcomes and their measurement have exploded in the last decades (Crossan and Apaydin, 2010). However such innovation studies have been criticized as being routinized investigation of facilitator and inhibitor variables of innovation that fall into the replication-extensions category (Sackett and Larsen, 1990) as opposed to theory-driven or deriving from real word problems (Anderson, Drue and Nijstad 2004; Lundvall, 2013).

To address this criticism and avoid the pitfall of too narrow a framing of study of innovation and performance outcomes, we seek to stretch the existing research frontier by providing evidence drawing from empirical investigation of the process of concept development. In particular we investigate how the potential and viability of different prototypes of concept proposals that are identified *during* the development and processing of a radical innovation project are determined. Hence, we develop our study with an empirical theory-building approach by redirecting focus from the ‘hard outcome measures’ to the *potential performance/value/impact* of concepts that are being developed *before* they are presented to organizational decision-makers. Thus we treat innovation as an independent variable as suggested by Anderson, Drue and Nijstad (2004) to be an important future path for innovation research. We demonstrate that the new knowledge creation and learning that occurs in an innovation team can bring about multiple benefits. First, one of our key take-aways is that the team members’ readiness for change is increased since they learn to examine multiple potentials of the future, instead of reactively responding to external pressures (Brix and Peters, 2014). Secondly, we demonstrate that the beneficial value extends to a potential for a) improved product performance, b) more efficient production processes, c) new or radically improved product-lines, d) architectural as well as modular innovations cf. Henderson and Clark (1990) and OECD (2005), and finally e) the development of breakthrough routines amongst the team members for knowledge search and integration.

1.1 The need for breakthroughs in turbulent markets

The Research Group for Radical Innovation, e.g. Leifer et al. (2000), O'Connor and Demartino (2006), Peters (2006) and O'Connor and Rice (2013) argue that incremental innovation is 'the bread and butter of organizational health' and that working proactively with new initiatives is better than not rethinking the business at all. However, their research also strongly determines that new ways of approaching innovation is necessary to go beyond the incremental trap of 'only' realizing a number of low ambition projects. These are referred to as incremental traps, because the tweaking of existing processes and products will fail to deliver what top management really expects for their innovative strivings: new breakthroughs and new state-of-the-art business models that will have a significant impact on the company and/or the market (Keupp, Palmié and Gassmann, 2012; Raisch et al. 2009; Shelton and Percival, 2013). Many top executives recognize that new business breakthroughs and game changers are not only important for growth but also are critical to survival. For this reason radical innovation is increasingly becoming part of the agenda of large organizations, as they exist in turbulent, ever changing and increasingly demanding environments. Here incremental innovation projects are no longer enough to ensure continuous growth in the private sector and to maintain high service levels in the public sector (Strebel, 1987; Bergek et al. 2013, Huber, 2011, Shelton and Percival, 2013).

There is however a paradox present in the organizations that emphasize radical innovation in their strategic intent: when faced with new and radical project proposals most decision-makers in these organizations are reluctant to allocate man-hours and to provide the necessary capital for the exploration of these kinds of proposals, even though they espouse the importance of them. Decision-makers are simply intimidated by the high levels of uncertainty and the long-term oriented nature of these projects, which might not add value to the organization on a short-term basis (Robeson and O'Connor 2013). Likewise, the decision-makers reject many proposals instantly, because the promoter(s) cannot highlight any immediate value and/or benefits to the organization when pitching their ideas (Talke and O'Connor, 2011). The shortcoming is evident: decision-makers utilize inappropriate tools such as cost-benefit analysis to evaluate the feasibility of radical innovation proposals to guide their decisions.

1.2 Purpose and goal of the study

Because the initiation of a radical innovation project is less likely than searching for small certain improvements in established firms, the purpose of our research is to explore and analyze the new knowledge that is created and developed when a high uncertainty proposal with a high level of managerial ambition is initiated in a real life setting. We assert that the learning stemming from the new knowledge creation and the exploration of a high uncertainty proposal represents a large potential for later exploitation – a potential that more often than not is bypassed by the decision-makers based on their false assumptions, lack of understanding and vague calculations regarding the result(s) and the estimated impact of the radical proposal's realization (Brix, 2014; Robeson and O'Connor, 2013).

The question we seek to elucidate in the study is therefore: *to what extent does the process of establishing a radical innovation proposal identify new potential for improved performance?*

The goal is to determine the types of early-stage concepts that are developed, their *potential* impact on the existing business and their *potential* value to the

organization's innovation stream. Our analysis seeks to ascertain if and how new potential for improved performance is identified during a radical innovation process and if so, in what way the identified potential may be of more importance and of higher value to the organization's innovation stream than preliminarily imagined. Determination of the existence of such unforeseen consequences from the early stages of the innovation process reinforces our assertion that investment in radical innovation proposals with high uncertainty is not necessarily 'valueless' if/when the initiated project does not reach the expected outcome(s). The propositions developed claim that the scope and impact from investing in these explorative learning activities is much further reaching than traditionally conceived performance measures as mentioned above. Moreover, the implications provide R&D managers, innovation consultants etc. with more ammunition to persuade top-managers, Board of Directors and other decision-makers to invest in high uncertainty projects: a need that is highly present in the aftermaths of the financial crisis where a strong focus on exploitation (short-termism) has not proven beneficial and in several cases led to organization demise.

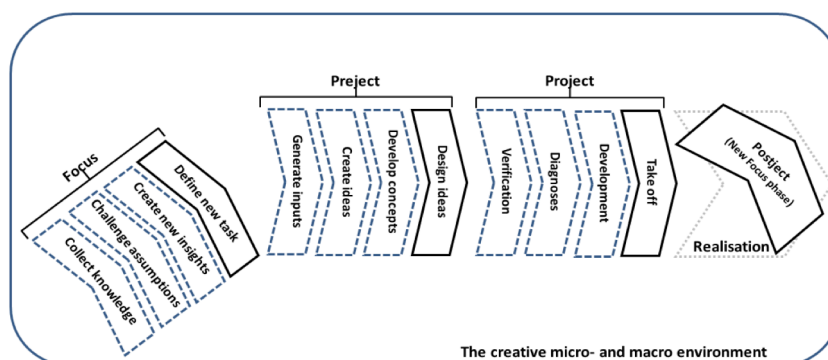
2. Methodology and case organization

We report on a longitudinal case study. The unit of analysis was a regional department in a multinational enterprise that produces technology-processing equipment for recycling of private and industrial scrap to be used in the district heating industry. The purpose of the initiated radical innovation proposal was to radically rethink the technology used to process scrap with a goal of increasing production efficiency by more than 50 per cent. Hence, the initiated project was according to OECD's (2005) Oslo Manual a product innovation project with a high degree of novelty and uncertainty.

Access to the case organization was created through two senior innovation consultants from the Danish Technological Institute (a private consultancy) that allowed one author to follow and observe their advising and collaboration with the case company over a period of nine months with the six-person innovation team that the top management had assembled.

The advantage of following the DTI consultants was twofold. First, the research setting was appropriate for our area of interest because we got in-depth insight about the case organizations practitioners and their innovative praxis cf. Whittington's (2006) recommendations on empirical theory building. Here we could investigate what happened when a team convened to develop and process the early stages of a radical innovation proposal, which makes our study and findings more robust due to the knowledge about actual 'theories-in-use' and not only the practitioners' 'espoused theories' (also cf. Argyris and Schön, 1974; Crossan and Apaydin, 2010). Secondly, the DTI consultants utilized the 'Creative Idea Solution' (CIS) framework, which is a systematic method to seek radical innovation (cf. Brix and Jakobsen, 2013): see figure 1 below. The utilization of the CIS methodology as a systematic approach to data collection makes the study replicable and comparable for later purposes (Eisenhardt and Graebner, 2007; Yin, 2009) and therefore it further strengthens its robustness.

Figure 1: the Creative Idea Solution (CIS) framework



Source: Brix and Jakobsen 2013

The CIS framework is a continuous innovation process that seeks radical innovation outcomes. It iterates three phases, the Postject/Focus phase, Preject phase and a Project phase (Ibid.). One of the authors was allowed to participate in the first two phases of the CIS approach, the Focus and the Preject phases. The Project phase was run by the case organization itself to its final stages and thus was outside the scope of this investigation thereby providing a clear delimitation to the study.

Basically activities in the two phases include: 1) bringing together different views about the state of the organization, the technology in use and the implications of this for the new radical proposal 2) determination of how the status analysis informs about reinforcing, refining or reforming project guidelines and specifications 3) carrying out stakeholder and experts workshops to uncover new opportunities, 4) convening a forum to exchange thoughts about the value and meaning of the identified new opportunities. Through negotiating about shared meanings and differences, more robust opportunities are articulated. 5) Choosing opportunities to develop and establish as projects.

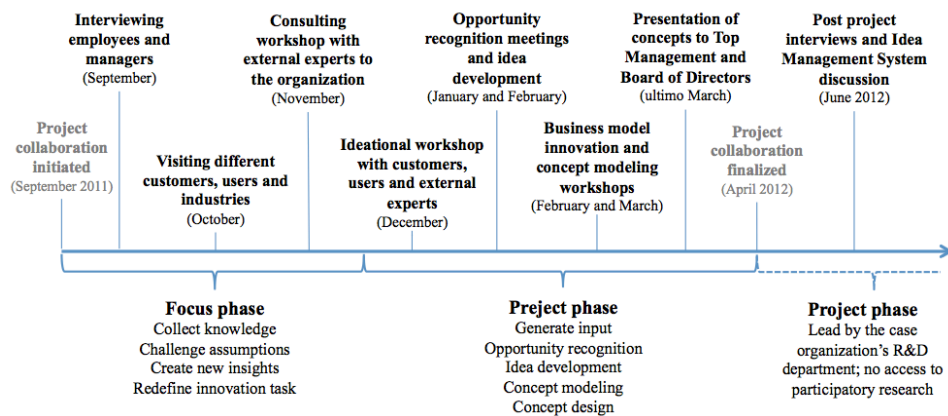
The participating author partook in the process of developing the radical innovation proposal from when it was initiated until the presentation of 31 concepts to the organizations Board of Directors. During the data collection process data such as field jottings, interview notes and photos were made which allowed us to observe the dynamic interactions, challenges to assumptions, pattern-breaking mechanisms and the negotiation of meaning during opportunity recognition, and the estimation of the potential value of newly developed concepts. One year after the participation ended the authors were permitted to access to the idea management system, which the team and the consultants utilized to manage the myriad of information and knowledge that was developed during the project. The information in the idea management system demonstrates the development of ideas from first stage (inputs from the idea generation workshops) until the final prototypes of new innovation concepts, which are described in proposals (business cases) used to present to decision-makers for approval to start up full-scale innovation projects.

This case study is therefore based on data about the background, the process and the preliminary results of the process (here regarded as the developed concepts) as well as observation regarding facilitation and subsequent reactions to the facilitation. For the purpose of this paper we present a description of the innovation process and we hereafter utilize the data from the idea management system to build empirically based theories.

3. The data collection process

The overall processing of the project is described to present an in depth story of the project's development. Figure 2 illustrates the general timeframe of the project. First the Focus phase is described and afterwards the Preject phase is described.

Figure 2: timeline for the project



Source: Authors' development

3.1 Following the Focus phase

The project collaboration started up September 2011 after the contract between the DTI and the field study company unit was signed. During the four steps in the Focus phase the innovation team presented their organization, its history and their products, which were different types of technological processing equipment for private/industrial scrap. The basic functions of the processing equipment were explored by visiting the production sites, and the types of materials utilized in the production of the machinery were documented. The collection of knowledge also included fieldtrips with the team by visiting customers in Germany to experience how the equipment functioned in practice and to get new insights by speaking to the daily operators of the machinery. The collection of knowledge worked as a 'state-of-the-art' for the consultants to advise the team. After having created the technological state-of-the-art about the existing technologies and how they worked in practice, a number of shortcomings were identified. Here earlier compromises had proven to be inadequate in relation to the operation of the machinery e.g. choice of materials for wear and tear parts, the physical work environment, and the integration (or lack of integration) with the value-system of processing scrap from the collection of it towards the utilization of the granulated/shredded materials in the district heating industry and/or in the following

recycling process. During the Focus phase different professionals were consulted to gain knowledge about facts and to avoid false assumptions or illusions about reality in relation to e.g. the before mentioned choice of materials and the characteristics of wear and tear, the feeding mechanism of the machinery, etc. Additional field visits were made in Denmark and in Germany and a consulting workshop was completed following Brix, Jakobsen and Jordansen's (2012) recommendation. Here a number of questions were developed which the invited experts, e.g. metallurgists, chemical, electronic and mechanical engineers were asked to answer, so the assumptions of the team were challenged and the team could get new insights. This workshop resulted in a re-formulation of the task of the project cf. the CIS framework (Brix and Jakobsen, 2013). The projects new defined task has been held confidential due to agreement with the case organization, but the overall purpose of increasing efficiency by at least 50 percent remained the same as it was when the team was assembled and the project initiated.

3.2 Following the Preject phase

After the new task of the project was defined an ideational workshop was set up. Here the intention was to create focused inputs that could serve as source of inspiration to the team in relation to the defined task. To get both practical and theoretical points of view the composition of the participants in the workshop included team members, various stakeholders to the project and experts. Some of the individuals who were specially invited included daily users of the organizations products, people from other departments, and architecture, chemical and mechanical engineers. The ideational workshop resulted in 543 different inputs (yellow stickers). These inputs were typed into an idea management system by the consultants. This was done to control the myriad of information that had been created and not least to control and manage the following development of the inputs.

After having typed the 543 inputs into the idea management system the innovation team members got a copy of the program. They were instructed to read the inputs and mark the ones they found interesting. In early January the team had a two-day opportunity recognition workshop where they went through the 543 inputs *in plenum*. Here opportunity recognition occurred as a 'negotiation of meaning' – where the concrete meaning of a certain input was formulated and new ideas were generated. This was done by negotiating the meaning and during this negotiating a consultant typed in the information to the different inputs that were discussed in the idea management system. Some ideas got little attention and others were discussed for longer periods of time. If the members of the innovation team did not agree with one another about the meaning and potential of the ideas that were developed, then the consultants made a copy of the idea, so two similar however different ideas could be developed by two different team members. The opportunity recognition workshop resulted in 359 newly described ideas/recognized opportunities. At the end of the workshop each of the team members had to select the new opportunities in which they saw a new potential and develop them into ideas, which could be the basis of a project. Each person chose between 10 and 15 different ideas – some individuals more than others.

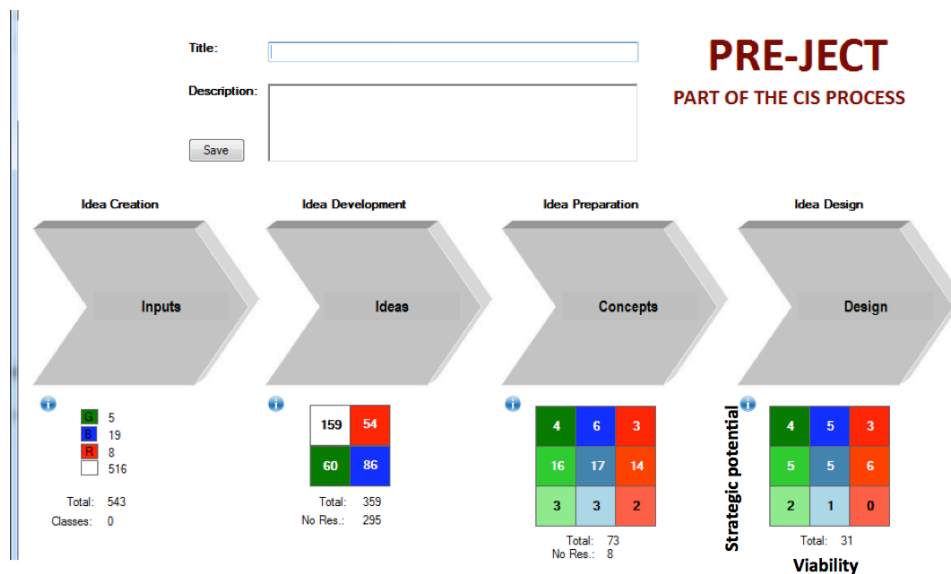
Individual team members developed their ideas by adding more information and new insights into the idea management system as they became more knowledgeable in their online and offline search of reducing uncertainty in relation to the different ideas. The team members e.g. contacted external experts in fields that were relevant to their concrete idea and they also contacted experts from their own organization; both in their own department and in other departments. The 359 ideas were reduced to 73 – the quantity had decreased and the quality of the ideas had increased: some ideas were not

further developed in the idea management system since their potential was no longer estimated to have an impact worthwhile pursuing. As the description and the development of the ideas were stagnating, the consultants decided to move forward in the Preject phase and to initiate the business model prototyping (Brix and Jakobsen, in press) part of the process. Here the team was guided in the development of concept modeling, where the different ideas that had been developed were explored in different business model set-ups. The result of the business model prototyping ended up in 31 concept descriptions where some concepts were more elaborated than others. When finalizing the business model prototyping the team discussed and, once again, negotiated how the different concepts could have different levels of potential and viability of being realized according to their insight about the current industry lifecycle, their organization and competitors activities. The results of the prototyping were described as business cases and these 31 ‘designed ideas’ represented potential new business, both small-scale innovations and large-scale changes.

3.3 Data from the idea management system

As stated previously the data from the idea management system was made accessible to the authors one year after the participatory data collection. Picture 1 below demonstrates the front page of the idea management system that was used by the team and the DTI consultants throughout the processing of the project.

Picture 1: screen dump of the idea management system



Source: the case company's intranet

3.3.1 Operational method for handling and analyzing the data

The data we utilize to shed light on the purpose of this paper is accessed by delving into the last part of the database, the *Idea Design*. Here the screen dump exhibits the 31 new concepts that were developed to spark new projects in the organization's innovation stream. To demonstrate the viability of the types of concepts that are designed in the three categories, 'green', 'blue' and 'red' we describe the types of information that are accessible in the database. A green concept is very specific and it is represented by a

detailed action plan for implementation/realization. Here there is an exact business case that can be made to demonstrate a ‘proof of concept’ to the organizational decision-makers. A blue concept is harder to describe because some, but not all elements are uncertain, and therefore the description becomes less specific/measurable. Consequently, the team can develop a partial business case and the impact of realization can be estimated, however not validated. A red concept is represented by a high level of uncertainty. Only one or few elements are certain and the rest is based on forecasting. However, if the one (or few) certain elements can be realized, then there is a breakthrough potential. Here operational actions such as ‘Discovery driven planning’ cf. Christensen and Raynor (2003) or Learning Planning cf. Rice and O’Connor (2008) is necessary to reduce the uncertainty and, in time, verify the business potential as uncertainty decreases and learning increases.

The ‘strategic potential’ is divided into low (light green, blue and red), medium (pale green, blue and red) and high (full colored green, blue and red). Here the team members placed the developed concepts and categorized them according to the potential level of impact they evaluated the concepts to have. Therefore the categorization does not treat the paradox between “easy to implement with large potential” and “hard to implement with low potential”. It only treats the degree of potential. This evaluation was made in the team as a negotiation of meaning, cf. section 3.2 ‘Following the Project phase’.

4. Results

The process of establishing a radical innovation proposal did identify new potential for the case organization, since it gave them new input to their innovation stream. Our content analysis of the data from the idea management system determines that the types of concepts that were developed can be divided into two categories: 1) concepts that improve the performance of existing offerings, e.g. reducing wear and tear of running parts and 2) new product concepts, e.g. the introduction of a transportable machinery instead of only offering stationary equipment. Hence, concepts were developed that represented a stretch of the existing s-curves to the company and new potential s-curves. These findings are summarized in tables 1 and 2 below. Table 1 presents 18 concepts that potentially improve performance features of *existing* offerings. Table 2 presents 13 concepts that represent *new products* to the organization.

Tables 1 and 2 are divided into five areas of inquiry: a) resources, b) technology, c) market, d) risk profile, and e) return tradeoff. The distinction between the new and existing aspects of tables 1 and 2 represents if the organization can use the existing resources or if it needs to access additional resource(s) to realize the potential of the proposed concept. E.g. the first concept ‘*Utilize specialized coatings (...) moving of parts*’ would require both new competencies and new technology in the organization, because coating-technology and coated materials were not part of the existing business during the data collection. Hence, the organization would need to further educate or retain an employee, or simply employ a new type of staff-member and buy-in and/or outsource the need for coating technology. The aspects of L (low), M (medium) and H (high) impact in relation to ‘risk profile’ and ‘return tradeoff’ of the concepts are negotiated estimates made by the innovation team during one of the final meetings where the ideas that were to be presented were selected.

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In general, the analysis in table 1 (below) exhibits that the development of concepts that improve existing offerings are skewed towards utilizing existing competencies (61,5 per cent) compared to 38,5 per cent focus on the need for new competencies. Interestingly there is a larger openness towards implementing new technology in the existing offerings to improve their performance and this is similar for New Product concepts as well (Table 2). Finally there is a large focus on serving the existing market(s) whereas project concepts that promote the penetration of new markets with the existing offerings are represented by only 11 per cent of the concepts. For new product concepts the penetration/creation of new markets represents 46% of the concepts (Table 2). Regarding the 'risk profiles' the developed concepts are equally distributed between low, medium and high risk concepts and the majority of the concepts represents a potential medium trade-off to the organization, if implemented/realized. Only three concepts (17 per cent) of the concepts developed to improve the existing offerings have a high estimated return trade-off. With respect to risk profiles and returns new product concepts show a much higher risk profile (54%), but like the concepts that improve existing business offerings the majority of concepts represent a potential medium return.

Concept headline	Resources		Technology		Market		Risk profile			Return tradeoff		
	New	Existing	New	Existing	New	Existing	L	M	H	L	M	H
1) Utilize specialized coatings such as (...) to reduce wear and tear of moving parts	x		x			x	x					x
2) Integrate a cylinder in "x" model to provide an improved feeder-mechanism for improved performance		x	x			x		x				x
3) Analyze competitors product ranges and learn from the functions they have which are not present in the "x" models		x		x		x	x			x		
4) Integrate a strainer in the feeder-mechanism for the x, y and z models to reduce the frequency of clogging		x	x			x	x					x
5) Each wear-part is replaceable instead of replacing an entire row of parts when some are worn out and others still functional according to requirements	x		x			x	x			x		
6) Reversing the processing of "x" reduces the wear and tear of replaceable parts		x		x		x		x				x
7) Automatic (intelligent) feedback system to engine and gearing to optimize throttle while processing mixed subject matters	x		x			x			x			x
8) Intelligent (self-adjusting) wear and tear parts on the machinery reduces the cost of service visits	x		x			x			x			x
9) On sight welding at customers/users for replacing worn out parts in stead of managing the logistics of moving the replaceable part from a to b and back again		x		x	x		x					x
10) Using drying/heating technology on wet/humid materials reduce clogging of machinery and the wear on replaceable parts	x		x			x		x				x
11) Utilize the model 'XX-000' in other industry – the function would cover the		x		x	x			x				x

need there												
12) Inducing 'x' on the knives reduces abrasion	x		x			x			x	x		
13) Implement knives made out of new materials (ceramics) to shred 'x' materials		x		x		x			x		x	
14) Hardening replacement-knives with extra welding improves the durability of the blade's cut up to 250 hours		x		x		x		x		x		
15) changing the placement of the engine will reduce time spent on service (because tubes, wires, etc. make it difficult to access 'x').		x		x		x			x	x		
16) use the heat that emerge from the processing of the scrap to 'x' the 'y'.		x	x			x		x				x
17) change the feeder mechanism to distribute the scrap equally in the shredder		x		x		x			x		x	
18) use water to cut/slice 'x' materials	x		x			x			x			x

Table 1: Concepts that improve performance of existing offerings

Table 2: New product concepts

Sum	7	11	10	8	2	16	5	6	7	5	10	3
Per cent	38,5	61,5	55	45	11	89	28	33	39	28	55	17

Concept headline	Resources		Technology		Market		Risk profile			Return tradeoff		
	New	Existing	New	Existing	New	Existing	L	M	H	L	M	H
1) Create a mini shredder (transportable) for on sight collection of scrap to increase loading capacity on trucks		x		x	x			x				x
2) Change the products design and reorganize the complete service system to add value to customers		x	x			x			x		x	
3) Using 'x' (a new technology) without parts that wear and tear can be utilized – here more service is needed to maintain efficiency	x		x			x			x		x	
4) Mixing 'x' and 'y' technology in a new machine design will serve different complementary functions in the shredding/granulation of scrap; both mono and poly stream materials	x		x			x			x			x
5) Create service packages to existing products to increase productivity at the customers – more value for less (avoid waiting time if customer's employees cannot fix it). Here sensors will be needed to inform us about time to service.	x		x			x			x	x		
6) Create a 'complete system' to benefit from the entire value network: produce conveyer systems with automatic sorting of materials	x		x		x				x		x	
7) New functions can shred, granulate and pull the scrap in pieces and sort them automatically into pre-defined material types	x		x			x			x	x		
8) New product range of replacement-knives in different material types		x		x	x			x			x	

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(ceramics, metals, composites, etc.) for mono-stream materials												
9) differentiate the existing product line – quality levels are unnecessary high for some customers; others are more demanding on wear and tear		x		x		x		x		x		
10) produce ‘xx-001’ model with ‘y’ engine – more throttle, less emission (‘green policies’ may demand this in few years).		x	x			x		x			x	
11) co-create production-line with new customers to meet their exact needs (mass-customization)		x		x	x			x				x
12) inspect customer’s production line to suggest improved efficiency (service)		x		x	x		x				x	
13) specialized machine to recycle large polymer subjects increases loading capacity of trucks per m ³		x		x	x				x			x
Sum	5	8	7	6	6	7	1	5	7	3	6	4
Per cent	38	62	54	46	46	54	8	38	54	23	46	31

Source: Authors’ elaboration

It seems that concepts with the ambition to improve the existing offerings drag along low uncertainty approaches, e.g. same markets and using same internal resources. On the other hand, the development of new product concepts with higher degree of uncertainty does drag along a more radical focus of technological and market uncertainty. Here behavioral economics and endowment effects could explain the result since it represents willingness to invest more in a familiar system rather than investing in unknown and thus uncertain activities cf. Kahneman, Knetsch and Thaler (2009).

4.1 Building theory

The propositions that can be developed are based on the analysis of the concept categorization and analysis in tables 1 and 2. They are as follows:

P1: new concepts will primarily focus on using existing competencies and by implementing/integrating new technology irrespective of whether the identified outcome is a new product or improving existing offerings.

The first proposition is developed since 61,5 percent of the concepts that improve performance of existing offerings and 62 per cent of the new product concepts are based on utilizing the existing resources.

P2: readiness for changes as proxied by ‘willingness to use new technology’ is not dependent on the category of concept development e.g. new product versus improving performance of existing.

The second proposition is developed since both concept categories focus more on potential projects that utilize new technology (55 percent in category 1 and 54 percent in category 2). In total 66 percent of the developed concepts that focus on new technology need new resources (e.g. competencies) and 33 percent of the concepts can be realized by using the organizations existing resources.

P3: new product concepts are more likely to have higher risk profiles than concepts developed to improve existing offerings businesses.

The third proposition is developed because 46 percent of the new product concepts aim at

	Degree of novelty (innovation)			Not innovation
	Maximum	Intermediate	Minimum	
	New to the	New to the	New to the	Already in

new markets compared to 11 percent in the other concept category. In addition, new product concepts have a total of 92 percent in medium or high risk profile whereas concepts that improve performance of existing products are represented by 72 per cent in this uncertainty categorization.

To analyze the potential value and impact the 31 concepts have on the organization we have created table 3 by following OECD's (2005) guidelines and definitions in the Oslo Manual: see below. Table 3 shows an analysis of how the 31 concepts from tables 1 and 2 potentially represent new innovations and their degree of novelty. The results represent interesting indications for the purpose of our study, which as a reminder, is to explore to what extent the establishing of radical innovation proposals identify new potential for improved performance. The first thing that is noticeable is that the radical approach to product innovation does reveal new potential of incremental character. This indication supports Csikszentmihalyi's (1997) theory of the 'Creative magnitude' that aiming at high levels of creativity always results in many less creative outputs as a beneficial side effect, and not *visé versa*. 10 concepts were developed that were 'new to the organization' and these could easily be realized to improve the performance on the existing product features. These are the concepts that are represented by different shades of green in the idea management system in section 3.3.

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			world	market(s)	organization	firm
TPP Innovation	Technologically new	Product	1.7; 1.10; 1.16; 2.7	1.1; 2.1; 1.8; 2.6	1.2; 1.4; 2.9	
		Production process			1.12	
		Delivery process		2.13		
	Significantly technologically improved	Product	1.18; 2.10	1.17; 2.3; 2.4	1.6; 1.15; 2.8	1.3
		Production process			1.13; 1.14	
		Delivery process		1.5; 2.11		
Other innovation	New or improved	Purely organization		1.11; 2.2; 2.5	1.9; 2.12	
Not innovation	No significant change, change without novelty or other creative improvement					

Table 3: The 31 concepts and their degree of novelty

Source: authors' elaboration; inspired by OECD (2005)

Hence, the radical approach to continuous innovation, in this context the CIS method (Brix and Jakobsen, 2013), did in our case identify multiple ways of improving the performance of existing product features, e.g. durability and lowering the maintenance as well as the service costs for the customers; and it did reveal the identification and development of new types of products. Also, during a post-project interview the project manager said:

“The many ideas and concepts we developed are not forgotten even though we only initiated two projects; they are just down-prioritized at the moment!” (...) “We did not expect a transformational breakthrough from the process, but if the new technology in few years is really going to work, our new machines will look very different from what we offer our customers today, and we expect that it will increase productivity by 70-80 percent!” He also stated that *“the (radical innovation) process has been an eye-opener for us and it has given us tools to seek and explore knowledge places where we would normally not go to get new insights!”*

This leads us to the construction of our fourth and fifth propositions:

P4: Pursuing a disciplined radical innovation process is a tool for helping change organizational knowledge search and creation routines, since it continuously facilitates the identification and development of new concepts that makes exploration knowledge exploitable.

P5: Pursuing a disciplined radical innovation process searching for product innovation leads to the establishment of both incremental and radical projects that potentially improve existing product performance; and it leads to the development of potential new to the organization, market and world products.

The fourth and fifth propositions are constructed since the 31 concepts represent a range of different types of innovation. 11 concepts are new to the company, 13 are new to the market and 6 are new to the world (estimates made by the innovation team and their research, e.g. in patent databases). 1 of the concepts is not regarded as innovation according to the Oslo manual, and therefore it is not categorized as such (concept 1.3: '*Analyze competitors product ranges and learn from their functions (...)*').

The 30 concepts that can be regarded as potential innovation projects either describe the creation of new products or explains how to improve performance on three different levels, being a) delivery/production process optimization, b) improvement of features in existing products, and c) organizational innovation that generates value in new ways build around the products. The value these concepts represent does not only contribute with new inputs to the organizations innovation stream (Tushman et al., 2010). It represents a new knowledge repository (Adams, Bessant and Phelps, 2005) with new clearly defined stream of both short and long term innovation projects that can be realized with different levels of ambition and degrees of uncertainty to boost the innovative performance of the case company when it initiates activities to explore, create and exploit knowledge to excel in the future (Smith and Tushman, 2005). Therefore a sixth proposition can be developed:

P6: identifying concrete exploitation opportunities as part of the exploration process generates knowledge that is vital to short term success irrespective of whether the identified outcome is an improved or new product; and it gives the participants the sense of small victories which motivates them in the development of the high uncertainty concepts.

In ultimo March 2012 the team presented six of the concepts to the Board of Directors and to the top management. These concepts are marked with bold text in table 3. Two of the concepts were initiated as full-scale projects. One of them represented the acquisition of a company based in a German-speaking country, a manufacturer of a process technology not before seen in the industry, and the other one a new product-line to the company; both concepts represented radical/breakthrough potential to the decision-makers.

5. Implications

The implications for our study are first divided into management practices and secondly to academic development. First it is stressed that approaching high uncertainty projects in a disciplined manner *can be beneficial* to an organization on both a long term *and* a short term basis, since knowledge that is directly exploitable is identified during the exploration process. This is perhaps also why a radical/breakthrough innovation focus is gaining in attention in the industry cf. Keupp, Palmié and Gassmann (2012), Raisch et al. (2009) and Shelton and Percival (2013). Our analysis revealed that 10 easy to implement concepts with a perceived low level of uncertainty were identified ranging from low to medium to high potential for the organization, event though the focus of the process was a radical approach to product innovation. This finding gives innovation consultants and R&D managers ammunition to persuade top management and Board of Directors to invest in high ambition projects, since incremental innovation activities (exploitable knowledge) are identified during the exploration process. And, the process also lead to a successful perceived result of radical product innovation, since a new technology was identified that could improve the performance of the existing product with 70 percent along side the development of 13 new product innovations with different levels of risk profile and return tradeoff.

Research wise we claim new knowledge to the beneficial value of initiating and creating radical innovation proposals instead of focusing on the results of finalized projects as dependable variables, as e.g. patents and economic return on new product introduction (Anderson, Drue and Nijstad, 2004; Crossan and Apaydin, 2010; Lundvall, 2013). Our study hence supports the assertion that aiming at radical innovation is more advantageous than only processing innovation projects with low ambition, as also O'Connor and Demartino (2006), Peters (2006) and O'Connor and Rice's (2013) claim. Moreover, we identified three interesting anomalies which needs further research attention: a) a focus on the potential of building radical innovation routines in existing enterprises, b) a further understanding of opportunity recognition as 'negotiation of meaning', and c) the potential of creating multiple concepts on the same idea, instead of using traditional brainstorming with a democratic selection of the one 'best idea'. Finally, we advance existing theory on radical innovation by building six new propositions that can be further studied in the context of organizational innovation streams.

6. Conclusion

Our study informs about the potential performance enhancing knowledge that is constructed in the early stages of a radical innovation project where new project proposals were identified and conceptualized. We obtained access to investigate practitioners working on their real life innovation praxis (Whittington, 2006) and we obtained access to data that demonstrates the construction of new business potential that was developed to feed the organization's stream of innovation *ex ante* top management decision-making. Our findings are unique cf. Crossan and Apaydin (2010), Adams, Bessant and Phelps (2006) and OECD (2005) since most innovation research concerning evaluation and/or performance is based on analyzing the results of *finalized projects* and not the complementary, knowledge generating and consequently uncertainty reducing benefits of processing these types of high uncertainty projects, cf. Schultz, Salomo and Talke (2013), Popadiuk and Choo (2006) and Battisti and Ioana (2009).

Hence, our endeavor to step out of the claimed routinization and treat innovation as an independent variable has proven fruitful, since our ambition to break new grounds gives clear answers to our research question: '*to what extent does the process of establishing a radical innovation proposal identify new potential for improved performance?*' We conclude that three types of performance improving activities are developed to be exploited when working disciplined with a radical innovation project. Here, our analysis demonstrates that the knowledge that was constructed during the process represented 31 concepts that potentially: a) improve the performance features of existing products, b) improve the existing production and/or delivery process, or they c) represent the construction of new products that are new to the company, market and/or new to the world. We thus claim that there is a need to work with a dynamic approach to understand the potential and the implications of processing radical innovation projects, since the strategic potential and the viability of the proposals that are identified and conceptualized during such processes represent a unique knowledge repository to improve the overall performance of existing product features, their production/delivery and the business in general. These newly identified and developed concepts need to be taken seriously into account by decision-makers so that the expected potential can be further explored and not least exploited to benefit the organization.

Moreover, the results indicate that the team members 'readiness to change' increases during the process as well as they develop new 'breakthrough routines' to work with and navigate in the high uncertainty projects.

The short version of our story is: processing a radical innovation proposal identifies incremental innovation potential, not *visè versa*. So it does not make sense to have low levels of managerial ambition when it comes to innovation projects, since the focus on large-scale improvements does the job for you anyway.

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A SUSTAINABLE STRATEGY MODEL

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A sustainable strategy model

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A sustainable strategy model

Abstract

Purpose: to create a (sustainable) strategy model explaining what organizations should have in focus in their strategy work, under which circumstances the strategy is implemented, and how this is related to the performance

Methodology: Using different state-of-the-art strategy approaches to create and validate a solid and causal strategy model

Findings: Strategy is complex, and organizations are facing more complex tasks matching the organizations resources to the environmental demands, making strategy for today and strategy for tomorrow, implement the strategies and executing the action plans.

Keywords: Strategy, competitive advantage, strategy process, execution, performance culture, productivity, Flexibility, innovation

Article Classification: Conceptual paper

Introduction

Through time, there have been many different perspectives on strategy, and it has been popular to categorise them (Chaffee, 1985; Mintzberg and Waters, 1985; Drejer and Printz, 2004; Whittington, 2001). All of these different perspectives contribute to the understanding of strategy. Many of the opposite positions have emerged on the basis of astonishment at or critique of existing theories and viewpoints, as for example deliberate vs. emergent strategies or content vs. process strategies (Mintzberg and Waters 1985; Chakravarthy and Doz, 1992). Each different strategy perspective contributes to explain the complex phenomenon of strategy, and most perspectives include identifiable strategy practices (for example Porter, 1980) and a view on strategy practitioners (for example Whittington, 2001). These (different) assumptions are important for understanding the making of strategy, and they will facilitate an understanding of the background of the theory and the practices developed, what the different practices can be used for and how they can be used. In practice a strategy process is making use of more than one strategy practice and mostly these different practices (ref) are from different strategy perspectives.

The rational mode of thinking has been forming the foundation for the strategy literature in the 1950s, and especially the 1960s. The rationality view implies that the decision-maker takes all available alternatives into account, identifies and evaluates all consequences related to the alternatives, and selects the optimal one (Meyerson and Banfield, 1955). The rational man of economic research was adopted into strategy research, implying systematic analyses of the environment and the internal strengths and weaknesses or core competences (Prahalad and Hamel, 1990) or dynamic capabilities (Teece, Pisano and Shuen, 1997; Regnér, 2008). Thus, strategy making (and thinking) is a rational process from analysis to explicit goal-setting to evaluation of generated alternatives and, when a choice has been made, development of a comprehensive plan for achieving the goals (Andrews, 1971; Ansoff, 1965; Porter, 1980).

The confidence in this view rests upon top managers' ability to analyse and implement strategy; thus, strategy is viewed as an issue of top management pursuing profit maximisation, based on the belief that all individuals are pursuing the most advantageous solution. Influential basic concepts and techniques contributing to the strategy field are Williamson's (1985) concept of transaction cost and Porter's (1980) industry structural analysis. The assumption of rationality was challenged by the behavioural theory.

The rational economic man is a theoretical philosophy, and the rational view that the decision-maker take all alternatives into account is illusory; in practice, people are only 'bounded rational' (Cyert and March, 1963). This means that we as people are only able to consider a few factors at a time, we are biased in our interpretation of data and we tend to choose the first satisfactory option instead of insisting on the best. In recognising that a myriad of individual interests are represented in an organisation, actors start bargaining with each other in an effort to attain acceptable goals and solutions. This view questions the assumption that only top management has a hand in strategy. The organisation as a whole takes part in strategy, suggesting that organisational members are able to play a significant role in the process (Mintzberg, 1978).

Recognising the individual limitations, Quinn (1978) proposed logical incrementalism as a normative ideal for making strategy, arguing that a broad direction can be predicted by top management and that the precise nature of the strategy will emerge over time. Hence, the focus of top management shifts from planning strategy to setting a strategic direction by creating a strong

vision and corporate values (Kotter, 1988; Weick, 1987), thereby creating a sense of purpose and direction that will guide actions taken by organisational members. This view evolves further, and involvement emerges as an important ingredient in strategy (Mintzberg, 1990, Wooldridge and Floyd, 1990). Primary reasons for such involvement are difficulties with strategy implementation (Galbraith and Kazanjian, 1986; Hrebiniak, 2005) and increasing environmental turbulence (Ansoff, 1979), such as innovation pressure, high uncertainty, change pressure, geographic diffusion, network, self-managing employees, digitalisation, shorter strategic lifecycles and skydiving communications cost (Mønsted and Poulfelt, 2007; Hamel, 2007).

Since strategy has emerged as a research area of interest, many scholars have made a point of portraying strategy (formation processes) as different archetypes to illustrate the different ways in which strategy is perceived (for example Chaffee, 1985; Hart, 1992; Mintzberg et al., 1998; Andersen, 2004).

Further, strategy has been seen as an external position in the market (Porter, 1980) and as a counterpoint for the approach that strategy has been seen as a bundle of resources (Wernerfelt, 1984). Still these two opposite approaches to strategy has been using the same theoretical lens to explain opposite positions of what creates competitive advantages for organizations. This theoretical lens is built on traditional micro economic theory. Parallel with the economic theories entry to strategy research, also empirical research has contributed immensely originated from the Resource Based View (RBV) with focus on the strategy process (Mintzberg, 1985; Burgelman, 1983; Pettigrew and Whipp, 1991), offering some useful understandings of strategy.

Our research is inspired from the assumptions that strategy is complex (Mintzberg, 1985), and organizations are facing more complex tasks matching the organizations resources to the environmental demands, making strategy for today and strategy for tomorrow, implement the strategies and executing the action plans. Our main purpose is to combine the above approaches to strategy in order to create and validate a solid and causal (sustainable) strategy model there is able to explain what organizations is (or should be) focused on in their strategy work and how this is related to their performance.

Theoretical Lenses in strategic management

The focus in strategic management research has been moving from the industry level (Porter, 1980) to the firm level (Wernerfelt, 1984) in the explanation of competitive advantage. The traditional approach to strategy is that strategy is something the organization has and that the strategy and strategy work is done primarily by top management (Andrews, 1961). The strategy work has traditionally been characterized as planning, followed by strategic planning (Ansoff, 1965) ascertained how the position in the market should be, for example following three generic strategies (Porter, 1980). The basic assumption in this approach is that the strategy is determined by drivers' related to external positions in a market, as for example related to Porters five forces (Porter, 1980). The RBV (Wernerfelt, 1984) was developed as a counterstrike to the positional view (Ansoff, 1980; Porter, 1980) arguing that firms has different access to resources which influence the possibility to gain competitive advantage. The RBV was developed with the use of the same economic theories and methodologies as used in the traditional strategy approach focusing at the industry level. The RBV is complementing the explanation of competitive advantage, where the traditional approach is focusing on the industry structure and positioning in that structure as the determinants for a company's competitive advantages. To complement this view, the RBV conceptualizes the firms as a bundle of resources distributed heterogeneously across companies, and the access and differences among resources have some kind of persistency over time (Wernerfelt, 1984). It is interesting how (high-level) resources or dynamic capabilities (Teece et al., 1997; Eisenhardt and Martin, 2000) is connected to the change of operational capabilities and thus modify organizational assets. These dynamics have an impact on performance, but still the focus has been on the strategy content, and further the findings are explaining how to achieve competitive advantage at an abstract level, neglecting the detailed processes and activities explicating the dynamic capabilities (Regner, 2008). The focus on the company and industry levels effects upon performance have not taken into account the people doing or practising strategy. This is the focus and aim of the Strategy-as-practice (SAP) approach. From the SAP approach strategy is seen as situated socially accomplished activities and strategizing comprises the actions of people and the practices they draw upon doing the activities (Jarzabkowski et al., 2007). There are three vital parameters in this approach: practitioners, practices and praxis. The SAP approach to strategy has developed fast over the last decade explaining who is doing strategy work in organizations and what (strategy) practices they draw upon when they strategize. Summed up the above shows that strategy is complex and have multiple explanations depending on the lens in play. Further it looks like there are more approaches

important for succeeding with strategy. Success is depending on organisations having focus on two generic strategic tasks and this is WHAT related to the strategy content, and HOW focusing on the strategy process. This means that a sustainable strategy model should be based on these two assumptions. In the following section the strategy model is developed and presented.

The strategy model

With point of departure in the traditional strategy approach (Ansoff, 1965; Porter, 1985), the dynamic capability approach (Teece et al., 1997; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2003), the strategy process approach (ref) and the SAP approach (ref), we are addressing the challenges of strategizing in organizations. These approaches are used to address the topic of actors at different levels in organizations strategizing: top-managers, middle managers and employees, and what kind of firm level resources, routines and capabilities they draw upon, and are there a connection between the involvement of different levels in strategizing and the performance of the organization.

We have identified five strategy areas an organization needs to focus on when strategizing. The areas are related to two veins of strategy research: the content of the strategy focusing on productivity, flexibility and innovation (Drejer and Printz, 2004), and the process planning (Chakravarthy and Lorange, 1991) and implementing the strategy where the focus is on execution (Hrebiniak, 2006; Joyce. et al., 2003) and the performance culture (Joyce. et al., 2003) in which the process is going on. So in general it can be argued that strategizing is about having strategy content with goals or some kind of directions and a process in which the strategy is created and executed.

The content of the strategy

We argue that there are three (generic) strategy areas related to the strategy content an organization has to take into consideration, and that are productivity, flexibility and innovation. They have all been the subject of research and investigations e.g. in explaining the necessary strategic focus regarding the evolution of companies (De Wit and Meyer, 2010). In the light of the need for more efficient use of the resources, higher complexity in the environment and the speed of changes in technology and customer preferences companies today must be aware of productivity, flexibility

and innovation at the same time and find the most value creating balance between these three subjects. (Drejer and Printz, 2004, Bolwijn and Kumpe, 1990).

Productivity is about the organisations focus on enhancing the existing resources and concentrate mostly of the strategically energy on quality and continuously improvements. The area is traditionally seen in organisations with stable environments with not that many changes in technology and costumer preferences, and with few inventions and new innovations. Nevertheless a lot of organisations in every kind of industries have for a long time had this inside-out view (De Wit and Meyer, 2010) focusing on optimising the supply chain through lean management or other kind of productivity improving tools (Christopher, 2011). A major inspiration source in this area has been the EFQM Excellence model, which has a holistic perspective on organization development, but still in the newest version has focused on quality and productivity (EFQM, 2013).

Flexibility is about the market. The focus of shifts in customer preferences have for many organisations been the most important issue regarding strategy. Close contacts to main costumers and systematically handling of complaints or appraisal of the products have been the main driver for changes. The strategy in those organisations is focusing on building reliable systems intercepting signals from former, present and future customers. In strategy terms it is also referred to as relational marketing doing customer relationship management (Clegg et al., 2011). It is an outside-in perspective (De Wit and Meyer, 2010) trying to adapt to customers changing preferences. Many traditional market oriented researchers focus on the importance of listen to the customer's needs and expectations and have argued that the only way to success is to follow the market and customer (Porter, 1980; De Wit and Meyer, 2010). Later this has been moderated and evolved so the customer now must be a part of the way companies work with every kind of development.

Innovation is here defined as (more) radical changes that drastically influence the value creation process. Fast changing industries, many new technologically inventions, fast changing customer preferences or heavy rivalry among competitors are all circumstances leading to a need for focus on innovation (Abell, 1999). A lot of effort has been put into this area through focusing on improving organisations ability to be more innovative and in concepts like Blue Ocean Strategy (Kim and Mauborgne, 2004) etc. It is of great importance for organisations to be able to renew their product portfolio not just once, but constantly be aware of the innovation possibilities regarding the market, the technology and/or the competitors. To avoid declining and promote development, working with strategy must include an evaluation of the level of the products maturity and their risk of being

obsolete together with focus on keeping the ability to change high through the performance culture in the organization.

The strategy process

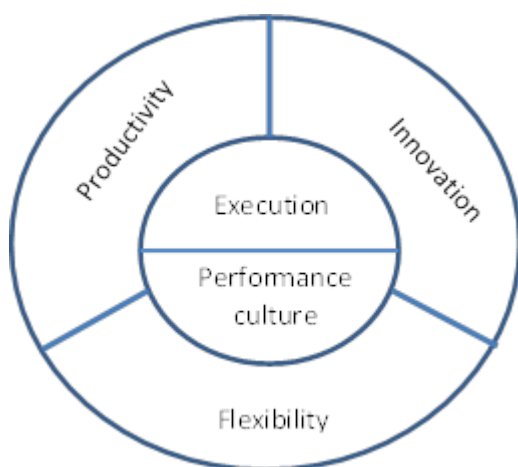
When we look at the strategy process we argue that it can be related to two areas: execution and performance culture.

Execution is related to the firm's ability to discuss growth possibilities and development trends and how involved different parties in the organization are in the strategy process and in fulfilling the strategy through a high communication level and by maintaining and develop the necessary management and employee competencies regarding executing the strategy (Hrebiniak, 2006; Joyce et al. 2003).

Performance culture is about achieving a committed and engaged organisation determined to get strategically results. It requires that the employees can relate to the demands and expectations they meet and a solid relationship between the goals and the communicated strategy. It is important that both the goals and the strategy are being adjusted continuously to fit with the changing environment and new strategically challenges (Joyce et al., 2003).

So working with strategy the focus must be on both the content of the strategy termed in productivity, flexibility and innovation, and on execution of the strategy, the actual implementing activities and how the different actors are involved in the process. This is shown in figure 1.

Figure 1 – The sustainable strategy model



The interconnectedness is visible, that the strategy content is depending upon the strategy process and vice versa. Further, the outer circle is the strategy content and generically is about productivity, flexibility and innovation. Strategy process is about the performance culture and executing the strategy. The five areas are all important in the strategy work but are in much strategy literature seen as separated areas or as counterpoints. Here we argue that the success of the strategy is depending upon the interplay between the five presented areas.

Discussion and concluding remarks

Having presented our strategy model for sustaining competitive, the next step is to test the model in order to contribute to the existing strategy research, and different strategy research is pointing at different issues for succeeding with strategy. Hrebiniak is focusing on obstacles for strategy implementation (Hrebiniak, 2006). Joyce et al. (2003) have identified some primary and secondary factors of importance for an organizations strategy. This indicates that there are some areas there are more important for success than others. Two of the most important areas are performance culture and sound execution. They argue that innovation is less important, if you have the opportunity to make mergers. By including innovation as part of the strategy areas it indicates that it is something the organization needs to take serious in the strategy work and that it will have impact of the performance especially in the long run. Focus has mainly been on the productivity and the flexibility. Only in recent years innovation has been integrated as a vital part of the strategy work.

A lot of effort has been made to increase the productivity and chasing customers – mostly the well-known customers on the existing market. Not many market expansions or launching new products have been in focus. So strategically organizations have to balance three strategic challenges in order to stay competitive and that is to stay productive, be flexible to the market and to be innovative. This is a very challenging task, and therefore it is important to get knowledge about how organizations address this challenge.

The participation of organizational actors have not had much attention in the strategy research, and as shown above the focus have primarily been at top management, but there are obvious benefits of involving more organizational actors in strategy (Weick, 2006, Holst-Mikkelsen and Poulfelt, 2008). Still this focus have only been at middle managers (Wooldridge et al., 2008), and employees are still not considered as strategy practitioner and are not even asked about strategy. In the SAP

approach a few studies is done including the employees as strategy practitioners (Mantere, 2005; Friis, 2012). The employees are not included in the strategy research, and it is to be questioned, and it should be considered to include the employees in the strategy process and therefore also in the research. That is what we will do in this research. This can shed insights about the strategy topics across organizational levels and further connect it to performance.

Most research are situated in one research tradition as for example the content or process tradition. We find it important to further investigate how all the five areas are interconnected. Thus it is of more interest to test how the five strategy areas are interrelated and how they affect performance in general and see how the different levels in organizations is perceiving the strategy areas and if the different levels have different perceptions of the strategy and how the organization perform. The model indicates that all five strategy areas are important, but can there be some connection, some interrelatedness between some of the strategy areas, some patterns in the five strategy areas indicating some points to pay attention to in the strategy work.

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0007

SELF-EFFICACY AND VERTICAL TRUST AS PREDICTORS OF DISTRIBUTED LEADERSHIP IN DANISH HEALTH CARE CONTEXT

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Self-Efficacy and Trust as Predictors of Distributing Leadership in Danish Health Care Context

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Purpose

This study aims at investigating the role of self-efficacy (micro variable) and vertical trust (macro variable) in enhancing distributed leadership during the period of a major organizational restructuring of four hospital units in Central Denmark region.

Design/methodology/approach

The data were collected using the questionnaires from 1,439 participants from four hospital units. Distributed leadership questionnaire was developed for this study while questionnaires on trust and self-efficacy were borrowed from the literature.

Findings

All three scales were found to meet the acceptable levels of model fit statistics (Chi Square = 1645.24, $p < .001$. CFI=.932, TLI=.922 and RMSEA=.066). The results of hierarchical regression analysis showed that self-efficacy and vertical trust, as expected, were found to be positively related with the distributed leadership. Results showed that relationship of distributed leadership with Self-efficacy ($\beta = .179 < .01$; Adjusted $R^2 = .085$) and with vertical trust ($\beta = .207 < .01$; Adjusted $R^2 = .126$) was highly significant.

Implications

Practitioners of management can focus on improving the level of employees 'self-efficacy and vertical trust to improve their participation in leadership activities. We believe that participation in leadership tasks is sine qua non for a high performing organization.

Originality/Value

These results contribute to the growing body of literature on the role of employees' involvement and participation at the work place (e.g., Woods, 2010); however this is among first few studies which have explored the role of self-efficacy and vertical trust in predicting the distributed leadership in organizational context.

Keywords- Distributed Leadership, Self-Efficacy, Vertical Trust, Danish Hospitals

Article Classification- Research Paper

Introduction

The success of an organization depends on employees' involvement and participation in organizational activities to meet unexpected environmental demands at the work place (e.g., Wood 2010). Current literature indicates that employees want to receive more information about their organizations' activities and seek an increased opportunities to be more fully engaged with their work (MacLeod and Clarke 2009; Alfes et al., 2010). In this regard, the concept of distributed leadership (DL) has emerged as a new substitute with the aim to integrate and involve employees in organizational activities at the leadership level. According to Uhl-Bien (2006), DL is a new perspective on leadership that has conceived leadership as a collective social process emerging through the interactions of multiple actors. In some cases, research shows that organizational change can be successfully implemented without 'anybody in charge' (e.g., Buchanan et al., 2007).

For many years, researchers believed that at the core of involvement and participation is an underlying notion of "influence or power sharing" or "joint decision making" (e.g., Mitchell, 1973; Locke and Schweiger, 1979). Regarding the effects of various participation schemes, Cotton *et al.*, (1988) have noted the importance of informal participation and employee ownership programs on improving both employee satisfaction and productivity. However, employee participation in leadership tasks is not a prescriptive task and cannot be forced upon employees. The effectiveness of DL practices, to a large extent, depends on employees' own initiatives and culture of the work place.

In this study, therefore, we are investigating the role of self-efficacy and vertical trust in influencing the participation of DL activities. Self-efficacy has been conceptualized at the micro level variable while vertical trust is measured as macro level. This paper answers to the call for more research on understanding the predictors or pre-conditions of implementing the concept of DL (Jain and Jeppesen, 2014) as most studies have been limited to either understanding the concept of DL per se (Bolden, 2011) or the benefits of DL in educational (Spillane, 2006) and health care context (Buchanan et al., 2007). We proposed that self-efficacy will strengthen the belief in one's competencies for participating in leadership task while vertical trust will act as pull factor in making the employee to go above and beyond their normal course of action to participate in such activities.

Distributed Leadership

Gronn (2002) has used the concept of DL as unit of analysis in a more formal manner. Gibb (1954) and Benne and Sheats (1948), in the opinion of Gronn (2008), were the first authors who have used the concept of DL in their writings. These writers have highlighted the idea that leadership is probably best conceived as a group quality, as a set of functions which must be carried out by the group and a group may operate with various degrees of diffusion of leadership functions. In recent literature, researchers have used different terminology to refer to group based styles of leadership for example, Shared Leadership (Pearce and Conger, 2003), Collective Leadership (Dennis et al 2001), Collaborative Leadership (Huxham and Vangen, 2000), Emergent Leadership (Beck, 1981), High involvement leadership (Yukl, 2002), horizontal leadership (Bolden et al, 2008, Collinson and Collinson, 2009), 'nobody in charge' (Buchanan et al. 2007) etc. These different approaches are comparable with the concept of distributing leadership. The major assumptions of DL are that; (1) competencies required are far greater than any one person is able to possess; (2) team structures and empowerment of individuals is becoming the norm; (3) consequently, leadership may no longer be exclusive to any one individual, but distributed amongst members of organization; (4) leadership is not the monopoly or responsibility of just one person, rather there is a need for collective and systematic understanding of leadership as a social process (Barker, 2001; Hosking, 1988).

Spillane (2006) stated that leadership is stretched over a number of individuals and that leadership is accomplished through the daily interaction of multiple leaders. According to Gronn (2002) there are two properties of DL. First is 'interdependence' which is revealed in the forms of overlapping responsibilities of organizational members and these responsibilities may be complementary. Second is 'coordination' which means managing dependencies between activities through a proper arrangement between task, people and resources. Spillane et al., (2004) believed that using the distributed leadership framework could help practitioners to interpret and think about their ongoing leadership practices. Leadership development should be an organization-wide process with emphasis on appropriate tools and techniques for practicing distributing leadership. So that leadership could be shared between a number of people in an organization or team (Storey, 2004). Some researchers have tried to understand the DL in terms of organizational functions performed by

different organizational members (e.g., Camburn, et al., 2003; Heller and Firestone, 1995; Pounder et al., 1995).

Determinants of DL: The idea of DL needs to be positioned within the broader sociotechnical context of the organization. Researchers have focused on the interaction of leadership with a context (Liden et al. 2009). As Gosling et al. (2009, p. 300) argue, ‘to appreciate the function of a distributed perspective upon leadership requires recognition of the social, political and power relations within the organization’. According to Woods (2004) distributed leadership is perhaps best conceived as an analytical—that is, predominantly descriptive—conception. He further talks about leadership as an emergent property of group and reliance on many actors to successfully perform different leadership functions. So these leadership properties seem to be important across very different societies, organizations and groups. The research in the field of DL was started within the context of schools and hospitals and spread over the other organizational contexts. According to Bolden (2011), DL needs to recognize the informal leaders and the manners in which situational factors (physical, social and cultural) impact leadership processes.

Distributed leadership is being recognized as an emergent leadership concept in primary, secondary and higher education (Leithwood, et al., 2009; Spillane, 2006; Bolden et al., 2008). Furthermore, the concept of DL has also been studied in health care and social care context (e.g., Buchanan et al., 2007; Currie and Lockett, 2011). Some scholars have taken the concept of DL in small and medium size organizational context and found the importance of blended leadership (a mix of heroic individual leadership and distributed team leadership) for building a successful entrepreneurial firms (Kempster, et al., 2010). Some researchers (e.g., Currie and Lockett, 2011) have focused on enactment of DL in the health and social care context. Health and social care is an exemplar of how contextual influences linked to professional hierarchy and policy impact on attempts to distribute leadership (Currie et al., 2009). Health and social care is professionally defined due to traditional professional hierarchy (Currie et al., 2008). A powerful core of staff (e.g. doctors in hospitals) may exercise significant autonomy over the means and ends of service delivery and self-regulate their activities, with limited scope for leadership intervention outside the ranks of this professional cadre (Hebdon and Kirkpatrick, 2005). A professional logic of hierarchy is dominant in hospitals which limits the distribution of leadership beyond the expert matters. Others e.g. nurses and managers have struggled to assert themselves in influencing the doctors in this case (Currie et al., 2010). Similarly, professionals from agencies outside health and social care, such as police or youth

workers find that they are marginalized in leadership influence (Huxham and Vangen, 2000). Thus, the power remains concentrated within the specialist doctors. Hence, the professional hierarchy moderates the execution of DL within the professional bureaucratic set up like hospitals. According to Currie and Lockett (2011) enactment of DL is possible through collective leadership in health and social care units for effective delivery of health services to the end users. Most studies have focused on conceptualization and importance of DL, however we did not find any study on antecedents of DL, therefore we are investigating the predictors of DL practices at individual, self-efficacy, and organizational level, vertical trust, in health care context in Denmark.

Self-efficacy

Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the course of action required to produce given attainments (Bandura, 1997). The concept of agency is proposed by Bandura (1997, 2000, 2006) and which is further expanded by Archer (2000). Personal agency operates within a broad network of socio-structural influences. The processes of human actions structure and restructure the conditions or functioning in a social context. In this study, we expand the Archer's notions about agency by drawing on Bandura's (2006) social cognitive theory, in which self-efficacy is a central concept. An individual's judgment of self-efficacy has motivational value to initiate an action and remain involved in that action till s/he achieves the goal. In the context of change management, Paglis and Green (2002) extended the concept of self-efficacy to leadership self-efficacy that comprise dimensions like direction setting, gaining follower's commitment and overcoming obstacles to change. So, leadership behavior and practices are strongly influenced by an employee's belief in his/her self-efficacy and therefore self-efficacy should enhance the level of employees' participation in leadership activities.

Therefore, self-efficacy beliefs can enhance the level of employees' involvement and participation in organizational decision making. People with high self-efficacy will be more positive towards their participation in the process of goal setting and goal attainment because of the higher commitment to goal. In this process, people with high self-efficacy will not suffer with high ego centricity and will be more willing to extend their support to their supervisors and peers. So it is goal attainment that is important to people with high self-efficacy rather issue linked with authority and power. Researchers have found that self-efficacy mediates the relationship between assigned goals and performance (Lee et al., 1997). Kirkpatrick and Locke (1996) found that self-efficacy

mediated the effect of visionary leadership on employee performance. Thus, by extending the literature, we propose the following hypothesis;

H1: Self-efficacy belief will enhance employees' participation and involvement in DL activities.

Vertical Trust

Trust has been studied from a variety of perspectives over the past decades and scientists have looked at it from social, economic, political, and psychological perspectives. Researchers have noted trust in authorities is typically labeled as vertical trust while trust in others is normally called horizontal trust (e.g., Eek and Rothstein, 2005). The trustworthiness of another person (a trustee) has been conceptualized as a matter of perceived ability, benevolence and integrity, i.e. that the trustee is able to act competently, has good intentions and a moral integrity (Mayer et al., 1995) In this study, we are investigating the impact of trust in hospital unit administration on DL practices in the context of a merger of four hospital units. When considering the issues linked to employees' participation, trust in authorities and administration seems to be a promising condition. Trust functions, according to Powell (1990), "a remarkably efficient lubricant to economic exchange that reduces complex realities for more quickly and economically than prediction, authority or bargaining". Researchers have showed the positive effects of trust in organization or management on employees' performance (Aryee et al., 2002; Dirks and Ferrin, 2002) in terms of their job satisfaction, turnover intentions, and organizational commitment.

Social exchange theory examines how social exchange relationships develop in engendering "feelings of personal obligations, gratitude and trust" (Blau, 1964, p.94). Trust refers to the belief on the part of individuals that their supervisors or management will not exploit or take unfair advantage of them. When relationships conform to the norms of reciprocity and when the pattern of exchange is perceived as being fair, individuals are more likely to believe that they will not be exploited (Blau 1964). Thus, trust is defined as a psychological state reflecting expectations of dutiful treatment from a social system (e.g., organization) and its people. Organizational trust was defined as trust experienced by managers and employees in the organization as a whole, including the structure, the process, and the people (see Kramer, 1999). More formally, Tan and Tan (2000) defined trust in organization as 'global evaluation of an organization's trustworthiness as perceived by the employee (p. 242). Konovsky and Pugh (1994) empirically examined the social exchange

model in their study on the concept of OCB. An employee's trust in a supervisor is considered to mediate the relationship between procedural fairness in the supervisor's decision-making and employee citizenship. In this way, trust is proposed to be important in relationship development because it allows individuals to be less calculative and to see longer-term outcomes (Scanzoni 1979).

The importance of trust in organization in the processes of managing change is widely reported in the literature (e.g., Morgan and Zeffane, 2010). The trust between employee-employer can be best achieved through consultation, participation and empowerment (e.g., Khan, 1997). In this way, trust becomes an emergent property of patterned relations between individual and organization (Rousseau et al, 1998). Thus the inherent components of trust are risk, interdependence and willingness to accept the vulnerability; all trust relationships are reciprocal in nature. Similar to this, the concept of DL that is based on intentions of developing and sharing leadership with other organizational members and which cannot be implemented in absence of mutual dependency and reciprocal trust between people. Thus the concept of trust can play a significant role in the successful implementation of DL in an organization. DL studies show that leaders need to build a high degree of reciprocal trust to negotiate successfully the fault lines of formal and informal leadership practice (Harris, 2011). Muijs and Harris (2006) suggested that a range of conditions needed to be in place in schools for teacher leadership to be successful, including a culture of trust and support, and structures that supported teacher leadership. Thus, by extending the literature, we proposed the following hypothesis.

H2: Trust in hospital unit administration will promote employees' involvement and participation DL activities.

Grounded in human agency and social exchange theory, we propose that self-efficacy and trust should enhance the level of employees' participation in leadership activities. By extending the literature, we argue that self-efficacy, at individual level, and vertical trust, at organizational level, should improve employees' participation in leadership practices.

Method

Participants and Procedure

The population of interest consisted of all hospital workers including health professionals, supporting service staff, and administrative staff (n= 4,575), who were employed at the newly merged hospital. In order to reach as many potential respondents as possible, the questionnaire was distributed to different segments of the hospital staff in three different ways; by e-mail for the staff with regular access to check their e-mail during work hours, by personal password to the survey webpage for the staff with no regular access to check their e-mail during work hours, and by paper for the staff with no work e-mail. This procedure resulted in a total of 2,217 responses corresponding to an overall response rate of 48.5 pct. However, after deleting incomplete answers and doubles, the number of respondents in the present study amounted to 1,680. The sample were comprising 219 male and 1461 female employees and the average age and average tenure for the total respondents sample was 44.4 years and 7.44 years respectively.

Measures

The study has employed the previously used measures to collect the data on self-efficacy and vertical trust. However, the measure for DL was developed in the context of this study as no suitable measure was available in the literature. The questionnaires were translated into Danish using the translation-back-translation procedure (Brislin, 1980). All survey items were measured on a five point Likert-type scale ranging from 1="none" to 5="very much".

Distribution of leadership was measured by developing 11-item questionnaire. The details of the development and validation of survey items and construction of the scale are described in Jeppesen, Jønsson and Jain (2014). This scale measures employees' inclination to engage in the coordination and setting of goals as well as the planning, organization and implementation of various resource allocation and HR-related activities at their departments. This means that agency in DL is measured at the individual level rather than at the team/group level since such a measure is virtually impossible to form validly across the many different internal structures at the hospital wards and units.

Self-efficacy was measured using a scale borrowed from the work of Schyns and Collani (2002). The scale was consisting of 8-items.

Trust in management is measured by a single item scale from the Australian Workplace Employee Relations Survey 1995 referred to in Morgan and Zeffane (2003) and with an addition of one item more. The two items were ‘Management at this workplace can be trusted to tell things the way they are’ and ‘I trust that management does all it can do’. The two items taps into trust in management’s honesty and integrity (the first) as well as trust in management’s competence and ability (the latter item).

Common Method Bias: Additionally, because the independent and dependent variables were all measured in one self-report survey, we followed common practice (Prati et al., 2009) and conducted the Harman’s one-factor test to determine the potential influence of common method variance (Podsakoff et al., 2003).

Control Variables: In this study, age, gender (male=1) and marital status were used as control variables.

Analytical Procedures: The data were analyzed using the SPSS 20 and MPlus 7.11 software. Data analysis was done in two parts: MPlus was used to examine the measurement model by using a confirmatory factor analyses for all three scales; distributed leadership, self-efficacy and vertical trust. The model was conducted to estimate the overall fit, construct reliability, convergent validity, and discriminant validity (Anderson and Gerbing, 1988). For use in the structural model tests, each of the constructs was represented by a single factor score. This strategy acts to minimize the number of parameters that need to be estimated in the structural models.

Results

Before examining the hypotheses, we completed a measurement model consisting of confirmatory factor analyses for all three scales in one model. This test may show whether the expected model of three separate constructs (i.e. trust, self-efficacy and distributed leadership agency) can be confirmed. All three scales were found to meet acceptable levels of model fit statistics (Chi Square = 1645.24, $p < .001$, CFI=.932, TLI=.922 and RMSEA=.066). The high values of TLI and CFI (0.90 or greater) and the low value of root mean square of approximation (RMSEA, less than 0.08) all indicate reasonably good level of overall model fit. Additionally, because being a single survey was

used, we followed common practice (Prati et al., 2009) and conducted Harman's one-factor test. The test indicated that no one factor accounted for most of the variance, suggesting that common method bias was not a problem.

Table 1 contains correlations and descriptive statistics for all three variables. Looking at the correlation table, we see that as expected, DL was found to be positively related to occupational self-efficacy ($r = .217, p < .01$) and trust in unit administration ($r = .247, p < .01$) and in turn both of these predictor variable had shown positive relationship ($r = .161, p < .01$). To test our hypotheses, we have used hierarchical regression analysis (HRA). The results of HRA are depicted in Table 2.

Table 1: Mean, Standard deviation and correlations among variables

		Mean	SD	1	2	3	4	5	6
1	Age (in years)	44.73	10.32	1					
2	Gender	1,87	0,34	-,066**	1				
3	Marital status	1,17	0,38	0,019	0,036	1			
4	Occupational Self Efficacy	3,98	0,51	0,038	-0,037	-0,002	1		
5	Trust in unit administration	3,94	0,93	0,02	0,001	-,062*	,161**	1	
6	Distributed leadership	0,21	0,85	,193**	-,081**	-0,037	,217**	,247**	1

Note: * = significance at .05 level and ** = Significance at .01 level

Hierarchical regression analysis: Three demographic variables (age, education and job tenure) were controlled in statistical analysis following previous researchers (e.g., Cooper et al., 1994). So the three models were used to see the impact of three sets of predictor variables namely, demographic variables, self-efficacy and vertical trust on employees' participation in leadership tasks. Hypotheses were tested using the model of hierarchical regression analysis (Cohen and Cohen, 1975) where the controlled variables were entered in the first step, followed by the two main predictor variables in next two steps. On step 1, demographic variables were entered; on step 2, self-efficacy was added along with demographic variables; on step 3 vertical trust was added to the regression equation. The results demonstrate that predictor variables had significant impact on

criterion measure thereby both the hypotheses were confirmed. The results of HRA appear in Table 2.

Table 2: Results of hierarchical regression analysis for distributed leadership

Variables	Model 1	Model 2	Model 3
Background Variables			
Age	.183**	.172**	.175**
Gender	-.063*	-.054*	-.058*
Marital Status	-.050	-.052*	-.039
Occupational Self-Efficacy		.217**	.179**
Trust in Unit Administration			.207**
Constant	1.909**	3.273**	2.959**
F	20.27 < .01	34.47 < .01	42.43 < .01
R^2	.041	.088	.129
Adjusted R^2	.039	.085	.126

*significance at .05 level; ** significance at .01 level;

Discussion

This study was aimed at investigating the impact of occupational self-efficacy and vertical trust on DL practices in the context of merger of four hospital units. As grounded in human agency and social exchange theory, we proposed that both the predictor variables should have positive impact on promoting DL practices in the health care context of merger of four hospital units. In the context of health and social care, staff (e.g. doctors) may exercise significant autonomy over the means and ends of service delivery and self-regulate their activities, with limited scope for leadership intervention outside the ranks of this professional cadre (Hebdon and Kirkpatrick, 2005).

The results of HRA have confirmed both the hypotheses. These results support the view that self-efficacy generates positive expectations about one's performance outcomes and employees exert

more efforts in achieving their goals. Results are consistent to previous studies showed (e.g., Locke and Latham, 1990; Latham and Locke, 2007) that people with high self-efficacy are committed to the attainment of organizational goals. So it is more likely that people with high self-efficacy will prefer to participate in DL practices for the sake of improving the chances of their success in their respective areas of work. Moreover, DL cannot be forced upon employees as it is not the essential aspect of their job description. Most employees at lower level of management are responsible for performing technical and routine jobs. So they might not find it useful to get involved in organizational leadership activities and prefer to save their time and concentrate more on to be rewarded and recognized for their job behavior. The participation in leadership tasks, to some extent, involve certain amount of risk for them as they need to shift the resources, time and labor, to a long term purpose which does not give them immediate results. Consequently employees with low self-efficacy would avoid participating in leadership tasks to reduce the chances of risk or failures in their job; however employees with high-efficacy will prefer to take more risk as they believe in their competencies and commitment to the goal achievement process. As argued by human agency theorists (Bandura, 1997) People with high self-efficacy would have higher chance to maintain their belief in competencies and commitment irrespective of situational constraints. Thus self-efficacy will create a higher motivation for participation in leadership tasks with a view of their personal development by taking more risk and seeking for better learning opportunities. Thus self-efficacy will act as a push factor for employees' participation in DL practices.

Furthermore, results showed that vertical trust has explained unique variances in explaining the employees' participation in leadership tasks. These results are consistent to previous studies about the positive effects of trust on organizational variables (Aryee et al., 2002; Dirks and Ferrin, 2002). In this study, vertical trust is taken as an environmental variable which acts as pull factor to DL practices. So it can be argued that self-efficacy will not solely promote participation in leadership until employee trust their unit administration during the process of the merger. In absence of trust, employees' self-efficacy may lack action orientation at surface level. They may have motivation to participate due to high self-efficacy beliefs but it will not result into actual involvement in leadership tasks until they have confidence in the unit administration. Vertical trust may act as a catalyst in promoting the DL practices. So we can argue that self-efficacy is a necessary condition for employees' participation but not enough. Organization needs to promote the culture of trust and cooperation in order to motivate employees to participate in leadership activities. As discussed, that the main features of DL are interdependency and coordination (Gronn, 2002). Trust will facilitate in

demonstrating one's competencies in relation to the organizational needs and goals. In such cases, employees' will take more risk and coordinate positively to improve the organizational leadership process.

Implications

This study supports the role of psychological processes in the implementation of a major organizational change program, for example Merger (Lipponen et al., 2004). Since this study is also conducted in the context of a major merger of four hospital units in Central Denmark region, so we believed that self-efficacy and trust should enhance the level of participation in the change management process. This is first empirical study which has investigated the effect of self-efficacy and trust in improving employees' participation in leadership activities. Results have demonstrated that employees' participation partly depends on an individual's belief in him/her and then conditions of the work place where one works. Practitioners of management can focus on improving the level of employees' self-efficacy and vertical trust to improve their participation in leadership activities. We believe that participation in leadership tasks is *sin qua non* for a high performing organization. Thus results of this study can be used to promote human development process (self-efficacy) and trust in authorities in order to promote participation in for profit and non-profit organizations.

Limitations and Suggestions

This study has used self-administered questionnaires; hence common method variance can be a source of bias. Though we have used Harman's test which is a common practice but it would be a better idea to take supervisory rating for employees' participation in leadership activities. In this study, we did not use any moderator or mediator on the relationship of self-efficacy and trust with DL. Future studies can explore the role of some of the mediator variables (e.g. psychological contract or perception of justice) and moderator variables (size of the hospital units) in the relationship of self-efficacy and trust with DL. Despite some of these limitations, results of this study contribute to the growing body of literature on the role of employees' involvement and participation at the work place (e.g., Woods, 2010); this is among the first few studies which have explored the concept of distributed leadership in the context of a merger in health care context. In

this way, it supports the relevance of studying distributed leadership in health care context (e.g., Currie and Lockett, 2011; Buchanan et al. 2007).

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0010

DISCUSSING PERFORMANCE MANAGEMENT ARCHITECTURE IN PUBLIC SERVICE BROADCASTING

TORBEN TAMBO, OLE DAHL GABEL

Discussing performance management architecture in public service broadcasting

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Abstract

Purpose: To demonstrate design of Performance Management (PM) processes in highly complex, non-profit, culture-producing organisations specifically the shift from Performance Management Systems (PMS) to Performance Management Architectures (PMA) specifically using Danish Broadcasting Corporation (DR) as case.

Design/methodology/approach: Qualitative, case-based, inspired by information systems research using ontologies of organisational performance governance frameworks.

Findings: A closer connection between corporate activities, metrics and the technologies defining and underpinning these metrics, reflected in an architecture, raises the certainty and level of organisational consensus.

Research limitations/implications: DR is unique as the largest cultural institution in the Danish language area backed by a political consensus, strong popular support, high level of funding and a disproportional "market share" against commercial actors. This is both interesting to research but also issues limits on the conclusions given the uniqueness.

Practical implications: Ambiguity, bad connectedness, and lack of consensus of measurement of organisational performance can tentatively have a negative effect on the strategic reliance on measurements. The paper contributes to organise the heterogeneous indicators more meaningful.

Originality/value: The value of this paper resides with considerations of implementation of PMA in complex and “unmeasurable” organisations actively getting the most out of weak and indirect links in data, and evaluating the possibility to use the law of large numbers. Additionally the PMA connects with the traditional opposites of reporting systems such as account systems and payroll systems.

Keywords: Performance Management, Public Service Broadcasting, Mass Media, Performance Management Architecture, Business Intelligence, Cultural Performance

Article classification: Case study

Introduction

This paper presents a case of developing a performance management architecture (PMA) for the Danish Broadcasting Corporation (DR). Public broadcasting is facing increasingly complex requirements related to politics, culture, media platforms, language, democracy, minorities and commercial competitors (Andreea, 2008). In a small language area, the national broadcaster is in many ways the most central cultural institution (Moe, 2010). Performance management is critical to monitor, if money is being spend in optimal accordance with the expectations of the public and the political system (Chen, 2011), and if the desired goals of supporting the fine as well as popular culture are going in the right direction (Brants, 2003; Coppens and Sayes, 2006; Skinner, 2011). Regulating contracts are setting a number of metrics for the expectations from the political system (Picard and Siciliani, 2013) but these metrics are developed by time consuming manual processes including data collection, adaptation of data to the legislative system, adjustment for exceptions and maintenance of historical traceability (Moe, 2010).

The paper gives an account of the transition from a mostly “manually driven” performance management system (PMS) to a more automated performance management architecture (PMA) (Tambo et al., 2012; van Dooren, 2011). In the PMA, direct and indirect (computerised) data sources are identified (Dimon, 2013; McNamara and Mong, 2005). Processes are established to harmonise data. Data is characterised by dispersed sources, weak links between data, performance measurement is a secondary purpose of data, and there is little tradition for uniformity of data (Ballard, 2005). The cultural dimension is adding complexity in comparison to regular business performance by requiring static capacities (e.g. size of symphony orchestra), artistic freedom, and “quantity as quality” (e.g. hours of classical music played) (Bakhshi and Throsby, 2012; Raboy, 1996).

The paper is also having emphasis on organisations changing from loose, accounting-based performance management to more precise systems based on broadly available data sources. E.g., can computerised broadcasting systems produce fairly precise statistics on composition of contents. This can be linked to resources behind the content production such as studios, hosts and music. Allocation of physical resources such as cameras can be aggregated through inventory and lending systems registering projects and agreed associated cost of these resources. The performance management rationale is not so much a cost-cutting agenda, but to utilise resources responsibly, identify available resources, redistribute resources, and overall support the politically defined agenda of culture and entertainment.

The problem statement is twofold, with (1) design of performance management architectures in complex organisational environments without a tradition for quantitative measurements, (2) to analyse the process of actual PMA design at DR.

Methodology

The case is presented using a qualitative, interpretivistic and socially inspired methodology in line with case-study research methods from information systems research. The performance management approach within the case is however predominantly quantitative and based on broad screenings of available data sources and numerical assessments of the feasibility, integrity and “connectedness”. The mixed method aims at both interpreting the context, applicability and appropriateness of available data projected towards meaningful business indicators.

Practically, the research has been conducted along the implementation of Oracle Business Intelligence Enterprise Edition (OBIEE). Existing data sources has been analysed for transfer to OBIEE. Management objectives and guidelines have been analysed. A mapping between organisational units and performance objectives has been made. Isolated performance indicators have been collected throughout the organisation. The form of interaction has typically been physical meetings and workshops involving business professionals, analysts and frequently also technological resource persons, e.g. software professionals.

Theory

Performance management must be closely integrated with the business processes that are to be measured (Ballard, 2005; Dimon, 2013). Business processes in terms of business process orientation and analytical indicators in form of PM are closely related and impose a synergistic dyad (Bronzo et al., 2013). Where performance management once was rooted in physical processes and at top management level, it is generally accepted as an approach to have metrics on services (Yasin and Gomes, 2011). Broadly performance management is not related to the sources of data underpinning it; weaknesses of performance management are therefore if there is a lack of scalability, objectivity, repeatability, and general consistence. Technology is critical in most performance management solutions whether it is as business intelligence systems, analytical online processing, datawarehouses and simulation / modelling tools (Tambo et al., 2012; Smith and Kavanagh, 2008; Ballard, 2005). Technology should support implementation of performance management systems to ensure timeliness, traceability, data management. Following the arguments of Ross et al. (2006) on the importance of changing the strategic implementation of IT in the organisation from silos to a more standardised, rationalised and finally modular architecture, and following Bieberstein et al. (2005) in defining Business Performance Management as the core of the design of Business Services, we use the term Performance Management Architecture (PMA) in the following.

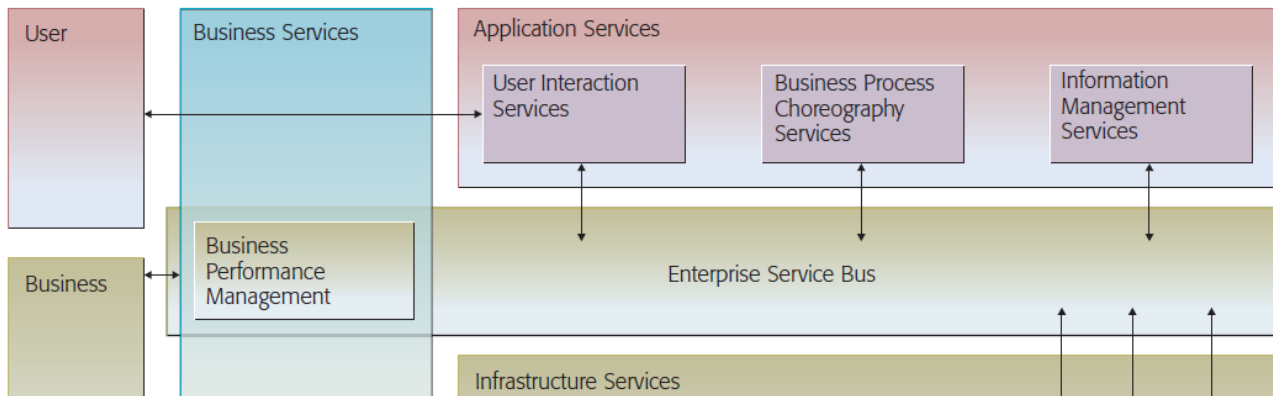


Figure 1. The integration of Business Performance Management from Bieberstein et al. (2005)

This reflects PMA as designed in the cross-section between business, organisation and technology in full analogy with Enterprise Architecture and follows the argument of Koyanagi et al. (2005) on co-design of business process management, technological infrastructure and performance management.

Ochurub et al. (2012) discuss the importance of engagement of organisational resources, and the risks of not having a sufficient organisational maturity, when introducing performance management systems. Organisational robustness and stringency in relevance and metrical design is proposed by Bianchi and Rivenbark (2012) in a comparative study within the governmental sector. Tambo et al. (2012) stresses the fact that business intelligence is frequently presented as a strategic management tool, but would rightfully better be understood tactically.

PSB's are classified as service of general economic interest (SGEI) with opportunities to operate on governmental funding without tendering but with obligations to justify a distinction from commercial operators (Halmagyi and Fetea, 2011). The construct of PSB is frequently puzzling scholars with governmental organisations in direct competition with private actors (Armstrong, 2005; Donders and Raats, 2012). Definitions of PSB however generally remain clear and operable (Harrison and Woods, 2001; EU Commission, 2009; Soraka et al., 2013). Pluralism, media diversity, the medias in the democratic process, national identity, diversity, respect for minorities are all concerns in the ongoing discussion that will joint be mentioned as the PSB's role in national culture (van Dijk et al., 2005; Skinner, 2011; Joesaar, 2011; Chen, 2011). Fiser (2010) emphasise the PSB's social responsibilities. Among critical arguments are that the PSB in some national contexts might be politically biased, serve the view of the political elite, etc. (Hesmondhalgh, et al., 2014).

The protected and special status of PSB's does not exempt them from performance management. Several scholars discuss the design of measurement of PSB. Value for money is a recurring issue in funding of PSB. Fenn et al. (2009) propose a strict econometric framework in assessing PSB productivity growth but assume a range of data to be precise known. PSB has for long recognised performance assessment using non-commercial terms. Moe (2010) outlines the German-inspired Drei-Stufen-Test consisting of (1) support of democratic, cultural and social needs test (2)

contribution to the publicistic competition (3) cost assessment. However, this relate largely to an external view. Meijer (2005) discuss popular ratings versus “quality”. Brants (2003) proposed auditing processes in PSB to retain autonomy by justifying objectives and resources spend. Coppens and Saeys (2006) take offset in the PSB’s ‘public service contract’ normally having the government as counterpart, and stress that PSB’s most be more answerable to the public on spending of funds by implementing new processes targeting accountability and performance, especially setting criterias and executing performance analysis.

Fenn et al. (2009) have analysed productivity in PSB and generally found a lower level of growth then in the rest of the society. As a whole, several contributions exist on analytical processes applied to the PSB organisations (Frisk et al., 2005; Liao and Chang, 2010; Tosics et al., 2008), however, these largely take an external view, and leave the PSB without tools for converting the external expectation to operational performance management. In designing performance management systems in cultural organisations, Gstrauntaler and Piber (2012) suggest a broader stakeholder identification replacing traditional views of (commercial) customers and owners, also considering that the PM system must reflect the strong professional socialisation taking place in such organisations.

PM is desirable and should justify expenditures, but Modell (2004) raises the critique of PM as constantly competing myths that are replacing themselves in relative short span of years. The critique of PM as “a hidden agenda for harnesses the PSB’s” is widespread (Hesmondhalgh, et al., 2006; Picard and Siciliani, 2013). There is however sufficient evidence in literature that cultural organisations are as measureable as other organisations (Bakhshi and Throsby, 2012; Chen, 2011; Moe, 2010).

In the analysis below, the offset is that PM is valid and desirable, but strongly require organisational meaningfulness and a common sense of relevance.

Case presentation

DR is with a budget of 0,5 bn EUR the largest cultural institution in Denmark. DR operates 7 TV channels, 20 radio channels, 5 orchestras and an internet platform that is among the 5 most visited in the country. DR has the largest share of media consumption and its TV channels are the most watched; the market share is the highest in Europe. DR is fully owned by the Danish government, funded by license fees, and has a board of directors composed by representatives from the political parties. DR is supported by a strong political consensus with currently little or no threat on budget cuts although some pressure exist to reduce own production and support mostly film production done by private film producers.

Threats on DR comes mostly from private, commercial, international TV channels attracting the younger segment, and particularly from streaming services allowing consumers to control their media consumption individually. It is of high priority to DR to continuously develop itself to reach most demographic groups to avert the long-term risk of simply being obsolete and thereby losing popular support.

The performance management initiative aims at improving the connection between data and operational activities to improve overall economic effectiveness and identify critical characteristics in the generation of attractive media content. To this day, most reporting has followed three tracks:

1. Financial reporting at management and operational level following governmental standard for reporting.
2. Reporting to the Ministry of Culture specifying the fulfilment of the operating contracts. These data are highly manual and highly processed to comply with the intent and philosophy of the political operating frameworks.
3. Disconnected and selective reporting at lower departmental level or ad hoc at management level.

Broadcasting is a fully digitalised process that broadcasts from a media server providing storage for offline produced content and records online (live) produced content. News, sport and weather are considered as online content even it is stored. This model applies to TV, radio broadcasting are more or less similar: Most content can be produced offline and broadcasted repeatedly. Content can be produced in-house or by contracted, however, most content is purchased from international distributors and from own backlog. Production of content is extremely diverse. DR has success with both ‘family prime time entertainment’ produced at low cost, but also long TV series and large show at very high cost. “Producer’s choice” is a cornerstone is the artistic freedom; when the producer has got a budget he is allowed to make the choices he believes fits the cultural expression.

The mostly digitalised processes of the broadcasting should pave the ground for better PM. Much data should be retrievable from digital sources. The following figure describes the alignment between possible sources and relevant business processes.

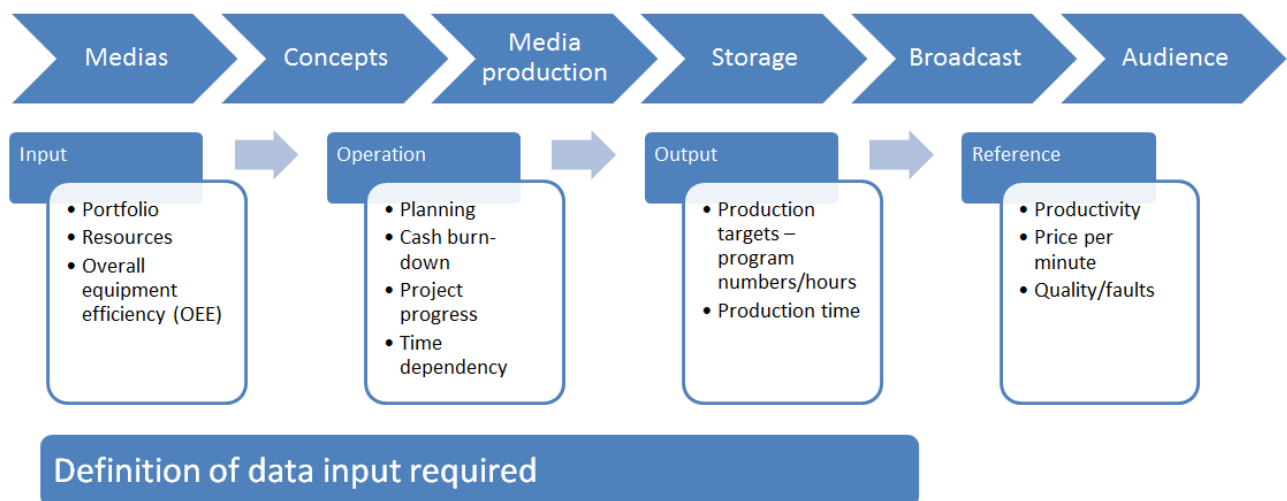


Figure 2. The media value chain – and it’s overall priorities

For each business process along the value chain, the aggregate and the underpinning KPI’s are defined together with the respective data sources. In the context the PM as a transitioning project, a

progress map has been defined. The progress on each KPI is marked to communicate current state of KPI definition as shown in the figure below:



Figure 3. KPI structure and progress maps (blurred on purpose)

The process has distinguished between

- Content production
- Broadcasting

Where the first is mainly project oriented and the latter is mainly with a operational and continuous focus. In content production there is again a separation between

- Online (news, sport, weather, gossip)
- Offline (culture, shows, features)

This is organised to organisationally. Equipment is basically fixed in online production and borrowed from a pool or leased in offline production.

Behind the broadcasting, several relatively large support functions exist: Real estate, equipment management, technological infrastructure, editing and production facilities, financial department, IT services, props depot, carpentry, etc. In assessing effectiveness the magnitude of the use of the support functions needs to be considered but has at the moment not reached is fullest.

In this process around 300 data sources have been identified. There is a target of reaching 75 KPI's. Data are to be consolidated and aggregated in OBIEE.

Examples of KPI's are

KPI on monthly basis	Data source	Rationale
Complaints on streaming services	Complaints database	The perceived quality of streaming services is critical is competing with private streaming services
Concurrent streaming TV users - peak	Conviva ®	The users of streaming users justifies the popular impact

Number of hours streaming	Conviva ®	Individual users and hours per user is defining the popular reception of streaming
Started projects	Project management information system	The ability to develop, execute and deliver projects is critical to meet the overall targets of content production and technological renewal
Delivered projects		
Ongoing project		
Waiting projects		
Project burn down rate		
Media storage down	IT incident management system	Media storage down will stop most broadcasting
IT incidents		With the digitalisation of the production, IT at all levels is critical to continue operation
Camera utilisation per type of camera	Zytech	Cameras are critical to production and bottlenecks within certain types of cameras can hamper creative processes
Cars and mobile production units	Workplace	Expensive resources important to production
Internal invoicing per department	Cost centre system	Internal invoicing reflect support functions effectiveness and utilisation
Editing rooms utilisation	IT infrastructure	Reflect equipment utilisation
Studios utilisation	TV studio plan	Reflect real estate effectiveness
Number of broadcasted hours (per channel)	DALET	Broadcast performance and incident rate
Number of faults and incidents (per channel)		

Table 1. Selected KPIs and their rationale

The project has come so far that it is indicatively possible to highlight the cost of each program related to

- Cost of equipment, fixed assets, royalties
- Cost related to internal invoicing
- Not cost related to editorial and creative staff

Thereby it is possible to justify the cost of superprimetime (20-22), primetime (17-23) and non-primetime programming on each channel.

The project has shown that consistency and uniformity of data is difficult to achieve. In finding staffing cost, it has been tried to use hour registration and collective work agreement salaries. Some, however, receive various extra rewards, some are on reduced hours due to health issues, where parts of the salary can be refunded from the health insurance. Some full time employees are actually trainees receiving less payment, but are fully registered. Integration to the HR payroll system is further on assumed to be valuable in drilling down in the actual cost structure.

Discussion and conclusions

Important to the case is the broad management support related to “actual” PM, proactive management / control and simulation of scenarios. This can be expressed in the relationship diagram below.

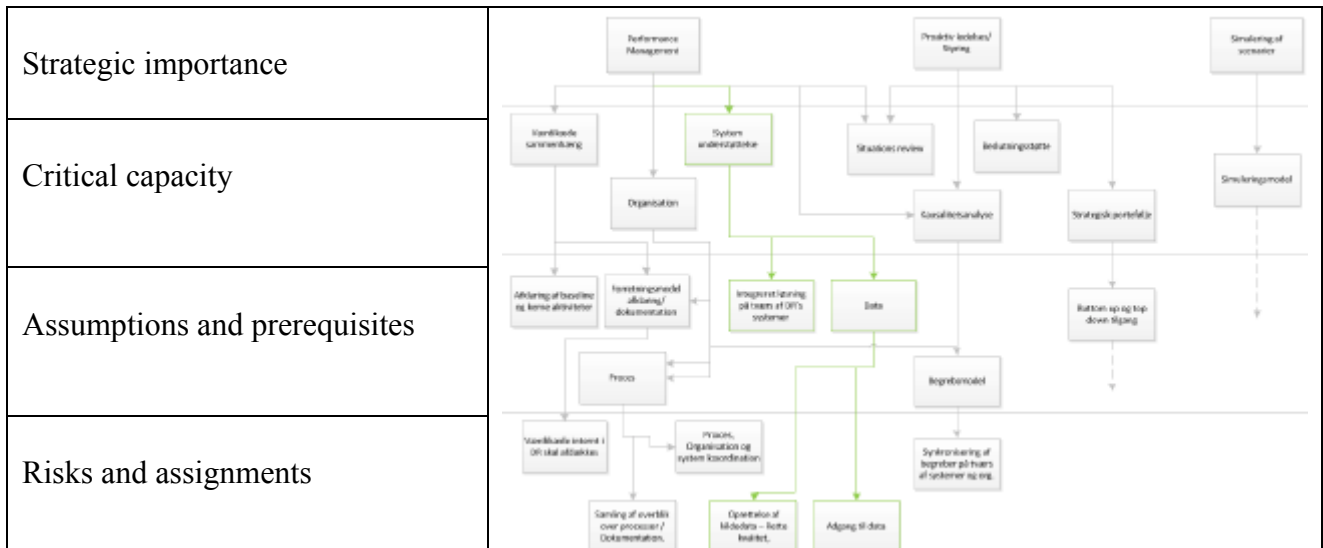


Figure 4. Strategic management map (blurred on purpose)

PM is thereby defined as connectedness to the value chain, organisation and systems support. This means that PM without system support is problematic. Assumptions for system support are an integrated, cross-organisational solution, probably OBIEE, and data with availability of data as a risk. This is highlighted with green in the figure.

The case illuminates a requirement for connecting activities and measurements more closely also in areas where measurement has been regarded as professionally inappropriate as of a cultural institution. This paper has demonstrated a transition from a ‘soft’ and frequently haphazard measurement system with multiple objectives to a more well-defined performance management architecture although not completed but underway.

In the development from conceptual PM to a more systematic approach, technology is therefore put in a determining role. Following Ross et al. (2005), the integrated and technology-based approach is moving from silos, through the use of standardised technology, into a rationalised data architecture, and this applied into the strategic and organisational framework of figure 4 will aim at providing a modularised architecture. Thus the transition from PMS to PMA will empower the DR management in the strategic development.

The continuous process recognising the DR PM project is expected to ensure the organisational engagement. At the same time, the technological foundation of the PM raises credibility at the organisational level. The PM effort is expected to increase effectiveness by shedding light to issues, although it is not at this point in time challenging the “producer’s choice” of creative liberty.

This study has demonstrated PM as a multi-faceted approach to a large cultural institution, where the digitalisation is giving sense to both providing data, but also elevate this insight to positively influence management processes and strategic development.

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0011

RELATIONSHIP BETWEEN TRUST, DISTRIBUTED LEADERSHIP AND JOB PERFORMANCE IN HEALTH CARE CONTEXT

EXPLORING THE MEDIATING ROLE OF JOB SATISFACTION

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Relationship between Trust, Distributed Leadership and Job Performance in Health Care Context: Exploring the mediating role of Job Satisfaction

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Purpose

This study aims at investigating the effect of vertical trust on distributed leadership and performance as mediated by job satisfaction, and further to see the role of DL in carrying out the effect of satisfaction on employees' performance.

Design

Grounded in literature on organizational citizenship behavior (OCB), we propose that employees' participation in DL should be viewed as an extra role behavior since leadership functions are not directly related to their job description. Employers cannot force an employee to participate in DL as it should be seen as the part of their voluntary behavior. The study uses a large-scale survey data from a study in one of Denmark's largest public hospitals (N= 1,439).

Findings

To test our hypotheses, we conducted structural equation modelling (SEM) analysis and results have confirmed all five hypotheses. The results of SEM analysis showed that job satisfaction mediates the relationship between vertical trust and distributed leadership, and further distributed leadership had a positive impact on job performance. Furthermore, the results also showed that job satisfaction had a positively significant impact on distributed leadership and employees' performance. Moreover, distributed leadership has affected employees' performance positively and it carries the impact of job satisfaction on performance.

Implications

The study showed that trust and job satisfaction are important triggers of DL. Furthermore, results are also interesting because literature so far has shown an insignificant relationship between satisfaction and performance. Here, we establish that the satisfaction-performance relationship is mediated by DL. The findings should motivate health care organizations to introduce structures and educate formal leaders so DL can be enabled.

Originality

These results contribute to the growing body of literature on dynamics of trust in organizational behavior context. This should be first study which relates trust and distributed leadership in an empirical manner. As grounded in OCB literature, results also showed the significance of job satisfaction as a mediator variable.

Introduction

Management and health care literature are increasingly preoccupied with leadership as a collective social process and related leadership concepts such as *distributed leadership* have therefore recently gained momentum. Most research in distributed leadership (DL) remains either at a conceptual or descriptive level (with the exception of Hulpia et al., 2009) or is applied in the education sector (for an overview see Bolden, 2011). A special arena for DL is without doubt the health care sector, as the complexity of professional and policy institutions may render any attempt to enact DL difficult (Currie and Lockett, 2011). Health care organizations can create a paradox to DL because they conform to the professional bureaucracy archetype of organizations (Mintzberg, 1979) with many layers of horizontal and vertical distribution of knowledge and jurisdiction (Abbott, 1988). Additionally a professional logic of hierarchy that remains essentially paternalistic and authoritarian is dominant (Bate, 2000). Multiple studies suggest that DL increases employee involvement and leads to greater professional and organizational empowerment. Since benefits of DL can ultimately result in increasing the organizational effectiveness, as argued by Hulpia and Devos, (2009) and Hulpia et al., (2011), then more knowledge of the triggers of DL might be of benefit to health care organizations in crisis. Additionally, we are missing empirical evidence on the outcomes of DL. These two gaps (triggers and outcomes) are addressed in this study. Therefore, this study aims at investigating the effect of vertical trust on distributed leadership and performance as mediated by job satisfaction, and further to see the role of DL in carrying out the effect of satisfaction on employees' performance.

Job Performance

One of the main objectives of psychological research in the field of organizational behavior is to enhance the performance of employees in the organization. However, performance has been defined operationally in different ways. Campbell et al. (1993) define work performance as employee controlled behavior that is relevant to organizational goals. Inherent in this definition are two characteristics of work performance. First, performance is multidimensional. That is there are no single performance variable, but different types of work behavior relevant to organizations in most contexts. Second, performance is behavior, not necessary results. Performance must be behavior that is under the control of the employee. Further, Campbell and his colleagues have proposed a "theory of job performance" and proposed following eight major dimensions, (Campbell et al., 1996; Campbell et al., 1993) (1) *Job specific task proficiency* (2) *Task proficiency of non-job specific nature* (3) *Written and oral communication* (4) *Demonstrative effort* (5) *Personal discipline* (6) *Facilitate peer and team performance* (7) *Leadership behavior and* (8) *Management and administrative tasks*. Organ and his colleagues (Organ, 1988; Organ and Ryan, 1995) have extended the concept of job performance to citizenship behavior. Similarly, employee's participation in leadership behavior (e.g., shared or distributed leadership) should also be considered as an important element of their work performance. As current leadership studies showed that leadership incompetence can be disastrous to organizational survival, for example one of the reasons of failure of Enron and Lehman Brothers can be linked with leadership incompetence at the top and lack of participation of employees in leadership activities. So leadership tasks should be spread or distributed across the members in the organization to mitigate the risk due to the dependency on one or few leaders. Therefore we have conceptualized distributed leadership and job performance as criterion variables.

Vertical Trust

Researchers have explored the essence and consequences of trust in organizational studies and it has been studied from a variety of perspective over the past decades (Wasti et al., 2007) for example, psychological, sociological, economic and strategic perspectives (e.g., Zucker, 1986). Accordingly, the concept of trust been defined from interpersonal and organizational point of views. For example, Tan and Tan (2000) defined trust in organization as global evaluation of an organization's trustworthiness as perceived by the employee whereas Boon and Holms (1991) defined trust as a state involving confidential positive expectation about another's motives with respect to oneself in situations entailing risk. Further, researchers have noted trust in authorities is typically labeled as vertical trust while trust in others is normally called horizontal trust (e.g., Eek and Rothstein, 2005). Overall, the concept has recently emerged as the most crucial construct for success in business relationships (Leung et al, 2005; Kriz and Keating, 2010). Therefore, in this study, we are investigating the impact of trust in hospital unit administration on DL practices in the context of a merger of four hospital units. Studies have explored the antecedents of trust (Christie and Geis, 1970; Deutsch, 1962; Rotter, 1971) the consequences of maintaining (or failing to maintain) trusting relations (e.g. Bromiley and Cummings, 1992; Rousseau, 1989). Empirical studies established the fact that trust in supervisor or in authorities lead people to engage in more cooperative behaviors and it increases organizational commitment, citizenship behavior, job satisfaction, productivity and reduces turnover and conflicts (Dirks and Ferrin, 2001; Tan and Tan, 2000; Tan and Lim, 2009; Chua et al, 2011).

The current literature on DL indicates a need to explore the preconditions for enhancing DL practices (Harris, 2011). In this study, we are exploring the effect of vertical trust on DL as mediated by job satisfaction in the context of a merger. According to Social exchange theory (e.g., Blau, 1964), trust and other macro motives such as loyalty and commitment provide a good basis for relational contracts and social exchange. Studies show the positive consequences of maintaining trusting relations (e.g., Bromiley and Cummings, 1992). Therefore, employees trust in the unit administration and the department will influence their motivation to participate in DL as mediated by satisfaction. According to Limerick and Cunnington (1993) organizational trust lubricates the smooth, harmonious functioning of the organization by eliminating friction and minimizing the need for bureaucratic structure that specify the behavior of participant who do not trust each other. Thus it can be argued that trust will increase the level of satisfaction thereby positively influencing employees' involvement in DL. Furthermore, Konovsky and Pugh (1994), based on social exchange model, trust in a supervisor mediated the relationship between procedural fairness in the supervisor's decision-making and employee citizenship. Similarly, Robinson and Morrison (1995) also found that trust mediates the relationship between psychological contract civic virtue behavior. The present study is conducted in the context of a merger of four hospital units, hence employees might have experienced a breach of psychological contract too, so we conceptualized trust in the unit and the department as predictor variable to job satisfaction and which may improve motivation for participation in leadership tasks. Trust is an integral to developing an environment that is able to sustain high level of job satisfaction (Ayree et al., 2002; Ferrer, et al., 2004). Extending the current literature, we have proposed the following hypothesis;

H1a: Trust in unit administration should have a positive effect on job satisfaction.

H1b: Trust in department administration should have a positive effect on job satisfaction.

Job Satisfaction

Job satisfaction connotes emotional processes or feelings such as joy, enthusiasm, pleasure, pride, happiness, delight, and fulfillment and widely considered to represent the contribution of a person's attitudes toward or about the job. Fisher (2000) linked emotions and moods with job satisfaction (that is defined as affective responses to one's job, but is usually measured largely as a cognitive evaluation of job features). Balzer et al. (1997, p10) have defined job satisfaction as “the feelings a worker has about his or her job or job experiences in relation to previous experiences, current expectations, or available alternatives”. Job satisfaction depends upon employee’s perception that how well the job outcomes meet the expectations of a particular employee (Tella et al. 2007). Job satisfaction correlates positively with employees’ well-being, while dissatisfied employees report significantly poorer health than satisfied employees (Faragher et al., 2005; Wegge et al., 2010). Further, other studies demonstrate the influence of satisfaction on productivity, organizational citizenship and communication (Grant, 2008; Petrescu, 2008; Proudfoot et al., 2009). Moreover, literature also shows the mediating role of job satisfaction in carrying out the effect of personality and dispositional variables, culture and other environmental variables on organizationally relevant outcome variables e.g., organizational productivity, efficiency, commitment, organizational citizenship behavior, turnover etc. (e.g., Yousf, 2002; Mowday et al., 1982). Therefore, it can be argued that job satisfaction should increase the level of commitment and involvement of employees in organizational leadership. However, reviews (e.g., Brayfield and Crockett, 1955; Iaffaldano and Muchinsky, 1985) have all reported statistical weak correlation between satisfaction and performance. Vroom (1964) concluded that the correlation between satisfaction and performance is .14. Therefore we have used DL practices as a mediator between satisfaction and performance relationship apart from measuring the direct effect of satisfaction on DL and job performance.

H2a: Job satisfaction should have a positive effect on distributed leadership.

H2b: Job satisfaction should have a positive effect on employees’ performance.

Job Satisfaction as a Mediator: Grounded in literature on organizational citizenship behavior (OCB), we propose that employees’ participation in DL should be viewed as an extra role behavior since leadership functions are not directly related to their job description. Senior managers or employers cannot force an employee to participate in DL. Employees’ participation in leadership tasks is more a part of their voluntary behavior. So it can be promoted by creating necessary conditions for DL practices. OCB literature showed that job satisfaction influences extra-role behavior positively (e.g., Organ, 1988). The main reason behind the development of the field of OCB is the failure of satisfaction-performance relationship (e.g., Iaffaldano and Muchinsky, 1985). Job satisfaction did not appear to cause job performance when performance is defined narrowly as quantity and / or quality of output. However, other forms of job performance such as OCB may exhibit a stronger relationship with satisfaction and may in fact be produced by it. Similar to OCB, we propose that DL can be viewed as part of employees’ voluntary performance that may likely to be exhibited by satisfied employees. To understand the deliberate aspects of DL, we can refer to Blau's (1964) theory of social exchange (in contrast to economic exchange), in which non-contractual actions are based on long-term relationships and trust and satisfaction at the work place. Extending the current literature, we have proposed the following hypothesis.

H3: Job satisfaction should mediate the relationship between vertical trust and distributed leadership.

Distributed Leadership

In literature the concept of distributed leadership (DL) has emerged as a substitute to heroic approach in leadership area (Badaracco, 2001). According to Hartley (2007) competence of people is more important than heroic contribution made by a single individual in running the organization well whereas the development of new government policies requires collaborative working across the public services. Despite the long history of participative styles of leadership, it is Gronn (2002) who has more formally used the concept of DL as unit of analysis in a more formal manner. As such, there is no definition which defines the concept of DL very clearly. Numerous authors have defined DL in their own ways. For example, Harris (2004) defined DL as “a form of collective leadership in which teachers develop expertise by working together” and “equates with maximizing the human capacity within the organization” (p. 14). Similarly, Copland (2003) defined DL as a state of being in which collective actions are made toward collective goals. Spillane (2006) stated that leadership is stretched over a number of individuals and that leadership is accomplished through the daily interaction of multiple leaders. Distributed leadership is being recognized as an emergent leadership concept in primary, secondary and higher education (Spillane, 2006; Spillane and Diamond, 2007). Furthermore, the concept of DL has also been studied in health care and social care context (e.g., Buchanan et al., 2007; Currie and Lockett, 2011). In few studies, researchers found that teachers' organizational commitment is mainly related to the quality of the supportive leadership, cooperation within the leadership team and participative decision making (Hulpia, Devos and Keer, 2011; Hulpia and Devos, 2010). Furthermore, researchers have also found that school leaders' perceptions concerning the cooperation of the leadership team, the distribution of leadership functions and participative decision-making on school leaders' job satisfaction (Hulpia and Devos, 2009). Extending the current literature, we believe that DL should enhance the employee's performance.

H4: Distributed leadership should have a positive effect on employees' performance

DL as a Mediator: Moreover it can also be argued that DL will mediate the relationship between job satisfaction and job performance. As discussed, studies have failed to show consistently strong positive relationship between job satisfaction and job performance (Iaffaldano and Muchinsky, 1985). Hence there is a need to explore the role of mediator variable into satisfaction-performance relationship. In this study, we have conceptualized DL as a mediator variable. Grounded in the organizational participation literature, it can be argued that employees have a desire to receive the information about the organizational affairs and willing to have an influence on organizational issues (IDE, 1993). Employee involvement and participation is defined as “a process which allows employees to exert some influence over their work and conditions under which they work” (Heller et al., 1998, p.15). Some researchers believe that at the core of participation is an underlying notion of “influence or power sharing” or “joint decision making” (Mitchell, 1973; Locke and Schweiger, 1979). Researchers have observed that employee involvement in organizational leadership can be another effective tool of promoting work motivation in organization which involves shared leadership in teams, organizational participation and organizational democracy (Wegge, et. al., 2010). Therefore we can argue that the perception of participation in leadership tasks should enhance employee's perception of their performance and it will mediate the relationship between job satisfaction and job performance. Extending the current literature, we have proposed the following hypotheses.

H5: Distributed leadership should mediate the relationship between job satisfaction and job performance.

The research scheme of the present study is presented in Figure 1.

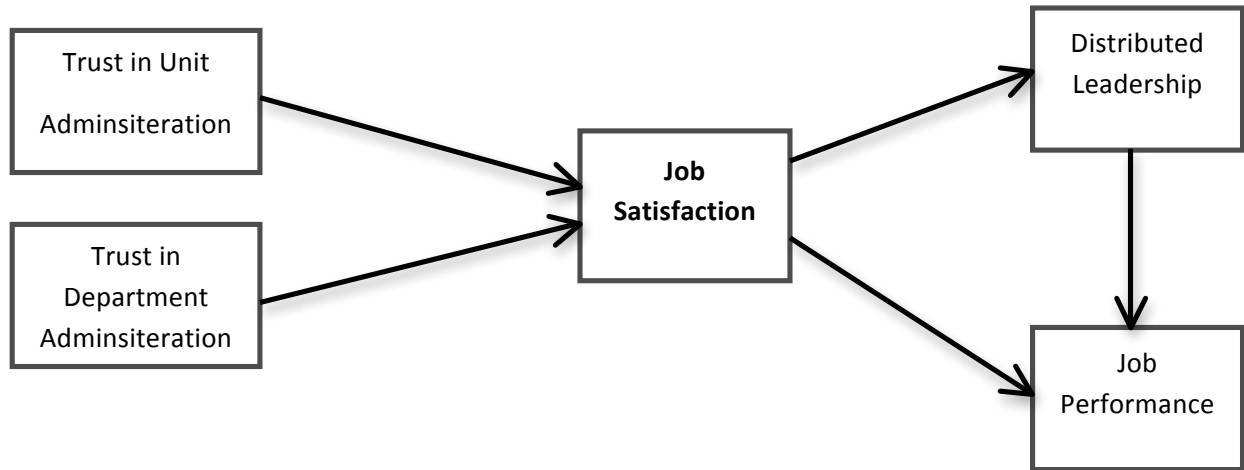


Figure 1: Research scheme of the present study

Method

Participants and Procedure

The data for this study were collected in the first part of a longitudinal, cross-disciplinary field study in context of a merger of four hospital units in Central Denmark region. The population of interest consisted of all hospital workers including health professionals, supporting service staff, and administrative staff ($n= 4,575$), who were employed at the newly merged hospital. In order to reach as many potential respondents as possible, the questionnaire was distributed to different segments of the hospital staff in three different ways; by e-mail for the staff with regular access to check their e-mail during work hours, by personal password to the survey webpage for the staff with no regular access to check their e-mail during work hours, and by paper for the staff with no work e-mail. This procedure resulted in a total of 2,217 responses corresponding to an overall response rate of 48.5 pct. However, after deleting incomplete answers and doubles, the number of respondents in the present study amounted to 1,680. The sample were comprising 219 male and 1461 female employees and the average age and average tenure for the total respondents sample was 44.4 years and 7.44 years respectively.

Measures

Distributed leadership questionnaire was developed in this study while questionnaires on trust, job satisfaction and job performance were borrowed from the literature. The questionnaires were administered in Danish language and they were translated into Danish using the translation-back-translation procedure (Brislin, 1980).

Distribution of leadership was measured by developing 11-item questionnaire. The details of the development and validation of survey items and construction of the scale are described in Jeppesen, Jønsson and Jain (2014). This scale measures employees' inclination to engage in the coordination and setting of goals as well as the planning, organization and implementation of various resources

allocation and HR-related activities at their departments. This means that agency in DL is measured at the individual level rather than at the team/group level since such a measure is virtually impossible to form validly across the many different internal structures at the hospital wards and units. The scale's Cronbach's alpha was .92

Trust in unit and department administration is measured by scale adapted from the work of from the work of Morgan and Zeffane (2003). The scale has four items and example of the item is, 'Management at this workplace can be trusted to tell things the way they are'. The scale's Cronbach's alpha was .93.

Job satisfaction was measured using a single item which is adapted from the work of Cammann et al., (1983).

Job performance was measured by using the 4-item scale borrowed from the work of Baird (1977). The example of items are, 'How do you evaluate your work effort', 'How do you evaluate the quantity of your work', 'How do you evaluate the quality of your work' and 'How do you evaluate your overall performance'. The scores on these four dimensions were the added to obtain an overall measure of performance. The scale's Cronbach's alpha was .86.

Control Variables: Three demographic variables (age, gender and tenure) were controlled in the statistical analysis. We controlled for employees' gender (male=1), age and tenure since male and female employees of different age and work experience may have different disposition for trust, job satisfaction and an inclination to engage in DL. The relationship between age and satisfaction is found positive, at least up to age 60 (Kalleberg and Loscocco, 1983). However, there is no evidence indicating that an employees' gender affects job satisfaction (Quinn et al., 1974). Other studies show that that tenure and satisfaction are positively related (Bedeian, et al., 1992).

Common Method Bias: Additionally, because the independent and dependent variables were all measured in one self-report survey, we followed common practice (Prati et al., 2009) and conducted the Harman's one-factor test to determine the potential influence of common method variance (Podsakoff et al., 2003).

Analytical Procedures: The data were analyzed using the SPSS 20 and AMOS software. Data analysis was done in two parts: AMOS was used to examine the measurement model by using a confirmatory factor analyses for all four scales; vertical trust, distributed leadership, job satisfaction and job performance. The CFA was conducted to estimate the overall fit, construct reliability, convergent validity and discriminant validity (Anderson and Gerbing, 1988). All variables were centred before being used in SEM analysis. For use in the structural model tests, each of the constructs was represented by a single factor score.

Results

Before administering the SEM analysis, all four scales were found to meet the acceptable levels of model fit statistics (Chi Square = 1895.72; $p < 0.01$; CFI=0.902; TLI=.901 and RMSEA=0.074). The high values of TLI and CFI (.90 or greater) and the low value of RMSEA, (below 0.08), all indicated reasonably good level of overall model fit.

Results of zero-order correlation are presented in Table 1. Table shows that trust had relatively weaker relationship with performance compare to job satisfaction and DL.

Table 1: Mean, SD and correlations among variables

Variables	Mean	SD	1	2	3	4
1. Trust in Department Administration	3,83	,90				
2. Trust in unit administration	3,94	,93	.76**			
3. Job satisfaction	4,16	,83	.43**	.44**		
4. Distrbuted leadership	2,11	,85	.23**	.25**	.16**	
5. Job Performance	3,71	,57	.09**	.09**	.18**	.20**

To test our hypotheses, we conducted SEM analysis and results have confirmed all five hypotheses. The results of SEM analysis showed that job satisfaction mediates the relationship between vertical trust and distributed leadership, and further distributed leadership had a positive impact on job performance. The relationship of job satisfaction with trust in unit administration (H1a: $\beta = .24 < .01$) and with trust in department administration (H1b: $\beta = .18 < .01$) was found to be significant. The relationship between trust in unit administration with satisfaction was found to be relatively stronger. Furthermore, the results also showed that job satisfaction had a positively significant impact on distributed leadership (H2a: $\beta = .16 < .01$) and on employees' performance (H2b: $\beta = .10 < .01$). Moreover, distributed leadership has affected employees' performance positively (H4: $\beta = .12 < .01$). Overall, job satisfaction has mediated the relationship between trust and distributed leadership and performance (H3) and further DL has mediated the relationship between satisfaction and performance (H5). Results of SEM analysis shows that all values meet the acceptable levels of model fit statistics (Chi Square = 59.23; $p < 0.001$; CFI=0.981; TLI=.928; RMSEA=0.073 and RMR = .043).

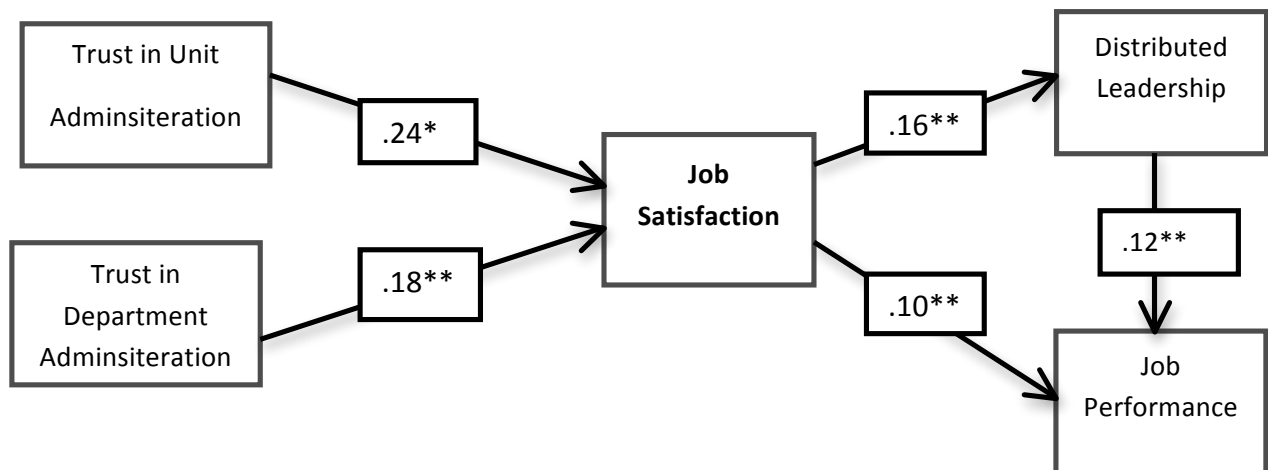


Figure 2: Results of SEM analysis (**significance at .001)

Discussion

The study was aimed at investigating the impact of vertical trust on DL as mediated by job satisfaction and how DL influences the job performance. As grounded in OCB literature, we proposed that job satisfaction should have a significant mediating impact on trust-DL relationship. Similarly, as grounded in organizational participation literature, we proposed that DL should mediate the satisfaction-performance relationship. Results of SEM analysis have shown a good model fit and thus satisfaction carries the impact of trust on DL practices in the health care context. Moreover, it also showed the mediating impact of DL on the relationship between satisfaction and performance.

Thus results support the importance of trust as a facilitator of improving the DL practices as regulated by the perception of employees' satisfaction. This study confirms usefulness of trust as a crucial construct for success in business relationships (Leung et al, 2005; Kriz and Keating, 2010). Trust in the hospital unit and department administration is crucial for the job satisfaction of employees in the context of the merger. There is a possibility of breach of trust in the context of organizational change (Rousseau, 2001). Empirical studies established the fact that trust in authorities lead people to engage in more cooperative behaviors and open communication with management (e.g., Tan and Lim, 2009; Chua et al, 2011). Trust as suggested by Harris (2011) is an important precondition for improving organizational participatory processes. However we empirically found that trust had an impact on DL but mediated by job satisfaction which is a major contribution of this study. Furthermore, job satisfaction has been conceptualized as a mediator variable as grounded in OCB literature (Hoffman et al., 2007). In this way, we indicate the role and importance of psychological processes in improving the employee's participation in leadership tasks, especially in the change management context.

Furthermore, the results are also indicative of the importance of DL as a mediator in carrying out the effect of job satisfaction on job performance. Thus the study also confirms that employee involvement in organizational leadership can promote work motivation (Wegge, et. al., 2010) and thereby job performance and thus confirms the importance of DL in health and social care context (e.g., Buchanan et al., 2007; Currie and Lockett, 2011). Most studies are conducted in the American and British context, so this is among the first few empirical studies which have been carried out in non-US and non-UK context.

Limitations and Suggestions

The major limitation of this study is the use of self-reported scales. The ratings for dependent variables should have been taken from the supervisors or peers. In an effort to determine whether common method variance was a problem, we did complete a Harman test. The results of the Harman test suggested that common method variance was not a problem in this study. In future, we are trying to get some hard data as part of this ongoing project e.g., patient satisfaction, employee turnover etc. Moreover, job satisfaction was measured using a single item which has limited usefulness, so a multiple item measurement of job satisfaction can be suggested in future studies. In a single item measure, employees overestimate their job satisfaction (Oshagbemi, 1999). Despite

some of these limitations, the results of this study empirically establish the usefulness of the concept of DL practices in improving the performance in health care context in Denmark. In other studies, researchers can make a comparison between DL and organizational citizenship behavior as outcome variables triggered by trust and satisfaction. Further an exploration of the relationship between DL and citizenship behavior can be an interesting topic for an empirical inquiry.

Conclusions

Results show the significance of trust in improving DL practices and employees' performance as mediated by job satisfaction. It showed that trust and job satisfaction are important triggers of DL and further DL had a positive impact on job performance. Moreover, results are also important because literature so far has shown an insignificant relationship between satisfaction and performance. This study confirms the satisfaction-performance relationship as mediated by DL. In this way, this study contributes to growing body of literature on DL and showed the relevance of DL as outcome and mediator both. The findings should motivate health care organizations to introduce structures and educate formal leaders so DL can be enabled. Furthermore, this study also confirms the importance of job satisfaction in enhancing voluntary forms of organizational behavior, e.g., OCB and DL. Thus the current study answers a call for more research on the facilitators of DL in organizational behavior context (Jain and Jeppesen, 2014).

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0012

DESIGNING HIGH PERFORMANCE CORPORATE CULTURE

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Title: Designing High Performance Corporate Culture

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The sole purpose of this research paper update is to directly assist the practitioner. If your goal is to design-in high performance corporate culture from day one of new enterprise or inter-prise, please feel free to actively participate in this ongoing research project*.

Abstract:

This conference paper is a midterm update of an historical research project. The research data drills much deeper than usual into the historic, often covert, conative triggers utilized by business excellence award winning organizations as they seek the most efficient and effective triggers that create individual, team, and corporate high performance. This study of 282 business excellence focused organizations, from Marrakesh to Manila unearthed 190 common decision making triggers that design-in high performance into corporate culture. Through a grouping sift using the initial triple OD cube data net, 115 triggers were identified and analysed. The data net assesses 7600 organizational component performance action scales. Frequency, success, and ease of learning criteria discovered 35 were the most effective ‘key triggers to excellence’ that can be incorporated into both distance and local decision making corporate cultures, but in different ways. As this study progresses, all eight layers of the corporate culture decision making patterns within the two organization development/design corporate and team cubes are being examined. Currently, for ongoing validity and reliability accuracy, successful onsite prototypes are being tested in the SAMENA Region**. To date, the study reveals that potentially, these action triggers could be utilized to increase the uptake of business excellence globally, especially within organizationally challenged corporations, and especially within narrative based environments.

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Key Words: Performance Management, Corporate Culture, Organizational Design, Organizational Development, Conative Triggers, Business Excellence.

Article Classification: Research Project Update

Author: James Grant Regan is a life-long professional scout and coach of Organizational Design, Development, Change, and Performance. Over the last 44 years he has conducted first hand studies of organizations in 66 countries. His recent 8 year academic research and dissertation studied 2015 organizational change agents identifying 155 common change

management techniques such as BSC and EFQM. His next 2 year research discovered that only 72 of these were effective in creating organizational change. The goal of this research was to accumulate successful case studies, share these with other change leaders, and encourage them to do the same. His current research is a 10 year longitudinal study of corporate cultures that utilize business excellence performance techniques. His focus is ‘achieving your quadruple bottom line faster’ through OD, Strategic Planning, OB, Human Technology Innovation, Effective Change Management, and Leading Organizational Change. Grant is also a Registered Organizational Development Professional (ODI) and member of the 2010 EFQM Model of Business Excellence UAE Elite Team.

Presentation Experience:

Grant has presented his research on numerous occasions. Current research updates were presented at the Organizational Development World Congress in Pretoria in 2010, Benchmarking conference in Bahrain 2010, TQM Central Asian Forums Kazakhstan 2011, Uzbekistan 2012, American University in Dubai, Zayed University, and University of Strathclyde in the UAE 2010, Massey University 2011, University of Auckland 2012, and University of Calgary 2013.

Designing High Performance Corporate Culture

A Longitudinal Research Update - Year 4

Overview:

The purpose of this research is to identify and analyze high performance decision making triggers that can be designed into evolving corporate cultures. These then can be custom designed and woven into the eight layers of each corporate and team culture. This is because our long term vision is to install these techniques into every new enterprise or inter-prise from day one of the business plan. And this is because from our experience with organizations around the world there is an urgent need to trigger a new level of global business excellence. Activating these decision making triggers may assist corporations in reaching their quadruple bottom line faster.

As a Singapore business man stated, “excellence is not just (for) survival, excellence brings profit, period”. With the exponential change happening right now, even the most agile organizations have a hard time catching up. The research results, although limited to a study of SAMENA corporations, will add to our global organizational performance and business excellence knowledge base.

The current research project is designed to data drill much deeper than usual into the conative triggers that actually ‘make excellence happen’. This research studies 282 high performing corporations via a data net of 7680 assessment scales that directly track high performance design patterns. Data is gathered through observations of high performance activity through site visits, corporate participation, data records, published documented histories, interviews, and virtual interviews.

Findings will be published through Organizational Design newsletters, journals, and a textbook for designing high performance corporate culture.

Our research is limited by geographic region and numbers simply due to current budget restrictions. Also, throughout the world there is limited access to high performance subjects and their private performance techniques and data. Trade secrets and formulae to these unique high performance skills usually only appear and are exposed when the corporation is already on to a new innovative springboard to excellence. Our corporations however opened their doors wide even to their own leading edge techniques, so in respect and appreciation our data will be fed back to each of them privately.

As Jim Rohn states, ‘success (does) leave clues’ and these clues can become springboards to new levels of corporate high performance. Toyota and Google can still learn from the Facebook and Twitter upstarts of the world. Just like we all can.

1. Introduction and Objective of Study

Designing High Performance Corporate Culture is an ‘update’ on the longitudinal research project entitled Making It Happen (MIH). MIH is a study of successful organizational excellence focused on conative triggers, performance technologies, and decision making patterns that are being utilized within two fast changing and evolving regions. It initially examined the decision making depth and breadth layer of corporate culture, this is the distance decision making versus local decision making scale within corporate cultures, similar to Hofstede’s power distance (Hofstede, 1991). This is corporate cultural decision making layer number four of our organizational development/design (OD) Cube.

For ongoing validity and reliability, prototyping tests are currently being conducted on the decision making patterns and ‘control panel action centers’ within the remaining seven corporate culture layers of the OD Cube [See Notes for terminology].

This research study was initiated to address an often ignored but urgently needed, empirically researched and ultimately proven, statistical resource of key ‘successful organizational performance conative technologies’ for future organizational excellence planning, development, and promotion. Our ultimate goal is to identify the most successful methods for promoting and increasing the uptake of business excellence in the SAMENA (South Asia Middle East North Africa) regions. The results may assist both start-ups and challenged organizations, especially within narrative based cultures (Cultures where the art and science of business is being improved through adventure challenge, collaboration, poetry, rhyme, time-sense, and scientific narrative).

Conative is identified here as that final motivational ‘trigger’ that actually makes it happen (i.e. not cognitive or affective). It is a term used for a component of the mind originally discussed by Socrates and Aristotle (Huitt, 1999). It is a component now researched mainly at Arizona State University (www.conativeabilities.org).

The information gained is to be utilized by the author and ADICOE (Abu Dhabi International Center for Organizational Excellence) as they assist organizations in creating, or continually improving, their leading edge learning organizations and consequently organizational excellence strategy. It will also provide a much needed base for further academic knowledge growth in the

field of fast paced performance management especially within MENA (Middle East North Africa).

The key issue and biggest challenge of this research is the lack of published academic research data on definitive conative actions in the literature, especially in MENA. After intensive research at the federal Center of Documentation and Research (CDR), and the Emirates Center for Strategic Studies and Research (ECSSR) in Abu Dhabi, we find decision making reports and results plentiful, but not the conative triggers that ‘make it happen’. This is especially crucial considering the volume of fast paced decision making happening especially in the UAE. This paper will also add to the professional logical academic underpinnings, both theoretical and practical, that will serve major decision making, and makers, for both accuracy and cost efficiency purposes.

Achieving quality and then moving on to business excellence is the corporate goal of most of our consulting and organizational development clients. To reach this goal they are demanding high performance work teams and organizations, and the most effective triggers that make them so. In turn, designing high performance corporate culture is our goal and the purpose of this research.

As academics and advisors we are called on for practical scientifically tested real world ‘applied research’ based advice. We thus need empirical evidence of what conative triggers make high performance work teams work, and ‘what really makes excellence happen’. Our most urgent request is for local ‘culturally compatible’ and consequentially unique MENA models of excellence. Singapore excellence models are also appreciated in both regions, so our research will use the SEAN (South East Asian Nations) region as a form of research control.

Over the 44 years of this author’s organizational development and consulting practice, the challenge of utilizing successful organizational performance conative technologies within organizations has evolved from a simple concern, to a matter of survival within the fast evolving global context. Because organizations began asking tougher questions, we needed to find better answers, especially for “complex organizations and their demand for emergent practices, and also chaos organizations and their demand for novel next practices” (Snowden, 2012).

2. The Challenge – Our Quest – ‘what triggers high performance?’

Because the force of economic growth in our two study areas today is rapid, variable, divergent, generative and massive, organizational responses must be flexible, accurate and immediate. Management, and all staff, must learn how to ‘speed learn’, react, and perform. Because of this, our base question then is; what organizational performance conative techniques achieve results efficiently and effectively, and most importantly why? We will need a correlation and ranking along with the reasons that these techniques are successful. Reasons arrive only from detailed analysis.

The detailed root analysis questions then are:

1. What high performance conative technologies are the most effective in achieving organizational success and why?
2. What have other similar studies found? And most importantly;
3. What do the results mean? (e.g. effectiveness patterns and scales, and replication efficiencies)

4. How easy were these technologies learned and implemented within the organization?
5. How can this material be quickly learned, replicated, and utilized by other individuals, teams, and organizations?

This quest must also consider the myriad of new high performance promotion focused technologies arriving daily. We first screened down to 190, and then grouped to 115 of the initial 239 promotional techniques identified. ISO, BSC, Six Sigma, Baldrige, and EFQM are five examples. This quest also assesses the required rapid learning of the selected technologies. Which of these most effective techniques can be learned most rapidly by all appropriate staff? What triggers individuals and their organizations to take the 'performance excellence' action step? Because of daily changes in this field, the first step then was to define the scope and criteria of appropriate subjects and techniques, and then categorize by our OD Cube data net possible answers within the areas of effective change management, learning, motivational, and communication techniques.

The final questions remained, 'what high performance conative techniques ultimately improve the promotion of organizational excellence, especially in proactive corporations?' And, 'how easy is it for other organizations and staff teams, including the board of directors, and all individual staff members to learn these new, sometimes culturally foreign and often overwhelmingly innovative performance excellence techniques, especially within challenging narrative based cultures?'

This research goes on to ultimately discover, analyze, and assess 115 highly effective concepts that could evolve into more effective communication and learning models. These models then could be utilized by academics, organizational performance coaches, learning organizations, and business excellence performance agencies such as ADICOE and PMA Forums.

Thus our quest, our refined 'problem statement' became; 'what are the most successful conative triggers that promote performance excellence in MENA and SEAN?'

And our bottom line, these answers may assist us as performance agencies in motivating more organizations to strive toward their journey to excellence. And in turn more may realize that, as a Singapore business man stated, 'excellence means profit, period ... awards are just a nice milepost along our journey'.

3. Background and Literature Review

The most relevant literature on the topic of empirically researching conative performance excellence promotion technologies seems to focus on either brain behaviour research or physical performance research. Arizona State University seems to be a leader in related conative brain research. We continue to follow up on these. fMRI brain research relating conation to organizational performance is sparse so far, but increasing rapidly. In the 1990's there were only a handful of related brain researchers. Today there are over 20,000 in the US alone. Only a few so far though are doing performance related research such as neuro-economics, neuro-cinematics, and neuro-marketing. This area will take more ongoing search. New York University seems to be the leader here as some related 'conative triggers' are emerging.

Fortunately however, physical performance research shows how it can quickly relate to business and economic development. In fact, the trend in using organizational and team performance development in business seems to be moving the business 'learning space' on to 'physical or innovative adventure activity learning' through both indoor and outdoor adventure experiences. It has staff relate this back to business and performance excellence. Al Shaheen Adventure Training in the UAE seems to be the leader in MENA. This is naturally limited to physically healthy individuals, but there are some schools now focusing also on less able and over-weight staff as well. SEAN has many centers.

It appears that in our two targeted performance excellence regions, as much as formalized adventure learning for performance excellence is relatively new to both, both regions have cultural roots in outdoor survival, one in the desert, and one in the jungle, so this parallel works, and is popular now in both regions. Performance excellence trainers are simply re-utilizing these two extreme environments to assist in 'speed learning' some of the more effective past and present organizational and team performance conative technologies. These are learned in a challenging environment and translated back to real business survival, one of the 115 'triggers to excellence'.

4. Research Variables

Considering our focused study environment, UAE and Singapore/Malaysia, both areas have a large Islamic culture base, and each are familiar to economic and security independence for around 40 years. Compared to any other young regions in the world, the growth of performance excellence in both locations has been obviously spectacular. From its origins in 1971, by 2013 the UAE economy had a 3.4% growth to 400 billion US GDP (Gulf News Mar. 4/14). Singapore also from 1963 to 2013 at 4.1% has reached nearly 400 billion US. This is very similar to Malaysia with a similar history. Malaysia's GDP for 2013 is up 4.7% and just a hair over that of Singapore at 417 billion (New Strait Times Mar. 6/14). Coincidentally also, even if it is only an attitude of economic progress, first Malaysia creates the world's tallest buildings, Singapore has their recent Marina Bay Sands development, and now the UAE has the highest building the world, Burj Khalifa. Evidence of spectacular growth is outstanding and commonplace in both of our case research regions.

Both regions are also attempting to remain on the leading edge of emerging new nations while at the same time faced with, and attempting to take advantage of, exponentially expanding world growth. For example in ICT alone, Internet traffic doubles every 100 days, Wireless capacity doubles every 9 months (nanotech.law.asu.edu), and chip performance doubles every 18-24 months (Gordon Moore's Law www.ece.uic.edu). Both regions are focused on utilizing the business tools of ICT excellence to keep in tune with this growth.

Also, "Anything that is not personalized and responsive to changing individual needs will rapidly be replaced by something that is." (From *Converging Technologies for Improving Human Performance* – Roco, Michael and Bainbridge, William. Natural Science Foundation, June 2002 Arlington, Virginia). This paper suggests merging the technologies of ICT, Biotechnology, Nanotech, and Social Networks Web 2.0 and Enterprise 2.0 and Learning Science to enhance organizational performance. Following this 'future trend' is another pattern of successful conative behaviour slowly being identified and utilized in both regions. This 'individualization' 'respect' and 'ownership' is within our 'conative trigger # 6'.

Since our goal is to study only successful organizational performance conative techniques utilized in these fast growing economies and limited by time and finances, we needed to further define, refine, and narrow our study focus.

Certain organizational performance techniques will be directly attached to finance or ICT. These are the dependant variables and are not under our consideration. To do this study, instead of depending on and researching the KPI tools used by finance or ICT technology, especially where accounting or ICT corporate silo culture sometimes attempt to replace both corporate culture and long term strategy, 'the tail often wagging the dog', we must instead study the independent variables of strategic and design thinking, decision sciences, culture, entrepreneurship, Web and Enterprise 2.0, leadership, management, and other organizational 'key performance indicators' (KPIs). These components are definitely the 'human technology' side of organizational excellence, the process, strategy, leadership, and people categories of our EFQM, Baldrige, and SPRING excellence model awards.

Our research is seeking to discover the patterns within this perceived organizational 'complexity' or 'chaos' (Snowden, 2012), especially in distance decision making corporate cultures. There should be many common identifiable and analytically similar patterns of organizational performance techniques utilized within these two regions that are repeatable, and that the rest of the world can learn from them. Only in a future study will we be able to 'design in' technical and finance 'research control' variables.

5. Research Methodology

This study progresses in a logical and sequential manner from the problem statement, existing knowledge, and collaborative research design, to field research, data collection, analysis, results, and recommendations. We first screened and then selected individual and corporate candidates that utilize successful organizational performance strategies that can be replicated. A high replication quality or ability allows for the potential sharing of success technology with others. This is the reason the complexity of each technique was also being assessed.

Due to the magnitude and dynamic nature of this research subject matter, this study has had to be limited to only two geographic and cultural areas. MENA (represented mostly by UAE) and SEAN (represented mostly by Singapore/Malaysia) regions have been chosen for this research study because of their recent great economic strides forward. As much as they were not selected for their cultural similarity, this similarity surely enables research efficiency. Although this limits the variety of subjects, the subjects will be from at least five organizational categories; traditional, governance, social, business, and proactive. This research pattern is applicable to, and could be replicated in many rapidly growing economies around the world. The MENA and SEAN regions are the most appropriate for this particular study, especially because the researcher is in direct contact with major decision makers in the course of his regular work in the MENA, and he also has many SEAN business contacts.

The results of this study will be shared freely and should be a valued addition to the academic and organizational performance knowledge base, both in theory and practice. These organizational performance techniques may in turn enable organizations to be empowered to reach their next level of achievement, and enable them to continue further along their 'journey to performance excellence'.

6. Research Design and Strategy

This historical research has been designed to be strategically flexible and efficient in core screening and assessing conative trigger techniques, all recorded in matrix format on Excel. This ‘data collection net’ or scaled matrix enables us to collect the techniques, identify and group them, prepare them for analysis, calculate utilization frequency and success weighting and ultimately a ranking.

Our collection ‘data’ matrix or ‘net’ is formatted and scaled to identify successful performance patterns. The data was gathered and recorded via journals and periodicals, newsletters, annual reports, books, video clips, conference presentations and papers, seminars, workshops, focus groups, corporate and individual plans and actions, Internet research, Web logs, and verified via business networking, and direct observation.

This design allows us to efficiently and effectively answer our research questions, especially in sensitive data gathering environments such as distance decision making corporate cultures. This design also allows us to screen out un-wanted variables as discussed earlier. Our greatest threat was subjectivity in identifying techniques that are successful rather than those simply popular because they are advertised widely. This all too common subjectivity would negatively affect our validity. Objectivity is key. Our focus is recording fact, not opinion surveys. And, just because a technique is advertised and even utilized by most organizations, does not mean it is successful.

Sampling must also be treated in a similar objective manner. We must continue our focus on success not just because a subject is popular, or even easy to access and research. The ideal sampling is a cross section in each region and of the five organization groupings, traditional, governance, social, business, and proactive. For ethics clearance no humans were used as subjects.

Because the research results will be most valuable to the business person, especially in challenged organizations and especially with distant decision making corporate cultures, instrumentation for the data analysis is a time saving simplified ranking conveyed in narrative format. This also allows our technique recording, observations, and analysis to be the most accurate, valid, reliable, and as transparent as possible.

7. Preliminary and Informal Findings Summary for this research working paper to date

1. A broader ‘uptake of the performance excellence journey’ is urgent. Under the current economic crisis the world is in, and the tsunami affects of our world population growth rate at about 220,000 more people on this earth per day ‘performance excellence’ obviously is not keeping up with our ‘global growth’. (www.worldometers.com)
2. The demand for better, higher level, emergent, innovative, and novel business practices (aka. excellence) naturally increases along with our global population growth. “How do we design our own ‘corporate culture’ to at least reach the basic benchmark in the latest in human technology to keep us on the ‘leading edge’ of business progress?” This

question was posed by a leading Abu Dhabi corporation. This question initiated this MIH research project, and also the result testing of prototypes.

3. MIH “Making It Happen” needs to focus on its ultimate goal to design-in high performance corporate culture from day one of every new enterprise or inter-prise.
4. Two hundred and eighty two (282) progressive organizations across two active areas of the world, MENA and SEAN (Middle East and North Africa, and South East Asian Nations) have been studied, via a cross-matrix OD Cube identifying 115 high performance ‘triggers’
5. This historical research project reviewing ‘upper middle management business excellence action’ has to date found empirical evidence verifying some commonly accepted theories of business excellence. It has also unearthed, literally from other historical and archaeology research, a greater understanding of the importance of knowing how to keep up with corporate cultures that have existed for centuries with ‘distant decision making’ deeply engrained in their way of doing business, especially within MENA. Distant Decision Making in this study is very similar to Hofstede’s term of High Power Distance (<http://www.geert-hofstede.com>). The second grouping is of corporate cultures that are largely Local Decision Making, or for readers of Hofstede similar to Low Power Distance. Current prototype verification research in the UAE also includes the testing of the other seven corporate culture decision making patterns of the OD Cube.
6. Here are some preliminary ‘decision making depth’ corporate culture patterns that have emerged.
 - a. In Distant Decision Making corporate cultures, all of these ‘triggers to business excellence’ need to be engaged as a package.
Upper Middle Managers in our most progressive corporations take action on quality and business excellence ‘mostly because’ of this package of triggers; 1) A Sense of Belonging 2) Relationship empathy 3) Reciprocation and Fairness 4) Corporate Consistency 5) Their authority is recognized 6) Respect 7) Patriotism 8) Hospitality 9) Social proof 10) Understanding the Corporate Vision 11) Understanding of Corporate Strategy (including quadruple bottom line) 12) Peer pressure 13) Benchmarks and 14) Business Excellence Award knowledge. (‘When BMW have 80% of staff qualified in EFQM, a pattern begins to emerge’ - Joe Schneider, a German EFQM Master Instructor).
 - b. In Local Decision Making corporate cultures, any of these triggers have been utilized individually to make middle management business excellence happen. Quality and Business Excellence happens mostly because of 1) Curiosity 2) Daily research 3) Teamwork 4) Quality culture 5) Knowledge of and ability to meet potential needs of clients 6) Ownership of Business Excellence throughout the corporation 7) Organizational Maturity (above 160 of the 320 steps) 8) Enjoyment of challenge 9) Corporate Communication that is efficient and effective 10) Attunement to global brand awareness 11) Fiscal efficiency 12) Business Excellence means profit x 4 (quadruple bottom line) 13) Business Excellence brings profits 14) Business Excellence adds value (at all three CTI levels) 15) Business Excellence Award knowledge 16) Business

Excellence Award feedback 17) Quality Assurance steps 18) Benchmarking action 19) Design thinking 20) Local Decision Making and 21) Business Excellence for Survival and Money.

- c. The World does not stand still – neither does the demand for Quality and Business Excellence. Fortunately all our worldwide business excellence initiatives and awards are working for our 1% ... we just need to work on the other 99%. Our real target with this information is the ‘next billion’, those new entrepreneurs and intrepeneurs in challenging environments currently planning and establishing their businesses, but still lack freely available internet access and global communication. This research is designed for them.

8. Conclusions

Under the urgency of our fast evolving global business climate, conclusions, interpretations, and recommendations in the full research paper discuss the data and ramifications both qualitatively and quantitatively. Because of the basic qualitative nature of the promotional triggers or processes, each result needs to be interpreted with variable consequences noted. The full research paper details, interprets, and quantifies each trigger, but of the 115 the highest ranked are the above 35.

Even if at the end of this study the findings are not fully implemented, at least the research will have uncovered and classified a vast number of possible techniques that can be tried by innovative entrepreneurs on a trial and error basis. Our applied prototype studies to date have proven our findings to be 91% accurate.

This study will also add to our academic organizational performance data base, another research methodology in analyzing organizational performance technology. Regardless of our result, this study should motivate the promotion of business excellence, especially for new entrepreneurs and their enterprises and intra-preneurs who wish to initiate excellence from ‘day one’ of their new enterprise. This research is also intended to initiate further research on the topic of building ‘cultures of excellence’, especially as the ‘next billion’ businesses enter their global connectivity (and internet) stage. A textbook is thus being compiled.

Notes: *The OD Cube** is often referred to in workshops as the OD Action Cube or OD CC (Control Center) Cube. It is an analogy for the performance management cube that is designed to categorize, scale, and act upon the ‘big data’ coming into the instrument or control panel of an aircraft which ultimately is used by the Pilot/CEO to control the mission and vision of an aircraft, or an organization. The aircraft analogy is especially designed for narrative based cultures, the focus of this research. The image of an aircraft is utilized here to identify many of the 7680 organizational components that the pilot or CEO controls. The Cube is actually a triple cube identifying the fact that each organization is dealing with not only the corporate culture, but also the culture that individuals bring to the scene, and most importantly the central team and its culture. Adapting to the Getzels Guba Organizational Model, it is the team where the actual performance happens.

We have found via our global research that humans, anywhere from the pygmies in the Ituri jungles to the executives in our urban jungles tend to follow organizational decision making patterns. Also, the thousands of existing organizational models can be equally assessed within this cube. Component labels may vary but patterns are similar. The front face of the cube is most familiar, our strategy and process. The vertical vector is our common eight pillars of business, the task, content, and structure. The horizontal vector is the systems, processes, and reframes. To be successful each pillar needs to climb through 8 times 5 process steps to reach all their five layers of maturity (CMM Carnegie Mellon). Behind this broad front face are eight solid layers of cultural decision making triggers. These are the layers that ‘eat our strategy for breakfast’ (Drucker). And also like the aircraft analogy, our ‘cheese is always on the move’ (Johnson).

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0013

PERFORMANCE MANAGEMENT PRACTICES AND ELDERLY CARE

JANNIS ANGELIS, HENRIK JORDAHL

Performance management practices and elderly care

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Biography

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Abstract

Purpose: The study compares management practices in private and publicly owned elderly care homes. The demands for cost-effective care combined with emphasis on client experience highlights the importance of appropriate management practices.

Method: The study utilises a survey of 500 homes covering management practices on monitoring, performance management, and staff development. These are highly correlated, allowing for treating the practices both in aggregate and individually in the analysis. Additional questions capture information on site and management conditions.

Findings: Management practices employed at the elderly care homes vary greatly, with high and low individual scores found in most homes. But private homes consistently score higher than public homes, especially when it comes to incentive practices. Also, elderly care homes of both ownership forms score at the top and bottom of each management practice. But looking at the average management score, there are fewer private homes that score really low and more private homes that score really high.

Practical implications: The results identify given characteristics and maturity of the various management practices employed to plan and control operations in the elderly care homes, and provides managerial and staff insights into their use.

Originality: The application and impact of standard management practices has previously been limited in publicly funded services. Little is known about management practices in elderly care and whether the practices are associated with better performance.

Article classification: Research paper

Keywords: Performance, management practices, measurement, care homes

Introduction

Management practices are a key driver of performance and market competitiveness, providing both cost and service quality advantages (Pineiro de Lima *et al.*, 2012). This study compares management practices in 500 private and publicly owned elderly care or nursing homes. In-house provision by public employees has been the traditional mode of production, but in recent decades contracting out to private providers has increasingly been seen as a viable or perhaps even necessary alternative. However, the application and impact of standard management practices has been limited in publicly funded services (Prentice *et al.* 2007). Little is known about the management practices in elderly care and whether the practices are associated with better performance. Knowing this would be valuable, not least given the common argument that it is difficult to procure services when quality is difficult to measure (Proudlove *et al.*, 2008). The demands for cost-effective care combined with emphasis on client experience highlights the importance of appropriate management practices in the sector.

Literature

A substantial body of knowledge shows that management practices are a key driver of performance and market competitiveness, providing both cost and service quality advantages (Van Reenen 2011; Pineiro de Lima *et al.* 2012; Waal and Kourtit, 2013). These management practices include operational practices such as lean and agile systems for improved quality and resource allocation (Franco-Santos *et al.*, 2007; Keane and Feinberg 2007; Shaw and Ward 2007), performance management systems for identification and action on effective and efficient conditions (Bourne *et al.* 2005; Pineiro de Lima *et al.* 2008; Vergidis *et al.* 2008), and behaviour and human resource related practices for staff skills development and use (Conti *et al.* 2006; Zu *et al.* 2010; Angelis *et al.*, 2011).

A body of literature exists on the role set management practices may have on operational, and indeed, overall performance on a wide range of institutions, covering both private and public, and profit and non-profit enterprises and institutions across industries and sectors. (Pineiro de Lima *et al.* 2008; Bourne *et al.* 2005; Choong, 2013). Studies by Bourne *et al.* (2005), Franco-Santos *et al.* (2007), Herzog *et al.* (2009), Neely (2005), Nudurupati *et al.* (2011), and Verbeeten and Boons (2009) focus on empirical evidence related to managing through measures. This provides a systematic and sustainable approach to management that is not reliant on individual efforts and interests, which may be difficult to sustain over time given initiative fatigue or staff turnover.

The management practices can be clustered into several sub-categories, each focusing on monitoring on-going operations, ensuring set targets are met, and enable capability development. Together they provide management with a set of comprehensive tools to keep operations both efficient and effective.

While initially developed in manufacturing companies and later on transferred to services, research has since incorporated the role and impact of management practices, such as performance systems and lean operations, in the health care sector – hospitals in particular (Proudlove *et al.* 2008; Thompson *et al.* 2003; Westwood *et al.* 2006). Since, various types of “best” practices, such as lean and six sigma processes and performance practices have been employed in a range of health service providers. However, the demands for cost-effective care combined with emphasis on patient or client experience highlights the importance of appropriately developed and employed management

practices in the health sector (Gaynor 2004; Prentice *et al.* 2007). Nursing homes provide housing, food and health care for its clients, and often have clinical need or social specialisations, such as dementia or gardening and cooking. This makes operations at each site quite complex in nature, and may require a degree of uniqueness in how management practices are implemented or employed.

Little is known about the application of management practices in elderly care and whether the practices are associated with better performance. Knowing this would be valuable, not least given the common argument that it is difficult to procure services when quality is difficult to measure (Proudlove *et al.*, 2008). Previous studies on management practices in (partly) tax financed services have been rare compared with other industries. In addition to a study by Delfgaauw *et al.* (2011) which pools nursing homes and adoption agencies, notable studies include Bloom *et al.* (2010) and McConnell *et al.* (2013) on health care, and McCormack *et al.* (in press) on universities.

Method

The study method relies on a large interview-based survey with 19 scoring dimensions (individual management practices) in the three areas operations, targets, and incentives. Conceptually, the survey relies on theories of operations, performance and health care management. The individual management practices are typically highly correlated according to previous research (Bloom and Van Reenen 2007). The survey is made up by open questions rather than closed questions. For each practice, follow-up questions were used, often by asking for an example. The study relies on information collected from a single source and is based on what managers say. Potential bias is mitigated by having the interviewers interpret and score management practices without the respondents knowing how they were scored. The interviewers did not have any information about the performance of individual nursing homes. In addition, previous research has demonstrated that companies that score high on the applied measure of management quality are more successful in terms of productivity, profitability, growth, and survival (Bloom and Van Reenen, 2010). Additional survey questions capture information on site and management conditions. We conducted several site visits to validate results. The survey consists of 19 management practices, most taken from Bloom *et al.* (2010) but adjusted for nursing homes. Each practice is scored from 1 (“worst practice”) to 5 (“best practice”). An overall measure of management practices is calculated as the average over these 19 practices. We also calculate simple averages to obtain measures for the three areas operations, targets and incentives.

Sample

The sample contains Swedish nursing homes that are public or privately owned but rely on public finances. We include nursing homes that were listed by the Swedish National Board of Health and Welfare in July 2013. To ensure comprehensive coverage, all 2334 nursing homes on that list were contacted for the study. We obtained responses from 500 homes, giving a response rate of 21 percent. We will mitigate potential selection bias by conducting a non-response analysis with respect to variables that are observed both for respondents and non-respondents and by comparing the responses of managers who were easy and who were hard to contact.

Data collection

The survey was conducted at the Research Institute of Industrial Economics in Stockholm by seven engineers graduated from the Royal Institute of Technology. All interviewers had experience in operations and performance management issues. The

contact method consisted of three stages. First a personal email was sent to the publicly listed manager of each nursing home, informing the manager about the study conducted and that a complementary telephone call would be made. This was followed by calls from the interviewer to provide further information if required, and to book an interview if the manager wanted to participate. Finally, an interview lasting approximately 45 minutes was conducted with managers willing to participate. An interview was scheduled or carried out during the first call for 19 percent of the interviewed homes. Up to ten calling attempts were made. In each case, the interviewers scored each practice depending on how well the home performs according to pre-determined scoring criteria, thereby generating a comprehensive listing of management practices employed at each case. The interviewer recorded the date, time and duration of the interview, and rated the manager's knowledge of management practices, willingness to provide information, and patience (on a 1–5 scale).

Results

Data on nursing homes and managers

We start by providing some descriptive statistics on a few background characteristics of the nursing homes and their managers. Table 1 contains such basic descriptive statistics. More than 90% of the homes are classified as general units, defined as a home in which people live permanently and receive long term care. There are also short term homes in which people stay for a shorter period and service homes for people with less severe care needs. Public nursing homes make up 78 percent of the sample, and private homes 22 percent.

The average home in our sample has been in operation for 27 years, has 41 beds and 43 employees. There are only a few empty beds in the homes – utilization of capacity stands at 97 percent in this respect. The average home has nine other homes within 30 minutes driving distance and one home in five has a special profile (e.g. culture or cooking). As expected, public homes are older than private homes (privatization being a relatively recent phenomenon). Public homes also have fewer beds and employees, and are only about half as likely as a private one to have a special profile of any kind. Private homes are typically located closer to other homes than are public homes. The average private home has 17 homes within 30 minutes driving distance compared with seven homes for the average public home. Union membership is high in general, but higher in public than in private homes. There is, however, no difference between public and private homes when it comes to utilization of capacity or turnover of employees.

Table 1 - Descriptive statistics for nursing homes

	All homes	Public homes	Private homes
Age of home (years)	26.8	27.9	22.9
Share of general units	92.2%	90.8%	97.2%
Homes within 30min driving distance	9.0	6.6	17.3
No. of beds	41.1	39.6	46.5
Utilization of capacity (occupied beds)	97.1%	97.2%	96.8%
No. of employees	42.8	41.2	48.5
Employee turnover last 12 months	4.0%	4.0%	4.3%
Employee union membership	84.3%	87.1%	74.4%
Home has a special profile	19.4%	15.4%	33.9%
No. of nursing homes	500	391	109

Most of the managers (65%) held the title “unit manager”. A significant share (25%) held the title “operations manager” whereas a smaller share (10%) held some other title. As can be seen in Table 2, women make up a vast majority of the managers. The average manager has worked for 4.6 years at the current home and has had her current title (at any home) for 9.1 years. Most managers have previous experience of leadership or management and it is more common to have it from a public organization. A striking difference is that private homes have recruited managers both from the public and the private sector whereas only 12 percent of managers in public homes have private sector experience.

Table 2 - Descriptive statistics for managers

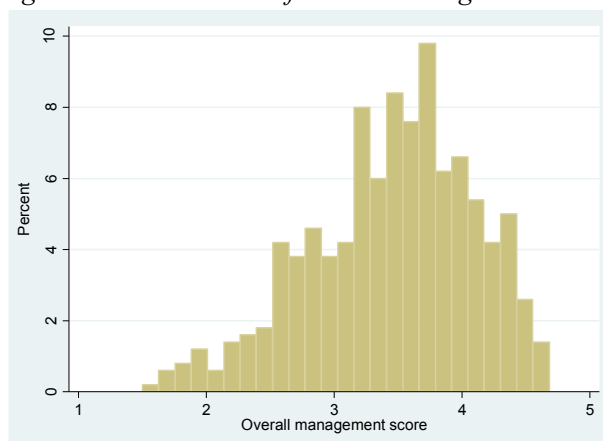
	All homes	Public homes	Private homes
Manager is female	90.4%	91.3%	87.2%
No. of years at current home	4.6	5.0	3.3
No. of years with current title	9.1	9.5	7.6
Manager has previous experience of leadership/management in public organization	75.0%	76.7%	68.8%
Manager has previous experience of leadership/management in private organization	22.8%	12.0%	61.5%
Manager is paid a bonus	1.6%	0.3%	6.9%
Largest investment manager is allowed to decide on (SEK)	39 200	42 000	29 100
No. managers	500	391	109

The table gives average values or percentage shares. Experience of leadership in public and private organizations are not mutually exclusive (15 percent of the managers have experience from both).

Management scores

We find that nursing homes appear to be reasonably well managed on average but with great variation among homes. The overall management scores ranges from 1.50 to 4.68 with an average of 3.45 and a standard deviation of 0.64. As can be seen in Figure 1, there are both high and low performing homes in terms of overall management practices: 2.2 percent of the homes score below 2 and 18.6 percent score above 4.

Figure 1 - Distribution of overall management scores



The wide distribution of scores could mean that the form and extent of management practices employed at each home are not determined by set clinical or organisational requirements, but rather based on site specific conditions that to some degree are alterable. The reliability of the overall measure of management practices (Cronbach's alpha) is 0.82 (0.70 for operations, 0.84 for targets, and 0.67 for incentives), although there are both high and low scores of individual management practices found in many homes.

Table 3 reports the statistics for the three covered areas of operations, targets and incentives. The average score is highest for operations and lowest for incentives, mirroring what has been found for Swedish firms (Bloom and Van Reenen 2010). Moreover, there is a significant difference in management practices between public and private homes. The table reports averages and standard deviations of the overall measure and for the three subcomponents operations, targets and incentives for private and public homes. Private homes consistently score higher than public homes. The difference is statistically significant at the five percent level in all four columns. There also seems to be a difference in that private for-profit homes (as well as public homes) score higher than private not-for-profit homes. However, as there are only eight private not-for-profit homes in our sample, we do not want to emphasize that difference (which has p-values between 0.03 and 0.14 in the four columns). The table gives average management scores and standard deviations in parenthesis. All differences between public and private homes are statistically significant at the one percent level.

Table 3 - Management scores in nursing homes

	Overall management	Operations	Targets	Incentives
All homes	3.45 (0.64)	3.81 (0.71)	3.56 (0.84)	2.96 (0.73)
Public homes	3.40 (0.60)	3.78 (0.71)	3.52 (0.81)	2.88 (0.71)
Private homes	3.63 (0.74)	3.94 (0.72)	3.70 (0.93)	3.24 (0.73)
Private for-profit homes	3.67 (0.74)	3.97 (0.73)	3.74 (0.93)	3.28 (0.74)
Private not-for-profit homes	3.15 (0.66)	3.50 (0.61)	3.23 (0.98)	2.71 (0.52)

The largest difference between public and private homes relates to the sub-category incentives (see Figures 3 and 4). The category covers staff development and identification and support, attraction and retention of high performing staff members, as well as retraining or reallocating low performers. Noticeably, there is a significant difference in the treatment of the latter category in privately versus publicly funded elderly homes. Private homes have more developed practices in place to identify and reallocate low performing staff, while for high performing staff the difference is less pronounced.

Figure 3 - Distribution of scores for Incentives, by ownership type

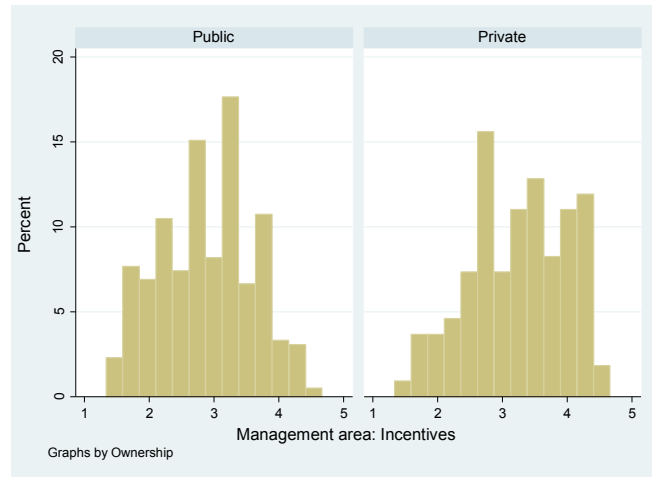
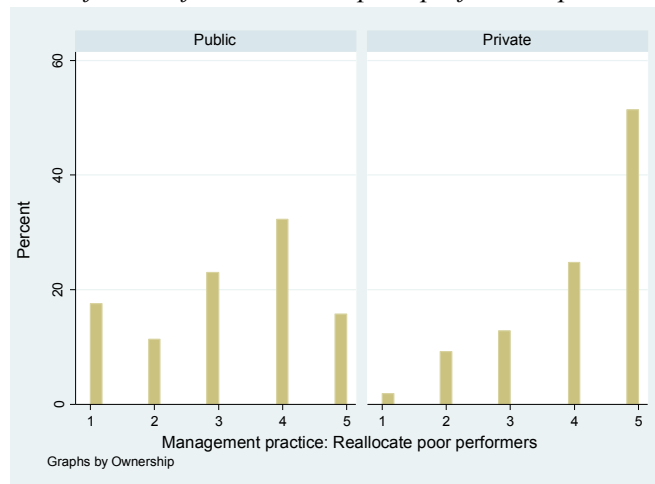


Figure 4 - Distribution of scores for Reallocate poor performers practice, by ownership type



Regression results

Finally, we use regression analysis to see whether the difference in overall management practices between public and private homes remain after controlling for a few background variables. The regression results are reported in Table 4. It demonstrates that private homes tend to score higher than public homes also when we control for the type of the home, the number of beds, as well as for interviewer fixed effects.

Table 4 - Regression results for management scores in nursing homes

	1		2
Private home	0.233*** (0.069)	0.261*** (0.069)	0.208** (0.093)
Short term home		0.318** (0.158)	0.285* (0.152)
Service homes		0.011 (0.138)	-0.019 (0.134)
No. of beds		0.0003 (0.001)	0.0008 (0.001)
Interviewer fixed effects	No	No	Yes
R-squared	0.02	0.03	0.12
No. observations	500	499	499

Dependent variable is overall management score. Private home is a dummy variable. The regressions contain an unreported constant. Standard errors are in parentheses. ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively.

Conclusion

To conclude, the study provides an understanding of management practices employed in elderly care homes, covering both the degree of development within the operations, targets and incentives areas. Empirically, the results identify given characteristics and maturity of the various management practices employed to plan and control operations in the homes, and provides managerial and staff insights into their use.

We find that both aggregate and individual management scores vary greatly among the homes, suggesting substantial room for improvement. A consistent pattern is that privately owned homes score higher than publicly owned homes, in particular when it comes to incentives and reallocation of low performing staff. There are high and low individual scores found in most homes, irrespective of general characteristics such as ownership, number of beds, length of existence, and experience of managers. There are also both high and low performers in terms of overall management practices. This suggests that form and extent of management practices employed at each home are not determined by set clinical or organisational requirements, but rather based on site specific conditions that to some degree are alterable.

There is a significant difference in management practices between public and private homes. Private homes consistently score higher than public homes, especially when it comes to incentives, which also seems to be the least developed category with an average score below three for all homes. Elderly care homes of both ownership forms score at the top and bottom of each management practice. But looking at the average management score, there are fewer private homes that score really low and more private homes that score really high. Employed performance measures and user participation were more common in privately owned homes, both which may play an increasingly important role in care provision.

The largest difference between public and private homes relates to the sub-category incentives. This category covers staff development and identification and support of high performing staff members, as well as their attraction and retention. The opposite is also true, with low performing staff members being identified and retrained or reallocated. Noticeably, there is a significant difference in the treatment of the latter category in privately versus publicly funded elderly homes. The former have more developed practices in place to identify and reallocate low performing staff. For high performing staff the difference is not as pronounced. Since staff numeration and incentives are limited in the sector, attracting and retaining talented staff is challenging. This may necessitate a low skill and autonomy approach to work processes or hybrid participation approach.

The study provides an understanding of the nature and extent of management practices employed, covering both the degree of development within the operations, targets and incentives areas. The results identify given characteristics and maturity of the various management practices employed to plan and control operations in the elderly care homes, and provides managerial and staff insights into their use. For further work, we will compare private equity owned nursing homes with other private homes. We will also link employed management practices to quality measures at the home level. This will allow us to investigate whether “management matters” and whether the same management style is appropriate to different types of ownership.

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0014

THE USES OF MEASURES IN PERFORMANCE PRISM IN DIFFERENT ORGANIZATIONAL CULTURES

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THE USES OF MEASURES IN PERFORMANCE PRISM IN DIFFERENT ORGANIZATIONAL CULTURES

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ABSTRACT

Purpose: The purpose of this study is to evaluate the usage performance measures in each of perspective in performance prism, a well-known performance measurement system that comprises five perspectives: stakeholder satisfaction, strategies, processes, capabilities, and stakeholder contribution and to compare the uses of these measures between two different organizational cultures: flexibility and stability cultures.

Design/Methodology/Approach: The survey method was used in this study. Questionnaires were distributed to the staff in management-level positions with job descriptions related to performance measurement systems in the financial firms listed on the stock exchange of Thailand. Samples were then divided into two types based on organizational culture: flexibility and stability cultures, based on the test score from questions in the questionnaire. Independent sample t-test was used to analyze the difference of usage of performance measures in each perspective in performance prism between firms in two different cultures.

Findings: 41 out of 57 organizations returned questionnaire (a response rate of 72%). Of these 41 organizations, 61% had a flexibility culture and 39% had a stability culture. It was found that customer satisfaction, strategic formulation budget, sufficient number of databases available for customer service purposes, risk management and control system measures, work done within deadline, and sales growth were measures that were used most often in these financial firms. Nevertheless, the results showed no significantly difference of usage of these measures in each of performance prism perspective between firms in different cultures.

Research limitations/implications: Financial firms tend to use similar measures in each of perspective in performance prism regardless of their organizational culture. This might lead to dysfunctional behavior, as performance measures should fit the culture of the organization. Nevertheless, due to the small sample size in this study, the generalization of results from this study might be limited.

Practical implications (if applicable): Managers who work in organizations should carefully select the performance measures that reflect their organizational culture. This can finally lead to the successful implementation of performance prism and any other performance measurement system in organizations.

Originality/value: This study reveals the nature of financial firms that then to use the similar measures regardless of their organizational culture. Findings in this study can be used to explain why one firms are successful in implementing performance measurement system while the others fail even they have similar measures.

Keywords: Organizational culture, performance prism, Thailand

Paper type: Research Paper

1. INTRODUCTION

The foundation of organizational culture is one of the most important factors that comprise value. Belief directs the working behavior of organizational members to participate creatively in certain activities. Many organizations focus on creating organizational culture as a route to becoming a quality organization. In this regard, one useful technique that improves the effectiveness of this process is the performance measurement system.

The Thai economy has recovered from the recent global economic recession. One factor that has contributed to this recovery has been the government's economic stimulus package, which improved consumer and investor confidence and, in turn, changed the economic direction towards a better course. Of the companies listed on the stock exchange of Thailand, the top three industries that yielded the highest profits were the resources, financial, and services sectors. The financial sector comprises three sectors, namely banking, finance and securities, and insurance. Moreover, the Thailand floods in 2011 affected all economic sectors; however, realistically, there was no permanent effect on Thai productivity because Thailand has strong financial institutions and a strong insurance sector. Given the foregoing, the study of organizational culture and the application of performance measurement systems in the Thailand financial sector are very significant.

Specifically, this research examines the relationship between organizational culture and the performance prism measurement system (PPMS), which is an outstanding concept compared with other similar systems. This research focuses on whether organizations that have different cultures use different measures in PPMS. The outcomes and recommendations yielded from this research could be utilized as guidelines for practitioners who wish to apply the PPMS to their organizations and for scholars interested in studying this system.

2. ORGANIZATIONAL CULTURE

Organizational culture is a system of shared meanings and common beliefs held by organizational members. Such a culture determines, to a large degree, how organizational members act towards each other and their work (Robbin and Coulter, 2010). Both the working environment and organizational procedures must be aligned with the organization's value and with other inherent organizational guidelines (Luthan, 1992). Organizational culture thus serves as a creative foundation for the working environment as members learn and develop shared basic assumptions, which lead to solutions to external problems and result in the integration of internal subjects (Schein, 1983). It also allows incumbents to transfer knowledge to newcomers. Organizational culture can even be reflected in an unwritten fashion even though it is considered an inherited culture (Daft, 2012).

Quinn and Cameron (1999) introduced the competing value model, which assesses organizational effectiveness through 39 measures. These measures can be divided into two dimensions. The first dimension relates to the strategic criteria on which the organization must focus internally or externally. The second dimension relates to the external environmental criteria that the organization must control or adapt to. These two dimensions can be subdivided into four cultural types: the first two types focus on control in order to induce stability, while the latter two focus on flexibility in order to adapt to the external environment. However, because financial firms in Thailand focus on both the internal and the external environments, it is difficult to delineate such organizational differences. Hence, this study compares organizational cultures that are characterized by both flexibility and control.

3. The PPMS

This research employed the PPMS developed by Kennerley and Neely (2002). The PPMS is noteworthy because it focuses on the stakeholder perspective. This concept can, for example, help reduce the problem of the overconsumption of resources and allow the user to create a realistic budget plan.

The PPMS has five perspectives that each requires the user to answer questions to set the parameters. Comparing whether these five perspectives align with to the organization's objectives reveals the effectiveness of this measurement system. These five perspectives, which aim to maximize shareholder value, are described below:

- 1) The Stakeholder Satisfaction (SS) perspective focuses on understanding the important stakeholders of the organization and what they require from organizations;
- 2) The Strategies (ST) perspective focuses on understanding which strategies are crucial and able to fulfill stakeholders' needs;
- 3) The Processes (PR) perspective focuses on understanding which processes organizations must possess to meet these organizational strategies;
- 4) The Capabilities (CB) perspective focuses on understanding which competencies organizations must possess and exercise continuously in order to acquire the results of organizational processes; and
- 5) The Stakeholder Contribution (SC) perspective focuses on understanding what organizations need and what should be contributed by stakeholders.

Previous studies have found a link between the PPMS and the fulfillment of stakeholders' needs. For example, Chillida (2009) analyzed the PPMS by using corporate social responsibility theory and reflected that the former has a foundation in stakeholder theory. Stakeholders are a group of collective people that can influence or be influenced by organizations (Freeman, 1984). This theory assumes that a stakeholder must possess the tools to measure organizational value. The key stakeholders must be grouped together and the management team must provide a clear business direction in order to meet organizational goals on a regular basis (Freeman et al. 2004). The PPMS also takes account of ethical concerns, such as the effective allocation and utilization of organizational resources. In this way, it enables an organization to respond to stakeholders' needs based on corporate social responsibility and to focus on overall stakeholder benefits.

Furthermore, Chillida (2009) studied the PPMS in SMEs and found that SMEs have promoted the use of the PPMS because this system is a useful tool for allocating limited resources yet allows organizations to yield the best possible performance given changing environmental conditions. Because SMEs improve business performance by creating stakeholder satisfaction, the application of the PPMS creates a strong foundation for involving and retaining stakeholder relations in an uncomplicated way.

Neely et al. (2002) found that UK company DHL adjusted its performance strategy by applying the PPMS. It used the PPMS in order to pinpoint (i) the criteria that create stakeholder satisfaction and (ii) the possible return on this. This approach also supported the segmentation of stakeholders into subgroups in order to customize services using the ST, PR, and CB perspectives. The PPMS was further used to analyze the needs of the management team in order to make the right decisions about business direction as well as to shape organizational culture. A year later, DHL found that applying the PPMS had improved management competencies. The managing director reflected that this quality measurement is able to respond to the overall target group of the organization and provide clearer information.

Neely et al. (2002) studied London Youth, a non-profit organization whose mission is to provide developmental support to children and working people. London Youth applied the PPMS to manage working processes and focus on organizational stakeholders. A number of perspectives were monitored in order to measure organizational performance. For instance, under the SS perspective, objectives were set that aimed to fulfill and enhance satisfaction in order to shed light on stakeholder desires. Under the ST perspective, the key success criteria for improving the effectiveness of organizational activities were the number of new product items and services offered. Under the PR perspective, the organization must establish interesting activities, the performance of which can be measured by the number of participants. Under the CB perspective, performance measurement assesses the investment made to improve staff competencies to an acceptable level. Finally, under the SC perspective, performance measurement assesses the percentage of cash inflow from several income sources. Applying the PPMS allows staff to acknowledge which areas are being measured, which motivates them to accomplish the goals and, in turn, fulfill the needs of all groups of stakeholders.

Epstein (2003) found that 21st century organizations must build stakeholder satisfaction to improve business performance. Previously, two types of stakeholders were typically focused on by organizations, namely stockholders and customers. Nonetheless, during the 1980s, maintaining a relationship with customers was unsuccessful, which led to reshaping management in order to focus on other stakeholders. There have been many cases where world-class organizations have encountered problems managing stakeholder. For example, Caterpillar, the renowned book publisher, once faced union disputes, which led to a protest that caused the company to shut down for 17 months and lose significant amount of its revenue. Similarly, NGOs requested Exxon-Mobil to provide clarification about the management of its gas stations around the globe and their effect on the local environment. Further, Shell UK stated that enhancing business performance by focusing on stakeholders, social responsibility, community, and the wider society could create a strong foundation for organizations to sustainably grow. Hence, the 21st century could be considered the age of stakeholder revolution.

Because of the focus on stakeholders as previously described, this research aim to address the uses of the performance measurement system that consider stakeholders' needs and contribution like PPMS. The main objective is to investigate the different of the usages between two distinct organizational cultures: flexibility and control.

4. METHODOLOGY

This research was conducted by using quantitative method. The original sample comprised 57 financial companies listed on the Stock Exchange of Thailand. Questionnaires were sent to the staff in management-level positions with job descriptions related to performance measurement systems. There were three parts to this questionnaire.

Part 1: Questions about organizational culture using the Organizational Culture Assessment Instrument (Quinn and Cameron, 1999). This part of the questionnaire contained six main topics about the organization's characteristics. The result of this part indicated whether the sample organization had flexibility or a stability culture.

Part 2: Questionnaire about performance measurement using the five perspectives of the PPMS described earlier. The performance measures in each perspective in PPMS were gathered from the research outcomes of Henri (2006). Participants provided rating scores based on the level of usage in their organizations (1= barely used; 5 = mostly used).

Part 3: Questionnaire about the demographics of the sample (e.g., gender, education, working experience). The gathered information was analyzed using statistical software in two parts: (i) the analysis of the demographic data of the sample using descriptive statistics (frequency and percentage) and (ii) hypothesis testing for difference of usage of measures in each perspective in PPMS based on independent sample t-test.

5. Results

We received information from 41 of the original 57 organizations, which was a response rate of 72%. Based on data collection using the Quinn and Cameron (1999) instrument, of these 41 organizations, 61% (or 25) had a flexibility culture and 39% (16) had a stability culture. Of the 41 participants, 50% were men, 59% had a Master's degree, and 37% had working experience of 10–20 years in a management position. Accounting managers returned most questionnaires (41%). The research results for each perspective are presented in Table 1 and summarized below:

1. SS perspective: the research results indicated that performance measures based on customer satisfaction were mostly used, with a total average score of 4.30. However, those based on the sufficient number of employees were barely used (3.82). Both flexibility and stability cultures had the highest use of customer satisfaction performance measures (4.327 and 4.250, respectively) compared with performance measures on the sufficient number of employees (3.820 and 3.813, respectively). However, there was no significant difference between the uses of these performance measures for both types (p -value > 0.05).
2. ST perspective: the research found that the performance measures on strategic formulation budget were mostly used (3.82); by contrast, those on the ratio of organizational website visitors were barely used (3.04). Both the flexibility and the stability types of culture had high uses of strategic formulation budget performance measure (3.627 and 4.125, respectively). However, the performance measures on the ratio of organizational website visitors were barely used (3.153 and 2.875, respectively) by comparison. Again, there was no significant difference between the uses of these performance measures for both types (p -value > 0.05).
3. PR perspective: the performance measures on the sufficient number of databases available for customer service purposes and risk management and control system were equal, with a total average score of 4.10. However, those on rewarding individual and team performance were barely used (3.50 and 3.69, respectively). Flexibility culture had the highest use of the sufficient number of databases available for customer service purposes (4.120). However, the performance measures on rewarding individual and team performance were infrequently used (3.493). By contrast, the stability culture type had the highest use of the risk management and control system performance measures (4.188) and deployed fewest performance measures on staff's work quality comparison using KPIs (3.563). As before, no significant differences were found (p -value > 0.05).
4. CB perspective: the performance measures on work done within deadline were mostly used (4.17) compared with those on foreign language capability (3.35). The flexibility culture had the highest use of work done within deadline performance measures (4.033); however, the performance measures on foreign language capability performance only had an average score of 3.220. By contrast, the stability culture type had the highest use of work done within deadline performance measures (4.375) and deployed the fewest performance measures on foreign language capability (3.563). No significant differences were found (p -value > 0.05).
5. SC perspective: the performance measures on sales growth were mostly used (4.30) and those on complaint letters from stakeholders for future organizational improvement used least (3.24). The flexibility culture had the highest use of operating sales performance measures (4.127), while

the stability culture had the highest use of sales growth performance measures (4.625). Both types had the least use of complaint letters from stakeholders for future organizational improvement performance measures (3.193 and 3.313, respectively). No significant differences were found (p -value > 0.05).

Table 1
Level of the usage of the performance measures of the PPMS

Performance Prism Measures	Mean	Standard Deviation	Mean of Flexibility culture	Mean of Stability culture	p-value
SS Perspective					
Market share	3.98	0.72	3.840	4.188	0.541
Customer satisfaction	4.30	0.62	4.327	4.250	0.177
Sufficient no. of employees	3.82	0.77	3.820	3.813	0.869
Duration of services	4.00	0.86	4.033	3.938	0.876
Health insurance for employees	4.00	1.13	3.993	4.000	0.606
ST Perspective					
Strategic formulation budget	3.82	0.94	3.627	4.125	0.643
New products each year	3.74	0.99	3.620	3.938	0.468
No. of development programs for staff	3.65	0.90	3.620	3.688	0.367
SWOT analysis report	3.52	1.20	3.607	3.375	0.326
Organizational website visitors ratio	3.04	1.11	3.153	2.875	0.573
PR Perspective					
No. of checkup times for operating assurance	3.78	0.96	3.793	3.750	0.424
Sufficient no. of databases available for customer service purposes	4.10	0.74	4.120	4.063	0.466
Risk management and control system	4.10	0.82	4.040	4.188	0.520
Staff's work quality comparison using KPIs	3.64	1.09	3.687	3.563	0.981
Rewarding individual and team performance	3.57	0.89	3.493	3.688	0.705
CB Perspective					
Leadership capability	3.89	0.73	3.733	4.125	0.764
Technological capability	3.81	0.95	3.807	3.813	0.845
Foreign language capability	3.35	0.96	3.220	3.563	0.968
Work done within deadline	4.17	0.92	4.033	4.375	0.314
Specialist certification	3.65	0.90	3.513	3.875	0.279
SC Perspective					
Operating sales	4.22	0.61	4.127	4.375	0.813
Sales growth	4.30	0.75	4.100	4.625	0.551
Continuously higher investment	3.66	0.83	3.520	3.875	0.860
No. of quality rewards obtained	3.52	0.92	3.327	3.813	0.791
Complaint letters from stakeholders for future organizational improvement	3.24	1.16	3.193	3.313	0.882

6. DISCUSSION AND CONCLUSION

This research studied the application of the PPMS in 41 Thailand-listed companies in the financial sector. Of these 41 firms, we found that 25 organizations have a flexibility culture and 16 have a stability culture. The research result showed that, overall, the listed financial firms sampled herein have applied the measures in each of PPMS perspective to a medium to high extent and that there is no significant difference between the usage of all five perspectives of the PPMS for both types of culture. After analyzing the average scores for these five perspectives, the performance measures that have the highest level of importance are as follows:

- 1) SS perspective: customer satisfaction;
- 2) ST perspective: strategic formulation budget;
- 3) PR perspective: sufficient number of databases available for customer service purposes and risk management and control system;
- 4) CB perspective: work done within deadline; and
- 5) SC perspective: sales growth.

Financial firms tend to use similar measures in each of perspective in performance prism regardless of their organizational culture. This might lead to dysfunctional behavior, as performance measures should fit the culture of the organization. Nevertheless, due to the small sample size in this study, the generalization of results from this study might be limited.

According to results of this study, managers who work in organizations should carefully select the performance measures that reflect their organizational culture. This can finally lead to the successful implementation of performance prism and any other performance measurement system in organizations.

In conclusion, this study reveals the nature of financial firms that use the similar measures regardless of their organizational culture. Findings in this study can also be used to explain why one firms are successful in implementing performance measurement system while the others fail even they have similar measures.

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0015

WHEN DOES IT PAY TO BE GOOD? -
MODERATORS AND MEDIATORS IN THE
CORPORATE SUSTAINABILITY
PERFORMANCE - CORPORATE FINANCIAL
PERFORMANCE RELATIONSHIP

A REVIEW

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WHEN DOES IT PAY TO BE GOOD?

Moderators and Mediators in the Corporate Sustainability Performance – Corporate Financial Performance Relationship: A Review

KEYWORDS: Corporate Sustainability Performance, Corporate Financial Performance, Moderators, Mediators, Strategic Performance Management, Strategic Corporate Sustainability

ARTICLE CLASSIFICATION: Literature Review

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consultant for various large German corporations on issues such as strategic planning, corporate reporting, and customer profitability.

STRUCTURED ABSTRACT

We review the literature on moderators and mediators in the corporate social performance (CSP) – corporate financial performance (CFP) relationship. We provide some clarity on what has been learned so far by taking a contingency perspective on this much-researched relationship. Overall, we find that this research has made some progress in the past. However, we also find this research stream to be characterized by three major shortcomings, namely low degree of novelty, missing investment in theory building, and lack of research design and measurement options. To address these shortcomings, we suggest avenues for future research. Beyond that we also argue for a stronger emphasis on the strategic perspective of Corporate Sustainability. In particular, we propose future research to take a step back and aim for an integration of the CSP-CFP relationship into the strategic management literature.

PURPOSE

The Corporate Sustainability Performance (CSP) and Corporate Financial Performance (CFP) link is one of the major research streams within Corporate Sustainability (CS) research (Linnenluecke & Griffiths, 2012). Since the mid-1970s scholars have tried to understand the relationship between CSP and CFP (Margolis & Walsh, 2003; Ullmann, 1985). Unfortunately, no consensus about the impact of CSP on CFP has been found yet. The relationship between CSP and CFP has been found to be (i) positive (Orlitzky, Schmidt, & Rynes, 2003), (ii) insignificant (Surroca, Tribo, & Waddock, 2010), (iii) negative (Aupperle, Carroll, & Hatfield, 1985), or (iv) others (Barnett & Salomon, 2012). The reasons for the ambiguous results are twofold. On the one hand, there are empirical shortcomings (Aupperle et al., 1985; Griffin & Mahon, 1997). On the other hand, there are existing theoretical deficiencies (Ullmann, 1985). This makes interpretation and synthesis problematic.

Therefore, some scholars have called for a more contingent perspective and the integration of moderators and mediators (Aguinis & Glavas, 2012; Barnett, 2007). The objective of the present study is to provide a review of research exploring the contingencies affecting the CSP – CFP

relationship. In doing so, we aim at increasing our understanding of the conditions under which CSP has a distinct effect on CFP.

METHODOLOGY

In order to identify the literature, we conducted a systematic literature search, based on 12 major academic journals within the field of management and sustainability research. The broad keyword database search focused at the timeframe from 1972–2013 and yields 274 potential relevant studies within the field of CSP-CFP. After carefully reviewing the abstracts, we eliminated all studies without a contingency perspective. This led us to a final working list of 31 studies, made up of 21 empirical studies, 8 conceptual papers, and 2 literature reviews.

ANALYSIS

We analyzed the broad variety of moderators and mediators according to their rationale behind. Based on the line of argumentation, we constructed the following classification scheme (see figure 1): *organizational* and *environmental moderators*, as well as *organizational* and *environmental mediators*. Identified organizational moderators are: (i) firm characteristics, (ii) differentiation between sustainability engagement, and (iii) managerial perception & behavior. Environmental moderators are: (i) stakeholder relationship, (ii) industry characteristics, and (iii) business environment. In general, mediators have been less considered so far. The identified mediators are intangible resources, relating to organizational mediators, and stakeholders response, relating to environmental mediators.

We further differentiated between the operationalization measure of the predictor CSP and the criterion CFP, as well as the kind of connection; positive, negative or other shape. This is needed to shed light on the gaps in the present state of knowledge and to identify underlying patterns. Outstanding in this analysis is the accumulation of organizational and environmental moderators within the context of CSP operationalized as other externally measured variables and CFP operationalized as market or accounting based measure.

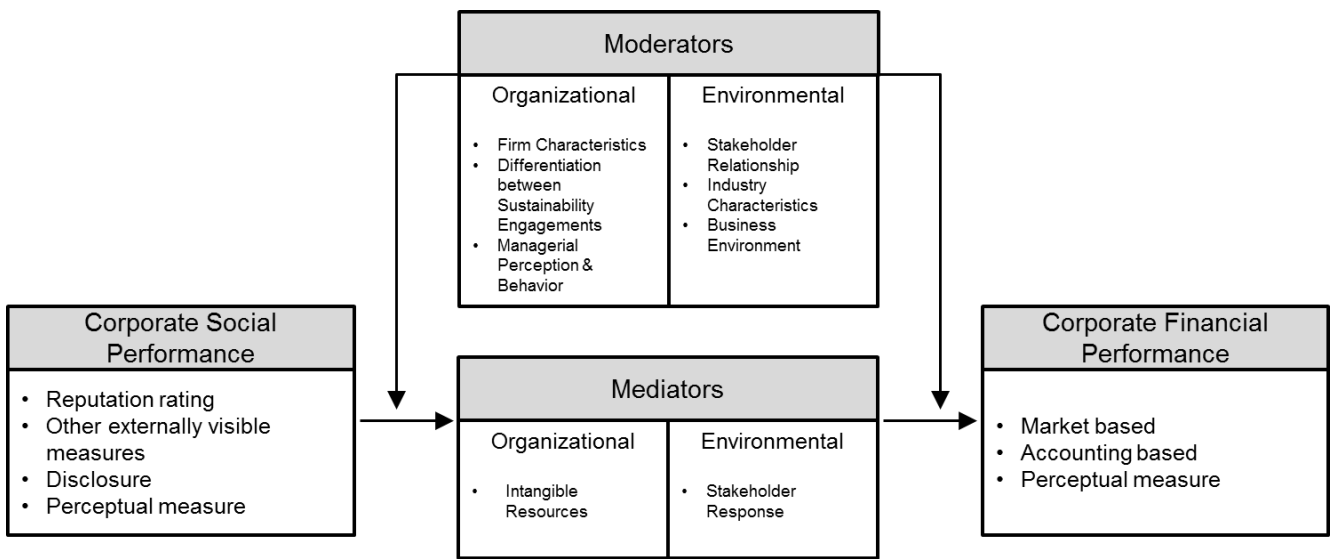


Figure 1: Framework used to review the literature

FINDINGS

Overall, our assessment of the literature taking a contingency perspective – moderators and mediators – on the CSP-CFP relationship is mixed. On the one hand, we find it encouraging for the field that scholars have begun to take a finer grained and more differentiated perspective on the CSP-CFP relationship. This is likely to substantially advance our knowledge and may ultimately reveal stable patterns in the relationship at hand, enabling us to answer the question *When does it pay to be good?*

On the other hand, however, we find research on moderators and mediators in the CSP-CFP relationship to be fragmented and underdeveloped. For one thing, considering the vast amount of studies addressing the CSP-CFP relationship and the fact that scholars have long called for a contingency perspective on this relationship, the number of studies exploring moderators and mediators is strikingly small. For another thing, we also find that available research taking a contingency perspective may be criticized for three issues, namely (i) limited novelty, (ii) missing investment in theory building, and (iii) shortcoming in research design and measurement options..

IMPLICATIONS

Given the limited number of studies exploring moderators and/or mediators in the CSP-CFP relationship there is a lack of topics deserving future research attention. Hence, we provide several suggestions for future research that we believe deserve particular attention. These suggestions are divided into *specific* suggestions for moderator and mediator and, through taking a step back, *broader* suggestions for future CSP-CFP research that evolved as a result of our review.

Concerning specific implications for moderators and mediators, more research needs to be done. Existing research about the general link between strategy and performance reveals potential moderating and mediating factors, which should to be considered also for the CSP-CFP context. Thus, *potential organizational moderators* can be: (i) leadership style, (ii) product type, and (iii) ownership type. *Potential environmental moderators* can be: (i) market structure, (ii) labor market conditions, and (iii) socio-demographic characteristics. Relating to *potential organizational mediators* we suggest: (i) administrative and social structure, (ii) organizational commitment, and (iii) competitive strategy. An interesting *potential environmental mediator* can be (i) strategic networks.

Nevertheless, our findings do not just reveal missing considered moderators and mediators. The results also indicate that the CSP-CFP research is in transition towards a paradigm status (Taneja, Taneja, & Gupta, 2011). This means that, in a broader perspective, there is a need to move away from a simple focus on CSP-CFP and its measures. Equally, important is to understand the underlying constructs of this phenomenon and to treat CS no longer as a 'black box'. Hereby, theoretical groundwork is needed, especially with respect to strategic management. Often decisions about CS activities are related to strategic decisions on the business and/or corporate level of a firm (McWilliams & Siegel, 2011). Therefore, in order to understand when it pays to be good, it is not enough to look at whether firms invest in CS activities and projects, but also whether these projects and investments are intended and designed strategically to enhance a firm's profit. We propose that measuring the pure financial impact of CSP shows only a limited picture of the value of CS activities for the firm. Considering the broader concept of organizational performance (Venkatraman & Ramanujam, 1986) does rather more reveal the value of CS and is more in line with the Triple Bottom Line (TBL) perspective (Elkington, 1997).

VALUE

In comparison to the impressive amount of literature about the pure relationship between CSP-CFP, there exists only a limited amount of studies, which consider the influence of moderators and mediators within this relationship. The broad variety of different named moderators and mediators can be combined to a compact classification scheme, based on their common line of argumentation. The findings of the analysis lead to two implications: first, a strong need for the inclusion of more moderators and mediators, and second the need for taking a step back and re-conceptualize the CSP-CFP relationship towards strategic management literature.

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0016

RESEARCH PAPER: AN ENGLISH HANDBELL ENSEMBLE RESONATES YOU MORE BY STRATEGIC CONSULTING - HOW AND WHY TO DECODE THE "KIRIKU OPERATING SYSTEM"

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Research paper: An English handbell ensemble resonates you more by strategic consulting – how and why to decode the “Kiriku Operating System”

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yasunori.mori@hakuodo.co.jp: Yasunori Mori, the author of this project, holds a BA in Sociology from The University of Tokyo (2000). He is now functioning as Strategic Consultant at advertising company Hakuodo Inc. with 15 years working experience in public/press relations, convention work, and business/creative consultancy for clients. Also he has been studying clarinet privately under Mr. Tomomi Takahashi (ex-principal clarinetist at Gelsenkirchen Philharmony, Germany) and has participated in opera/ballet productions of major and hidden repertoires including Leon Cavallo's *La Boheme* Japanese premiere.

Structured Abstract :

- **Purpose:** Originally as a strategic consultant, the author provided performance management services for Kiriku Handbell Ensemble. In the later phases of the project, the author decoded their own management way, or “Kiriku Operating System”, in order to extract essences which can be applied to traditional firms’ performances.
- **Design/methodology/approach:** Internal interviews with Kiriku with reference to their historical/artistic resonance with Japanese culture: tea masters and Takemitsu Toru.
- **Findings:** Kiriku’s high level of performance has been achieved by exploiting their competitive advantages. Their success as a self-learning organization holds clues to other firms’ performance. Research conducted by U.S. experts in Japanese industry in the 90s seem to support this conclusion. In essence, Japanese Culture fostered an aesthetic drive to complete the incompleteness; to “form the image of the bright moon obscured by clouds”. By following this aesthetic in fulfilling the vacancies of what is suggested, Kiriku became self-learners who established an organization with high competency.
- **Research limitations:** We need more practical cases to prove this theory.
- **Originality/value:** Suggests businesses should consider cultural/aesthetic activity as a concept model of high performance especially for organizing a self-learning organization.

Keywords: Performing arts, Entertainment, Strategy, Competitive Advantage, Organizational Capability, Management Consulting, Performance Management

"Muse, speak to me now of that resourceful person(s)"

--- Homer, *Odyssey*

Purpose

Searching for the key to decode the "Kiriku Operating System"

This is a practical report of organizational performance as exhibited by a unique case in management/marketing consulting for a performing arts group. Hakuhodo Inc. and The Kiriku Ensemble have decoded their strategic perspective through focused interviews. In this preliminary study, the author introduces the procedure and illustrates how they continue to overperform.

Although this report began as a focused investigation into Kiriku's performance management and effectiveness, it's focus changed to application of their unusual strengths to other firms. Therefore, the later phases of this project expanded to investigate their refined way with the intention of accentuating how and why to decode the "Kiriku Operating System" as an example of invisible management with reference to tea masters described by Kakuzo Okakura. This paper has a slightly longer *Coda* than *Exposition*.

Profile as artists

The Kiriku Handbell Ensemble is a world-class English handbell ensemble based in Japan. They exhibit extraordinarily high levels of performance in several areas.

First the ensemble thrives with fewer people (around 8 players) than ordinary groups (at least 12 players or more). Fewer members mean that to play the same passages they have to operate more bells than ordinary groups. Second, while some players and their artistic and ideological leader, Taiko Otsubo, are full time and semi-full time, other members have regular jobs. They are not playing to make a living but to achieve their aesthetic goals; not for money but for self-expression. Third, they are a highly competitive handbell group with an extensive repertoire. They have covered J.S. Bach's Church-Cantata Music, "Ave Maria" (Franz Peter Schubert, 1797-1828) as well as complex keyboard piano piece transcriptions. In particular, "Nocturne in C-sharp minor, Op. posth" (Frederic Chopin, 1810 - 1849) was well transcribed into independent voices and lyrically reorganized.

The above is not their official biography but reflects the third party experience of the author. Reviews of their US tour 2013 support the author's experience with quotes such as:

“Their artistry is breathtaking. Their slow pieces make you want to weep, and their fast pieces make you want to dance. Truly inspirational!” (Pamela “P.L.” Grove / leader of *Velocity*, handbell group^[1])

Despite the mature entertainment market in Japan, they have achieved significant success with ticket sales and reviews from experts. However, it was thought that there was still space for growth. This assumption basically originated with reviews of their October 2013 performance: something stuck in the middle was felt.

First, the lyric melody line especially on longer singing passages - the skyline of the composer’s perspective - was sometimes missed. They felt the audience might lose the architecture of the composition. Second, their passion for *genuine* sound can be blurred by photogenic ringing performances. It is often the case that audiences appreciate their fast dance-like ringing actions, but in that precise moment, their sound can be cloudy. Finally, they felt their true aim should be clearly announced. At times they seemed pegged in-between musicians and juggling circus clowns. All of their concerns can affect their strategic positioning. By getting rid of their weaknesses, they can amplify their competitive advantages on musical and artistic scenes.

With these thoughts in mind, Yasunori Mori, the author of this report, asked to meet with the group and they warmly accepted. Interviews and constructive discussions with Kiriku core member were organized.

Design/methodology/approach:

Exposition: enhance performance potential by maximizing inside resources.

Hakuhodo interviewed Kiriku Handbell Ensemble leader Ms. Taiko Otsubo and acting general affairs officer/core musician Ms. Eri Koyama on 30 October 2013, 29 November 2013, and 6 February 2014. Because key points were often repeated in multiple interviews, this paper refers to information gathered collectively “at our interview” but verified by Ms. Otsubo and Ms. Koyama on 22 April 2014. The author of this report critically reviewed two of their performances from his classical musician background ^[2]: the former was on 9 October, and the later on 24 December 2013.^[3]

Because management consultants often compare musical performing groups to firms when considering organizational performance, the method of this report is *not always unique*. Excellent previous research includes: Minzberg, H. investigated Winipeg Symphony Orchestra to find conductors’ real function similar to first line supervisors and so to speak “directors” in order to attain high levels of professionalism.^[4] Safter, H. and Economy, P. discussed collaborative leadership methods incubating within the world of a

conductor-less chamber orchestra, the Orpheus Chamber Orchestra. [5] Their research is quite inspiring.

To differentiate our project, the author laterally compared the Kiriku way and the way of tea masters in medieval/pre-modern Japan as described by Kakuzo Okakura (also known as Tenshin Okakura 1862–1913). [6] This is to better illustrate Kiriku's strengths. Partly because Kiriku musicians are not full time players [7] but exhibit world class excellence in their performing, they are very like the tea masters who were officially warriors, governors, or great merchants; not professional artists but also busy with real business/bureaucratic duties. Similarly, Russian composer Nikolai Andreyevich Rimsky-Korsakov (1844-1908) worked as a Russian Imperial Naval officer.

How do Kiriku members keep and refine their qualities despite their time and focus restrictions? This is clarified with reference to tea masters. Tea masters lived to be aesthetic even in their daily lives. Their lives were to be aesthetic. Kiriku follows the same path as revealed in our interviews.

Additionally, during our interview, Ms. Otsubo continually asserted the true reason to play was a passion for *genuine* sound. Toru Takemitsu (composer 1930-1996) may have decoded and clarified her intention. Takemitsu's text will be referred to later.

Thus this report has three legs, Kiriku leader's interview, thoughts of tea masters, and Toru Takemitsu.

Findings:

Principal section: The search for for "Ichion Jobutsu" makes Kiriku distinctive

Kiriku's reason to exist

During our Kiriku interviews, the authors shared their practical needs of performing. The first issue was income, but it quickly became apparent that was not essential. They did not take advantage of opportunities to promote themselves as Christmas-song ringers during the Christmas/New Year Season. Here in Japan, Christmas is a very popular seasonal event, the consumption rate is fairly high during this season and there are many special promoting opportunities. However they expressed anxieties about being Christmas promotion musicians even if that would be lucrative. This discussion in fact clarified one point: Kiriku plays for their aim not for making a living.

If not for remuneration, what is their aim? This was the second issue. Ms. Otsubo explained:

"We'd like to re-invent the concept of English handbell ensemble itself.

This instrument was originally a training tool for the ringers of huge bells on churches and if we trace more historically, it has been connected to something ritual, especially in ancient days. Because metal casting technology was monopolized by the Throne, so to speak, bells are metaphors of ruling class legitimacy. The sound of bells functioned to form a synthesis of our conception. Even in this modern age, it should have the same power to grab people's thoughts and make them feel together. However now, English handbell is thought as school girls' off time activity in Japan or aged women's time-killing-entertainment in the U.S. There are few opportunities to experience its high-edged artistic performances. Few repertoires are properly composed for handbells. Our aim is to break through with original/*genuine* sonic performances with aesthetic perfection. Therefore, place to play is also a decisive matter for my qualification: an occasion without enough live acoustic effects is not recommended, even if requested." [8]

Here we have to take some steps to decode her remarks. If read metaphorically, *genuine* sound often means a code: thus combinations of sound and its texture. However, Ms. Otsubo intended differently. She meant that every single sound should be exclusively artistic. This is clearly decoded if we refer to the essays of Toru Takemitsu:

In working with Japanese performers I often feel that they think discovering sounds is more significant than expressing by sounds...as a people who developed the concept of "attaining Buddhahood in a single sound" (*ichion jobutsu*), the Japanese found more meaning in listening to the innate quality of sound rather than in using sound as a means of expression.

(*Noh and Transience* From *Ongaku No Yohaku Kara*[From the Margin of The Music] Tokyo Shinchosya, 1980) [9]

Of *shakuhachi* music it is often said, "*ichion jobutsu*" - suggesting that the universe is explored in a single sound.

(*Sound of East, Sound of West* From "Higashi no Oto, Nishi no Oto. Sawari no Bunka ni tsuite" Monthly Shincho, Tokyo: Shinchosya Jan. 1990) [10]

For her (and possibly for other Japanese musicians) a single sound forms a universe and therefore it should be *genuine*. This is quite oppositional to the idea of harmony which needs a few (at least three) different notes. But it is clearly her belief.

Finally the author asked the reason for Kiriku Ensemble's existence. Each organization has its own reason. If we see the surface, for instance, the reason of a for-profit organization could simply be to make revenue for investors, pay tax for governments, and provide job opportunities for employees. While all this is definitely true it is also something of a facade. On a deeper layer, each organization has true/genuine reasons to be and that kind of character, sometimes idiosyncratic, forms something un-interchangeable and too difficult to copy by competitors. Thus it makes them differentiated and makes their real competitive advantage. Ms. Otsubo said in her way:

"We do not intend to play photogenic: we play just for sound. By those sorts of *genuine* sonic performances we can possibly deliver something to the audience but that is not our intention. We are just functioning as the parameter. We never play to express ourselves." [11]

Practical Proposal for Kiriku

After grasping their center of excellence, our proposal was easily formed. Technically, it was supposed to be as follows.

Firstly it should focus on a genre which is suitable for their aim because they plan to reinvent English handbell performing. At this moment, the authors decided that they would achieve best performance if they shaped their strategy with consistency. Indeed the market is not consistent, and if we stick to something it would not make sense. Yet if one focuses its force in one direction, it generates more effect with less effort. These thoughts led us to focus on what the English handbell genre can do exclusively. This proposal has broad meaning and needs to be considered longer term.

Second, it is better to focus on sonic performance since they seek the *genuine* sound of English handbell and never handbell juggling performance as found in the "Cirque du Soleil". This means live performance is by far the most important source. DVD or YouTube streaming could be effective as informing opportunities but never a substitute for live performance.

Third (to be explored further later) this group should acknowledge its internal advantage: excellent at leadership management in its own way. Their leader shows how to play but not in detail and members should feel and try to understand what was meant. Their leader is not directing but members are always learning and unlearning, that is to say, they are "crafting strategy like creating pots from clay" as Minzberg wrote. [12]

Development: Kiriku way and tea masters

Their teaching method seems similar to the teaching method of the tea ceremony in Japan:

The reality of a room, for instance, was to be found in the “vacant space”(vacuum) enclosed by the roof and walls, not in the roof and walls themselves...In art the importance of the same principle is illustrated by the value of suggestion. In leaving something unsaid the beholder is given a chance to complete the idea and thus a great masterpiece irresistibly rivets your attention until you seem to become actually a part of it. A vacuum is there for you to enter and fill up to the full measure of your aesthetic emotion. [13]

Kakuzo Okakura *The Book of Tea* / “Taoism and Zennism”

This is a strict way of teaching because learners must fill in the blanks left in the teaching (it is a vacuum):

For Teism is the art of concealing beauty that you may discover it, of suggesting what you dare not reveal.[14]

Kakuzo Okakura *The Book of Tea* / “The Cup of Humanity”

Until one has made himself beautiful he has no right to approach beauty.[15]

Kakuzo Okakura *The Book of Tea* / “Tea-Masters”

Recapitulation: After proposal effect for December 2013 performance

After this procedure, the Tokyo performance on 24 December 2013 received a standing ovation. Texture and perspectives of the music piece was clearly described during the penultimate performance in October. Still they played for audiences in a juggler-like photogenic way, the performance itself was an excellent *soundscape*.

Thus this group extended their potential and they will keep going with *genuine* handbell performing. They have received many invitations to play at locations around the globe. They will be promising soul shaking ringers.

Practical implications: Operation System of each organization

The Kiriku style of management can be applied to firms or any type of for-profit organization. H. Safter discussed something similar after he investigated the “Orpheus Process” or multi/collaborative leadership, but the Kiriku way is also different from Orpheus. Kiriku has its own operating system, can be idiosyncratic, too costly to copy and

makes them exclusively differentiated. Detailed discussion will be shown later.

Originality/value:

Coda: Covert Management and Kiriku Players who knows living to be aesthetic

After deep consideration of the Kiriku way and the things that make them excellent, we are left with the impression that the Kiriku way is very likely an operating system based on oriental teaching. "Master does not explain enough and lets apprentices learn by themselves what was meant".

This finding extended the scope of our study because it indicates an alternative way for leaders/managers to instruct new members or an organization as a whole. Their method is quite attractive for management: a high-performance, world-class handbell ensemble composed of part time and semi-full time members. How can this be? It is because they live to be artistic. They overcome all limitations they face.

The Japanese way to live with beauty by completing the incompleteness is shown by medieval philosopher/priest Kenko Yoshida (1283? - 1350?). He wrote in *Essays in Idleness* The Tsurezuregusa (1330-1332):

Are we to look at cherry blossoms only in full bloom, the moon only when it is cloudless? To long for the moon while looking at the rain, to lower the blinds and be unaware of the passing of the spring - these are even more deeply moving. (No.137 *Essays in Idleness* The Tsurezuregusa) [16]

His essay is a peak treasure of medieval Japanese philosophy. Every person in Japan has learned his words in school: they are our highest common literature. This essay expressed no logical thing. The moon obscured by clouds or blossoms still in their bud make us feel something beautiful literally impossible to express. His meaning, however is clearly communicated: imperfection makes perfect. Kenko asserted that if we mentally fill the vacancies, true beauty emerges righter or delighter. He tells us that the moon our mind creates when the real moon is absent - the blossoms we imagine when the real blossoms are still in their buds - these are far better than if we had seen the real thing.

The same thing is also expressed in Okakura's Tea-ism appreciation as:

True beauty could be discovered only by one who mentally completed the incomplete...In the tea-room it is left for each guest in imagination to complete the total effect in relation to himself. [17]

The Book of Tea / "The Tea-Room"

The great masters both of the East and the West never forgot the value of suggestion as a means for taking the spectator into their confidence.^[18]

The Book of Tea / "Art Appreciation"

Sen no Rikyū (1522-1591, also known simply as Sen Rikyū), one of the greatest tea masters of the sixteenth century^[19], shows his way by quoting an old sonnet by Ietaka Fujiwara (1158-1237, poet/governing aristocrat):

"To those who long only for flowers, fain would I show the full-blown spring which abides in the toiling buds of snow-covered hills."^[20]

These flowers are the cherry blossoms in full bloom. Usually, people tend to spotlight something easy to admire, however learners must be aware of "true beauty": a small flower breaking through the snow in the beginning of spring is a metaphor for true beauty. It is also a symbol of treasures which most people forget. Kenko and the tea masters are passing the same baton of philosophy: if we fill nothingness, we generate genuine beauty.

Ms. Taiko Otsubo, leader of the Kiriku Handbell Ensemble seems to be functioning as those great tea masters. She simply demonstrates the playing of bells and does not show how and why. Ms. Eri Koyama leading member, explained at the interview:

"Actually we're not sure we measure up to Kiriku's performing arts requirements. We just do as we live a daily life. For training new members, [we] show just the playing which is thought to be suitable for performance and are not sure why. We just show how to play as it is *supposed to be*. Gradually, new players will grow accustomed: otherwise they have to be out."^[21]

She is close to Ms. Otsubo and has contributed greatly to this research project. She often explains those kinds of understandings. To mentally complete the incompleteness: their center-of-excellence at teaching are not clearly announced - often just indicated - and not definitively established. This could be called "covert management". Indeed it is, or at least should be, visible when a front line manager leads. However, the Kiriku management way is *somewhat invisible*: or incompleteness which has to be completed by the learners. In addition, Kiriku people are not only excellent musicians but know how to complete the incompleteness as Ms. Koyama indicated at our interview "*just do as we live a daily life*". Their way functions because of their choice to live to be aesthetic.

The good blending of suggestive/covert teaching by leader and players who excel at completing the incompleteness, has allowed them to become first-class artists. This can be called the “Kiriku Operating System”.

Connecting to real business

The author has to connect their aesthetic way to real business. This connection is suggested by U.S. researchers who investigated Japanese industries in the 90s. At that time, Japanese industries’ high performance were fairly well studied by foreigners. Barney discussed the competitive advantages of Japanese industries:

Interaction between physical resources and socially complex organizational resources is at the heart of many of the difficulties that U.S. firms have had imitating the manufacturing success of Japanese firms. [22]

Among those kinds of reports, Spear and Bowen (1999) directly consider the common experience:

What is curious is that few manufacturers have managed to imitate Toyota successfully - even though the company has been extraordinarily open about its practices. [23]

After meticulous investigation of 40 manufacturing plants, they found an essence of the rule of working and the workers learn it by following procedure:

Managers don’t tell workers and supervisors specifically how to do their work. Rather, they use a teaching and learning approach that allows their workers to discover the rules as a consequence of solving problems. For example, the supervisor (is) teaching a person (by) asks a series of questions:

- How do you do this work?
- How do you know you are doing this work correctly?
- What do you do if you have a problem? [24]

Curiously enough, Spear and Bowen (1999) concludes this teaching style has been transferred successfully. As the author stated before, workers (learners) should fill the incompleteness of the supervisors. This is the same way of Kenko, Tea-Masters and Kiriku. When we read those studies by U.S. experts, there is not so specific analysis which connects

fine arts education dosed to Japanese people and workers' way of behaviours directly. However, the author considers there is some resonance.

Spear and Bowen (1999) conclude this teaching style has been transferred successfully. As the author stated before, workers (learners) should fill the incompleteness of the supervisors. This is the same way of Kenko, tea masters and Kiriku. When we read those studies by U.S. experts, there is no specific analysis which connects fine arts education and worker behavior directly. However, the author believes there is some resonance.

Self-learning workers have been treated as a resources which generates Japanese Firms' competitive advantages. However, how can this skill be transferred? The Kiriku way carries the thoughts of aesthetic predecessors, Kenko, tea masters, and Takemitsu: a way close to the Toyota way. Quite indicative of our new path for performance management. For a long time, Japanese firms have invested heavily in workers who can learn by themselves, but is that operating in a reasonable way? The Kiriku way suggests a solution.

Regrettably, the author's odyssey to find Kiriku's real strength is still underway. On this project our strategic consultancy contributed to stretch their activity to some extent and coincidentally identified a resonance of Kiriku management style and real business. We have reached our research limitations. To clarify how/how much our thesis or the "Kiriku Operating System" can amplify real business situations. We need to continue our studies.

[1] Testimony showed on Kiriku concert brochures at Kioi Concert Hall Tokyo, Japan on 9 October 2013. Bio-graph available at

<http://handbellmusicians.org/news/the-results-are-in/> (accessed 30 April 2014). Also Ms. P.L.Grove is the ideologue of U.S./Worldwide ringers and elected for President of Handbell Musicians of America on April 2014.

Further inquiries for testimonies, please contact to Million Concert Management. Inc, TEL +81-3-3501-5638 Toranomom 1-21-10-702, Minato-ku, Tokyo, Japan Zip 105-0001

<http://www.millionconcert.co.jp/>

[2] The author has been studying Clarinet privately under Mr. Tomomi Takahashi (ex-principal clarinetist at Gelsenkirchen Philharmony, Germany) and has experienced Opera/Ballet productions of major and hidden repertoires including Leon Cavallo's "La Boheme" Japanese premiere.

[3] Hamarikyū Concert Hall Tokyo, Japan on 24 December 2014.

[4] Mintzberg, H.(1998) "Covert leadership: notes on managing professionals. Knowledge workers respond to inspiration, not supervision", *Harvard Business Review*, November-December.

[5] Seifter, H. and Economy, P. (2001) *Leadership Ensemble: Lessons in Collaborative Management from the World's Only Conductorless Orchestra* Times Books New York, NY

[6] Okakura, K.(1906) *The Book of Tea*, republished by Dover Publications, Inc.(1964), New York, NY.

[7] Please kindly be advised, its leader Ms. Taiko Ohtsubo is full time player and trainer for

English Handbell.

[8] At our interview(2013/2014)

[9] Takemitsu,T /Translated and edited by Kakudo, Y and Glasow, G(1995) ,*Confronting Silence: Selected Writings*, The Scarecrow Press, Inc. A Fallen Leaf Press Book, Berkeley, CA Although there is more writings by the composer in Japanese and this is only one excerpt, but since this is the official translation admitted by the composer, the author basically refer this text.

[10] Takemitsu,T /Translated and edited by Kakudo, Y and Glasow, G(1995)

[11] At our interview(2013/2014)

[12] Mintzberg, H.(1987) "Crafting Strategy", *Harvard Business Review*, July/ August.

[13] Okakura, K.(1906)

[14] Okakura, K.(1906)

[15] Okakura, K.(1906)

[16] Yoshida,K(1330-1332) /Translated by Keene, D(1967) ,*Essays in Idleness The Tsurezuregusa of Kenko* Tuttle Publishing. Tokyo, Japan

[17] Okakura, K.(1906)

[18] Okakura, K.(1906)

[19] Please note he was originally a fishery market broker and became general advisor of the highest governor Hideyoshi at that time.

[20] English translation by Kakuzo Okamura on *The Book of Tea / "Tea-Masters"*(1906)

[21] At our interview(2013/2014)

[22] Barney, J. B.(1997) *Gaining and Sustaining Competitive Advantage* Addison-Wesley Publishing Company

[23] Spear, S and Bowen, H.K(1999) "Decoding the DNA of the Toyota Production System" *Harvard Business Review* September-October

[24] Spear, S and Bowen, H.K(1999)

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DYNAMIC SYSTEM CRISIS'S DETECTING USING BIG DATA FLOW

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Article Title

Dynamic system crisis's detecting using big data flow

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Dr. **Andrey Dmitriev**, professor of National Research University Higher School of Economics. Doctor of Physical and Mathematical Sciences (Biophysics). The prize the N.N Semenov International Fund for the development of science (founders of UNESCO and the Russian Academy of Sciences). Professional interests: mathematical and computer modelling of complex systems, big data systems, nonlinear dynamics, non-stationary time series analysis of market risks on the time series.

Structured Abstract

Purpose

The building and computer developing of the mathematical model of detecting of the crises modes in the non-linear dynamic systems that simulate the price formation in steel market, using big market real time data inflows. The exploring and the analysis of market risks in a sense of a loss of system's stability (system crisis) and sharp fluctuations of the price with a large amplitude as the subject of the research.

Methodology

In this research we understand "crisis" as juddering changes of system's states, arising as the system's reaction to the smooth changes of parameters or external conditions. The fundamental state of the proposed model is homeomorphism of economic dynamic systems and the hydrodynamic type. System that generates the forecasts of the market slab prices can be modeled with the hierarchically related systems (steel billet prices and exchange rate EUR/USD). Price forming system is the system of the non-linear differential equations with the time variables, controlling parameters and initial conditions; the solution of this system is the relationship model of the steel billet prices and exchange rate EUR/USD and time variable.

Findings

We proposed the nonlinear dynamic model of the formation of the market prices of steel billet prices and exchange rate EUR/USD based on the econophysic considerations. This model is a system of three ordinary differential equations relating the time dependence of elasticity, variations of bid and ask prices; it is similar to the Lorenz system. The areas of the dynamic stochasticity in experimental data were found with the comparing of the experimental and the theoretical ask and bid prices. These areas are the precursors of the crisis mode in the form of dynamic chaos. For the implementation of the following model using Big Data from the Bloomberg Terminal we have developed the prototype of the computer software based on the Open API Bloomberg (BLPAPI) using the C++ code. This software is operating the large data arrays coming as the data input (supply and demand prices) in the real time mode and it is the actual decision making support system.

Value

The computer implementation of the proposed mathematical model using big market data flows in real time mode that are forecasted the new and effective information system of the early prevention of the crisis's modes in the steel market.

Keywords

Non-linear economic dynamics, crisis's detecting, big data flows, market risks

Article Classification

Research paper

1 Introduction

At present conditions the effective functioning of the majority of organizations is impossible without using of the effective decisions making support systems, including the early warning of the crisis regime development systems in the time interval ample to deploy the anti crisis measures. In this particular paper the crisis regime is defined as the juddering changes in the price making system with large market data flows, emerging as a reaction of the system to the smooth changes of the parameters and the external conditions. These juddering changes are foremost explained by the loss of the dynamic steadiness (stability) of the market system.

The complexity of such support and decision making systems' construction is foremost related to the complexity of building the mathematical models of the crisis data formation and which is most important building the pre-crisis regimes in the certain market. The most well spread approaches to the crisis detection are based on the statistical analysis of the observed supply, demand and spot price time series. In the terminology of the of the market trading such approach can be related to the technical analysis procedure, connected with the forecasting of the time series based on the existing experimental data. The drawback of such approach is evident – it is the lack of the fundamental economic and mathematical analysis of the market which in the majority of cases doesn't allow to authentically detect the pre-crisis and crisis regimes.

For the building of the mathematical decision making support system we introduce the assumption that the price making in the market is described by the hydrodynamic type of model. Indeed the market prices are formed by the interaction of the various flows, which are functioning in different directions. The bright example of such counteracting directions are the traders pursuing the different goals in market and called "bears" and "bulls". The "bulls" are expecting the price increase, by buying out the asset at a lower price and trying to sell it at a higher price. The "bears" are expecting to lower the price by concluding the contract or the option for selling. According to the following approach we propose the nonlinear dynamic model and it's computer prototype software realization of the support and decision making system, describing the dynamics of the supply and demand price elasticity with the following approbation of such model with the forecasting the pre-crisis regimes in the steel market. The most well spread pre-crisis regimes in such dynamics systems are the alternation and the doubling cascade. In addition, we haven't implemented only these regimes.

The subject of our research is the steel slab – one of the final products of the black steel market. The price of the slab is influenced by the foreign currency exchange rates, raw material prices and the prices of the standard product (steel billet), which is being traded in the stock exchange. The fluctuations of the steel billet prices are influenced by the situation in the macro economy, prices of the raw materials for producing the steel, energy source prices (gas, oil, electricity), the coal (coking and stone). In the absence of the correct and full data regarding the raw materials, we shall foremost base our assumption on the EUR/USD exchange cross-rate index. For testing of the decision making support system in the steel market we have used the historical time series using the Bloomberg Professional platform.

2 Nonlinear Dynamic Model of Price Formation

While constructing the non-linear dynamic model of a price formation on the steel billet and the quotation EUR/USD we assumed that the basis of the price formation dynamic is a basic dynamic structure that allows the mathematical formalization. We believe that the foreign exchange market and global steel market are homeomorphic to the dynamic systems of the hydrodynamic type from the

standpoint of macroscopic flows of a capital, goods and services in the phase space of the economic dynamic system. Therefore if the interacting counter flows arise in such systems then usually the phenomenon of generalized turbulence that generates the crisis modes of state development of such dynamic systems arises. Successful application of the hydrodynamic formalism for the economic system modeling can be seen in (Chen, 1988; Cai and Huang, 2007; Serletis and Shintani, 2006).

Let's determine the functions and variables of the state that will be used in the mathematical model of the non-equilibrium markets:

- $Y_1(t)$ – localized variety of ask function;
- $Y_2(t)$ – localized variety of bid function;
- $X_1(t)$ – locally varying ask price;
- $X_2(t)$ – locally varying bid price;
- $Y_1^{(0)} = Y_2^{(0)} = Q_0$ – equilibrium values of the demand and supply functions in an equilibrium state of market;
- $X_1^{(0)} = X_2^{(0)} = P_0$ – equilibrium values of the ask and bid prices in the equilibrium state of the market $R = \langle P_0, Q_0 \rangle$;
- $[Y_i(t) - Y_i(t-1)] \equiv \delta Y_i(t) \equiv y_i, (i = 1, 2)$ – volume variations of demand and supply near the equilibrium state $R = \langle P_0, Q_0 \rangle$;
- $[X_j(t) - X_j(t-1)] \equiv \delta X_j(t) \equiv y_j, (j = 1, 2)$ – ask and bid prices variations near the equilibrium state $R = \langle P_0, Q_0 \rangle$;
- $F_1(x_1, x_2)$ – function of aggregated demand to aggregated product market as a function of various kinds of prices;
- $F_2(x_1, x_2)$ – function of aggregated supply to aggregated product market as a function of various kinds of prices.

If the variations x_1 and x_2 and the prices are small, then with a good degree of accuracy, we can get the Onsager relations in the matrix representation that relates the extensive (y_1, y_2) and intensive (x_1, x_2) variables

$$\vec{y} = \tilde{A} \vec{x} \quad (1)$$

$$\text{In matrix equation form (1): } \vec{x} = (x_1, x_2), \vec{y} = (y_1, y_2), \tilde{A} = \begin{pmatrix} \frac{\partial F_1}{\partial x_1} & \frac{\partial F_1}{\partial x_2} \\ \frac{\partial F_2}{\partial x_1} & \frac{\partial F_2}{\partial x_2} \end{pmatrix}.$$

Economic dynamic should induce a temporary change in variation price \vec{x} in virtue of deviation of demand $Y_1(t)$ and supply $Y_2(t)$ from their equilibrium value $Y_1^{(0)} = Y_2^{(0)} = Q_0$. Approximately this dynamic can be represented in a system of ordinary differential equations form:

$$\frac{d\vec{x}}{dt} = \tilde{K} \vec{y} \quad (2)$$

where \tilde{K} – matrix of the dynamic conjecture of the market.

Simultaneous solution of the equations (1) and (2) gives the equation that describes the nonequilibrium dynamics of economic-dynamic system:

$$\frac{d\vec{x}}{dt} = \tilde{L}\vec{x} \quad (3)$$

where $\tilde{L}(t) = \tilde{K}\tilde{A}$ is a matrix that defines the dynamics of the considering dynamic system.

We represent the vector-matrix equation (3) as a system of two differential equations with two unknowns:

$$\begin{aligned} \frac{dx_1}{dt} &= L_{11}x_1 + L_{12}x_2 \\ \frac{dx_2}{dt} &= L_{21}x_1 + L_{22}x_2 \end{aligned} \quad (4)$$

where L_{ij} – elements of the matrix \tilde{L} .

Let's make the economic and non-linear dynamic analysis of the system (4). If in the second equation of the system (4) $x_1 \cong 0$, then $\frac{dx_2}{dt} \cong L_{22}x_2$. Since $X_2(t)$ relaxationly approaches to P_0 , then $L_{22} < 0$ and the relaxation time $X_1 \rightarrow P_0$ is $\tau_{12} \cong 1/|L_{22}|$. Near the state of dynamic equilibrium $|x_1| \cong |x_2|$ should also appear the states $\frac{dx_2}{dt} \cong 0$, which is possible if $|L_{22}| \cong L_{21} = 1/\tau_2$. Therefore, up to the first order (by x_1 and x_2) second equation (4) becomes:

$$\frac{dx_2}{dt} \cong -\frac{1}{\tau_2}(x_2 - x_1) \quad (5)$$

Similar arguments regarding the coefficients of the first equation of system (4) lead to the fact that $L_{11} = 1/\tau_1$, where τ_1 – the characteristic relaxation time $X_2 \rightarrow P_0$. If $|x_1|, |x_2|$ sufficiently small, then $L_{12} = const$. In this case the solution of (4) will be a noisy relaxation oscillations near the equilibrium position $R = \langle P_0, Q_0 \rangle$.

As the amplitude of variant deviations $X_1(t), Y_2(t)$ from $R = \langle P_0, Q_0 \rangle$ increases variations of ask and bid prices x_1 and x_2 start "hitching up" to each other. The simple nonlinear interaction between supply and demand appears in the system (4). Consequently, there is a relationship between the variables x_1 and x_2 that expresses the elasticity of x_1 on the x_2 .

Let

$$L_{12}(t) = L_{21}E_{12}(t) \quad (6)$$

where E_{12} – the elasticity of x_1 on the x_2 .

For convenience of the further computer simulation let's renormalize all the values of (4) and introduce the dimensionless time T :

$$T = \frac{t}{\tau_1}, dT = \frac{dt}{\tau_1} \quad (7)$$

Multiplying (5) to τ_1 and taking into account (7) we obtain the following equation:

$$\frac{dx_2}{dT} = -\sigma(x_2 - x_1) \quad (8)$$

where $\sigma = \frac{\tau_1}{\tau_2}$.

Factor σ shows the way the speeds of the relaxations $X_1, X_2 \rightarrow P_0$ relate to each other, so it represents the relative sensitivity to changes in market ask and bid prices. If $\tau_1 < \tau_2$, there is a lag reaction effect of ask price for rapid change in the bid price, which leads to a certain dynamic effects.

Taking into consideration (6) and (7), the first equation (4) takes the form:

$$\frac{dx_1}{dt} = -x_1 + \tau_1 L_{21} E_{12}(t) x_2 \quad (9)$$

Value $E_{12}(t)$ will be regarded as an independent dynamic variable, represented in the following form. The essence of nonequilibrium dynamics of the market allows us to conclude that nonlinear differential equation for $E_{12}(t)$ approximately has the following form:

$$\frac{dE_{12}(t)}{dt} = -eE_{12}(t) + kx_1x_2 \quad (10)$$

where $k, e > 0$ – invariables, $e = 1/\tau_E$, τ_E – characteristic relaxation time $E_{12}(t) \rightarrow E_{12}^{(0)}$, $E_{12}^{(0)}$ – elasticity in the equilibrium system state.

We obtain the following equation by defining $C = \tau_1 L_{21}$, $K = \tau_1 k$, $\beta = \tau_1/\tau_E$ and multiplying (10) to τ_1 :

$$\frac{dE_{12}}{dt} = -\beta E_{12} + Kx_1x_2 \quad (11)$$

Now we introduce some characteristic scale of elasticity λ , and with this in mind, the new redefined values:

$$\rho = \frac{E_{12}^{(0)}}{\lambda}, z = \rho - \frac{E_{12}}{t}, x = \sqrt{\frac{K}{C}}x_1, y = \sqrt{\frac{K}{C}}x_2, \dot{x} = \frac{dx}{dT}, \dot{y} = \frac{dy}{dT}, \dot{z} = \frac{dz}{dT} \quad (12)$$

Considering (12) the system of the ordinary differential equations takes the form:

$$\begin{aligned} \dot{x} &= -\sigma(x - y) \\ \dot{y} &= \rho x - y - xz \\ \dot{z} &= -\beta z + xy \end{aligned} \quad (13)$$

System (13) and the control parameters (σ, β, ρ) , known as the Lorenz system (Hirsch *et al.*, 2003), describe the dynamics of the variations of ask and bid prices, as well as the dynamics of elasticity. Lorenz system describes the dynamics of many physical systems - convection in a layer convection in a circular tube, single-mode laser, and the economic system. While researching the price dynamics we use classical parameter values $\sigma = 10$, $\beta = 8/3$.

We point out the main features of the solution of the Lorenz system (Hirsch *et al.*, 2003) without the detailed conclusions.

Stationary points of the system are:

$$O = (0,0,0), O_1 = (\sigma\sqrt{\rho-1}, \sigma\sqrt{\rho-1}, \rho-1), O_2 = (-\sigma\sqrt{\rho-1}, -\sigma\sqrt{\rho-1}, 1-\rho) \quad (14)$$

Point O is stable for $\rho < 1$ (low elasticity in equilibrium) and unstable (cease to be an attractor) for $\rho > 1$ (Fig. 1a). From the point of view of the classification of the stationary points, with $\rho < 1$ is a stable node and $\rho > 1$ – the saddle-node. Consequently, the concept of the equilibrium price makes sense only at a low elasticity.

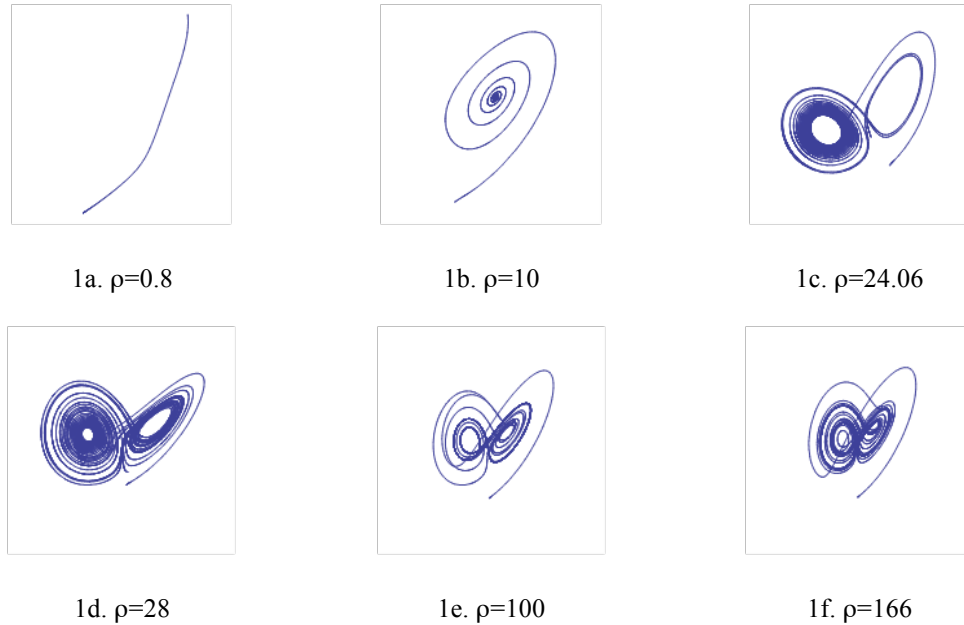


Fig. 1. Lorenz system trajectories

Stationary points O_1 and O_2 exist for $\rho > 1$.

Phase trajectories spirally converge (damped oscillations) to points O_1 and O_2 for $1 < \rho < 13.927$ (Fig. 1b). If the trajectory leaves the origin, then after making a complete turnaround from one of the stable stationary points it comes back to the starting point (for $\rho > 13.927$). There are two homoclinic loops, for which the trajectory goes out and comes in the same position of equilibrium. When $\rho > 13.927$, the trajectory comes into the one of two stable points depending on the direction. Homoclinic loops convert to unstable limit cycles. When $\rho = 24.06$ trajectories asymptotically approach the unstable limit cycles (Fig. 1c). When $\rho \geq 28$ chaotic "jumps" of the representing phase point from the one attracting center $O_1 \leftrightarrow O_2$, to another appear in the system (Fig. 1d). Such "jumps" and "winding" the phase trajectory on the centers of gravity O_1 and O_2 are very complex and can't be computed analytically. As $T \rightarrow \infty$ the net of the phase trajectory fills a special area near the attracting centers O_1 and O_2 , which is called a strange attractor (Lorenz attractor).

When $\rho \in (98,100)$ system moves into a self-oscillation mode. Thus decreasing this parameter leads to the observing of the transition to chaos through a sequence of period-doubling (Fig. 1e). There is another scenario for the transition to chaos - transition to chaos through intermittency, which is observed in the system with $\rho \approx 166$. Intermittency is the alternation of smooth (laminar) and irregular areas (turbulent) regions (Fig. 1f).

3 Results of Mathematical Modeling and Computational Simulation

As mentioned earlier the price slab depends on exchange rate (EUR/USD) and the steel billet price. Therefore, for the detection of significant changes for slab prices we detected the crisis fields (dynamical chaos fields) for ask and bid price on the foreign exchange market (EUR/USD) and London Metal Exchange (steel billet). Real ask and bid prices we took from Bloomberg Terminal during the period from January, 3 2012 to April, 14 2014. Price data for slabs we obtained in the same time period with an interval from 4 to 10 days (Fig. 2).

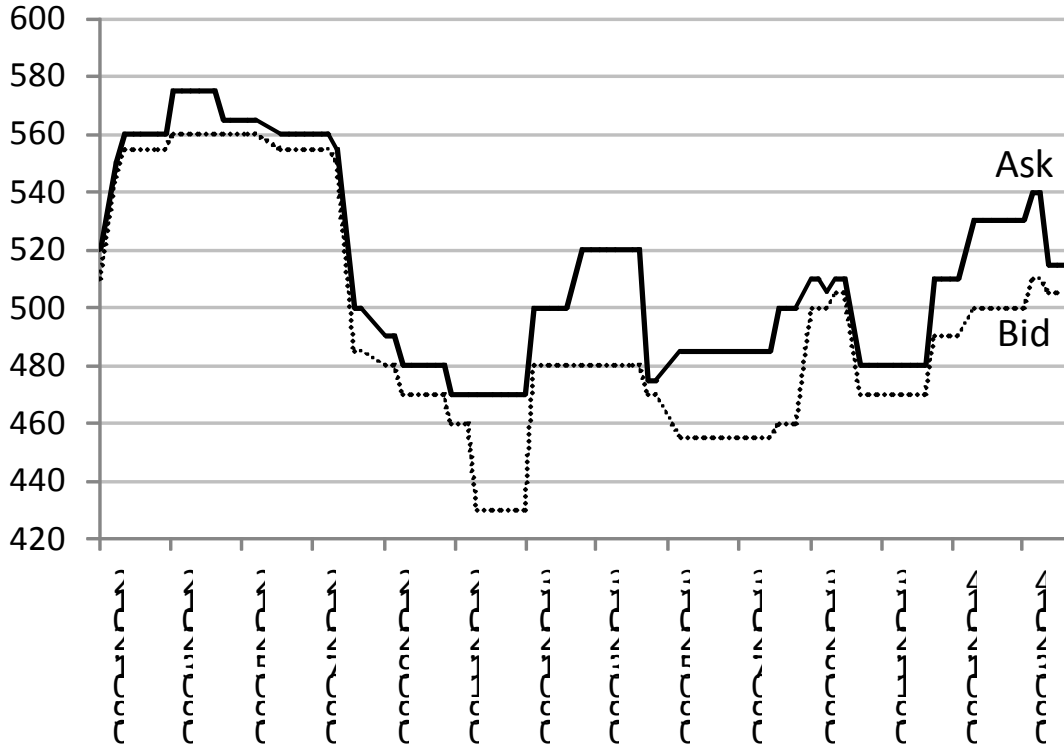


Fig. 2. Ask and bid price of slabs

The problem we solve needs the comparison of the theoretical and the experimental data (taken from Bloomberg system) of ask and bid prices. The aim is to compare the experimental and the theoretical data with the particular algorithm of minimization of the residuals. In this case the input are the values $x[i]$, $y[i]$, $z[i]$ ($i=0..n-1$), the output - $x[i+1]$, $y[i+1]$, $z[i+1]$ ($i=0..n-1$). Thus the given problem reduces to the problem of the ρ , β , σ parameters computation, that were calculated with the method of steepest descend. In this case, the criteria:

$$\begin{cases} x[i] - \tilde{x}[i] \rightarrow \min \\ y[i] - \tilde{y}[i] \rightarrow \min \\ z[i] - \tilde{z}[i] \rightarrow \min \end{cases} \quad (14)$$

where $\tilde{x}[i]$, $\tilde{y}[i]$, $\tilde{z}[i]$ - the values, that were calculated with the system (13)

During the optimization (14) we calculated the values of ρ , β , σ parameters. These parameters can't be constant because of instability of the market system, so in this case it is necessary to pick out the intervals of the parameter comparative constancy. Parameter ρ is the control parameter of the system (13), which defines the system dynamic character (determined or stochastic). We distinguished the intervals of the determinacy and the dynamic chaotic state of the system (13) solution. If $\rho \in (0, 23.7)$, $(99.2, 99.5)$, $(146, 165)$ and $\rho > 215$ then we can see the regular (determined) relations of the ask and bid prices and time. If $\rho \in (23.7, 99.2)$, $(99.5, 146)$ and $(165, 215)$ then the chaotic relations of the ask and bid prices and time can be observed. Thereby we considered the big variety of the pre-crisis intervals and did not limit ourselves with the considering of the intermittency areas and the double period areas.

The algorithm of the fragmentation of the experimental relation $\rho(t)$ to the intervals of ρ parameter constancy is the following. The first aim is to form the first constancy interval $\rho = \rho_1$ with the sequential adding of the experimental values $\rho(t_1), \rho(t_2), \dots, \rho(t_m)$. The criteria of the necessity of adding $\rho(t_{m+1})$ to the first interval is the constancy or the insignificant ρ_1 value variation. If the variation is

significant then we can start considering the second parameter constancy interval and etc. The diagram of the ρ parameter constancy intervals and the appropriate values of this parameter for the observing market ask and bid prices is presented on the Fig. 3 and Fig. 4. This diagram gives us the opportunity to define the intervals with the determined and the chaotic dynamics of the market prices.

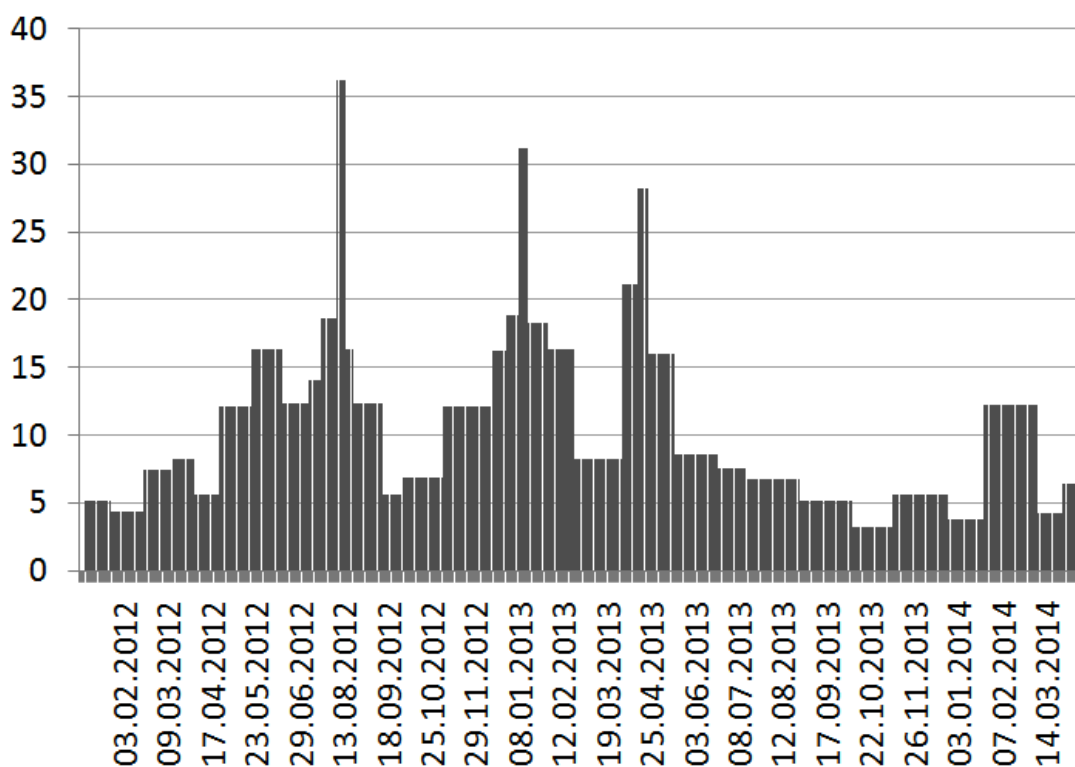


Fig. 3. ρ parameter constancy intervals for steel billet price

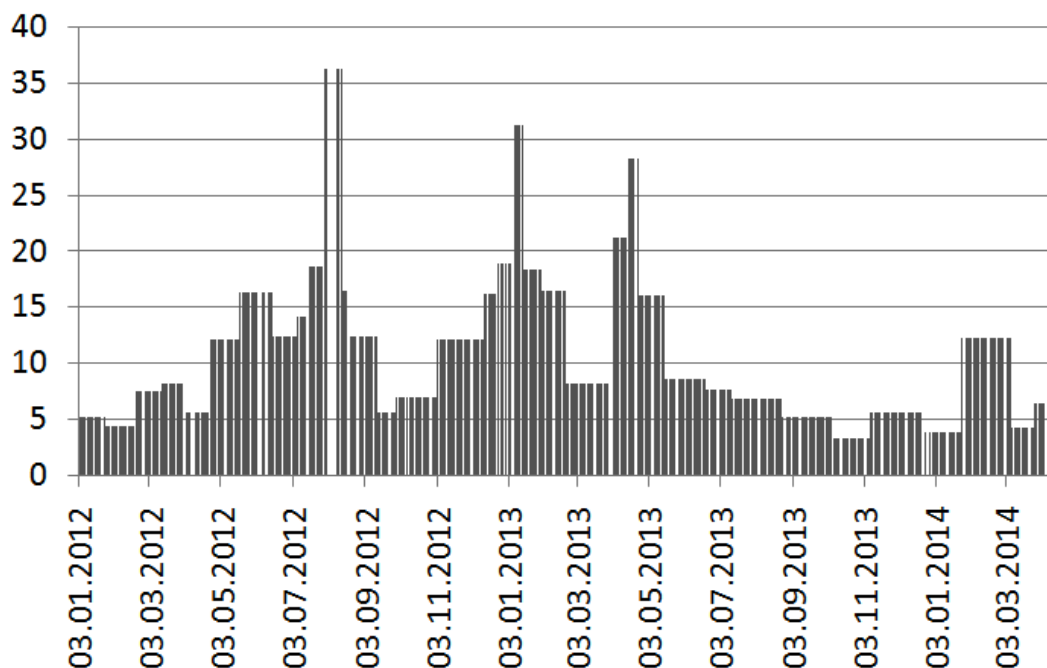


Fig 4. ρ parameter constancy intervals for exchange rate EUR/USD

Generally we detected three fields of the dynamic stochasticity in the experimental values of ask and bid prices of the steel billet and exchange rate EUR/USD.

These areas correspond to time intervals:

- 1) from 30 July, 2012 to 13 August, 2012 (-75 USD);
- 2) from 7 January, 2013 to 14 January 2013 (+50 USD);
- 3) from 15 April, 2013 to 22 April, 2013 (-45 USD).

These intervals correspond to a significant change of slabs price (see fig. 2). Therefore, our mathematical model can forecast significant changes of metal market prices.

For the implementation of the following model using Big Data from the Bloomberg Terminal we have developed the prototype of the computer software based on the Open API Bloomberg (BLPAPI) using the C++ code. This software is operating the large data arrays coming as the data input (supply and demand prices) in the real time mode and it is the actual decision making support system. The software user should only specify the data source, and by implementing the algorithm the program will identify the pre-crisis regimes and signal about the possible significant changes of the price for a certain product or a financial instrument.

4 Discussion

Despite the number of assumptions underlying our model of ask and bid prices formation for the slabs market, this model allows to predict the crisis regimes in this market with a good accuracy. We think that the main direction of the improvement of the model firstly should be associated with the transition from the hard to soft type of the system of formation of the market prices. In this case it is necessary to take into the account the time dependence of the control parameters: $\sigma=\sigma(t)$, $\beta=\beta(t)$, $\rho=\rho(t)$. In subsequent researches we plan to establish the explicit form of the relations of the control parameters of the time corresponding to a particular experimental time series of prices using neural network modeling. Ask and bid price formation model that is enhanced in this way and its subsequent computer implementation is going to be effective information system of the early detection of the crisis modes of the market.

The further direction of the software development and improvement we view as the improvement of the model by automatic monitoring of the “live” Bloomberg’s news adds and by setting the precision of the algorithm using the system of the feedback sending by the user in order to detect the forecasting errors.

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0018

DUALITY SOLUTION IN PLS SATISFACTION SURVEYS

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EPSI measurement on agent performance

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Introduction

Since Fornell introduced a national customer satisfaction model in 1992 [1], the EPSI model has been applied in many different countries and sectors [2], [3], and the relation from customer satisfaction and loyalty to financial performance is well-established [4], [5]. We are now well versed in the structure of the model and the level of indices [6]. However, contrary to previously EPSI-studied businesses, the real estate business and others stand out since these businesses operate with two types of “customers”; the seller who pays for the service and the buyer who, strictly speaking, receives the service for free. It is not a problem to come up with two models and apply the EPSI model on sellers as well as buyers. But, although these customers have a common interest in concluding a deal, they have conflicting interests when it comes to price and terms. The forthcoming study therefore simultaneously examines both sides of the coin.

Even though the real estate agent is the seller’s agent, he must also take measures to satisfy the buyer, thus ensuring that he is in commission to sell and possibly also resell the property in the future. Accordingly, the real estate agent faces the challenge of being able to simultaneously secure a higher satisfaction level among both the buyer and the seller (Exhibit 1).

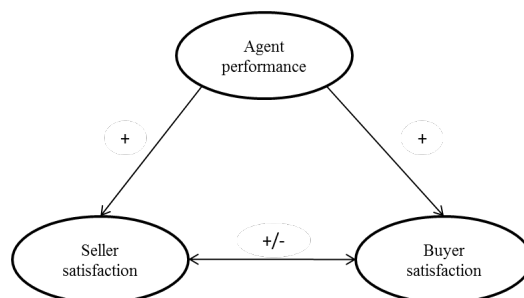


Exhibit 1: The buyer-seller-agent triangle

As a result, in the real estate business, the satisfaction concept becomes multidimensional at the latent level, which entails some interesting challenges for the traditional EPSI model. This problem is new in customer satisfaction measurement, and a coming case study will hopefully result in an empirical model with reference to the EPSI model based on game- and agent-theoretical considerations. Data come from a survey among buyer/seller pairs who, within the last 3 months, all have sold real estate through DanBolig, one of the largest real estate chains in Denmark. PLS path modeling [7], [8] [9] will be applied to estimate the suggested relationships.

Analysis of dyadic data

In the presence of dyadic data, one of the key assumptions in many analyses, namely the assumption of independency, is violated and needs to be addressed. Instead of seeing the violation of this assumption as a problem that needs to be neglected or bypassed by only choosing either the seller or the buyer, the point is that a study of both members of the dyad and by addressing the covariance across seller and buyer in the analysis of these non-interchangeable interdependent data with distinguishable dyad members could provide rich information about the interpersonal associations and about how each member of the seller/buyer dyad influences the others' satisfaction and loyalty.

Model specification

The point of departure is the classical EPSI model with loyalty as an endogenous variable, satisfaction and value for money as partially endogenous variables, and image, expectation, and product and service quality as exogenous variables. The model and the paths that connect the latent variables appear from [3].

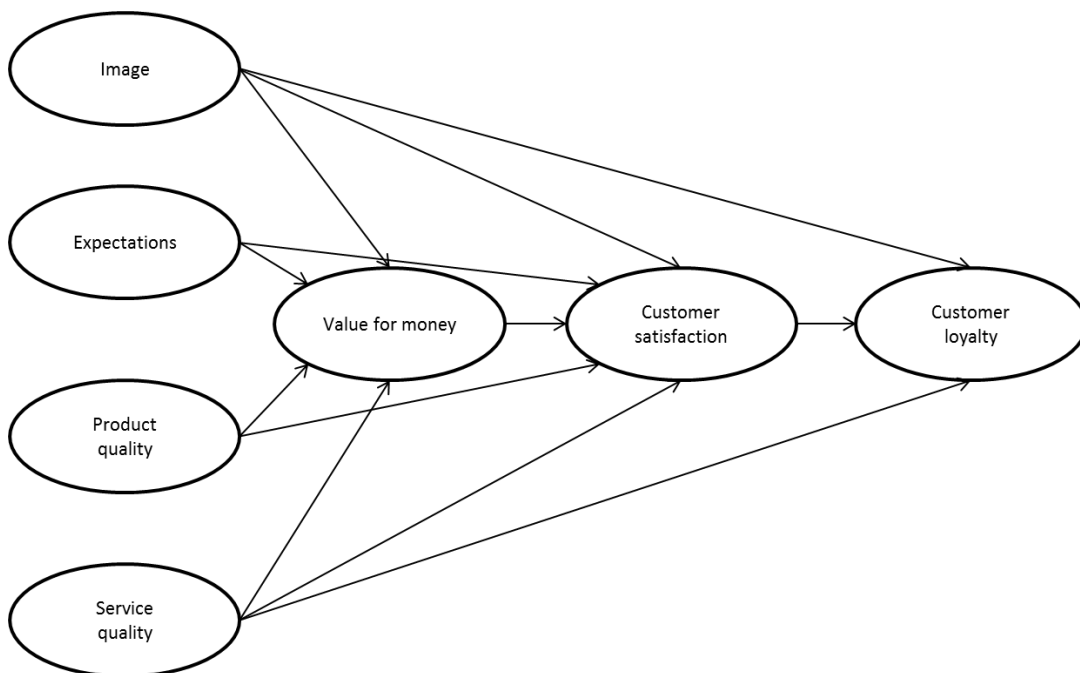


Exhibit 2: The EPSI model

Behind all 7 latent dimensions lie a number of manifest (measurable) variables (from 2 to 6, 30 in total) that are explored, and one of the great advantages of the national customer satisfaction models, such as EPSI and ASCI, is that they, using a series of suitably flexible, yet generic questions for each latent variable, can be employed in a vast array of different industries. We have come to know quite a bit about the model and its structure in a wide range of industries, and valid and reliable industry benchmarks have been created. However, since the real estate business does not only stand out because it operates with two types of “customers”, but also because the transaction of real estate is extremely low-frequent, a preliminary study has been conducted among sellers of property.

Data for that study were collected in mid-June 2012 in cooperation with one of the largest real estate chains in Denmark. The respondents were customers who had sold real estate through the chain within the last 12 months. Via email, the customers were encouraged to participate in the survey by clicking a link that took them to an online questionnaire. All the EPSI questions were answered according to a 10-item scale, which is in keeping with the recommendations [10] and the tradition within EPSI measurements.

Despite the low-frequency nature of the transactions, the preliminary study produced absolute and relative GoFs of impressive 0.85 and 0.98, respectively. Both measures are descriptive, and there are no thresholds by which to judge the statistical significance of their values. However, they are both bounded between 0 and 1, and an absolute GoF above 0.7 and a relative GoF of at least 0.90 are said to speak in favor of the model [11]. Furthermore, as a measure of the unidimensionality, the Cronbach's alphas (measure of internal consistency) range from 0.934 to 0.982 and Dillon-Goldstein's rho (better known as composite reliability) ranges from 0.958 to 0.985 – both measures are recommended to be above 0.7. Finally, the R^2 for value for money, satisfaction and loyalty are 0.79, 0.85 and 0.84, respectively, so all things considered, the EPSI framework seems to be applicable in the real estate business.

The correlation between the two exogenous variables product quality and service quality is 0.95, indicating that it might be difficult for the respondents to distinguish between these two dimensions. As a consequence, they are merged, leaving us with a model with only 3 exogenous variables: image, expectations, and product/service quality. Moreover, a PLS-based study does not necessary benefit from 6 indicators on each latent variable [10], for which reason the question batteries are reduced. Thus, image and expectations are only measured by the 3 manifest variables that have the highest communality for each dimension. For the new product/service dimension, we use the manifest variable with the highest communality with product and service, respectively, and a third variable that measures the overall quality of the services and products provided by the real estate agent. The value for money dimension is measured by the overall value and two questions concerning the product and the service, respectively, and finally the satisfaction and the loyalty dimensions are measured by the traditional questions (3 and 2, respectively). Accordingly, the model consists of an integration of 2 modified EPSI models with loyalty as an endogenous variable, satisfaction and value for money as partially endogenous variables, and image, expectation, and product/service quality as exogenous variables.

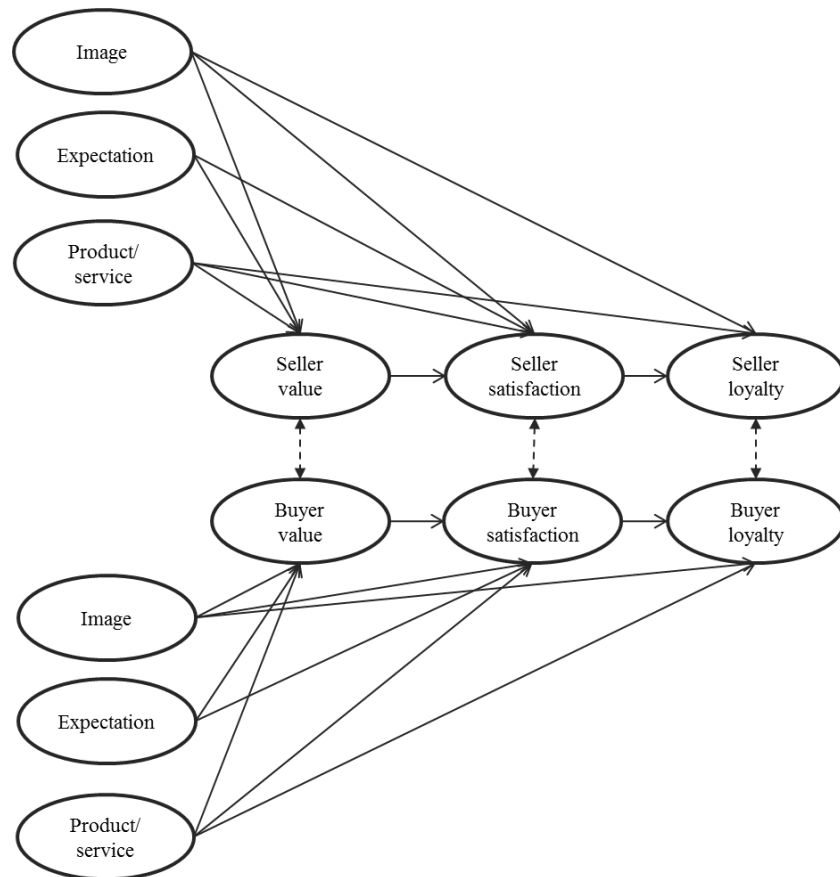


Exhibit 3: The adjusted EPSI-model for dyadic data.

The model is estimated with the following 17 manifest variables, which are common for the seller as well as the buyer. Following the recommendations [10], the questions measuring the endogenous variables are placed first:

Dimension	Question	Mean
Satisfaction	On the basis of your overall experience with your real estate agent, how satisfied are you altogether? (1 = very unsatisfied, 10 = very satisfied).	7.57
Satisfaction	Imagine the ideal real estate agent – how far from or how close to this ideal is your real estate agent? (1 = very far from, 10 = very close to).	7.71
Satisfaction	How well do you think your real estate agent managed to meet your overall expectations? (1 = much worse than expected, 10 = much better than expected).	7.53
Loyalty	If you were to sell a property today, how certain are you that you would choose the same real estate agent/estate agency chain as the last time? (1 = definitely not, 10 = definitely).	7.69
Loyalty	Would you recommend the real estate agent to friends and colleagues? (1 = definitely not, 10 = definitely).	7.83
Value for money	How do you rate the value in relation to the sales result (sales price, price reduction, other terms)? (1 = very low, 10 = very high).	6.64
Value for money	How do you rate the value in relation to personal service and counseling? (1 = very low, 10 = very high).	7.17
Value for money	How do you rate the overall value for money? (1 = very low, 10 = very high).	7.21
Expectation	How were your expectations to the quality of the product and service provided by your real estate agent in connection with sale of real estate (1 = very low, 10 = very high).	8.00
Expectation	How were your expectations to personal service and counseling (1 = very low, 10 = very high).	8.14
Expectation	How were your overall expectations to all the factors you consider important for a real estate agent (1 = very low, 10 = very high).	8.21
Product/service	How did you rate the quality of the product/service? (1 = very low, 10 = very high).	7.64
Product/service	How did you rate the quality of the personal service and counseling? (1 = very low, 10 = very high).	7.76
Product/service	How did you rate the overall quality of the services and products provided by your real estate agent? (1 = very low, 10 = very high).	7.87
	Consider your estate agent's image. How do you perceive the general image of your real estate agent when thinking of:	
Image	A real estate agent who gives priority to the seller's wishes? (1 = very low image, 10 = very high image).	7.76
Image	A real estate agent who is characterized by professionalism and expertise? (1 = very low image, 10 = very high image).	7.97
Image	The overall image of your real estate agent? (1 = very low image, 10 = very high image).	7.85

Table 1: The 17 manifest variables.

In June/July 2014, the questionnaire will be sent to 300 buyer/seller pairs who, within the last 3 months, all have bought/sold real estate through DanBolig, one of the largest real estate chains in Denmark.

In Denmark, a seller typically contacts one real estate agent who is commissioned to sell the property. Potential buyers are then to contact this agent directly in order to see and possibly buy the property. Accordingly, only one real estate agent is on commission to sell the property, and only the seller pays for the service of the real estate agent – for the buyer, the service is free. Even though the real estate agent, as a rule, is the seller's agent, he must also take measures to satisfy the buyer to ensure that he is in commission to resell the property in the future. In addition, most real estate agents in Denmark are organized in real estate chains, so even if the sellers move away from the area, a high level of satisfaction will, if nothing else, lead to a sense of loyalty towards the chain. Finally, in all probability, the seller will share his experiences and level of estate agent satisfaction with his former neighbors and additional social network connections in his old neighborhood.

Concluding remarks

In this paper we have taken the first steps towards an EPSI model that can be used in business where we in the minefield between two types of customers have a broker with the task to make both ends meet. The model will be exposed to an empirical study in the summer 2014. The idea is to end up with a model that can be used not only when dealing with estates in the household sector, but also on the commercial real estate sector

It would be really interesting to see if the estimated connections are the same in other parts of the world, where the sale of property is organized in other ways (listings, 2 brokers etc.).

Furthermore the approach described in this paper could also be relevant in other sectors that operate as brokers between buyer and seller. Examples of such sectors could be auction house and the transport sector.

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0019

ANALYSIS OF VISUALIZATION TECHNIQUES SUPPORTING PERFORMANCE MEASUREMENT PROCES

AKI JÄÄSKELÄINEN, JUHO-MATIAS ROITTO

Analysis of visualization techniques supporting performance measurement process

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Structured abstract:

Purpose

This paper aims to understand how performance measurement process can be supported by visualization techniques. It analyses the suitability of different visualization techniques in the tasks needed in designing, implementing and using performance measurement.

Design/methodology/approach

The research is based mainly on literature review and analysis. The empirical access to 10 recent performance measurement system development projects is also utilized in order to illustrate and evaluate the applicability of visualization techniques. The following visualizations are examined: maps, networks, visualized models, graphs, plots, charts and dashboards.

Findings

The study provides a concise overview of the multifaceted literature on information visualization highlighting the managerial tasks related to performance measurement process. It contributes as a discussion opener inviting more academicians to study the topic of visualization in management and to further test and broaden the proposals presented in this paper.

Research limitations

Further in-depth empirical research is needed regarding each phase of performance measurement process.

Practical implications

The topic of information visualization is practically-driven. The results support practitioners in evaluating and choosing visualization techniques supporting their timely challenges in the performance measurement process.

Originality/value

Quite few studies on information visualization have been carried out in the context of management science. Visualization can integrate human in the data exploration process and improve understanding over large data sets without complex quantitative methods. Visualization techniques have been proposed as powerful means to enhance the effectiveness of performance measurement. This study structures and clarifies the ambiguous topic of visualization and performance management, and facilitates interdisciplinary discussion.

Keywords: development process, literature review, performance measurement, performance management, visualization

Article classification: research paper

1. Introduction

The use of performance measurement systems (PMS) is often promoted for facilitating strategy implementation and improving organizational performance. However, there is also a lot of indication that the potential of PMS is rarely exploited in practice (Bourne et al., 2005). The logic of PMSs, e.g. underlying cause and effect chains can be unclear. Measurement results are possibly not communicated properly (Jääskeläinen and Sillanpää, 2013). Since most organizations have already a lot of performance information

available, overall picture is easily lost. The focus should be gradually shifted from the question how to measure, to how to utilize performance information (Nudurupati et al., 2011).

Visualization techniques have been proposed as powerful means to address the abovementioned challenges. Visualization concerns the representation of data, information and knowledge in a graphic way in order to gain insights, draw conclusions, develop an elaborate understanding or communicate experiences (Lenger and Eppler, 2007). Visualization can accelerate perception and provide insights, e.g. by combining and structuring data (Chen, 2004). It can be used to improve understanding over large data sets without complex quantitative methods. Well-designed visual representations can replace calculations with simple perceptual interpretations and improve comprehension, memory, and decision making (Heer et al., 2010). Visualization integrates human in the data exploration process (Gershon et al., 1998; Keim, 2002). In addition, visualization can help to overcome the dominant logic of the firm by challenging self-imposed limitations (Platts and Hua 2004).

Despite the clear potential, it has been stated that still quite few visualization methods are used in management (Lengler and Eppler, 2007). While visualization has been studied in several fields such as information management and strategic management, few successful stories have been published so far (Zhu and Chen, 2008). Visualization has been often studied in a laboratory-like setting without specified context of application. Visualization has recently gained increasing attention also in the field of performance measurement (Al Kassab et al., 2013; Cocca et al., 2012). However, the topic is still quite and ambiguous new in the field. Visualization is easily perceived in connection to various kinds of graphs and sometimes almost as synonymous to dashboards. Performance dashboards are an all-inclusive package of different visualization techniques and there is indication of their positive business impacts (Yigitbasioglu and Velcu, 2012). However, visualization regarding PMS is much more than just designing impressive dashboards (Chiang, 2011). Some of the key questions that should be asked before choosing visualization techniques are: what type of information is visualized, what is the purpose of visualization, and who are the users of visualization (Eppler and Burkhard, 2007).

This paper *aims to understand how performance measurement process can be supported by visualization techniques*. The literature provides only a few examples of visual tools employed at different stages of the performance measurement process (Cocca et al., 2012) which each include slightly different managerial tasks and arguably different visualization forms (cf. Yigitbasioglu and Velcu, 2012; Zhu and Chen, 2008). The explorative approach of the paper intends to provide more structured understanding on the roles and opportunities of visualization techniques in the field of performance measurement. The topic has previously been rather practically-driven and this study intends to facilitate academic debate. Thus, the secondary objective is to bind the current knowledge around the topic which has been argued to remain localized in narrow research areas (cf. Cocca et al., 2012).

2. Methodology

This research is based mainly on literature review and analysis regarding different visualization techniques, their characteristics and potential purposes. The structure of the study follows common phasing of the development of PMSs which includes design, implementation and use of systems (Neely et al., 2000). The tasks and information requirements of the process are used as basis for analysis:

- Design (e.g. understanding cause-effect relationships between measurement objects, communicating strategy)
- Implementation (e.g. influencing and informing key stakeholders)
- Use (e.g. communicating and analyzing measurement results)

The update phase is excluded from the analysis, since it repeats the features of previous three phases. The characteristics of reviewed visualization techniques (see e.g. Heer et al., 2010) are analyzed in order to identify appropriate ways to support performance measurement process. For example, Al Kassab et al. (2011) identify three supportive roles linked to communication, knowledge management and decision-making. With regard to use phase, this study concentrates solely on three distinguishing comparative tasks in performance management (cf. Matta, 1989): trend analysis (comparison to previous results), benchmarking (comparing results from other similar organizations or units) and goal analysis (comparison to defined target levels). It is notable that in addition to the managerial task, the applicability of different visualization forms is also dependent on the personality of interpreter (Kostov and Fukuda 2001). This aspect is not in the focus of this study.

It has been stated that interview and case studies could provide more in-depth understanding of the benefits of visualization techniques in real management settings (Zhu and Chen, 2008), since previous research has often been limited to very narrow laboratory-like experiments. This study has empirical access to 10 recent PMS development projects. The qualitative data in the form of field notes and firm-specific documentations gathered during around 70 workshops is utilized in order to illustrate and evaluate the applicability of visualization techniques, whenever appropriate.

3. Literature review: visualizations techniques and their characteristics

There is almost an endless range of visualization techniques and this study only scratches the surface. There are also many ways to classify these techniques. Lengler and Eppler (2007) distinguish data visualization and information visualization. Data visualization includes pie charts, histograms, tables etc. Information visualization refers to exploring, comparison and classification of data. Keim (2002) discusses dynamic and interactive visualization, depending on whether the changes to the visualizations are made automatically or manually (by direct user interaction). Examples of user interaction is drilling down or filtering measurement results. In addition, the underlying data can be classified variously in relation to visualization techniques. For example, uni- (histogram, pie chart)-, bi- (scatterplots)-, tri-, and multidimensional, network (e.g. relationship between actors), temporal (time series), and hierarchical (tree maps) data can be identified (Shneiderman, 1996). Sets of values changing over time or time-series data is one of the most common forms of recorded data. Time-varying phenomena are central to many domains. (Heer et al., 2010). The scope of different visualization techniques is described next with an intuitive and simplistic classification.

Maps, networks and visualized managerial models

Performance information can often be organized into hierarchies which can be efficiency captured by various kinds of maps. Most common map in the field of performance measurement is strategy map popularized by Kaplan and Norton (1996). It describes the linkages between measurement objects driving the strategy of an organization. There are positive experiences of strategy maps which supplement PMS and increase attention paid to key performance indicators (KPI) (Banker et al., 2004). Similar logic can be applied variously, sometimes more specifically related to individual success factors such as productivity (Figure 1).

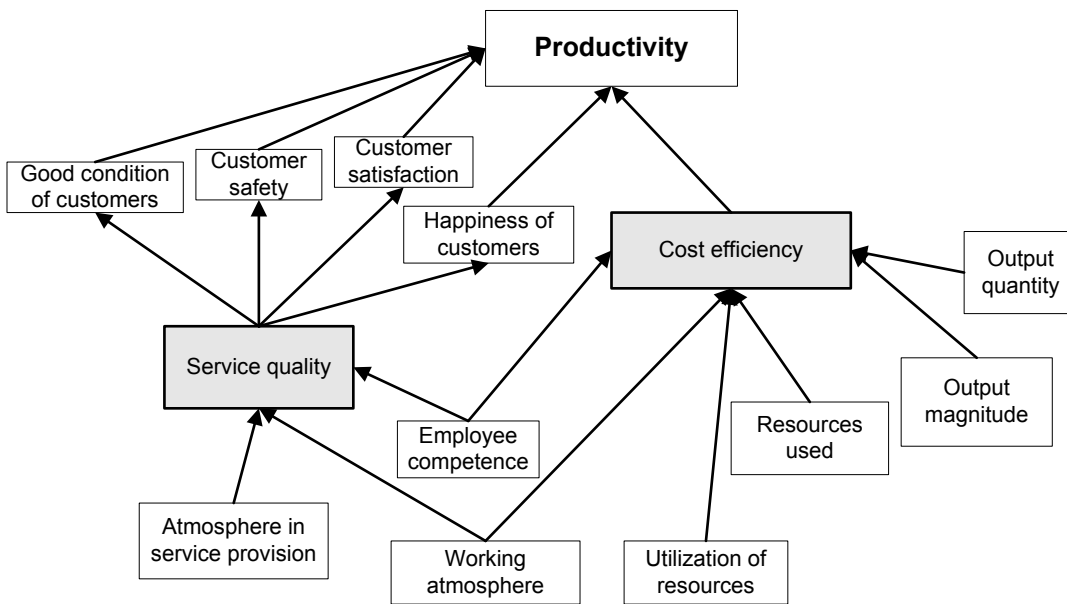


Figure 1 Map of different productivity affecting factors in a public welfare service

Roadmapping is also used in management to improve communication and implement strategy (Kernbach and Eppler, 2010). It has been argued to have at least two advantages (Platts and Hua, 2004). First, it reduces the complexity of abstract concepts. Second, it illustrates and explains causal relationships (similarly to strategy map). Treemaps are efficient in displaying a number of dimensions (Songer et al., 2004). A key feature of a treemap is area, since large branches in the hierarchy are given large areas. In performance measurement context, tree diagrams can be efficient in visualizing the driver measures of KPIs (Figure 2).

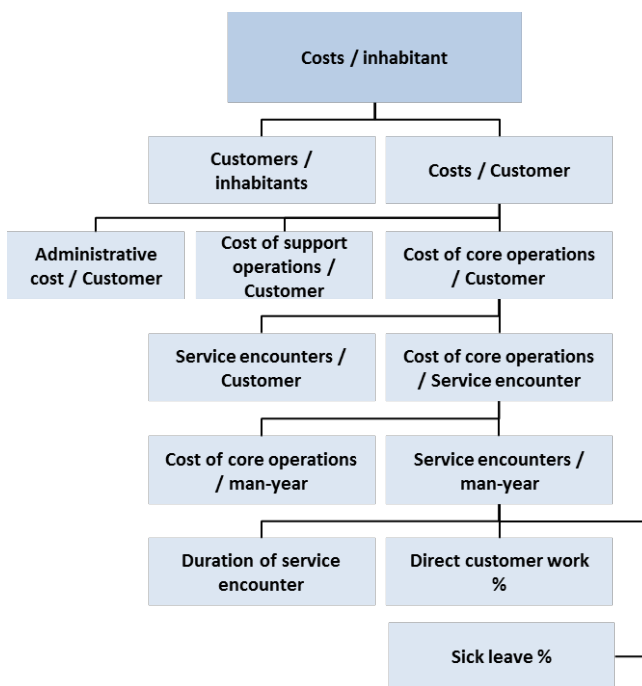


Figure 2 Tree diagram of KPI

Organizations consist and are highly dependent of complex social actor networks. Analysis of such networks is beneficial, e.g. in making hiring decisions, optimizing the flow of information among employees and facilitating innovations from the social networks of staff. Visualization is increasingly used to describe these networks and interpret structural components such as centrality, betweenness, and structural similarity. Network maps typically present social network data through node-link format. (Zhu et al., 2010) One challenge in network mapping is that such maps are often drawn upon data reflecting one point in a time. However, network mapping has a lot of potential in facilitating the use of data from external sources (e.g. social media). (Huhtamäki et al., 2012) This enables novel approaches to performance measurement necessary, e.g. in marketing purposes.

Visualization is also a way to illustrate managerial concepts and models. It has been argued to be efficient in promoting new ideas and in making them more scientific (Lynch, 1990). As an example, visualization has had an important role in promoting the claims of the BSC. One of the advantages of such visualization is the allowing of multiple interpretations of the same image giving flexibility to the presented ideas. (Free and Qu, 2011)

Graphs, plots and charts

Graphs, plots, charts and similar visualization forms are good examples of functional visualization (Chen, 2004) highlighting the ease of using information more than affecting the mind of interpreter. There is almost an endless choice of different combinations of such visualizations. A line chart or line graph displays information as a series of data points connected by straight line segments. It is a basic visualization common in many fields and powerful in providing an overall view of the entire data set.

When considering time-series data, the ability of graphs to present relative changes is often valued since raw values are less important. An index chart is an interactive line chart showing percentage changes for a collection of time-series data in relation to a selected index point. Time-series data may also be aggregated. A stacked or stream graph is a visual summation of time-series values and often supports drill-down into a subset of individual series. (Heer et al. 2010) Graphs can also be used to illustrate multidimensional data. Scatterplot shows the data as a collection of points positioned on the horizontal and vertical axes. This kind of graph is useful in identifying whether two data sets are correlated or not (Figure 3).

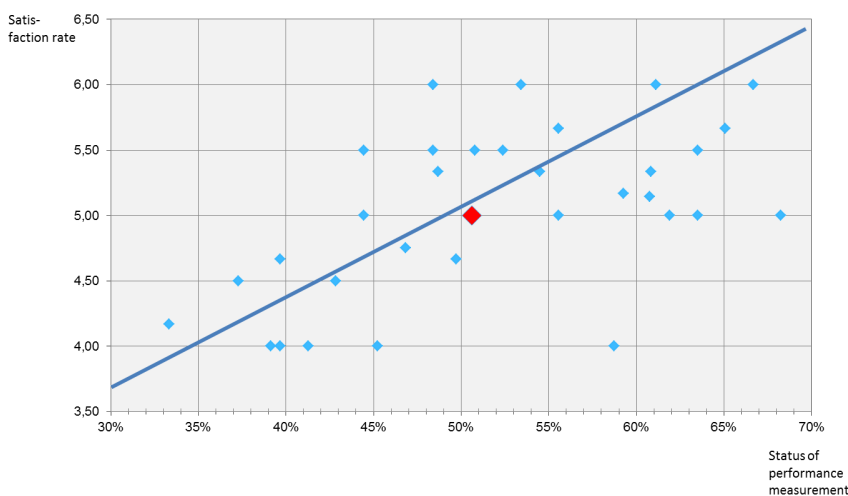


Figure 3 Illustration of scatterplot

Bar chart (and column chart) is often used in emphasizing individual values, rather than overall trends. It is useful in comparing items with few categories (Abela, 2009). Scaling is sometimes regarded as its drawback. If the value scale does not begin from the zero, interpretations may be misleading. Histogram is similar to bar chart and has been regarded as a decent way to describe distributions (Heer et al., 2010). Pie chart is also often used in presenting distributions and it has its advantages in simplistic and clear illustration. However, pie chart has been criticized to have low data density (only one set of data) and the limitation of using percentages instead of exact values (e.g. Tufte, 2006).

Dashboards and other PMS visualizations

Visualization in connection to performance measurement is easily perceived unilaterally as designing management dashboards. Chiang (2011) defines dashboard as a visualization which present all the necessary information in a space fitting into computer screen. It presents all the KPIs and enables interactive use, e.g. drilling down measurement results. Interactivity also means that presented data is updated automatically with a software solution. Dashboards combine different visualization techniques and are often consisted of simplistic visualization forms such as traffic lights and gauges (Gruman, 2004). Gauges, as an example, typically present values of single measures and can also be used to compare values to the target values. Gauges have been criticized to have limited visualization power since they waste space (Tufte, 2006).

Dashboards can be designed for different purposes such as strategic, operative and analytical (Cocca et al. 2012). Even though dashboards are interactive, they can be regarded as static since they do not necessary satisfy ad-hoc managerial information needs. However, they can enhance the use of performance information. Schmidt (2005) argues that the dashboard approach is a logical development of the use of BSC. It makes PMSs more flexible and automates the costly and time-consuming data preparation inherent in BSC. Pauwels et al. (2009) regard that dashboards can complement traditional BSC approach by facilitating the analysis of external environment such as competitors. According to Eckerson (2009), dashboards support management by monitoring critical business processes and analyzing problems.

Gitlow (2005) presents some key intended benefits of dashboards including a focus on the entire firm rather than a fragmented view. Dashboards are usually expected to collect, summarize, and present information from multiple sources such as legacy, ERP, and BI software (Yigitbasioglu and Velcu, 2012). Pauwels et al. (2009) regard that a dashboard provides a common organizing framework for data which is obtained from diverse sources, organizational levels and time periods. Dashboard helps management to build a bridge between internal use of performance information and external reporting. It also allows different executives in different departments and locations to share the same information from their own viewpoints.

Performance matrix or objectives matrix (see e.g. Jääskeläinen, 2009) is a conventional method in which a set of performance measures is used to compose a single measurement result. It is a simple example of visualization combining information of many performance measures in order to illustrate the results of a PMS in a single screen (Figure 4).

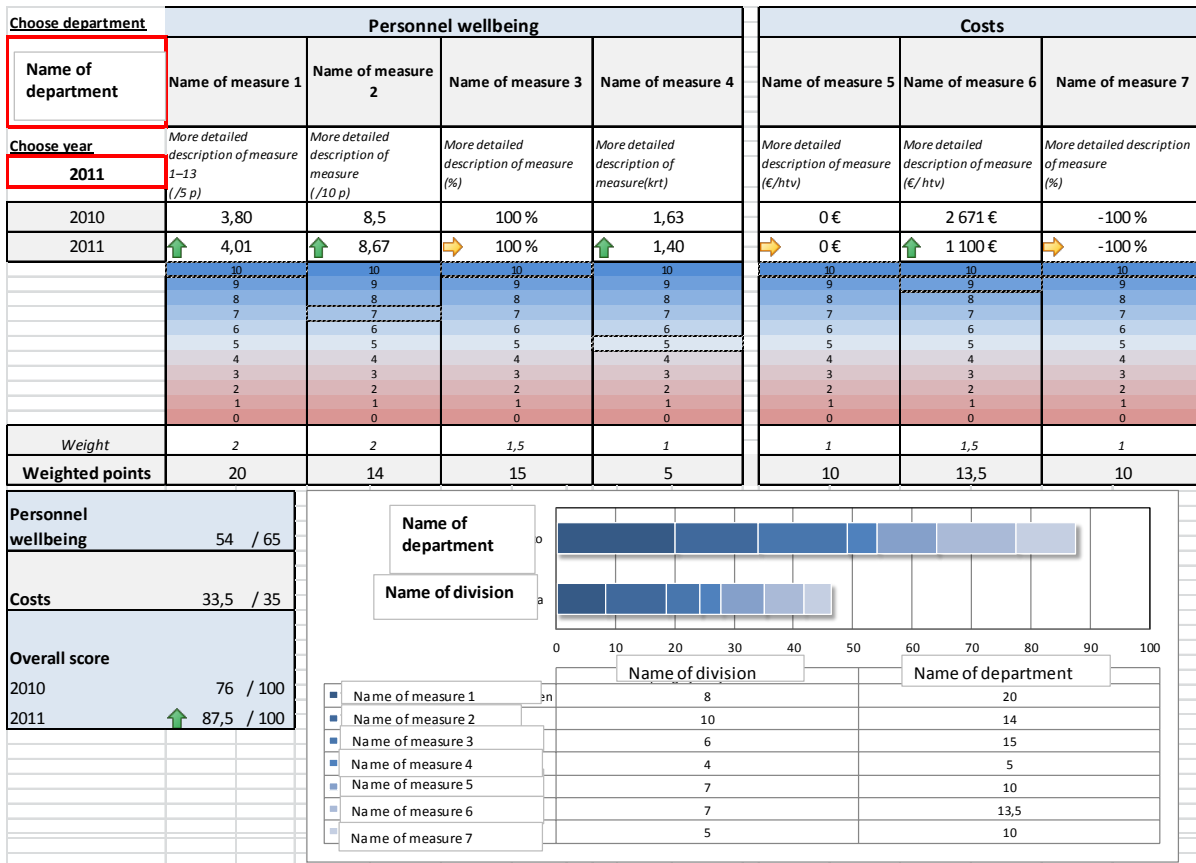


Figure 4: Illustration of the matrix-based visualization

The logic of performance matrix is easy to follow. Every measure has its own weight (0-10) in the calculations. There should not be more than 7 measures per matrix since matrices with more measures are in danger of becoming too complex and the power of visualization is lost. In a traditional application of the matrix, the expected values of different measures are scaled in order to produce a score from 0 to 10 for each measure. By first multiplying the score of each measure by the weights and then summing up the results, the matrix produces a total score from 0 to 100. The disadvantage of the approach is that it is not interactive as such. In addition, weighting of different measures can distort the overall results.

4. Visualization and performance measurement process

This section describes how visualization techniques can be utilized in supporting performance measurement process. The presentation is based on the experiences from recent PMS development projects which followed rather conventional and analogous path. The emphasis in these projects was more in satisfying managerial information needs with appropriately defined measures, than in designing information systems.

Designing of a PMS consists commonly of discussion about drivers of strategy or success factors. These factors are multidimensional including both financial and non-financial perspectives. Especially in large organizations, overall picture of measurement objects is complex leading to challenges in actually implementing strategy to the operative level (Kernbach and Eppler, 2010). There should be means to address this problem. As a manager of industrial services put it:

- It is important that personnel understand the logic of measurement since it facilitates the acceptance of PMS.

It has been shown that visualization improves the communication of strategy (Kernbach and Eppler, 2010). In the context of performance measurement, visualization can be useful in describing cause-effect relationships between measurement objects as well as illustrating the interconnections between actors, organizational levels and other organizational entities. In the examined measurement development projects, strategy maps have been widely regarded as beneficial in increasing the understanding of the phenomena to be measured. They have been commented as useful in understanding and prioritizing measures as well as in analyzing the prevailing status of measurement, e.g. in which aspects there are no functional measures for the drivers of strategy.

In addition to the strategy maps in their conventional form, specific kinds of maps have been successfully utilized in the examined projects of large organizations. In these maps, the managerial levels (e.g. operative, middle, top) with broader performance perspectives and their interconnections have been illustrated. Such maps have also supported the illustration of the synergies and co-operation of units and highlighted horizontal processes. These visualizations have been regarded to build bridges between the efforts of individual employees and the strategic success factors defined at the top organizational level. In addition, they have been useful in avoiding overlapping between the PMSs of numerous organizational levels and units. This has enabled in building compact and managerially relevant PMSs.

Visualization appears to be most useful in defining and understanding what is measured while there is less support in the actual design of measures. It should also be noted that visualizations are not prerequisite or guarantee of success. In any case, illustrations seem to support the communication of desirable PMS structure. This is especially important in the context where personnel are not experienced in performance measurement related issues.

There are two key aspects that can be examined in the **implementation** of PMS: technical and social (e.g. Jääskeläinen and Sillanpää, 2013). This study concentrates on the latter aspect which is essentially driven by two facilitating factors, also frequently mentioned in the change management literature: communication and commitment (Kennerley and Neely, 2002). Key issues that need to be communicated are: why measurement is implemented (and what is not the purpose) and what benefits are pursued. Various kinds of maps have been perceived to be equally useful in communicating as in the design phase in providing understanding of the overall logic of measurement.

Communication deals not only with rational aspects since resistance and prejudices towards measurement may be rooted more deeply in the organizational culture. Therefore, it is proposed that some kind of visual metaphors could be useful since they affect the mind and feelings of the interpreter. However, these kinds of visualizations were not used in the examined development projects. According to Kernbach and Eppler, (2010), visual metaphors are an indirect way of communication since interpreter has to first mentally reconstruct the displayed visualization correctly. They can be used to transfer existing knowledge to new areas. Easily understandable visual metaphors are useful in transferring knowledge and they also help to remember and convey it (Eppler and Burkhard, 2007). Hence, they appear to be worth testing to support the implementation phase especially when employees are not familiar with performance measurement.

In the **use** phase, performance information is utilized in different managerial purposes. Since measurement results are not meaningful as such, various kinds of comparison analysis have to be carried out. All of these analyses require different visualization techniques. Comparison of results between organizational units or other entities can be supported with bar charts highlighting individual values and their differences. Trends or time series have commonly been illustrated with graphs which still are functional in that purpose. When considering goal analysis, the comparison of measurement results against set objectives, traffic lights have been widely utilized as a part of managerial dashboards with promising results. Advantage of such visualization is that measurement result does not require constant monitoring. Only red light means that something needs to be done. In one of the case environment examined (small knowledge-intensive organization), a simplistic traffic light monitoring the set delivery times was in fact the most essential and influential measure of all. Table 1 summarizes the proposed use of visualization techniques in a PMS development process.

Table 1 Proposed usage of visualization techniques as part of performance measurement process

Phase	Visualization technique	Description
Design	Strategy map	Illustrates the cause and effect relationships between measurement objects or strategy driving success factors
	Measurement framework, e.g. BSC	Facilitates understanding on the necessary perspectives that are generally useful to be covered in a PMS.
	Tree diagram	Can be used in discovering and defining the driver measures of KPIs such as overall cost efficiency.
	Actor network mapping	Enhances understanding on the role and relationships between organizational entities and other actors such as customers. This can be a prerequisite to defining measurement objects and in strategy mapping.
Implementation	Visual metaphor	Facilitates persuasive communication necessary in committing employees and management
Use	Bar chart/column chart	Useful in comparison analysis
	Graph	Useful in trend analysis
	Traffic light	Useful in goal analysis
	Objectives matrix	Provides on overall view and combines comparison, trend and goal analysis

Objectives matrix is a simple example of management dashboard which combines the different analysis possibilities and condenses a lot of information to be seen at a glance. In one of the case environments comparison analysis was regarded as its key advantage. Similar units used similar matrices and unit managers actively compared and discussed about their own measurement results. This led sometimes to the discovery of operational differences explaining variance in the measurement results. Matrix was also regarded to have 'built-in' target-orientation, since the visualization method describes which measurement results are regarded poor, average and good. Time series of total measurement scores was also monitored with a matrix. This meant that the construction of the matrix was intended to be fixed for the time period of 5 years. The visualization was deemed useful at specified organizational level, different and tailored design was regarded necessary when different organizational levels were considered.

While matrix method is static as such, most of the modern management dashboard solutions include dynamic aspect which usually means the possibility to drill down measurement results. It is notable that this may also affect the choice of measures. In one of the cases (large public organization) a modern

software solution was intended to be purchased. This affected the decision to use similar measures (i.e. measures with the same component that can be summed) at different organizational levels in order to facilitate drilling down. Dashboards have been found to enforce consistency in measures across departments and business units (Pauwels et al., 2009). Despite the notable potential of dashboards, it is clear that they do not, as such, solve measurement-related problems.

In each of the cases examined, visualization played also role in the actual definition of managerial processes around performance measures. In this purpose, visualization commonly took the form of an annual clock including forums (e.g. executive group) with specified and recurring topics (e.g. budgeting), and time schedules.

5. Conclusions

This paper provided a concise overview of the multifaceted literature on information visualization highlighting managerial tasks related to performance measurement process. The results support practitioners in evaluating and choosing visualization techniques supporting their timely challenges of developing PMS. In addition, the paper contributes as a discussion opener inviting more academicians to study the topic of visualization in management and to further test and broaden the proposals presented in this paper. Visualization is widely used in practice in supportive role to performance measurement but it is still difficult to find academic publications around the topic. The scientific literature has failed to keep pace with the developments of dashboards (Yigitbasioglu and Velcu, 2012).

The topic of information visualization is practically-driven. Many different visualization forms are marketed and claimed to be better than some other ones. There is clearly no one truth around the subject and visualization should not be overemphasized. It has been presented that conventional tabs are often a functional way of presenting measurement results, especially when interpreter has at least some experience of interpreting quantitative data.

This research was mostly based on explorative literature review and only limited empirical data supported the proposals which clearly require more testing in the future. Further in-depth research is needed regarding each phase of performance measurement process. In addition, there are many other forms and possibilities to apply visualization in the context of this study, which were not discussed in this paper. These include, e.g. distributions, relationships between variables, geographical mapping and animation which all are potential in approaching 'big data' not only restricted inside organizational boundaries.

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CORPORATE SUSTAINABILITY REPORTS IN THE APPAREL INDUSTRY

AN ANALYSIS OF REPORTED INDICATORS

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**Corporate sustainability reports in the apparel industry:
An analysis of reported indicators**

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Corporate sustainability reports in the apparel industry:

An analysis of reported indicators

Abstract

Purpose: The purpose of this paper is to identify the reported indicators in corporate sustainability reports and the websites of 14 apparel brands belonging to the Sustainable Apparel Coalition (SAC).

Design/methodology: A content analysis of the websites of the 14 SAC apparel brands was conducted to identify indicators related to sustainability. Qualitative and quantitative data was collected on all reported sustainability initiatives, actions and indicators. A normative business model was developed for the categorization of the indicators and a cross-case analysis of the apparel brands sustainability reporting was conducted.

Findings: A total of 87 reported indicators were identified. The key findings of the study are a lack of comparability among reported corporate sustainability indicators. The majority of reported indicators dealt with performance in supply-chain sustainability while the least reported indicators were in business innovation and consumer engagement.

Originality: This paper provides one of the first in-depth reviews of the indicators reported by apparel brands within their websites and corporate sustainability reports.

Keywords: *CSR reporting; sustainability reporting; sustainable apparel; sustainability indicators; corporate social responsibility; Sustainable Apparel Coalition; Global Reporting Initiative*

Article Classification: Research paper/Case study

1. Introduction

Increased concern over issues such as the use of non-renewable resources, climate change, environmental degradation and ethical business practices has cultivated a growing dialogue within the apparel community regarding sustainability issues. This has led apparel brands to improve environmental and social responsibility throughout their supply-chains. However, despite the growing discourse, solutions for a truly sustainable apparel industry have yet to be developed, to be implemented or to demonstrate actionable results.

It has been found that while the concept of sustainability is well understood, organizations struggle with integrating the concept into their strategies of corporate social responsibility (CSR) (Carter & Rogers, 2008). CSR itself continues to be a highly debated topic as consensus on a clear definition continues to be a struggle (McWilliams & Siegel, 2001; Van Marrewijk, 2003; Kakabadse, Rozuel, & Lee-Davies, 2005). Within the apparel industry, the development of CSR is still relatively new (Dickson et al., 2009); however, even with the lack of an industry-wide accepted definition (Dickson et al., 2009), sustainability concerns are increasingly recognized as a significant issue (Dickson & Eckman, 2006).

To communicate their progress on CSR initiatives, a number of apparel brands have released CSR reports to the public. There is an increasing use of indicators by organizations in publishing CSR reports to communicate their economic, environmental, and social performance. The majority of studies evaluate the use of performance indicators in measuring the operational, manufacturing, and supply-chain management (Upton, 1998; Lee & Kincade, 2003; Lohman, Fortuin, & Wouters, 2004; Jin, 2006). However, while the use of indicators for CSR reporting is growing, lack of standardization, verification, and voluntary communication cast doubt as to the completeness and accuracy of the claims (Adams & Frost, 2008; Davis & Searcy, 2010). Particularly, there is a lack of literature that explores the development and use of indicators to measure CSR performance by organizations within the apparel industry.

The purpose of this paper is to identify and analyze the indicators disclosed in the CSR reports of apparel brands. This is accomplished through a review of the publicly available CSR reports and websites of the Sustainable Apparel Coalition (SAC) apparel brands. The key contribution of this

paper is an in-depth review of the CSR indicators reported by SAC apparel brands within their websites and CSR reports. The remainder of the paper is organized as follows. The following section provides a brief review of the research approach. The results and discussion are presented in Section 3. A brief conclusion and future research possibilities are provided in Section 4.

2. Research Approach

The central question used to guide this study is: *“Is the current CSR reporting by the SAC apparel brands effectively measuring their CSR performance?”* To address the research question, a qualitative multiple case study of SAC apparel brands was conducted. Apparel brands belonging to the SAC were chosen due to its recent creation by multiple stakeholders in an effort to improve the environmental and social performance of the industry. Formed in 2011, the apparel and footwear companies belonging to the SAC represent nearly one third of the market share within the industry (SAC, 2012). There are fourteen apparel brands belonging to the SAC: H&M, Gap Inc., Nike, adidas, Puma, Patagonia, Mountain Equipment Co-op (MEC), Levi’s, Hanesbrand, Marks & Spencer (M&S), Esprit, Columbia, Timberland and Loomstate. These brands represent a diverse sampling of the various types of North American and European apparel retailers within the industry. This sample of brands includes sportswear, publicly traded multinationals, private retailers, fast fashion, casual mass retailers, outdoors, department stores, and co-operatives. For the purposes of this study, the apparel brands that are members of the SAC are considered to be self-declared industry leaders in sustainability.

A content analysis of the CSR reports and websites of the 14 SAC apparel brands was conducted to identify indicators related to sustainability. Content reviewed included all publicly available reported CSR information of the 14 apparel brands. This included annual reports, CSR reports, accountability reports, governance, environmental reports, interactive media, company blogs, news updates, and product information published on the website. Qualitative and quantitative data was collected on all reported sustainability initiatives, actions and indicators in order to create a comprehensive database.

The collection and analysis of the data was centered around the five key themes depicted in Figure 1.

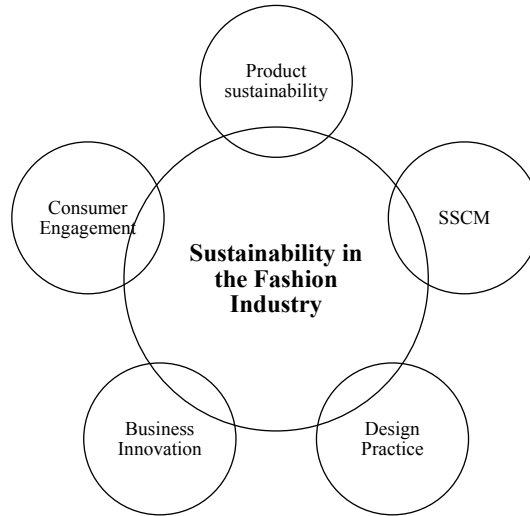


Figure 1: Key Themes in CSR Reporting of SAC Fashion Brands

One of the key documents that influenced the selection of the five themes shown in Figure 1 was the Apparel and Footwear Sector Supplement (AFSS) of the Global Reporting Initiative (GRI, 2011). The GRI AFSS is the first guideline available to the apparel industry related to the selection of sustainability indicators, and reporting. The GRI AFSS identifies 34 sector-specific performance indicators, which fall into four categories: supply chain standards and practices, economic, environmental and social (GRI, 2011). However, the GRI AFSS is largely focused on supply chain issues and does not adequately capture all of the key sustainability issues apparel brands report on. The themes used in this study were developed through an extensive review of the literature, which is described further in Kozlowski, Bardecki and Searcy (2013). As illustrated in Figure 1, the five key themes were:

- Product sustainability (PS):
- Design practice (DP):
- Sustainable supply chain management (SSCM):
- Consumer engagement (CE):
- Business innovation (BI):

Enhancing product sustainability is one of the easiest initiatives for developing sustainability within an apparel brand, as brands can exercise direct control through design and product development (Armstrong & LeHew, 2011; Fletcher & Groese, 2012). While product sustainability may be

achieved via various transformations such as processing methods, use behaviours, and end-of-life strategies, the easiest and most common is the switch to the use of more environmentally preferred materials. This can significantly reduce the environmental impact and increase resourcefulness throughout the garment life cycle without change to design or product development process (Graedel & Allenby, 1995; Ljungberg, 2007; Fletcher & Grose, 2012).

The design phase and product development process are key areas where modifications can have significant impact. The design phase provides opportunity for designers to introduce and integrate the dimensions of sustainability, greatly reducing environmental and social impacts (Dickson et al., 2009; Armstrong & LeHew, 2011).

A supply chain is all the activities that are involved in moving goods from the raw material phase to the end consumer. Despite the prominence of CSR strategies directed to supply-chain sustainability, there are many questions as to what constitutes a sustainable supply-chain and the defining characteristics that make up a sustainable supply-chain. Key characteristics cited within the literature are transparency, development of codes of conduct, auditing, and capacity building (Wong & Taylor, 2000; Allwood et al., 2006; Carter & Rogers, 2008; Fletcher, 2008; Bhaduri & Ha-Brookshire, 2011; GRI, 2011).

Apparel brands bear a great deal of responsibility for shaping the structure and organization of the apparel system. The movement to off-shore production and the subsequent shift to cheaper, low-quality goods evolved into a quantity over quality consumer mentality for apparel consumption. The relationship between apparel brands and consumers requires a reevaluation, is extremely important in the pursuit of sustainability and establishing a vision for social responsibility (Dickson et al., 2009). New processes and concepts are needed to alter how apparel is designed, used, disposed, recycled or reused; extending the life span of the products and the meaning they bring (Hethorn & Ulasewicz, 2008).

Over-consumption and the negative environmental and social impacts are a result of how the apparel industry operates today, highlighting the need for change in the business, structure and operation of the apparel system (Fletcher & Grose, 2012). Conceivably the industry could move toward multiple

business strategies that encompass the ideals of sustainability where apparel is produced in a manner with no environmental or social impacts. The creation of a diverse system employing cradle-to-cradle and design for environment principles could satisfy consumer's appetite for all types of apparel from sportswear to fashion.

Analysis of the publicly available information of the 14 SAC brands resulted in the identification of 87 sustainability indicators. These indicators were subsequently categorized within the themes of the model in Figure 1 and an analysis was conducted to determine the type, distribution, and comparability of the reported indicators. The apparel brands were subsequently compared based on the number of reported indicators within the five themes and a cross case analysis was conducted. The analysis addresses the question as to the effectiveness of CSR reporting as a tool for measuring progress towards sustainability.

3. Results and Discussion

A summary of the reported indicators by theme is provided in Figure 2. As shown in the figure, the with the most reported indicators was SSCM with 45 while the least was BI with 7.

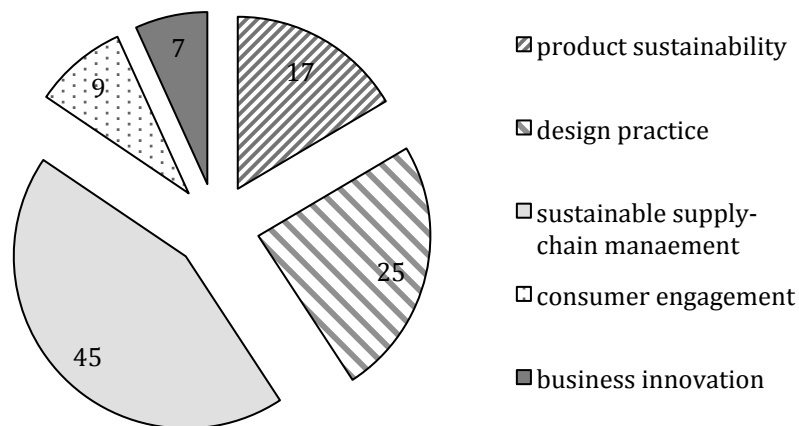


Figure 2: Number of Reported Indicators per theme.

It should be noted that only eight of the 14 apparel brands had developed a standalone CSR report. Six of the eight brands referred to the GRI guidelines for their CSR report. Nike and adidas had the highest number of reported indicators at 75, while Esprit had the least with 14. The mean of the reported indicators was 51.9 with a standard deviation of 21.6. A summary of the mean number of reported indicators per for each brand is provided in Figure 3.

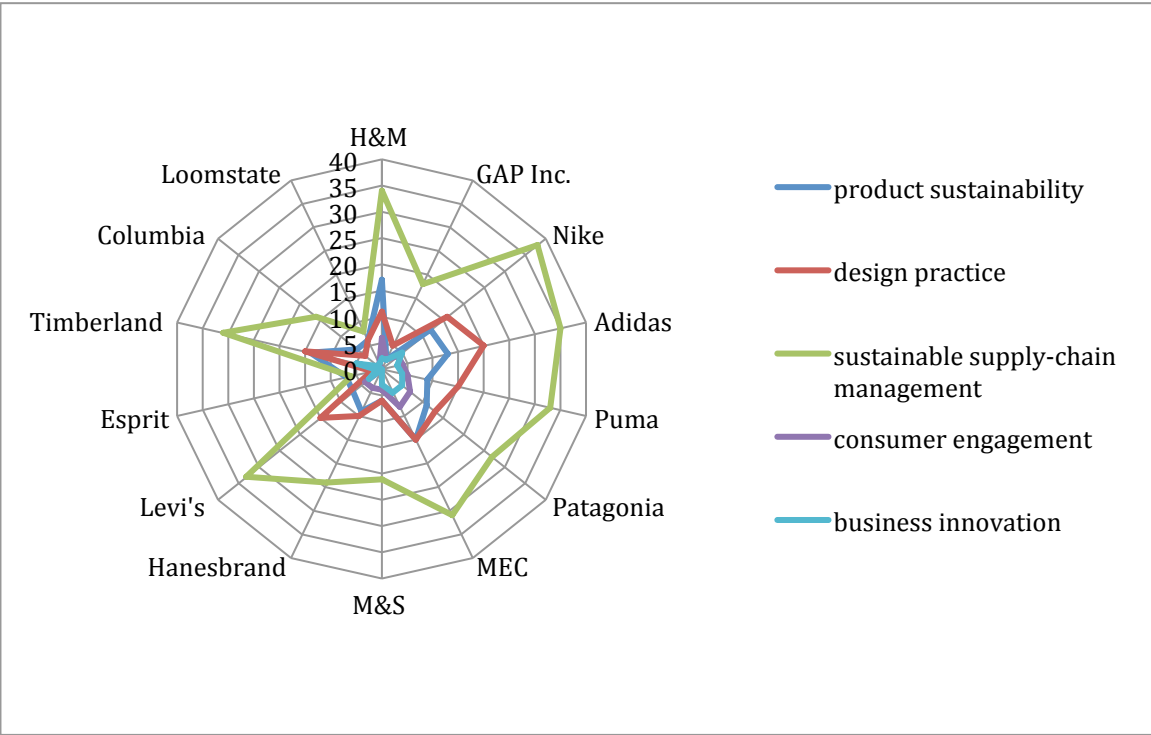


Figure 3: Mean Number of Reported Indicators per per Brand

An analysis of the reported indicators per is provided in the sub-sections below.

3.1 Product sustainability

A summary of the indicators reported for product sustainability is provided in Table 1.

Table 1: Summary of Reported Indicators for Product Sustainability

Indicator	Number of apparel brands that reported
Use cotton/polyester blends	13
Use organic cotton	11
Phasing in recycled polyester	11
Use environmentally preferred cotton	10
Use recycled polyester	9
Use 100% environmentally preferred materials within products	9
Use certified organic cotton	8

Use up to 5% environmentally preferred materials within products	8
Use 50% or more environmentally preferred materials within products	8
Limit PVC use/phasing out	8
Do not use Uzbekistan cotton	7
Use other environmentally preferred materials	7
Have a special collection for sustainable products	7
Use Better Cotton (BCI)	6
Use up to 10% environmentally preferred materials within products	5
Do not use PVC	4
Use certified recycled polyester	3

PS was observed through the reported indicators where 14 out of the 17 were related to the use of environmentally preferred materials such as organic cotton and recycled polyester. Increased use of these fibres and textiles aids in building this emerging market while fostering development of other environmentally preferred materials. H&M had the highest number of reported indicators with 17 while six apparel brands (Gap Inc., M&S, Levi's, Esprit, Columbia and Loomstate) reported less than half of the indicators in Table 1. Increasing product sustainability, if labeled accordingly for consumer visibility, communicates environmental responsibility thereby creating opportunity to positively affect a brands reputation. While this alternative use of environmentally preferred materials is more desirable, it does not deal with deeper issues such as increasing consumption rates or end-of-life strategies (Fletcher & Groese, 2012).

3.2 Design Practice

A summary of the reported indicators for design practice is provided in Table 2.

Table 2: Summary of reported indicators within design practice.

Indicator	Number of apparel brands that reported
Use environmentally preferred material	13
Use cotton/polyester blends	13
Design for environment approach	10
Have a sustainable product guideline	10
Reduce/use textile waste	10
Have sustainability training/education for designers	9
Have sustainability initiatives integrated throughout product ranges	9
Have a restricted substance list	8
Phasing out PVC's	8
Use of low-impact dye	8
Review current research	7
Have conducted a LCA	7
Use a index tool	6
Use/reference a LCA	5

Have a material guideline/database	5
Have an environmental guideline regarding wet textile processing	5
No PVCs in products	4
Reduce colour combinations	3
Use Bluesign® standard	3
Reduce number of colours used	2
Reduce product range/styles	2
Increase pattern efficiency	2
Have a sandblasting ban for denim products	2
Reduce material combinations	1
Use Safe Chemistry	1

Indicators within this highlight the level of sustainability integration within the design and product development processes from alternative material use to recyclability of a product. These indicators exhibit the most variability across the apparel brands, suggesting a variety of strategic approaches, indicators and targets. Ten of the brands reported a design for environment approach; however, this approach mainly consisted of dye and environmentally preferred material substitutions for a limited product range. This only reinforced the observation of environmentally preferred material use as the most commonly reported indicator by 13 of the apparel brands. The next highest reported indicators by ten of the apparel brands were the use of RSL (restricted substance list), the use of a sustainable product guideline and the integration of textile scraps and waste into other products. As a creative industry, the design process is quite variable among different apparel brands. Therefore, it was not surprising to see a wide variety of approaches and reported indicators in adapting the design practice. adidas reported more indicators regarding sustainable design practices than any other brand.

Sustainable approaches to design are still relatively new (Walker, 2006). Research suggests an impediment to working within a more sustainable design framework is the domination of aesthetic features versus environmental or social considerations when consumers purchase apparel products (Dickson & Littrell, 1996; Kim & Damhorst, 1998; Kim & Damhorst, 1999; Shaw & Tomolillo, 2004; Joergens, 2006). This highlights the importance of designers creating apparel, which appeals to consumers, thereby ensuring financial goals are met while pursuing objectives of enhancing environmental and social sustainability.

3.3 Sustainable Supply-Chain Management

A summary of the indicators reported for product sustainability is provided in Table 3.

Table 3: Summary of reported indicators within sustainable supply-chain management.

Indicator	Number of apparel brands that reported
<i>Environmental</i>	
Have a packaging reduction target	12
Use organic cotton	11
Use key performance indicators (KPI)	10
GHG measurement /reduction	10
Use recycled polyester	9
Phasing out PVCs	8
Waste reduction	8
Have a restricted substance list	8
Use recycled material	8
Use of low-impact dye	8
Use other environmentally preferred materials	7
Reducing water use	7
VOC reduction	7
Reducing energy use in manufacturing	7
Phasing in waterless dyeing	5
Committed to Greenpeace Zero Discharge of Hazardous Materials campaign	5
No PVCs in products	4
Use Bluesign® standard	3
Use environmentally preferred rubber	2
Use waterless dyeing	0
<i>Social</i>	
Have a Code of Conduct for suppliers	14
Member of Fair Labour Association	14
Code of Conduct is publicly available	12
ILO/UN/FLA guidelines used for Code of Conduct development	12
Performs audits on suppliers	12
Implement capacity building and corrective actions for non-compliance	12
Use a supplier ranking system	12
Use alternative to conventional cotton (Better Cotton, Fairtrade)	12
Perform unannounced audits on suppliers	11
Have a policy for subcontractor approval and compliance to the Code of Conduct	10
Have an implementation guide for Code of Conduct	10
Compliance with local laws	9
Member of organic exchange	9
Encourage EMS implementation amongst suppliers	8
Use traceability/'String' programs	8
Member of International Labour Organization	8
Supplier list is publicly available	7
Do not use Uzbekistan cotton	7
Member of Fair Factories Clearinghouse (FFC)	7
Member of Better Cotton Initiative	6
Member of Leather Working Group	6
Member of Global Contact	5

Member of ILO Better Work	5
Have a sandblasting ban for denim products	3
Have requirements for silica levels	3

The indicators for sustainable supply-chain management have been divided into two sub-themes: environmental and social responsibility. The environmental indicators look at reductions and measurements at the supplier level for waste, water, energy, and greenhouse gases such as employing waterless dyeing processes, measuring greenhouse gases or utilizing key performance indicators. The social indicators assess the use of codes of conduct for suppliers, their implementation and compliance, audits, audit reviews, and ranking of suppliers to distinguish those with better compliance records.

The most commonly reported indicators included by ten of the apparel brands included the use of key performance indicators (KPIs) for suppliers and GHG measurements and/or GHG emission targets. Eight out of the 14 apparel brands reported the phase out of PVCs from products, while three out of the eight have completely eliminated PVCs. The use of RSL is reported by 10 apparel brands while Puma, Patagonia and MEC utilize the Bluesign® standard. Only six apparel brands, H&M, Nike, adidas, Puma, MEC and Levi’s have publicly agreed to participate in Greenpeace’s Zero Discharge campaign.

Membership in labour rights NGOs like Fair Labour Association (FLA) and International Labour Organization (ILO) had the highest level of reported indicators within SSCM. Many of these organizations are collaborative efforts to reduce the incidences of labour rights violations and improve the auditing process. All SAC brands are members of the FLA and reported the use of a code of conduct for suppliers. Other than Esprit and Loomstate, the brands had high levels of engagement for this .

It was not surprising to see that the majority of CSR indicators were directed at social responsibility in sustainable supply-chain management. Labour rights issues have been a highly publicized chronic problem within the apparel industry for decades. This has allowed for a longer time for apparel brands to develop indicators and implement social responsibility strategies. However, despite the development of codes of conduct, auditing schemes, goals, targets and indicators, there is still a high

level of non-compliance. Rising volumes of product production and the use of multiple contracted suppliers in various countries makes compliance monitoring a challenge. A possible explanation for the increased reporting of supply-chain transparency and supplier disclosure is mitigating public media allegations and/or criticism when violations are discovered. Labour violations continue to be a highly criticized issue within the media.

3.4 Consumer Engagement

A summary of the indicators reported for product sustainability is provided in Table 4.

Table 4: Summary of reported indicators within consumer engagement.

Indicator	Number of apparel brands that reported
Have a product take-back/recycling program	9
Have a clothing take-back program	7
Have a permanent product take-back/recycling program	7
Have a special collection for sustainable products	7
Have a footwear take-back/recycling program	6
Encourage donation/re-use/re-sell of products	6
Have a label/logo identifying sustainable products	6
Encourage washing/drying behaviours that have less negative impact on environment	3
Provide special care and repair services/instructions	2

The most common initiative from the observed indicators is the presence of product recycling and/or take-back program, as reported by nine of the 14 apparel brands. Reducing the impact from consumer apparel laundering was one of the lowest reported indicators as was special care and repair to increase the longevity of garments. Seven apparel brands conducted a LCA and recognized the significant impact on the environment resulting from consumer use. However only four provide information and/or encourage more environmentally friendly laundry behaviours. Only seven of the apparel brands produce special eco collections where six identify these collections with a special label or logo. Six brands encourage donation or resell of garments. This had very little reported indicators by the majority of the apparel brands. This had very little reporting and was limited to few initiatives.

3.5 Sustainable Business Model Innovation

A summary of the indicators reported for product sustainability is provided in Table 5.

Table 5: Summary of reported indicators within business innovation.

Indicator	Number of apparel brands that reported
Have a product take-back/recycling program	9
Have a permanent product take-back program	7
Collaboration for end-of-life product recycling/re-use	7
Design/product project collaboration	6
Implementing closed loop/c2c strategies	5
Share best practices within the industry	4
Provide special care and repair services/instructions	2

The indicators in this reveal various strategies that apparel brands have undertaken thus far which are limited to the idea of diverting apparel waste from landfills. This along with consumer engagement had the lowest number of reported indicators among the apparel brands. The indicator most often reported by nine of the 14 brands is the implementation of a recycling or take-back program but only seven had a permanent take-back program. These initiatives are significant as textile waste is becoming a big concern and consumer engagement is needed to facilitate these business strategies orientated around product return. The problem with these programs is that they are not standardized throughout the business. Puma and adidas have introduced take-back programs for their footwear and apparel but this initiative is limited to a few locations. Only five brands reported the phasing in of closed loop, C2C practices while only four of the apparel brands, Nike, Levi's, Timberland and Columbia reported initiatives to share best practices. Patagonia and MEC were the only two brands that offer repair services or provide information on how to repair and extend the life of their garments.

Business innovation is the crossover point where the apparel brands begin to demonstrate their sustainability efforts from the design phase through to production and consumer engagement. Apparel brands also exercise direct control over business practices and innovation.

3.6 Key Findings

Upon the initial data collection of CSR information, the data were found to be incomparable: the type of indicators reported, how the CSR information and indicators were presented, the format and the

metrics did not allow for comparison. A lack of standardized CSR reporting does not allow for comparability among the SAC apparel brands.

The key findings of the study are a lack of comparability among reported CSR indicators. There was a similar distribution pattern of the type of reported indicators across the five themes by the 14 apparel brands. The majority of reported indicators dealt with performance in supply-chain sustainability while the least reported indicators were in business innovation and consumer engagement. The results highlight that CSR reporting is not effective in providing a true reflection of an apparel brands CSR actions and initiatives.

4. Conclusion

There are very few studies looking at CSR reporting and the use of sustainability indicators by apparel brands. This study provides insight into the type of sustainability indicators and CSR reporting by SAC apparel brands. Research showed a large proportion of the reported CSR information related to sustainable supply-chain management and indicators used were quantitative and metric based. Indicators reported with the design practice and product sustainability were mainly qualitative and had the second and third largest proportion of reported indicators. There was very little information on consumer engagement and sustainable business innovation.

The findings of this study are significant as they highlight the themes where reporting is weak and where it is fairly developed. It is interesting that in the themes where reporting is high and fairly developed that comparability is almost non-existent. However, the results of the analysis do not seem to provide a clear picture of the CSR performance and progress towards sustainability amongst the brands. What this study does find is that comparability is possible and conclusions can be drawn.

This research was primarily focused on those indicators that are unique to the apparel industry. Research findings are limited to the apparel brands belonging to SAC and should be a consideration when extrapolating findings to the apparel industry as a whole. Data collection relied solely on the current publicly available information on the websites of the 14 SAC apparel brands. The limitation of self-reported data was the dominant qualitative nature as the use of quantitative data is undoubtedly preferable. This research highlights the importance of comparability and measurability of reported sustainability indicators to ensure clarity for stakeholders. Improvements require measurement. Progress towards sustainability cannot be established and sustainability practices

cannot be improved upon without a system of measurement. The use of measurement tools such as performance indicators that utilize a common metrics for comparability is essential for progress.

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LEAN LIFELONG LEARNING – CASE SWEDEN

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Abstract

Purpose

The questions in this paper are what options the adult learner has for continued learning and what role universities are playing in providing net-based education. This paper describes current options for lifelong learning and improvement opportunities in the educational process based on an assessment with inspiration from Lean Management principles.

Methodology

Sweden is chosen as an example. The current level of net-based university education and the demand for it is assessed using official Swedish data. Lean Management principles are used

as a starting point to define parameters for interest for the adult learner. These parameters are then converted into a five level scale for assessing current performance with focus on university courses. We also study how Swedish County Councils manage their employee education and carry out a check of courses offered from MOOC providers.

Findings

Lean Management principles in combination with customer focus seem to provide relevant parameters for assessing distance education. Preliminary results indicate that Lean Lifelong Learning has a significant improvement potential. The main reasons for the existing improvement potential seem to be more of a bureaucratic and political nature, whereas technology and resources appears to be less of an issue.

Practical implications

The results have implications for both universities and organisations. There is most likely going to be pressure on universities to become more customer focused.

Originality

Applying principles from Lean Management for education.

Keywords: Lean Learning; Lifelong Learning; Competence development; Learning organisation; Organisational learning; Team Learning; Distance Education; Massive Open Online Courses;

Research paper

Introduction

Most organisations are subjected to accelerating change, which puts focus on their learning ability (Hallencreutz, 2012). The quick pace of external change puts pressure on organisations to continuously adapt and to acquire new knowledge. The estimate is that up to 70% of organisational change initiatives fail, see for example Beer and Nohria (2000). Peter Senge writes about the Learning Organisation and claims that the only sustainable mode of competition is the speed to learn quicker than the competition (Senge, 1990). In order to have organisational learning there must also be individual learning, which puts focus on lifelong learning. From a perspective of national competitiveness it should be an advantage if new knowledge is easily accessible. The Lean philosophy has been successfully spread to several fields, like to health care (Mazzocato et al., 2010). However, applications for education still seem to be scarce. Antony et al. (2012) write that: “Although LSS (Lean Six Sigma) as a powerful business process improvement strategy has been around for over ten years, its applications in the context of HEIs are still in their embryonic stages”. Compared to their younger classmates working mature students could be expected to know more clearly what they need. Studying in parallel with a traditional employment requires customisation of the provided education, just in time delivery and probably also evening out the working load (heijunka) to suit the learner. It might be argued that leaning learning could be a way to increase both effectiveness and efficiency of learning – doing the right thing in the right way. In this paper we look at three options for adult learning: University distance courses, company internal courses and Massive Open On-line Courses (MOOC).

Universities in Sweden have for some 20 years been providing net-based courses and until recently there has been a steadily growing number of distance students. From 2012 to 2013 here was an 8% reduction of distance courses (SHEA, 2013). Assuming that interest in distance education is increasing this could mean that course availability is reduced, negatively affecting the ambitions of Lean Lifelong Learning.

Many Swedish County Councils are organising their own education. As an example medical doctors need continuous updates. Courses have to be set up quickly and sometimes only run for short periods. For this, different e-learning solutions are used. In the job learning differs significantly from university studies, but could still provide some interesting insights. Need based courses could be expected to be much more customer focused. With working students, stronger focus is on efficient use of time to learn something identified based on needs. This is somewhat different from university studies where the length of education often is standardised without it necessarily directly relating to forthcoming competence needs.

Another option for Lean Learning could be MOOCs. Free of charge net education and the available quality of it seems to be increasing rapidly (Haggard, 2013). This is a quickly evolving field that might become quite competitive and customer focused (Weller and Anderson, 2013). Technically it should be possible to customise courses in scope, level, extent and speed that suit the customer. For lifelong learning MOOCs are a very promising development. The first studies of MOOC participants’ experiences show an individualised and need focused application of the courses (Veletsianos, 2013). In particular, the flexibility of scope and speed is appreciated, combined with the freedom of not having to finish the course, but instead being able to choose the most interesting and important parts (Londeore, 2013).

Methodology

Sweden is an IT-savvy country with a well-educated population and could therefore form the basis for highlighting strengths and opportunities within lifelong learning. We study options for adult learning, concentrating on how the Swedish University system is performing to support lifelong net-based learning. The highlighted improvement potential is discussed with the purpose of identifying drivers and barriers for more effective and efficient learning. We study official Swedish statistics to explain the general interest for university level distance courses in Sweden, looking at both demand and offering. Based on Lean Management principles and customer focus we propose an assessment matrix for net-based education including five parameters. For each parameter we create a Likert scale of 1-5, with 5 being a proposed benchmark. These parameters are then used for examining Swedish university courses. For this we use the web-site www.studera.nu that presents available university courses within the country. To delimit our study we restrict the examination to the area of Quality Management (QM). A reason for this is that the area has relevance for many adult learners. Another explanation is the insight that the authors have of the area. We carry out a search for the words “Lean” and “Kvalitetsteknik” (Quality Management/Quality Technology). The parameters used are: Existence, Extent, Waiting, Pace, all graded by five level Likert scales. Additionally we look at Availability as number of applicants per study place based on some convenience sampling of courses. The reason is that this indicator cannot be extracted from www.studera.nu. We also look at the ratio of number of QM courses on distance compared to total number of courses. This is additionally done for some other topics as a check of if the results for Lean and QM distance courses are typical. We also study how County Councils manage competence development of their employees with the purpose of finding ideas for benchmarks. This is done by one of the authors working for a County Council. We also do a brief search of MOOCs in Quality Management and Lean on the Learning Platforms such as Coursera, EdX and Udacity that are well known MOOC providers. We have not looked at commercial offerings for distance education.

The assessment matrix

Isaksson et al. (2013) interpret Lean for educational and research processes based on Liker (2004). Focus is on the value adding in the educational process and in identifying the main types of waste. Isaksson et al. (2013) define the educational process from perceived educational needs to when the acquired knowledge is used and then study causes for waste in this process. The main types of waste identified are waiting, inventory, overproduction and defects. Frontloading knowledge long before it is used is by Isaksson et al. (2013) classified as inventory, with the problem being that learning things well in advance will lead to great losses in the form of forgetting. There could be an advantage in learning things when they are needed – Just-In-Time. Since courses often come in fixed sizes without individual assessment of customer needs overproduction is frequent. Course throughput is often well below 100%, indicating a high level of defects.

Based on a customer focus on mature distance students – doing the right thing in the right way - we propose five criteria for net-based Lean Learning.

1. Existence – does the required educational product exist?
2. Extent – is the extent of it as required (overproduction)
3. Availability – is it possible to enter the education in a planned way? The course could exist, but not be available due to overbooking.
4. Waiting – when can the education be accessed (waiting)
5. Pace – is it possible to adapt the speed of learning (over-processing, waiting)

The criteria 1 and 3 are seemingly not part of the 7 types of waste (Liker, 2004). These relate to the question: "Are we doing the right thing", which could be seen as a prerequisite for doing the thing the right way. Isaksson et al. (2013) define the end of the educational process to be when things learnt are put into use. We have limited the process to the end of the education. In Table 1 the proposed parameters are combined with defined criteria for the different levels.

Table 1. Proposed criteria for assessing the level of "Lean" in education.

Criteria	1	2	3	4	5
Parameter					
1.Existence	No course found	Some courses	Some courses at some different levels	Many courses at some different levels	Many relevant courses at many different levels
2.Extent	Courses of one extent only	Some variation in extent	Variation in extent	Some courses in the entire range from 1-30 ECTS	Several courses ranging from 1 ECTS and up
3.Availability	Very hard to access, > 5 appl./place	Difficult to access 2-5 appl./place	Medium access <2 appl./place	Good access; <1 applicant/place	Guaranteed access
4.Waiting	Waiting > 6 months	3-6 months	1-3 months	<1 month	Course can be started immediately
5.Pace	Courses with one pace only	Courses with some variation in pace	Courses ranging from 25-100%	Courses ranging from 10-100%	Several courses with fully flexible pace including intermittent learning

University distance learning in Sweden

Students attending distance courses in Sweden have increased over the years, until 2010-2011, see Figure 1.

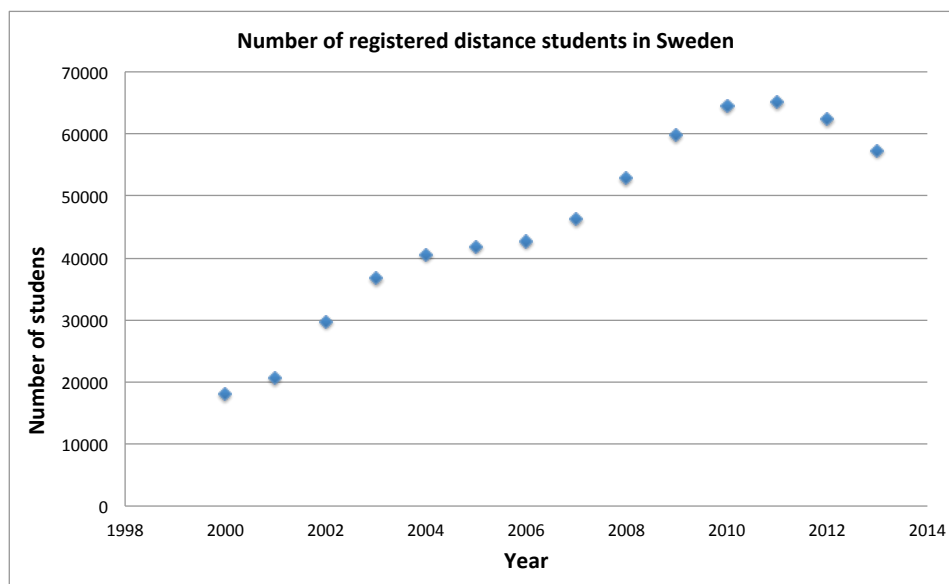


Figure 1. Number of registered distance students in Sweden in fall semester over time (SHEA, 2014).

Since 2011 the trend for number of students registered on distance is pointing downwards with the main reason for this being reduced course availability, see Table 2 and 5.

In order to assess the number of applicants per course we have combined statistics for percentage of applications with number of applicants and the number of places for the respective year, see Table 2.

Table2. Data on number of applicants and calculated values for number of applicants per place for campus and distance.

Year	Accepted (new) Fall sem. (thousand)	Applicants (new) Fall sem. (thousand)	Calc. total appl/ place	New dist. appl. %	Calculated number of new appl dist	Calc. new reg. on dist.	Calc. Dist appl/ place	Reg on distance Fall sem.	Totally reg. Fall sem.	Calc. % on distance
2001	182	269	1,5					20662	300669	6,9%
2002	191	284	1,5					29628	328738	9,0%
2003	194	292	1,5					36771	339893	10,8%
2004	186	294	1,6					40520	337382	12,0%
2005	181	290	1,6					41795	330875	12,6%
2006	172	264	1,5					42598	319924	13,3%
2007	191	292	1,5					46174	319120	14,5%
2008	191	295	1,5	22	64900	30895	2,1	52731	325997	16,2%
2009	226	360	1,6	24	86400	37920	2,3	59898	356987	16,8%
2010	235	373	1,6	25	93250	41542	2,2	64505	364901	17,7%
2011	243	385	1,6	27	103950	44248	2,3	65171	357907	18,2%
2012	249	403	1,6	27	108810	44253	2,5	62474	351524	17,8%
2013	242	413	1,7	27	111510	40160	2,8	57331	345473	16,6%

Table 2 includes calculated figures. The number of new students registered on distance in fall semester is based on the percentage of registered students in the fall season. The number of registered includes both new and previous students. An assumption is that we can use the percentage for total registered for new students as well. Results indicate that the number of applicants per place for distance has increased and that it successively has become considerably more difficult to enter distance courses.

Results from course search

We searched courses on www.studera.nu using the words Lean and QM, recording total number of hits for courses and then for net-based education only. Since we chose to work with a limited topic we also carried out a background search as comparison, see Table 3. Results show that the topics of Lean and QM have a higher percentage of distance courses.

Table 3. Results from www.studera.nu searching courses (not programs) in total and the number of the total given on distance.

	Lean	Quality Management	Business Administration	Programming	English
Total number of courses	22	34	795	289	538
On distance	16	26	134	108	179
Percentage on distance	73%	76%	17%	37%	33%

Figures for availability cannot be found on www.studera.nu and we have therefore used input from Table 2 looking at the assessed number of places per applicant and specific information

from Gotland University, see Table 5 and text below, to define the Availability to present results in Table 4.

Table 4. Results for Lean and Quality Management

Parameters	Rating					Average rating
	1	2	3	4	5	
Existence			L	QM		3,5
Extent	L	QM				1,5
Availability	L/QM					1
Waiting		L/QM				2
Pace		L	QM			2,5

The arithmetic average rating in Table 4 is 2.1 out of 5. However, seen from a customer perspective the situation is dominated by the low Availability. A good offering is worth little if it cannot be accessed. There are many courses to choose from and for QM some different levels. The extent is mostly 7.5 ECTS or requiring about 200 hours of total study time, which is on the high side for many mature students who work in parallel to their studies. Waiting is a function of the educational system. There are two openings for applications yearly, which results in waiting being some 3-7 months. The pace for QM courses can be chosen between 25-100% of full time studies. There is little or no synchronization between the offerings from different universities. Most courses are started in September or January and often in parallel with similar courses from other universities. The starting points are normally four per year, i.e. September, November, January and March. Out of the total of QM and Lean courses only 11% start in November.

In fall 2013 Uppsala University Campus Gotland had some 5700 persons applying distance courses within QM and Leadership, corresponding to almost 1000 full year students. Out of these 11% were accepted. This gives the rating of 1 as Availability. Based on Table 2 the number of applicants generally for distance courses is 2.8/place, which would indicate 2 as rating, but specifically for QM and Lean the example from Gotland University is believed to be representative and therefore 1 is chosen. Results of number of applicants for some example courses for Gotland University are listed in Table 5.

Table 5. Number of applicants with first priority for distance courses in Gotland University (Uppsala University Campus Gotland starting 2013)

Course	2002	2007	2008	2009	2010	2011	2012	2013
Quality Management 7,5 ECTS	34	22	22	45	55	64	68	145
Quality and Organizational Development 15 ECTS	26	31	40	42	87	78	126	300
Change Management 7,5hp					36	49	80	179
Leadership and coaching 7,5 ECTS					386	473	805	1321
Leadership and group dynamic perspectives			44	98	85	179	289	534
Leadership and conflict management 7,5 ECTS			106	64	292	252	428	683
Leadership and organization 30 ECTS		114	89	115	291	277	429	567
Process Management 7,5hp		37	35	65		101	114	296
Project Management 7,5hp				83	304	340	352	844
Total	60	204	336	512	1536	1813	2691	4869

The number of applicants over time indicates an exponential increase. Since 2009 the number of places on distance in Gotland University has remained the same or has been reduced. A further reduction is predicted. The new policy from Uppsala University Campus Gotland calls for a minimum 50% increase of campus students maintaining a fixed total, which will lead to approximately a 50% reduction of all courses given on distance compared to 2012 Figures.

Examples of life-long learning from County Councils

Another example of e-learning initiatives is the work carried out by the Swedish County Councils. These organisations' core business is health care and they need to have a high level of efficiency, innovation and flexibility. Knowledge management is therefore a key methodology (Persson, Stirna and Aggestam, 2008). E-learning in the health care sector is emerging as a practitioner and research area. E-learning is defined as a method of delivering knowledge through diverse technological tools, such as web-based learning and virtual classrooms (Guidy-Olai and Tarn, 2012). Examples of workplace e-learning include interactive videos, games and virtual patient simulations for medical training (Dror, Schmidt and O'Connor 2011, Albertsson and Sundström, 2011, Guise et al. 2012). Presently around half of the 20 County Councils in Sweden practice e-learning to increase knowledge among adult employees or related organisations. These are characteristics of e-learning at the County Councils:

- Educational content mainly covers hands-on topics directly applicable in daily operations, e.g. improvement of basic hand hygiene and fire prevention.
- E-learning content is made accessible mainly in the form of so called SCORM packages, an industry standard for e-learning interoperability. These packages are interactive multimedia productions containing text, images, graphics, video or other media. One e-learning course is usually contained in one or many SCORM packages, depending on the course structure and length. These courses in turn are hosted on Learning Management Systems (LMS). Employees can access these LMS at a place and time of their own choice. Time for e-learning can also be allocated and scheduled for specific staff categories. Furthermore, e-learning can be used in combination with classroom education.
- The length of a complete e-learning education is typically 30-45 minutes.
- E-learning at the County Councils is a relatively new phenomenon. The County Councils that are most advanced in this area have been operating for 4-5 years, offering a hundred or so e-learning courses in various categories.

While e-learning is a fairly new concept in this sector it is clear that the phenomenon is rapidly growing. It has been suggested that learning at schools should be influenced partly by workplace learning. Concretely, the on-the-job learning process is often of a collaborative nature and new knowledge can often be instantly applied in everyday working processes (Tynjälä and Häkkinen, 2005).

MOOCs on Lean and QM

A search on courses for Lean and QM on Coursera, EdX and Udacity results in only a few hits. Coursera has one course in Operations Management to offer, starting March 2014 and with no information on further courses. There is nothing on Lean and Quality in EdX and Udacity. All three are well known providers of MOOCs. This means that so far there seems to be no real competition to what universities are offering within QM and Lean for the adult learner.

Conclusions

The number of places for distance learning in Sweden is being reduced, while the demand is increasing. From the perspective of Lean Lifelong Learning, waste is increasing. The Lean inspired assessment matrix seems to provide a reasonable first assessment. Results indicate that if Availability could be increased the situation would improve considerably. Studying MOOCs, even if doing it in English, within Quality and Lean Management does not currently seem to be an alternative. Examples from County Councils show that practically oriented customer focused courses are being quickly produced for employees. This indicates that corporate e-learning such as at the County Councils, is a cost-effective way of distributing learning and to increase the knowledge level of employees. Given that the alternative in many cases would be traditional face-to-face classroom education, e-learning can be produced at a fraction of the cost. Cost-effectiveness increases with the number of learners. Typically at County Councils an e-learning course has a target group of up to 10,000 individuals.

Discussion

These results are surprising. With the discussions of MOOCs becoming a game changer and potentially a way to largely bypass universities the expected reaction from universities would be to focus more on distance education instead of winding it down. The direct reason for Swedish universities giving priority to campus education could be based on the interpretation many universities have made of governmental directives that seem to favour campus education. Also, for universities it is easier to handle campus education where there is a long time commitment from students, which provides economic predictability. For business in Sweden the low level of Lean for distance education is bad news since voluntary individual competence development becomes more difficult. An important aspect stopping innovation is the fact that the number of students attending is regulated based on the revenue from courses, and not the cost. This means that if a university distance course could be developed to allow 1000 persons instead of a 100 for the same cost, this is not possible. The revenue would go over the quota of courses, which the university gets paid for by the State. Universities generally seem to be afraid of producing over the quota since this could lead to questions from the authorities on the level of remuneration needed. Additionally lecturers have little incentives on changing the way of education since most universities focus on research. As long as there is queue of students for campus education there is no need of changing the traditional “sage on the stage” approach. This situation is unlikely to change until there will be an external shake-up, which could be in the form of customer demand going somewhere else with the help of modern technology. One example of this could be the way in which Swedish County Councils work and another the further development of MOOC-offerings. Universities could still be a relevant alternative if only course Availability was improved. Based on examples from Gotland University it can be said that for 5-10 years ago most students applying for distance courses were admitted. Currently it is much more difficult to plan for attending on a specific course. For lifelong learning it could be argued that guaranteed access for those with the required qualifications is the benchmark that would serve national interest in the best way. This could probably be done without too much expenditure by using modern technology and pedagogics as exemplified by MOOCs and courses given by Swedish County Councils. An area suitable for testing could be Quality Management where there are many distance courses and where there is a high demand.

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0023

PERFORMANCE MEASUREMENT EFFECTS ON ORGANIZATIONAL RESPONSES TO THREATS

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PERFORMANCE MEASUREMENT EFFECTS ON ORGANIZATIONAL RESPONSES TO THREATS

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Structured Abstract

Article classification: Research paper

Purpose: The purpose of this work is to explain how an organization's performance measurement systems can influence the appropriateness of an organization's responses to threats.

Methodology: Inductive and deductive reasoning, drawing on major theories and on empirical findings in the management literature.

Findings: An organization's performance measurement systems can influence the effectiveness of the organization's detections of threats and the appropriateness of the organization's responses to threats.

Originality/Value: The idea, that an organization's performance measurement systems can influence the effectiveness of the organization's detections of threats and the appropriateness of the organization's responses to threats, is not articulated in the management literature. Thus the research reported here is original and would seem to have value to the research community, the organization design community (as an organization's control systems are an important component of its architecture), the practitioner community and perhaps to society's regulators.

Keywords: performance measurement, organization design, organizational performance, organizational adaptation, organizational decision making, environmental threat, environmental monitoring.

PERFORMANCE MEASUREMENT EFFECTS ON

ORGANIZATIONAL RESPONSES TO THREATS

Casual introspection suggests that performance measurement systems serve decision contexts different from the decision context of organizations facing environmental threats.

Performance measurement systems generally involve quantitative assessments of past performance for the purpose of managing future performance – in environments very similar to the already-experienced environments where past performance was assessed. In contrast, large-scale field studies (Nutt, 1994; Shapira, 1995) indicate that organizational responses to threats are largely the result of executive judgments heavily influenced by executives' qualitative estimates of future outcomes (see also Simon, 1979), *generally in unfamiliar environments*. Given these realities, we might well have low expectations concerning the possible effects of performance measurement systems on organizational responses to threats. In contrast to this expectation, however, the results of the work reported lead to the conclusion that the characteristics of an organization's performance measurement systems can be and often are important determinants of how and how well an organization responds to threats.

Two types of measurement systems are relevant: (1) the systems that the organization uses to detect and analyze threats and (2) the systems that the organization uses to assess and improve its performance in the face of a threat. The purposes of the work reported here are (1) to explain how an organization's performance measurement systems can influence the organization's responses to threats, (2) to identify some not uncommon shortcomings in performance measurement systems, and (3) to suggest how these shortcomings can be remedied.

It will be useful to consider three different types of threats. One type might be called *evolving environmental threats*. This *threat* is the effect on organizational performance that might be caused by *evolving environmental situations*. As examples of evolving

environmental situations, technological change could render the organization's core production or distribution technology obsolete, demographic change could shrink the baby food market in countries with declining birth rates, cultural change could reduce the demand for tobacco products, and a recession could reduce the buying power of potential customers. After discussing performance measurement issues for evolving environmental threats, I will discuss performance measurement issues for *commitment-to-program threats and competitor threats*.

EVOLVING ENVIRONMENTAL THREATS: Performance Measurement Issues

Each of four problems – which in aggregate are not infrequent – reduce the effectiveness of performance measurement systems as mechanisms for detecting and assessing evolving environmental threats: (1) Not accounting for users' information processing limitations, (2) Not accounting for creeping normality, (3) Not accounting for threat-obscuring phenomena, and (4) Not testing proffered explanations for declining performance and not testing for alternative explanations for the decline in performance. The likelihood that any of these problems is present varies with the care and sophistication with which the system was originally designed and fitted to the phenomenon being measured and with changes in the phenomenon being measured that are not accounted for in the current measurement system,

Problem 1: Not accounting for *information processing limitations*.

People do not sense change across a series of numbers in a row or column as readily as they sense change across a graph of these same numbers plotted as curve of data points along a time line.

Solution: To enhance detection of an evolving environmental threat, supplement numerical reports with graphical reports using the same data.

Problem 2: Not accounting for *creeping normality*.

If the rate at which an adverse environmental change evolves is slow, and most are, managers and hence organizations can come to view slowly declining performance as a not unusual condition. Indeed, if the variation in measurements of performance per unit of time is large relative to the long term decrease in performance per unit of time, managers may not even recognize that decline is occurring, that a threat is evolving.

Solution: People sense abrupt change much more readily than they sense gradual change. Thus a possible solution to the lack of recognition of the threat is to add the performance changes across a set of adjacent intervals so as to create a more time-encompassing measure, and do this across several sets of adjacent intervals so as to create a stair-step cumulative change curve. If change exists, this way of presenting performance data will increase the likelihood that the threat will be detected.

Problem 3: Not accounting for *threat-obscuring phenomena*.

An evolving environmental threat could be in effect but its presence might not be detected because its negative effect on performance might be obscured by the positive effect of phenomena, such as inflation, or temporary increases in the number or purchasing power of consumers in the organization's product-market domain.

Solution: Test for the presence of such phenomena and, if found, subtract their positive effect from the organization's apparent performance to determine the organization's actual performance, and thus obtain more accurate insight into the effect of the evolving environmental situation.

Problems 4 & 5: Not testing *proffered explanations* for declining performance and *not testing for alternative explanations* of the decline in performance.

Research studies document that, when an organization's performance does not meet the aspirations of stakeholders (including the organization's executive) the organization's executive tends to believe and/or declare that the cause is external to the organization and communicates this conclusion to stakeholders. For discussion, let us assume that an entity neutral to the question, such as the board of directors, or perhaps the CEO, seeks to ascertain whether the hypothesized environmental condition is actually the cause of the unsatisfactory performance. Two challenges must be addressed: (1) If people can imagine a causal relationship, they tend to believe that it exists (Kahneman, 2011), especially if they want to believe that it exists. (2) If powerful entities don't want a causal relationship to be found, those assigned the task of searching for the relationship are in danger of retaliation if they find and report that the relationship exists (Ross and Staw, 1991),

Solutions: (1) The first of the challenges is clearly a performance measurement issue. Entities involved the search and/or likely to be affected by the outcome must agree, *before the search for a relationship is undertaken*, on what evidence would be considered conclusive and on the method used to search for and analyze data relevant to providing evidence of the proffered causal environmental condition (this agreement might benefit from a discussion of alternative explanations for the decline). (2) The second of the challenges is a performance measurement issue only in the very broadest sense of the term. Considerable effort must be made to ensure that those tasked with searching for the relationship are not inhibited and will not experience retaliation. More about this matter involves organizational culture and structure (broadly speaking) and is beyond the scope of this paper.

Interim Conclusion

If any of these four problems is present and is unrecognized or remains uncorrected, interpretation of data from the the organization's performance measurement system for detecting threats will, in some way, be biased and will very likely lead to organizational

response actions different from those which are in the organization's best interests. From this, it is reasonable to conclude that the performance measurement system just discussed can influence the appropriateness of an organization's responses to threats.

Let us turn now to a very different kind of threat, involving very different performance measurement issues.

COMMITMENT-TO-PROGRAM THREATS: Performance Measurement Issues

Escalation of Commitment Theory.

An escalation situation is one "where there is an opportunity to persist or withdraw and where the consequences of these actions are uncertain" (Staw, 1997: 192). In such situations, *commitment to the failing program* (i.e., project, product, or policy) *often escalates* (with associated escalation of resources to support or strengthen the program) until the combination of the losses associated with the failing program and the losses employed in the escalation effort overwhelm the entity's available resources. The relevance of escalation of commitment theory to organizational responses to threats is that program managers may be in denial that the program is failing and therefore may fail to "detect" the threat. Even if the threat is detected, the organization or some key managers might be so committed to the program that, to defend it, they escalate the level of resources committed to the program so as to ensure its retention (thus, perhaps, endangering the survival of the organization) (see Staw & Ross, 1987).

As described in Staw (2005), escalation of commitment was postulated originally as a behavior of individuals, but has evolved to be viewed as a phenomenon that manifests itself at all levels of human systems, including organizations. Much of the field research that employs the theory has been at the organizational level. Although the richest theorizing appears in Staw and Ross (1987), with an escalation cycle involving project, then

psychological, then social, and then structural determinants of the escalation of commitment, in recent reviews the observed effect of situational variability is described as having shifted focus from this sequential-determinants model to a more aggregate set-of-determinants model (Staw, 1997, 2005).

Problems: Managerial denial and organizational escalation.

To protect their position as the person in charge of the program, or to protect their self-image or their professional status, program managers are likely not to accept as valid negative information about the program's performance – especially if they were responsible for the initiation of the program (Staw, 1976). In essence, they go into denial and thereby fail to detect the threat and contribute to the failure of others to detect the threat. Factors related to this emotional, cognitive, social and political resistance include the following: (1) much of the assumed “relevant” information in program management – especially in the program's early stages – is qualitative and subject to the program manager's self-serving biases (Kahneman, 2011); (2) much of a program manager's received information is provided by subordinates who are involved in the program and are hesitant to report any but positive feedback about performance (Detert and Burris, 2007); and (3) the program manager's belief that current data are unrepresentative of future performance – perhaps because “the program hasn't been in effect long enough to succeed.” Not to be neglected in this discussion is the fact that executives tend to believe that they can influence organizational outcomes to a greater extent than is actually the case (Heath and Tversky, 1991; Kahneman, 2011). It sometimes occurs that consideration of social and structural factors (e.g., reputation management, sunk costs, closing costs) causes the organization's top management to become so committed to the program that the consequent escalation of resources for the program leads to the failure of the organization (see Staw & Ross, 1987).

Practices for detecting or curtailing problems: There are over a dozen management practices that arguably can contribute to attenuating or curtailing commitment-to-program problems at the program-manager level or at the organizational level (see Ross & Staw, 1991; Staw & Ross, 1987). Three involve performance measurement:

(1) *Unambiguous negative feedback* is difficult to achieve, but in a favorable case would involve a program-neutral entity posting using interval-scale performance data at regular intervals and significant positive and negative events on a time-line as they occur.

(2) *Enforcement* (as unanticipated or uncontrollable events reasonably permit) *of limits* on allowable program costs or minimum program benefits at preset stages using interval-scale data.

(3) *Ongoing estimation of salvage value and closing costs*, using models and metrics that were agreed upon before the project was started.

Interim Conclusion

If the problems associated with a commitment-to-program threat, described above, are not successfully remedied with the performance measurement and control practices just noted, or with other solutions or practices, the organization's consequent actions or inactions will put its survival, or at least its performance or health, at risk.

Note

In addition to the problems at the individual level, described above, Ross and Staw (1991) and Staw and Ross (1987) describe and discuss problems in controlling escalation at the project level, the organizational level, and the stakeholder level, and also describe approaches (not involving performance measurement) for attenuating or curtailing each of these identified problems.

Let us turn now to the use of performance measurement systems in the pursuit of focused and efficiency-minded efforts to respond to a competitive threat.

COMPETITIVE THREATS: Performance Measurement Issues

Competitive threats to an organization are *attempts* by a competitor to capture a portion of the organization's product-market domain. With very few exceptions, competitive threats – as *attempts* – cannot be prevented. What an organization can do is to attempt to attenuate or curtail the competitor's level of success in capturing any portions of the organization's domain.

Organizations are internally competitive environments (Scott and Davis, 2007). It seems highly likely that some components of the organization, often with self-serving goals, would propose that the organization initiate new products or procedures. Some of these initiatives might be authorized for implementation. More generally, however, it is likely that the organization as a whole would not react hastily, but would proceed with focused and efficiency-minded efforts. Why assume this? Because *strong behavioral theory indicates that organizations are energy-conserving and routine-enacting systems*. Two strong and relevant theories are living systems theory (Miller, 1978) and the behavioral theory of the firm (Cyert and March, 1963).

Living Systems Theory

Living Systems Theory (Miller, 1978) applies to entities at all levels of living systems – the cell, organ, organism (e.g., individual human), group, organization, society, and supra-national system (Miller, 1978). The theory was induced from literature reviews at each of these levels of analysis and describes *innate properties* of living systems. Organizations have been singled out for particular attention (Miller, 1972: 2-182; 1978: 595-746). Aspects of the

theory focus on an entity's efforts to *adapt to a stressor with minimal expenditures of energy and use of time*. Two examples of organizational-level propositions are:

P1: A system which survives generally decides to employ the least costly adjustment to a threat or a strain produced by a stress first and increasingly more costly ones later”

(Miller, 1978: 100); where “cost” means “effort”).

P2. A system that survives generally decides to use first the adjustment processes which can be most immediately applied to relieve a threat or a strain produced by a stress and later those which are less quickly available” (Miller, 1978: 100).

Behavioral Theory of the Firm

Central to *A Behavioral Theory of the Firm* (Cyert and March, 1963) is that organizations are prone to respond to problems with actions that were previously learned to be efficacious and that, because they were reinforced, have become routines for responding to problems. Routines for changing routines are also outcomes of these learning processes. For example, the theory posits two “simple search rules” that characterize organizational search for responses to problems (e.g., threats) and that reflect the sense of routines mentioned just above: (1) “search in the neighborhood of the problem symptom” and (2) “search in the neighborhood of the current alternative” (Cyert and March, 1963: 121). Both of these rules (routines) conserve effort and time. Importantly, *A Behavioral Theory of the Firm* continues with “When search, with simple causal rules, is not immediately successful . . . the organization uses increasingly complex (“distant”) search . . . (and) the organization introduces a . . . third search rule: search in organizationally vulnerable areas” (Cyert and March, 1963: 122). Thus the theory includes *adaptation* as a routine response to threat, but where adaptation is generally the enactment of routines that are different in kind from the two “causal rules” just noted. “Distant” search can mean seeking ideas from entities outside of the local environment, such as examining the responses to threats that other organizations have

made to similar threats. Searching in “vulnerable areas” can mean adopting a response that is risky if less risky responses fail to adequately address the threat. The automatic use of – and change of – routines, if early efforts to address the threat do not satisfy aspirations, is an attempt by the organization to *adapt to the problem but with minimal expenditure of energy and use of time.*

Performance Measurement Issues in Responding to Competitive Threats

When experiencing declining performance, organizations engage in multiple and varied actions. It seems reasonable to assume that, when anticipating the possibility of a decline in revenues due to actions of a competitor, organizations would consider and engage in anticipatory response actions and in information seeking actions. A common anticipatory organizational reaction to a decline in revenues is to *initiate efforts to reduce operating costs.* A probable information seeking action is to attempt to *identify specific linkages between the arrival of the competitor and the decline in performance.* In each of these two endeavors, performance measurement systems and issues are relevant.

Potential Problems in Measuring Reductions in Operating Costs

To direct units to reduce their operating costs is easy. To determine if efforts to lower operating costs have been successful is a task that logically involves performance measurement systems. The same four problems that could reduce the effectiveness of performance measurement systems as mechanisms for detecting and assessing evolving environmental threats, described earlier, could also reduce the effectiveness of performance measurement systems as mechanisms for measuring reductions in operating costs: (1) Not accounting for users’ information processing limitations, (2) Not accounting for creeping normality, (3) Not accounting for threat-obscuring phenomena, and (4) Not testing proffered explanations for declining performance and not testing for alternative explanations for the

decline in performance. The same proposed solutions would be available. For the sake of brevity, these problems and solutions are not repeated here. One additional problem that could compromise the effectiveness of the organization's performance measurement system for detecting the effects of efforts to reduce operating costs is the matter of a *shifting baseline*.

Problem 5: Not accounting for the possibility of a *shifting baseline*.

The baseline sales against which post-competitor sales will be compared could be influenced by factors that do not influence the sales of the organization's product in the post-competitor period. For example, product sales in either the baseline period or the post-competitor period could be influenced by seasonal or economic factors not present in the other period.

Solution: Draw on employees' knowledge about the two periods for relevant ideas and information about relevant differences in the two periods and account for differences in the two periods when analyzing and/or interpreting the sales data.

Interim Conclusion

If any of these five problems is present and is unrecognized or remains uncorrected, interpretation of data from the organization's performance measurement system for determining the extent to which intended reductions in operating costs have been achieved will, in some way, be biased and will very likely lead to organizational response actions different from those which are in the organization's best interests. From this, it is reasonable to conclude that the performance measurement system just discussed can influence the appropriateness of an organization's responses to threats.

Potential Problems in Determining Which, If Any, of The Organization's Products Are Being Threatened by The Competitor.

Responding to a competitor's attack on a particular product could be quite expensive, and would be quite wasteful if the organization's product was not in danger. Thus it is to be expected that the organization would attempt to rigorously determine which of the organization's products is being adversely affected by the competitor's products, and by how much. This effort would almost certainly involve an examination of the performance of the organization's various product lines before-and-after the competitor's arrival in the organization's domain. If sales declined in a product line after the arrival of the competitor in the organization's domain, the decline would very likely be attributed to the competitor. But before a perhaps expensive and/or inappropriate remedial action was undertaken, it would seem reasonable to test the validity of this attribution.

The same five problems that could reduce the effectiveness of performance measurement systems as a mechanism for measuring changes in operating costs (see above) could also reduce the effectiveness of a performance measurement system as a mechanism for detecting and assessing competitive threats. The same proposed solutions would also be available. For brevity, these problems and solutions are not repeated here.

Interim Conclusion

If any of these five problems is present and is unrecognized or remains uncorrected, interpretation of data from the organization's performance measurement system for determining which products are under competitive threat and to what extent they are threatened will, in some way, be biased and will very likely lead to organizational response actions different from those which are in the organization's best interests. From this, it is reasonable to conclude that the performance measurement system just discussed can influence the appropriateness of an organization's responses to threats.

CONCLUSION

This paper attempts: (1) to explain how an organization's performance measurement systems can influence the organization's responses to threats; (2) to identify some not uncommon shortcomings in performance measurement systems; and (3) to suggest how these shortcomings might be remedied.

At the beginning of the paper, I explained why it might be reasonable to have a low expectation concerning possible effects of performance measurement systems on organizational responses to threats. The work reported here is the result of inductive and deductive reasoning directed at determining whether this expectation, or its opposite, is valid. From the preceding four **interim conclusions**, it is reasonable to conclude that an organization's performance measurement systems can influence the effectiveness of an organization's detections of threats and the appropriateness of the organization's responses to threats.

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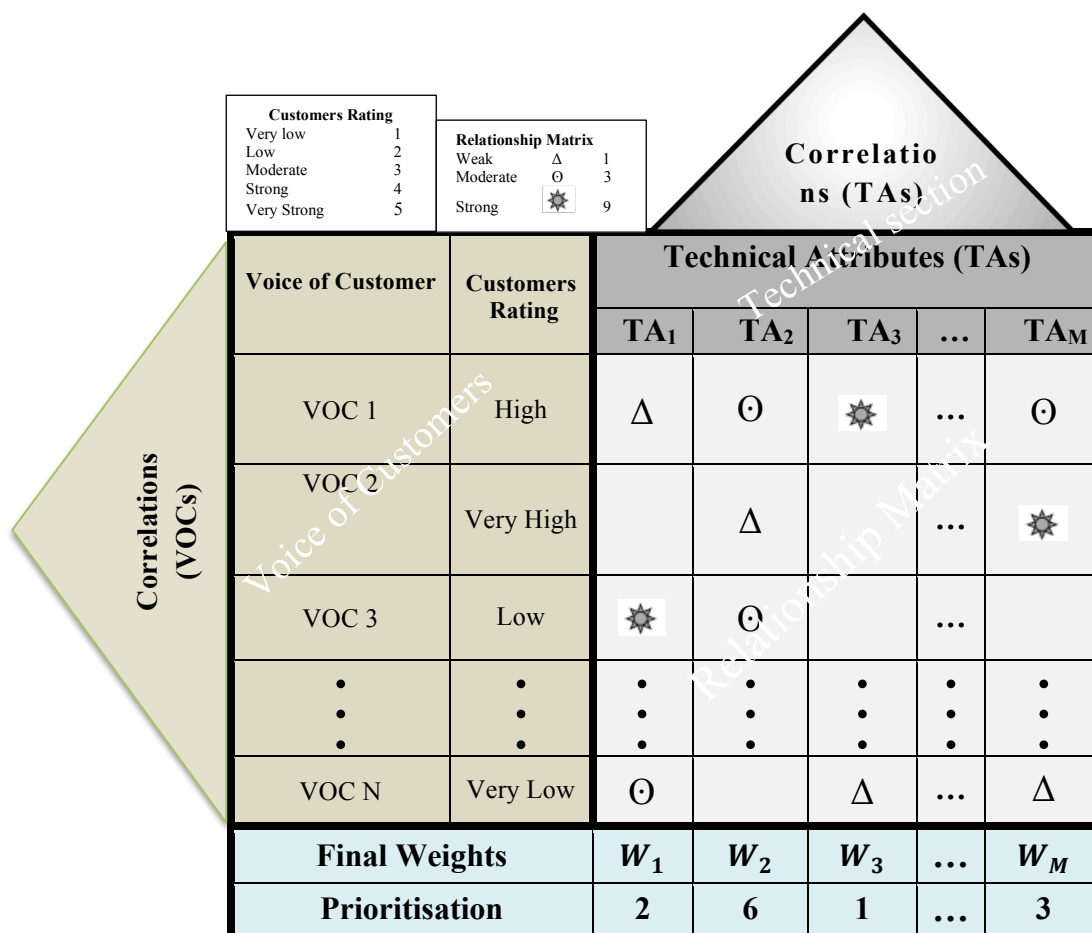
ENHANCING PRIORITISATION OF TECHNICAL ATTRIBUTES IN QUALITY FUNCTION DEPLOYMENT

ZAFAR IQBAL, NIGEL P. GRIGG, NICKY CAMPBELL-ALLEN

1.1 Introduction, Quality Function Deployment (QFD)

Quality Function Deployment (QFD) is an important product/services development methodology, committed to transforming consumer requirements into technical attributes (Li et al. (2011)). QFD provides a way for practitioners to understand customer needs and demands for a product or service. Han et al. (2001) classify QFD as an essential management tool to guarantee quality in products. Professor Akao introduced QFD in Japan in the late 1960s and early 1970s (Schaal and Slabey, 1991; Griffin and Hauser, 1993; An et al., 2008) argue that QFD methodology not only helps in manufacturing, it also helps in the planning, designing and processing stages of the product. To complete the process systematically, QFD uses the House of Quality (HOQ - Figure 1). A HOQ, so-called after its resemblance to an actual house, and comprises different rooms (sections) containing summarised information about customers requirements, engineering attributes, competitor ratings etc. Figure 1 illustrates the important sections of QFD–HOQ.

Figure 1. Quality Function Deployment, House of Quality



In order to satisfy customers' needs and demands, the technical team suggests engineering or technical attributes (TAs) in relation to a product or service. The basic art of the QFD methodology is to quantify final weights (FWs) and set priorities for these TAs. The prioritisation then defines which TA is the most, and which is the least important (Gunasekaran et al., 2006; Stehn and Bergström, 2002; Crowe and Cheng, 1996). Once the TA prioritisation process has been finalised then the tackling of the TAs becomes the responsibility of practitioners. Therefore the prioritisation-based undertaking of TAs plays a crucial role in making successful product/services within short time frames and at minimum cost.

The literature review identified that researchers and practitioners have made various attempts to improve QFD. Some researchers have enriched QFD by working on linguistic-numeric scales while others have introduced hybrid approaches to increase the reliability of results. For example Garver (2012), introduced maximum scaling difference for precise identification of customers' importance ratings. Matzler and Hinterhuber, (1998) suggested Kano's model integration with QFD to achieve maximum customer satisfaction. De Felice and Petrillo (2011) presented a joint QFD-AHP methodology for multiple choice decision analysis, whilst Lin et al. (2010) integrate QFD with ANP to enhance linguistic preferences. Masud and Dean (1992), and Zhou (1998) introduced another version of QFD called fuzzy QFD to control uncertainties and lack of quantitative scales. All of these theories and heuristics however have a tendency towards the quantification of FWs for the TAs. Based on the researches which often have convoluted FWs of TAs, we have identified a need to differentiate and improve prioritisation of TAs. A simple prioritisation of TAs based on FWs does not provide sufficient evidence. In order to further distinguish the priority order of TAs, Iqbal et al. (2014) proposed a methodology that defines the statistical significance of two TAs based on empirical data given in a HOQ.

In order to enhance the prioritisation of TAs, in this article we propose a methodology, to make statistical inference on FWs differences (d). We extend the procedure adopted by Iqbal et al. (2014) to generate theoretical population for parametric bootstrap (Poisson). Further we

simulate theoretical population by bootstrap sampling and permutation sampling and then use these (including parametric bootstrap (Poisson)) to investigate (d). It is well known that there is a close relationship between significance test and confidence interval. So we also develop a method to estimate confidence interval using percentile and standard method from the given theoretical populations of FWs obtained through QFD. Using a published case study as an example, we derive results. Based on significance test (p-values) and confidence interval, we infer the robustness, similarities and differences in the results computed from all three sampling methods. In the next section, we discuss the role and importance of these sections in deriving the FWs of TAs and setting their priorities.

2. Quality Function Deployment Framework (House of Quality)

QFD studies help practitioners to establish a HOQ with the belief that products will be designed and produced according to customers' desires and tastes (Temponi et al., 1999). The HOQ comprises of different sections, which are sequentially and systematically populated by information collected from customers, engineers and competitors. Each section has its own importance and some are mandatory for QFD studies. In the next section we discuss some of the important sections of the HOQ.

2.1 Voice of Customers (VOCs) Section

This is the first section in the QFD framework. This section comprises of actual customer needs and demands, their importance ratings and the correlations between them. VOCs' importance ratings (I), are the most significant and frequently used variable to drive the FWs of TAs. George and Leone (1992) argue that selection of customer demands and their importance ratings is a compulsory part of QFD studies. Determination of correct VOCs and their importance ratings is crucial because they meaningfully affect the FWs and consequent prioritisation of TAs. Various 3-point, 5-point, 7-point, 9-point and 10-point scales with different strengths have been used in published case studies. The most commonly used scale is 1-5-points; where 1 represents very low importance and 5 represents very high importance. The customer importance rating as variable (I) is used to derive FWs by equation 1.

2.2 Technical Attributes Section

Once the VOCs have been determined, the next step is to populate the TAs section. This section includes the engineering or technical attributes and their correlation. Hauser and Clausing (1988) suggest that TAs are likely to satisfy at least one or more VOCs. The TAs are the technical translation of VOCs to achieve maximum customer satisfaction (Bouchereau and Rowlands (2000). TAs are so important that Govers (1996) describes them as ‘the heart of QFD methodology’. These engineering characteristics are designed to affect the product’s performance and to meet customer requirements. Some QFD practitioners also analyse the correlation between TAs to avoid any negative impacts on the system. TAs *strength of relationship* (relationship matrix) together with VOCs is used to find FWs, which is discussed in the next section.

2.3 *Relationship Matrix Section*

The relationship matrix is a table of ‘N’ rows (VOCs) and ‘M’ columns (TAs). It expresses the intensity of relationship between each TA and the VOCs. The relationship matrix ensures the required VOCs are satisfied by the technical requirements (Han et al., 2001). The development of relationships with different intensities is a complex procedure. Several methodologies have been developed to populate the relationship matrix; for example Likert scales, fuzzy and AHP (De Felice and Petrillo, 2011); Khoo and Ho, 1996). The most commonly used method is the Likert scale, which often uses a 3-point and 5-point qualitative-quantitative measurement, as shown in figure 2. In Likert scales low numbers indicate weak relationships while large numbers represent a strong relationship; for example, Weak=1, Medium=3 and Strong=5.

Figure 2. Qualitative-quantitative rating scales used in the relationship matrix (Crowe and Cheng, (1996); Tan et al., (1998); Zhang, (1999); Bouchereau and Rowlands, (2000); Dikmen et al., (2005);Tan, (2003); Kim et al., (2007);Jeong and Oh, (1998)



The relationship matrix's intensity scales (R), integrated with customer importance ratings (I), determine the FWs (W).

2.4 Final Weights (FWs) of TAs and their Priority

FWs are derived on the basis of the information that comprises the various sections of the HOQ. Equation 1 shows the general mathematical expression to compute FWs, (W), which is the sum of linear relationships between the variables comprising the sections of the HOQ. In the derivation of FWs (W), R and I are fixed variables, and X, Y, \dots, Z are optional variables resultant from the various HOQ sections. Optional variables might include correlations between TAs, correlations between VOCs, benchmarking, or degree of difficulty in developing the TA, etc.

$$W_j = \sum_i^n R_{i,j} \times I_i \times \{X \times Y \times \dots \times Z\} \quad (1)$$

Where R is the relationship matrix's strength, I is the customers' importance and $X, Y \dots Z$ are some of the optional variables which some researchers may choose to include.

Equation 1 is a generalised form of equation adapted from articles written by Han et al., 2001); Wang et al., 2012; Pakdil et al., 2012; Franceschini and Rossetto, 2002; Chang, 2006).

FWs and their determine priorities may help to guide decision making around making trade-offs in the allocation of resources (Shen et al., 2000). The prioritised TAs provide a way of defining which TAs have the largest effect on VOCs.

Table 1. FWs and their ranking

Final Weights (FWs) of Technical Attributes (TAs)

Technical Attributes	TA ₁	TA ₂	TA ₃	...	TA _M
FWs	W ₁	W ₂	W ₃	...	W _M
Ranking of FWs	2	3	1	...	9

3. Enhancing Prioritisation (Ranking) of Technical Attributes

Prioritisation of the TAs is based on FWs derived using equation 1. The TA with the highest FW gets a number 1 ranking and the TA with the lowest FW gets the lowest number in ranking. The highest ranked TA will therefore have the highest priority in terms of what is tackled and is supposed to meet customer desires at a higher rate comparatively. Two TAs with different FWs, may however satisfy VOCs equally. This means that the sampling variables (depicted from the HOQ sections) used to quantify FWs belong to the same population and the difference between them is just sampling error (random error). We can test the difference (d) between two FWs to achieve a test-statistic. One important point to note here is that traditional testing methods cannot be applied, as all the variables used in equation 1 are Likert scales. The likert scales have different interval and their strengths also vary from case study to case study. We do not know about statistical hypothetical population and these scales also not follow any assumption of normality, equal variance. As traditional testing procedures cannot be adopted, we will use a given empirical data variable (relationship matrix (I)) as the source to generate a theoretical population of scales which represents actual given empirical data (Likert scales). Iqbal et al. (2014) describe how to test the difference between FWs (d) using parametric bootstrap (Poisson). They demonstrate how Poisson distribution is appropriate to generate a theoretical population of the size of the relationship matrix. In the next section, we describe the methodology for test-statistic p-values and confidence Interval.

3.1 Methodology

3.1.1 Test-statistic(s) and p-values

In statistical significance testing, the p-value is the probability (proportion) of obtaining a test-statistic from a given population. In QFD studies it helps to know whether a selected TA has the same or a higher priority. In this article we compare each TA with the other TAs

based on their FWs. So all the possible differences (d) of M FWs are our test-statistic(s), i.e. there will be $\frac{M(M-1)}{2}$ test-statistic(s) to test, (see table 2).

Table 2. Differences between the FWs

	TA_s	TA₁	TA₂	TA₃	...	TA_M
TA_s	FW_s	W₁	W₂	W₃	...	W_M
TA₁	W₁	NA	$W_1 - W_2$	$W_1 - W_3$...	$W_1 - W_M$
TA₂	W₂	NA	NA	$W_2 - W_3$...	$W_2 - W_M$
TA₃	W₃	NA	NA	NA	...	$W_3 - W_M$
	⋮	⋮	⋮	⋮	⋮	⋮
TA_N	W_N	NA	NA	NA	...	NA

To derive the p-value(s), we need a large theoretical population of FW differences (\underline{d}). As described by Iqbal et al. (2014), we will generate this by the following steps. First we simulate a very large number of relationship matrices R of the same size as the given size of the relationship matrix ($I_{N,M}$). Then for each generated R , we derive FWs and their differences. The FW differences may be positive or negative. In fact the positive or negative sign does not have any effect and so we consider negative values as positive values, i.e. folded theoretical distribution, without the algebraic sign (folded normal distribution if it is normal distribution), (Leone et al., 1961). Finally the proportion of each given statistic (actual FW differences (d), $\frac{M(M-1)}{2}$) with the generated test-statistics theoretical population (\underline{d}) determine the p-values. In section 4, a case study is tested to demonstrate the above methods.

3.1.2 Confidence Interval

All (d) found in confidence interval (CI) are plausible values based on empirical data given in the HOQ. FW differences (d) outside the interval however, increase the priority and consequent importance given to a TA. So CI estimation provides another simple way to test the significance of TAs. In order to support the estimated p-values; CI estimation is also carried out on the same selected case study. At 95% confidence level, we estimate CI for the three theoretical populations of FW differences. We estimate this by two ways: a). Percentile methods: This approach is simple and straightforward. It does not require any assumptions.

First we sort the theoretical population and then find 2.5% quantiles from each side. This will provide the upper and lower limits of CI. b). The second approach is a standard way of computing CI and requires normality assumptions. Due to the large size of the generated theoretical population, the central-limit theorem ensures their asymptotic normality. So for the current scenario, the general expression to estimate CI for (d) is the standard way of estimating CI for a normal population, i.e. $\bar{d} \pm 1.96 \times SE(\bar{d})$, where \bar{d} is the theoretical population of FW differences. Before applying the standard CI method, we observe normality by plotting a QQ plot and boxplot. If the theoretical population is found to be normal, then the CI computed by both approaches should be the same. If the simulated populations are proved to be normally distributed then we will consider this as folded normal distribution (as the algebraic sign has no significance (Leone et al., 1961)). The folded normal distribution will be used to estimate one-sided CI.

4. Case Study and Results

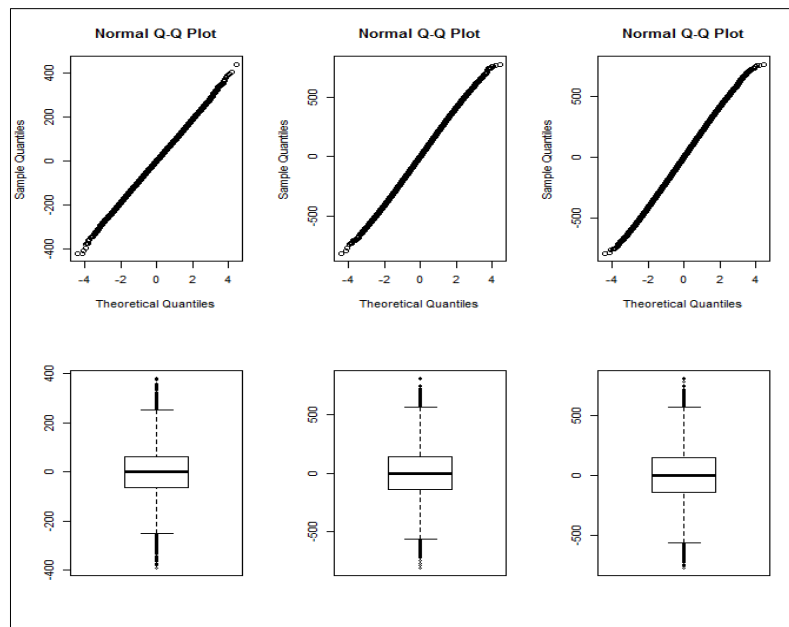
A case study to improve hospitality service management has been selected from the literature, (Jeong and Oh, 1998). In Figure 3, the HOQ shows VOCs (the service attributes), TAs (the service design/management requirements), the relationship matrix and FWs (with raw importance weight). There are eight VOCs and ten TAs. The relationship matrix is of size 8 x 10, with an intensity of No=0, Weak=1, Medium=3 and Strong=10. The bottom row shows the FWs of TAs that have been computed using equation 1.

Figure 3. House of Quality modified form, (Jeong & Oh, 1998), showing priority rating of ten technical attributes

p-values: Now it's time to apply parametric bootstrap (Poisson), bootstrap and permutation sampling to estimate the *p*-values for the test-statistic(s) (*d*) given in table 3. Using R programming and following the procedure detailed in section 3.1.1, we simulate theoretical populations and then derive the tables (table 5, table 6, and table 7) of *p*-values for all statistic(s) (*d*) for the three populations.

In order to check the normality of theoretical populations *d* we generate QQ plots and boxplots. Both sets of plots (figure 4) clearly indicate populations are normally distributed. As populations are normally distributed and the algebraic sign has no effect, we will use folded normal distribution for *p*-values and CI (one sided).

Figure 4. QQ plot and boxplots for the three theoretical populations



For further analysis, first we compare TA9 (the highest ranked) with the other TAs. To do this we generate density plots of three-folded normal populations (figure 5). We can see that all the generated populations are positively skewed. We then find the differences (TA9 versus the others) on these density plots by drawing lines. The green line shows statistical insignificance while the red line indicates statistical significance. The red area on right side of the density plots shows 5% of the total area. Figure 5 and table 4, both show TA9 has a high significant difference from the other TAs in the parametric bootstrap (Poisson) simulation as

compared to bootstrap and permutation sampling. While the results for bootstrap and permutation are almost identical.

Figure 5. Density plots of three-folded normal distribution, showing the differences in position of TA9 to the other TAs

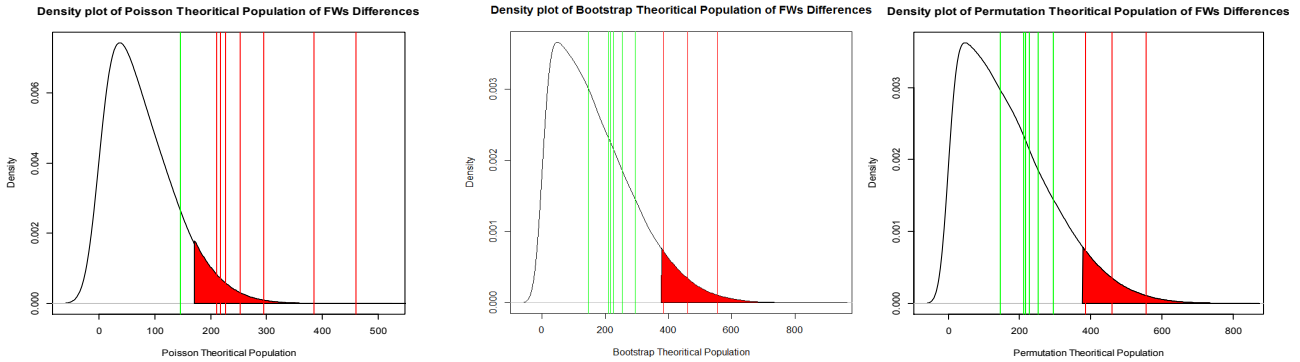


Table 4. p-values for the difference of TA9 from the other TAs

Methods	TAs	TAs	TA7	TA8	TA4	TA3	TA10	TA5	TA6	TA10	TA2
		FWs	157	268	346	438	452	478	488	494	559
Poisson	TA9	705	\$0.000	\$0.000	\$0.000	\$0.005	\$0.009	\$0.015	\$0.022	\$0.024	\$0.127
Bootstrap	TA9	705	\$0.007	\$0.034	\$0.083	\$0.198	\$0.222	\$0.274	\$0.297	\$0.311	\$0.484
Permutation	TA9	705	\$0.007	\$0.033	\$0.084	\$0.200	\$0.229	\$0.279	\$0.300	\$0.316	\$0.487

Table 5. p-values generated from parametric bootstrap (Poisson)

		TAs	TA9	TA2	TA1	TA6	TA5	TA10	TA3	TA4	TA8	TA7
TAs and FWs in descending order	TAs	FWs	705	559	494	488	478	452	438	346	268	157
	TA7	157	0.0000	0.0003	0.0005	0.0008	0.0008	0.0015	0.0045	0.0455	.2300	NA
	TA8	268	0.0000	0.0018	0.0213	0.0185	0.0325	0.0493	0.0723	0.4055	NA	NA
	TA4	346	0.0000	0.0273	0.1188	0.1290	0.1660	0.2535	0.3245	NA	NA	NA
	TA3	438	0.0050	0.2053	0.5490	0.5945	0.6678	0.8758	NA	NA	NA	NA
	TA10	452	0.0085	0.2535	0.6645	0.6878	0.7743	NA	NA	NA	NA	NA
	TA5	478	0.0150	0.3828	0.8575	0.9088	NA	NA	NA	NA	NA	NA
	TA6	488	0.0218	0.4530	0.9468	NA	NA	NA	NA	NA	NA	NA
	TA10	494	0.0243	0.4835	NA	NA	NA	NA	NA	NA	NA	NA
	TA2	559	0.1268	NA	NA	NA	NA	NA	NA	NA	NA	NA
	TA9	705	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 6. p-values generated from bootstrap

		TAs	TA9	TA2	TA1	TA6	TA5	TA10	TA3	TA4	TA8	TA7
TAs and FWs in descending order	TAs	FWs	705	559	494	488	478	452	438	346	268	157
	TA7	157	0.0074	0.0514	0.1039	0.1088	0.1204	0.1560	0.1765	0.3659	.5976	NA
	TA8	268	0.0335	0.1617	0.2801	0.2924	0.3128	0.3777	0.4142	0.7070	NA	NA
	TA4	346	0.0826	0.3059	0.4783	0.4947	0.5244	0.6123	0.6593	NA	NA	NA
	TA3	438	0.1980	0.5622	0.7894	0.8106	0.8457	0.9444	NA	NA	NA	NA
	TA10	452	0.2219	0.6064	0.8393	0.8627	0.8984	NA	NA	NA	NA	NA
	TA5	478	0.2742	0.6961	0.9366	0.9597	NA	NA	NA	NA	NA	NA
	TA6	488	0.2974	0.7350	0.9752	NA	NA	NA	NA	NA	NA	NA
	TA10	494	0.3110	0.7522	NA	NA	NA	NA	NA	NA	NA	NA
	TA2	559	0.4838	NA	NA	NA	NA	NA	NA	NA	NA	NA
	TA9	705	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 7. p-values generated from permutation sampling

		TAs	TA9	TA2	TA1	TA6	TA5	TA10	TA3	TA4	TA8	TA7
TAs and FWs in descending order	TAs	FWs	705	559	494	488	478	452	438	346	268	157
	TA7	157	0.0070	0.0522	0.1052	0.1127	0.1225	0.1598	0.1795	0.3675	.5980	NA
	TA8	268	0.0334	0.1630	0.2820	0.2941	0.3161	0.3824	0.4175	0.7074	NA	NA
	TA4	346	0.0839	0.3109	0.4820	0.4964	0.5306	0.6145	0.6610	NA	NA	NA
	TA3	438	0.1997	0.5640	0.7909	0.8091	0.8472	0.9444	NA	NA	NA	NA
	TA10	452	0.2289	0.6114	0.8392	0.8632	0.9014	NA	NA	NA	NA	NA
	TA5	478	0.2785	0.6987	0.9389	0.9611	NA	NA	NA	NA	NA	NA
	TA6	488	0.3002	0.7397	0.9752	NA	NA	NA	NA	NA	NA	NA
	TA10	494	0.3155	0.7565	NA	NA	NA	NA	NA	NA	NA	NA
	TA2	559	0.4866	NA	NA	NA	NA	NA	NA	NA	NA	NA
	TA9	705	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

The above p-value tables show that parametric bootstrap has a high significance level compared to bootstrap and permutation. The reason behind this difference is that for the bootstrap and permutation sampling, the given data is sampled with and without replacement, while parametric bootstrap generates data using Poisson to represent the original data. There could however, be a different result for different case studies.

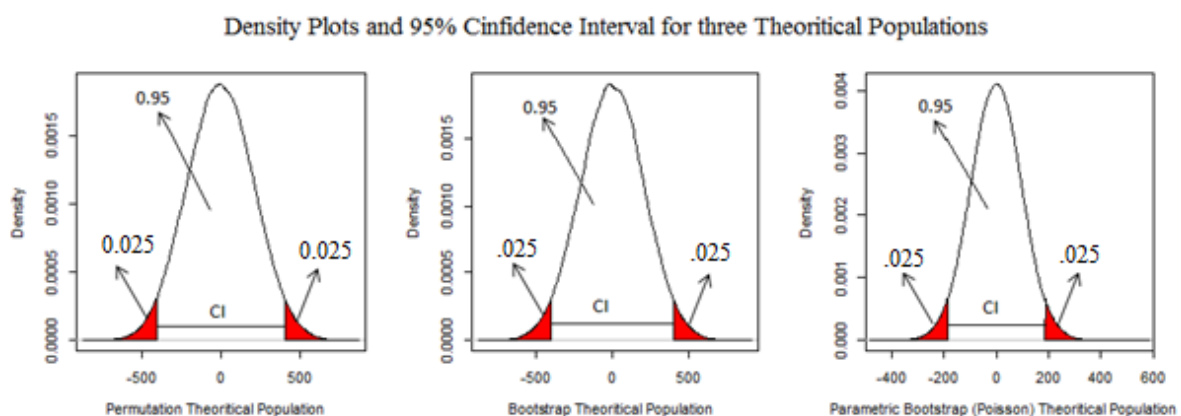
Confidence Interval:

Now in order to determine the robustness of the above computed p-value results; we estimate the CI for the three theoretical populations. The presence of FW differences within CI shows that they may be treated equally. For the percentile method, we arranged data in descending order and obtained the lower limit by finding the 0.025th percentile and the upper limit by finding the 0.975th percentile. We can also estimate CI by the standard method. As we can see from figure 4, the QQ plots and boxplots show that all three theoretical populations are normally distributed. Table 8, shows the estimated CIs computed by both approaches. One-sided CI is also estimated for folded normal distribution using the percentile (0.95th percentile) and standard method.

Table 8. Confidence intervals for three populations by percentile and standard method

Theoretical Population	Method	Two Sided 5%		One Sided 5%
C.I. for Parametric Bootstrap($\lambda=3$)	Percentile	-186	186	186
	Standard	-185.69	185.69	187.59
C.I. for Parametric Bootstrap($\lambda=\text{mean}=(1+3+10)/3$)	Percentile	-232	231	232
	Standard	-231.41	-231.41	233.91
C.I. for Bootstrap	Percentile	-404	403	404
	Standard	-404.71	404.71	407
C.I. for Permutation	Percentile	-405	404	407
	Standard	-407.37	407.37	409

Figure 6.



We can see (table 8 and figure 6) that the CI for parametric bootstrap has a shorter range compared to bootstrap and permutation which have a wider range. So the probability of a difference in the CI is high in parametric. We also see the CI change by altering λ . On the

other hand the CI estimated by bootstrap and permutation is the same. This is because it makes no difference whether the large amount of resampling is done with replacement (bootstrap) or without replacement (permutation).

5. Conclusions

In this article, we demonstrate how theoretical populations can be simulated from given data in QFD studies, when we are unable to identify the actual population or make any assumptions about it. We further demonstrated how statistical inference can be made about the equal importance of two TAs when they have different FWs. We investigated that parametric bootstrap (Poisson) method inference resulted in a high rate of rejection for the equality of two TAs. And this rate of rejection can be altered by changing λ (mean). Bootstrap (with replacement sampling) and permutation (without replacement sampling) both produced the same results. All three methods support large number theory and follow central-limit theorem to obtain the same results by percentile and standard method. CI helps us to determine the least significant difference and makes the job of assessing whether two TAs have the same importance much easier. The above mentioned procedures help practitioners in the better selection of a TA when other factors like the cost of TA, time to develop, or practical difficulties also play an important part. The proposed methods can be adopted by QFD researchers, engineers and practitioners for an effective choice of TAs to achieve maximum customer satisfaction.

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0025

RELEVANCE AND RESPONSIBILITY

OBLIGATORY COMPONENTS IN COMMERCIAL
INNOVATION

GREGORY WATSON

Title: (No more than eight words in length)

Relevance and Responsibility: Obligatory Components in Commercial Innovation

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Innovation, product design, new product introduction, business relevance, management responsibility

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

Purpose: This paper distinguishes between managerial responsibility and engineering responsibility in the innovation process for the development of new products and identifies lessons learned based upon an historical analysis of leading 20th century contributors to this body of knowledge. An historical review begins with observations of how Mary Parker-Follett advanced discussion of “scientific management” which previously had focused myopically on human tasks to consider human beings holistically and develop the idea of collaborative work in a control environment that was self-regulated by the workers. Chester I. Barnard expanded on the ideas of Mary Parker-Follett by taking them into the executive suite and proscribing means to develop collaborative organizations based on his theory of zones of indifference. Herbert A. Simon described the cultural and moral considerations that were identified by Barnard as zones of indifference, Simon referred to as zones of acceptance. The ideas of relevance and responsibility are included in writings of Barnard and Simon as fundamental concerns for managerial decision-making. This theme was advanced by Peter F. Drucker, W. Edwards Deming and Joseph M. Juran. This paper describes the development of these ideas and identifies its implications for current approaches to performance management. Related to concepts of responsibility is the development of relevance of innovative efforts toward commercialization. These topics become conjoined as the requirements for time-to-market are collapsed for structured projects in new product development. This paper presents a model for integrating these concepts that has evolved over the past century.

Design/methodology/approach (mandatory):

Approach: This conceptual paper is based upon an in-depth survey of the early literature of industrial engineering and management science.

Findings (mandatory):

Findings: The common threads of relevance and responsibility are traced through these authors and the centrality of these ideas to executive decision making is capable of demonstration through a model that focuses on the new product development process and examines how relevance and responsibility are critical components in reducing uncertainty during the “fuzzy front end” of the process.

Research limitations/implications (if applicable):

Research Implications: This paper will point the way to follow-on inquiry that researchers may consider to investigate further models for responsibility allocation within industrial research and development projects.

Practical implications (if applicable):

Practical Implications: Responsibility management is not well-managed strategic sourcing and supplier selection processes. Determining which organization will accept engineering responsibility for lifetime support of the technical components of a new product is as important as pricing discounts offered for volume commitments. While relevance to customer applications is a typical consideration in defining new product requirements, relevance to current manufacturing processes, distribution through supply chains, and global sourcing considerations do not meet with the same degree of management attention. By broadening the definitions of relevance and responsibility in the management decisions related to design and development of new products management can improve the ‘lifetime information economy’ contributions of new products and eliminate foreseeable concerns that are not evident with narrower price-driven considerations reign supreme.

Social implications (if applicable):

Social Implications: Many cultures (e.g., Oriental and Scandinavian) hold dearly the principle of 'respect for the individual' as a core value. However, this value scheme can become distorted in a way that fails to support the scientific inquiry necessary in new product development process. In many cases this core value of respect for individuals reduces to an attitude of 'don't question the expert' or 'it is my right to make choices in my area of responsibility.' However, a core consideration in all scientific inquiry is the transparency of information and the community critique of findings to assure that solutions are indeed as 'fault-free' as the collective minds of the involved team can make them. This community sharing is also an essential ingredient in developing systems where implications of all considerations are not fully understood by all members of the team who tend to be specialists in their narrow area of the design concentration. Only when the engagement of 'responsible engineers' and 'responsible managers' has been broadened can a systems solution to new product development actually reduce these risks.

Originality/value (mandatory):

Value: The value of this paper lies in its initiation of a new dialog regarding responsibility in new product development with respect to defining focused (relevant) 'management responsibility' and 'engineering responsibility' and the intersection between these tasks as ingredients of design control.

0027

CURRENT TRENDS IN STRATEGIC MANAGEMENT AND PERFORMANCE MEASUREMENT

EVIDENCE FROM JAPAN

MICHAELA BLAHOVÁ, PARISSA HAGHIRIAN, PŘEMYSL PÁLKA

CURRENT TRENDS IN STRATEGIC MANAGEMENT AND PERFORMANCE MEASUREMENT: Evidence from Japan

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Abstract

Purpose: This paper seeks to investigate current trends influencing strategic management and, therefore, having influence on corporate performance and its measurement in selected manufacturing companies located in Japan in respect to their key business perspectives focused on people, processes and systems, innovations, finance, social responsibility and ecology, and that in relation to ongoing economic crises and a fundamental transformation of mature societies (in particular in USA, Japan and Western Europe).

Design/methodology/approach: The research involved assembling key academic and other literature on the subject of trends in strategic management and performance measurement in Japan as well as semi-structured interviews with managers within manufacturing companies located in Japan that deal with performance measurement, finance, strategic management, etc. and a review of various internal management reports.

Findings: The research has been useful in identifying companies that respond to current changes and trends the fastest and the most effective.

Research limitations/implications: Among the limitations of the conclusions belongs rather a small sample of companies involved in the research. Moreover, the respondents may have seen their own company more favourably than an objective outsider would have done.

Originality/value: This paper shares insights on current trends influencing strategic management and performance measurement in Japan and how these trends are implemented, used and updated in a selected sample of companies located in Japan.

Keywords: Trend, Performance, Measurement, Strategic Management, Japan, Japanese Management, Crisis, Transformation

Article Classification: Research paper

Introduction

Current trends in strategic management and performance measurement have been the subject of a wide number of studies (Franco-Santos *et al.*, 2012; Franco-Santos *et al.*, 2007; Bititci *et al.*, 2012; Neely, 2007; Micheli *et al.*, 2011; Busi and Bititci, 2006; Bourne *et al.*, 2013, Bourne *et al.*, 2005; Blahová, and Zelený, 2013; Franceschini *et al.*, 2013; Nudurupati *et al.*, 2011; Sousa *et al.*, 2006; Cocca and Alberti, 2010; Cokins, 2009; Mia, 2000; Marr, 2009; Marr, 2012; Arai *et al.*, 2013). Although our understanding of the topic has certainly been improved, there is still a number of questions that have remained unanswered and that still deserve empirical examination.

The aim of the paper is to show which transformational processes and changes have been observed in companies located in Japan as a result of the economic challenges of the past decades. New research results identifying main trends influencing strategic management and, subsequently, performance of companies in recent years, are presented. Through this paper current trends influencing strategic management and, therefore, having influence on corporate performance and its measurement in selected Japanese companies in respect to their key business perspectives focused on people, processes and systems, innovations, finance, social responsibility and ecology are investigated.

The research was undertaken by two academic teams from the Czech Republic and Japan to establish a multi-perspective view in the context of global and business trends .

The paper is structured as follows. In the next section, the literature review with a focus on Japanese management practices, contemporary trends in Japanese business environment as well as performance management and measurement in companies located in Japan is performed. Building on the review of the literature, the research hypotheses are formulated and the methodology described. The following sections present the insights gained through interviews. The paper concludes by emphasizing the main lessons learned, limitations and outlining a number of recommendations for both theory and practice.

Literature review

Until the end of the 1980s, the Japanese economy was seen as the most successful economic model in the world (Drucker, 1971; Hayes, 1981; Schonberger, 1982; Pasclae and Athos, 1982; Yang, 1984; Pucik, 1985; Betancourt and Gautschi, 1988; Rehfeld, 1990; Sakai, 1990; Hall and Soskice, 2001; Pudelko and Haak, 2005).

However, after a great boom in the 1970s and 1980s, in the 1990s and the 2000s the Japanese management system started to be considered to be a model of the past, Porter *et al.* (2000) remark to the topic. Numerous factors have contributed to this, including the long-lasting stagnation of the Japanese economy, ill-advised macroeconomic policies, delayed microeconomic reforms, etc.

The bursting of the speculative “bubble economy” – and the longest recession in Japan’s post-war history that followed it – plunged the Japanese economy into crisis and called many of the idiosyncrasies into question which, until that time, had been seen as factors in the successes of Japanese businesses (Schmidt, 1997). At the same time, the interest of Western researchers also seemed to have shifted away from Japanese management. Lifetime employment, the seniority system, and group-oriented decision-making have been strongly criticized as holding Japanese companies back for a long time (Haghirian, 2010; Arai *et al.*, 2013; Firkola, 2006; Sakikawa, 2012; Horn and Cross, 2009; Kato *et al.*, 2012; Lehmborg *et al.*, 2013; Miyoshi and Nakata, 2010; Pudelko, 2009; Pudelko and Haak, 2005; Pudelko and Harzing, 2011; Pudelko and Mendenhall, 2007).

By the end of 2011 there had been a dramatic change in the mind-set and behaviour of the Japanese in virtually all categories of industry and on all levels of management – a change based on the stark realization that the future of Japan depended on the rapid rationalization and globalization of both the economy and society in general (De Mente, 2012).

To sum up, since the emergence of the Japanese model in the 1980s, important changes that have had an enormous influence on corporate performance have been made in the management practices of Japanese firms. The main aim of the paper is a recognition of contemporary trends influencing Japanese management practices and their consequences to corporate world by conducting the research that involved assembling key academic literature on the subject of trends in strategic management and performance measurement in Japan as well as semi-structured interviews with managers within manufacturing companies located in Japan that deal with performance measurement, finance, strategic management, etc.

Hypotheses

On the basis of the literature review, an overarching research hypotheses were formulated:

H1: Share of female staff in companies in Japan as an employee performance indicator will not gain importance in the near future.

H2: Share of foreign staff in companies in Japan as an employee performance indicator will not gain importance in the near future.

H3: Integration of customers into innovation processes is not considered to be an important trend in the area of innovations performance indicators in companies in Japan.

H4: Companies in Japan do not tend to focus internationally in the near future.

H5: Companies in Japan tend to use more non-financial performance indicators in performance measurement.

H6: Employment in companies in Japan will keep a lifelong character in the near future.

Methodology

The steps followed in this research are similar to those followed by Saraph *et al.* (1989) and Yusof and Aspinwall (2000).

Following a literature review, the subject of current trends in strategic management and performance measurement was discussed with both academic and non-academic specialists and hypotheses were formulated. This provided the basis for the construction of a questionnaire which was pre-tested and revised. The final survey form served as a basis for semi-structured interviews with managers in 20 manufacturing companies located in Japan (the majority of them were Japanese companies) in order to investigate the issues related to trends and changes in strategic management in more depth and strengthen the validity of the findings. Among the interviewed companies belong e.g. Apple Japan, Bosch Corporation, Canon, Denso, Hitachi Chemical, Mitsubishi Morgan Stanley, NEC Corporation, Nihon Tetra Pak, Nissan Motor, Sony, Toshiba and others.

The questionnaire consisted of 14 questions. Questions 1-12 were divided into 2 parts – the first part addressed the issues related to the current state of the art, the second part focused on future prospects (estimation of changes in 5 years). These questions focused on various performance indicators (customer, employee, internal processes, innovations, financial, ecological, social responsibility) being used / going to be used in companies and a determination of the most important ones as well as characterization of management style and leadership in the companies, identification of factors that hold companies together and on what basis companies define. Question 13 consisted of 11 statements that were divided into 3 sections focusing mainly on discovering how fast the examined company reacts to business opportunities in the market. Question 14 was intended to determine general information like the name of company, number of employees, main business area, current position of the interviewee in the company and a number of years the interviewee has been worked in the selected company.

During the qualitative surveys (research interviews), at every interview two or three researchers were present. When recording was possible (the company was sometimes reluctant to do so), the material

was subsequently coded independently by each researcher and then compared. The analysis of the qualitative data led to a series of findings which are presented and discussed in the following section.

Results and Discussion

In this section we present our findings of the research that has examined current trends in strategic management and performance measurement in companies located in Japan and their relevance to managers, policymakers and academic researchers in accordance with the set hypotheses. The summary of results is shown in Table 1.

Table 1: Summary of results.

Model hypotheses	Results
H1: Share of female staff in companies in Japan as an employee performance indicator will not gain importance in the near future.	Reject the null hypothesis (p-value less than 0.05)
H2: Share of foreign staff in companies in Japan as an employee performance indicator will not gain importance in the near future.	Reject the null hypothesis (p-value less than 0.05)
H3: Integration of customers into innovation processes is not considered to be an important trend in the area of innovations performance indicators in companies in Japan.	Reject the null hypothesis (p-value less than 0.05)
H4: Companies in Japan do not tend to focus internationally in the near future.	Fail to reject the null hypothesis Data failed to show evidence beyond a reasonable doubt (p-value is greater than 0.05) Statistical power analysis: 0.7156166 (h=0.8, sig. level 0.05, n=20)
H5: Companies in Japan tend to use more non-financial performance indicators in performance measurement.	Fail to reject the null hypothesis Data failed to show evidence beyond a reasonable doubt (p-value is greater than 0.05) Statistical power analysis: 0.7156166 (h=0.8, sig. level 0.05, n=20)
H6: Employment in companies in Japan will keep a lifelong character in the near future.	Reject the null hypothesis (p-value less than 0.05)

The data were analysed by the R free software environment for statistical computing and graphics. As can be seen, 4 of the 6 null hypotheses are rejected (p-value is less than the significance level, $\alpha = 0.05$), 2 of the 6 null hypotheses fail to be rejected (p-value is greater than the significance level, $\alpha = 0.05$), so there is not sufficient evidence to reject the null hypotheses. Afterwards, statistic power analysis for 2 hypotheses that failed to be rejected was pursued. The post-hoc power analysis used the obtained sample size and effect size to determine what the power was in the study. The confidence level reflected the confidence with which a significant difference between the two proportions was detected. The confidence level was set to 95%, i.e. there is a 5% probability of incorrectly detecting a significant difference when one does not exist. The generating Cohen's effect size h (the difference between the observed proportion and a theoretically expected proportion after each of these proportions has been transformed to radians; i.e. an arcsine transformation) was set to 0.8 that represents a large effect size. The H4 and H5 powers (probability of detecting a significant difference when one exists) are 0.7156166 (i.e. 72%) which means that we have a 28% probability of failing to detect a significant difference when one does exist, i.e. a false negative result (otherwise known as type II error).

The next six sub-sections describe the findings in detail.

- Integrating women into the workforce

Our research has shown that although companies in Japan still hold a comparatively low number of female staff and female managers, the situation is being changed. Eventually, the number of women staff as well as number of women in management positions will increase in coming years. The majority of researched companies stated that an increase of women staff and women managers is anticipated in their company in the near future. Some of their opinions and statements are provided as follows:

As we are a Japanese company with a long history, all executives and general managers are men. Women have not had enough opportunities to apply for such positions because of marriage and child raising. However, we would like to change the situation. We should let women work on new projects and make an environment where they can grow and support them while being on a maternity leave.

Diversity has become an important factor especially in terms of gender balance (such as female percentage of total officers and managerial positions).

- Integrating foreigners into the workforce

In our research, the respondents considered integration of foreigners into their workforce as one of the trends that has already started to be implemented. Prime motivation for attracting foreigners still remains the increased push towards internationalization, bringing in language skills, or just for the transfer of job-related skills. Many workplaces are now starting to accept diversity, changing past expectations of homogeneity – as statements provided below:

One of the trends we have encountered in our company recently is that Japanese employees are shrinking and overseas employees are increasing. We estimate an increase of foreign workers in the following years.

We try to expand our diversity. We are trying to hire people who are international, not only from English-speaking countries. Our customers are diverse and coming from all over the world.

- Integrating customers into innovation processes

Our research provides insights into the innovation strategies of selected companies. Based on the answers, companies consider integrating customers into innovation processes as one of the key features of future growth. However, some companies clearly stated that they do not want to integrate customers into innovations as they think they know more about them (then the customers themselves). Some interesting ideas from the interviews are mentioned below:

We integrate customers into innovation. Our technological innovations are customer-based, starting from the demand from each customer.

The recent trends of innovation are really diversified. It means that we really need more and more interaction with our customers. Without them we cannot captivate the needs of the market.

- International focus

A trend towards an international focus – as set in hypothesis H4 - failed to be rejected as data failed to show evidence beyond a reasonable doubt. Companies in Japan have already become truly globalized, with overseas activities now making up roughly one-third of production capacities and sales. Nowadays, a true trend lies in promising emerging markets (BRIC countries, Latin America, the

Middle East) to which Japan's trade is focusing. Nevertheless, some remarkable ideas arising from the qualitative interviews are mentioned as follows:

We think that one of the factors that has been the main driver of internationalization in our company has been the rise of the Chinese economy.

We consider a shift towards global market (especially emerging markets) as an important strategy how to be resilient from downturn effects in times of economic crises in industrialized economies.

- Non-financial performance indicators

The research hypothesis H5 focused on the utilization of non-financial performance indicators failed to be rejected as data failed to show evidence beyond a reasonable doubt. Nevertheless, some interesting opinions are available as follows:

Our company focuses on employees who possess a wide range of qualifications and perform a great variety of functions. With their talents, skills and commitment, they contribute to our economic success sustainability.

Our firm supports suggestions for improvements coming from our employees in order to improve our ability to compete in the market. Our strategy also involves corporate responsibility, helping people, society and environment.

- Less lifelong employment orientation

Our research confirmed a strong agreement of researchers and practitioners that employment in companies in Japan will not keep a lifelong character in the near future, as confirmed by the following statements:

Although lifetime employment brings a lot of benefits, there are also problems occurring from it. In today's global economy more flexibility in hiring people is required.

We understand that the current system tends to discourage innovation and risk-taking.

Conclusion

The main aim of this study was to look at issues related to current trends in strategic management and performance measurement in companies located in Japan. Data were collected from 20 manufacturing companies. A number of significant findings emerge by linking the empirical findings to the literature.

Within the research we identified key trends that have been recently acknowledged by researchers as well as corporate world as main drivers of change of the traditional Japanese management model. Through this paper, we have identified challenges that companies need to be aware of in order to proactively anticipate them.

Following a literature review, 6 hypotheses were formulated. They provided the basis for the construction of a questionnaire for semi-structured interviews with managers in companies located in Japan in order to investigate the issues related to trends and changes in strategic management in more depth. 4 out of the 6 hypotheses were rejected, 2 of the 6 hypotheses failed to be rejected.

Based on the results and hypotheses set, the following trends were identified, confirmed and described in detail: integrating women into the workforce, integrating foreigners into the workforce, integrating customers into innovation processes and less lifelong employment orientation. Data failed to show evidence beyond a reasonable doubt in the following hypotheses: international focus and non-financial performance indicators.

Limitations and suggestions for further research

Although we believe that the results presented in this paper could be extended to other contexts, this study has limitations that could be addressed in further studies.

Firstly, as the researched sample was too small we propose to validate the findings in a wider setting to give statistically significant results.

We would also recommend to link a new survey to reported financial data, so that the impact of trends implemented in companies can be related to published financial performance.

As researchers, we may lack a practical view on the researched topic. Managers have to live and deal with all this complexity concurrently, thus gaining the opportunity to rethink and reshape how we research trends in strategic management and performance measurement in the future.

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0028

EMPLOYEE JOB SATISFACTION AND QUIT BEHAVIOR

ANDERS FREDERIKSEN

The value of long-term employer-employee cooperation:

A study of job satisfaction surveys and employee retention

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Preliminary

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Abstract

In this paper, I study an employment situation where the employer and the employees cooperate about the implementation of a job satisfaction survey. Cooperation is valuable because it improves the firm's ability to predict employee quits, but it is only an equilibrium outcome because the employer-employee relation is repeated and long-term. The empirical analysis shows that the cooperation reduces the firm's employee turnover costs by 16 per cent each year; a cost reduction which clearly exceeds the cost of conducting the survey. The analysis also reveals that the firm is willing to sacrifice profits corresponding to 17 per cent of employee turnover costs in a given year to be able to sustain the cooperative relationship with the employees.

JEL codes: M5

Key words: quits, job satisfaction, cooperation, retention

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1. Introduction

Cooperation between employers and employees makes it possible to achieve superior outcomes. Employees receive higher utility from work and employers earn higher profits. In this paper, I study an employment situation where an employer and the employees are cooperating about the implementation of a job satisfaction survey. This survey is valuable because it improves the employer's ability to predict employee quits. I will use this setting to estimate the value of the cooperation between the employer and the employees, and I will determine the short-term costs the employer is willing to pay in order to be able to sustain the valuable collaboration with the employees.

When an employee quits, it imposes costs on the organisation. The employee has to be replaced and the new employee trained. The quit may also cause significant and costly disruptions to the production process (Wasmuth and Davis, 1983). This provides clear incentives for the firm to prevent quits or, at least, to be able to predict when and where quits can be expected. In the literature, there have been numerous papers establishing how demographic and firm characteristics influence employee turnover propensities.¹ Researchers have also stressed the close link between employee job satisfaction and firms' ability to retain employees. For example, Clark (2001) uses data from the British Household Panel Survey (BHPS) to show that satisfaction with total pay, job security, ability to work on own initiative, the actual work itself and hours of work leads to fewer quits. The paradox is, however, that while information on job satisfaction at the individual level is available in supplement to representative datasets such as the BHPS, the National Longitudinal Survey of Youth (NLSY) or the German Socio-Economic Panel (GSOP), it is not available to decision-makers in companies. Hence, managers cannot use this information to predict quits.

The main reason job satisfaction data (or, more generally, survey data) at *the individual level* are unavailable to managers is that employees are likely to respond strategically if the answers will be used at the individual level. For example, if employees are asked to evaluate their immediate manager and the answers will be made available to the manager, it is most unlikely that negative feedback will be given. Hence, our representative datasets allow us to establish the effects of job

¹ Anderson and Meyer (1994) identify the characteristics of high employee turnover firms. Royalty (1998) focuses on how job separation rates differ by demographic characteristics. More recently, Frederiksen, Honoré and Hu (2007) and Frederiksen (2008) use employer-employee data to estimate the job separation process, and by doing so they are able to simultaneously study the importance of firm and individual characteristics. Studies using firm-level data similar to those being used in this study include Weiss (1984) and Sicherman (1996).

satisfaction on employee retention, but decision-makers in companies are generally unable to use job satisfaction scores at the individual level in their management of firms.

Nevertheless, many companies have employee surveys conducted. To obtain useful information (i.e. secure “*truth telling*” by employees), employers apply a particular mechanism that secures the individual’s anonymity: they have an external consulting company conduct the job satisfaction survey, and they receive information on employee job satisfaction scores from the consulting company in an aggregated form, for example as the average job satisfaction scores in business units. Managers can then make decisions based on these average job satisfaction scores, which is valuable, but clearly the average scores are less attractive than the individual scores.

A natural way to think about the employment situation is in the context of an infinitely repeated prisoner’s dilemma. The company has a clear interest in eliciting truthful answers from employees, because they can be used to improve business performance, for instance through a better ability to predict employee quits. The employees also have a clear interest in telling the truth, as they will receive better management. Hence, cooperation, in the sense that employees tell the truth in an employee survey and the company uses the information at an “aggregate” level, is a desirable equilibrium. The firm is tempted, however, to use the employees’ individual answers to the survey questions because of the information advantage. However, if the employees cannot be sure that the firm keeps its promise only to use the answers in an anonymised and aggregated way, they will behave strategically and not tell the truth. This implies that, in the one-shot game, the only Nash equilibrium is the one where both parties do not cooperate. In other words, there is no point in conducting a survey. However, in an infinitely repeated game, a simple Grim Trigger Strategy can make cooperation a subgame perfect Nash equilibrium.

For the subgame perfect Nash equilibrium in the infinitely repeated game to exist, the survey information must be valuable to the firm when used at an aggregate level and even more valuable when applied at the level of the individual employee. For this reason, it is important to determine empirically how valuable aggregate and individual level survey information is to the firm. These results are also important for other reasons: They provide new insights into the value of having employee surveys conducted, and they shed light on how much profit the firm is willing to give up in the short term to be able to sustain a long-term cooperative relationship with its employees.

The value of the survey information will be established in the context of a quit analysis. The idea is to compare the firm's ability to predict quits when using the information conveyed in personnel records and employee job satisfaction surveys at an individual level and an aggregate level, respectively. Subsequently, these findings will be used to assess how valuable the different types of information are to the firm.

In the empirical analysis, I make use of unique personnel records from a large bank and information from employee job satisfaction surveys. The surveys were conducted by an external bureau among the bank's employees on a yearly basis, and the results were reported to the firm as averages at the business unit level. I obtained both the personnel records and the job satisfaction surveys (scores at the individual level) and was able to merge the two data sources. The sampling period spans 2004 to 2010.

The empirical results show that the job satisfaction survey contains valuable information that can be used to predict employee quits. When the firm relies only on the information conveyed in the personnel records, the prediction error measured as the mean absolute distance (MAD) is 0.146. When information on job satisfaction at the business unit level is added, the MAD is reduced to 0.133, and when the job satisfaction scores are included at the individual level, it is further reduced to 0.117. Hence, the survey information is valuable for predicting quits, and when the firm applies the survey information in the best possible (aggregate) way, the improvements in predictive ability are assessed to result in savings corresponding to 16 per cent of employee turnover costs each year. This amount clearly exceeds the cost of conducting the survey. The results also show that the firm foregoes profits corresponding to 17 per cent of turnover costs in a given year to be able to maintain and sustain the long-term collaborative relationship with the employees.

The remainder of the paper is organised as follows: In the next section, I provide a theoretical motivation for why the bank and its employees cooperate with respect to the collection of job satisfaction data. In section 3, I present the bank, the personnel records and the data from the job satisfaction surveys. The empirical results are presented in section 4. Section 5 provides a discussion of the results, and section 6 concludes on the findings.

2. Theory

In this section, I establish how employer-employee cooperation about the implementation of a job satisfaction survey can be seen as an equilibrium outcome. In the present context, cooperation

means that employees answer truthfully to an employee survey and that the employer uses the answers from the employee survey at an aggregate level, such that the anonymity of the employees is preserved.

Cooperation is not a trivial equilibrium outcome. If the employees answer truthfully to the survey questions, the employer has a clear incentive to capture all the information conveyed in the survey answers (at the individual level), as the superior information can be used to increase profits.

Naturally, employees anticipate this, and they will respond strategically to the survey questions.

Thus, the only outcome in the one-shot game is non-cooperation. It turns out, however, that if the employer and the employees engage in a relationship with an infinite horizon, a Grim Trigger Strategy can make cooperation a subgame perfect Nash equilibrium. In other words, if both the employer and the employees see the relationship as ongoing, cooperation is a possibility.

To formally analyse the employment situation, consider the following situation: Employees have a choice between telling the truth about their job situation in an employee survey or strategically manipulating their answers, and the employer has the choice between using the information from the employee survey at an aggregate level, which maintains the employees' anonymity, or using the information at an individual level, which violates the employees' anonymity.

From the employees' perspective, telling the truth when the employer uses the data from the survey at an aggregate level is desirable because they will experience better management decisions; let us assume that this yields a payoff of 2. An even better situation for the employees occurs if they manipulate the feedback they give to the employer, i.e. lie, and the employer uses the data at an aggregate level. In this case, the employees can manipulate the employer into improving the working conditions, which gives an employee payoff of 3. However, there is a risk that the employer will capture all the information conveyed in the survey once the employees have provided their answers. If this happens and the employees have told the truth, it will have negative consequences. For instance, if some employees have revealed that they are dissatisfied with their immediate management or that they disagree with the way senior management is running the firm, it could prove harmful to the employees' future in the company. This situation would yield a payoff of -1. Finally, manipulated answers are deemed useless information if used at the individual level, and both the firm and employee payoff are zero.

From the company's perspective, it is valuable when the employees tell the truth in the survey because it allows for better decision-making. When this information is applied at an aggregate level, the payoff to the firm is A. If the firm decides to use the information from the survey at the individual level, it is able to make even better decisions and the resulting payoff is B, with $B > A$. In contrast, in the very unfortunate situation that the employees strategically manipulate their answers in the survey and the firm uses the information at an aggregate level, the firm would be basing its decisions on false information and the consequence is a firm payoff of -1. Finally, as already established, manipulated survey information used at the level of the individual employee yields a payoff of 0 to the firm.

The payoffs to the employees and the company are summarised in Figure 1, where the (X,.) reflects the employees' payoff and the (.,X) reflects the employer's payoff. If $A = 2$ and $B = 3$, it is a standard prisoner's dilemma situation with a unique Nash equilibrium at {SM, EL} with resulting payoffs of {0,0}. In other words, the whole idea of collecting survey information about the employees' job situation is worthless.

Figure 1. The prisoner's dilemma

		Company	
		Applies survey information at an aggregate level (AL)	Applies survey information at the level of the employees (EL)
Employees	Truth telling (TT)	2 , A	-1 , B
	Strategic manipulation (SM)	3 , -1	0 , 0

Instead of modelling the situation as a one-shot game, it is more appropriate to think of it as an infinitely repeated game. This is reasonable if the company is expected to continue operations indefinitely (and the probability of bankruptcy is estimated at zero). In this case, a simple Grim Trigger Strategy can be used to implement cooperation in equilibrium. That is, if the parties cooperate in the first period and any period t thereafter, if the opponent has cooperated in every time

period up to period t and if the parties defect in every period that follows a period where the opponent defected, then cooperation $\{TT, AL\}$ is a subgame perfect Nash equilibrium (if the discount rate is not too high). In the present context, with $3 = B > A = 2$, the equilibrium exists if the discount factor is $\delta < 2$.² If we have $\delta = 1/(1 + r)$, this condition is satisfied for $r < 2$. Hence, only in the situation where the employees or the company are very impatient (interest rate of more than 200%), they will stop cooperating.

A further condition is required for the equilibrium to exist: $B > A$, i.e. that the truthful information about the employees' job situation is more valuable at the individual level than at the aggregate level.

In the empirical analysis conducted below, I will, in the context of a quit analysis, estimate the magnitudes of A and B and determine by how much B exceeds A . By doing this, it is possible to establish if the conditions required for the equilibrium to exist are satisfied. It is also possible to shed light on how valuable survey information is, and it is possible to determine how much the firm is willing to give up in the short run to be able to collaborate with the employees in the future.

3. The bank and data

The bank is the market leader in the domestic market and has some activities abroad. In this study, I use information about domestic employees. This involves 17,649 unique individuals and 87,237 person-year observations during the period 2004 to 2010. I am aware that the last two years of data, from 2008 to 2010, are years where the financial crisis was at its peak and the market was highly uncertain – in particular for a financial firm. The applied econometric methodology accounts for this issue.

The data stem from two sources. The first source is the firm's personnel records. These records contain information about wages, tenure and demographic variables such as age and gender. The records also contain information about the employee's job level and department. The second source is an employee survey. The survey is structured around the "Nordic Employee Index Model" (Eskildsen, Westlund and Kristensen, 2004) and is conducted every year. The survey includes 38 questions covering the following domains: Overall satisfaction, loyalty, motivation, salary and benefits, corporate leadership, immediate manager, cooperation, conditions at work, career development and image. The survey is presented in Table A1 in the Appendix.

² For details, see Gibbons (1992) or Campbell (2006).

In Table 2, I present descriptive statistics for the personnel records used in the benchmark regression presented below. In that regression, I use a subsample consisting of 62,845 person-year observations. The main reasons for the drop in observations are the timing of the survey and the research design. The survey is conducted during the period late September to early October. For this reason, the survey information from year t-1 is matched to personnel records from January year t, and the quit variable is constructed by comparing the employment status in January year t with the employment status in January year t+1. This implies that the first and last sample years are excluded from the regression data. Additionally, dismissed employees are excluded from the sample, as the company has no difficulty in explaining an exit of this type.

The regressions including information from the employee survey are based on a subset of the 62,845 person-year observations. The main reason being that the survey response rate is 88.7 per cent (across all years). Furthermore, some employees do not answer all 38 questions, for which reason there is an overall drop in sample size as a result of the response rate and an additional drop in the sample size when some employees have refrained from answering particular survey questions. The issue that regressions including survey data only run on a subsample is explicitly addressed in section 5 below.

Returning to the descriptive statistics presented in Table 2, it can be seen that the yearly quit rate in the company is 8.4 per cent. The average age is 43.83 years, tenure is 18.12 years and 51.99 per cent of the employees are women. Furthermore, 11 per cent of the employees serve as supervisors, and the employees are organised such that 52.33 per cent work in the branches, 36.60 per cent work in central staff positions, 5.74 work in market functions and the remaining 5.33 work in “other” functions.

Table 1. Descriptive statistics

	Mean (std. dev.)
Quit rate	0.084
Age	43.827 (10.559)
Women	0.528
Tenure	18.119

	(13.350)
Supervisor	0.111
Departments	
Branches	51.99
Central staff	36.91
Market functions	6.00
Other	5.10
<hr/>	
Unique individuals	16,464
Person-year observations	62,845
<hr/>	

The personnel records also contain information about the employees' job level and compensation. There are nine job levels (detailed descriptions are not shown), and these will be controlled for in the regressions through a full set of job level dummies. I will also follow Card et al. (2012) who show that relative wages are important for job satisfaction, and control for the residuals from a log wage regression in the quit models presented below. In the log wage regression (not shown), I control for the job level, a polynomial of degree 4 in age, a quadratic in tenure, dummies for gender and supervisor together with fixed effects for year and department.

4. Estimation results

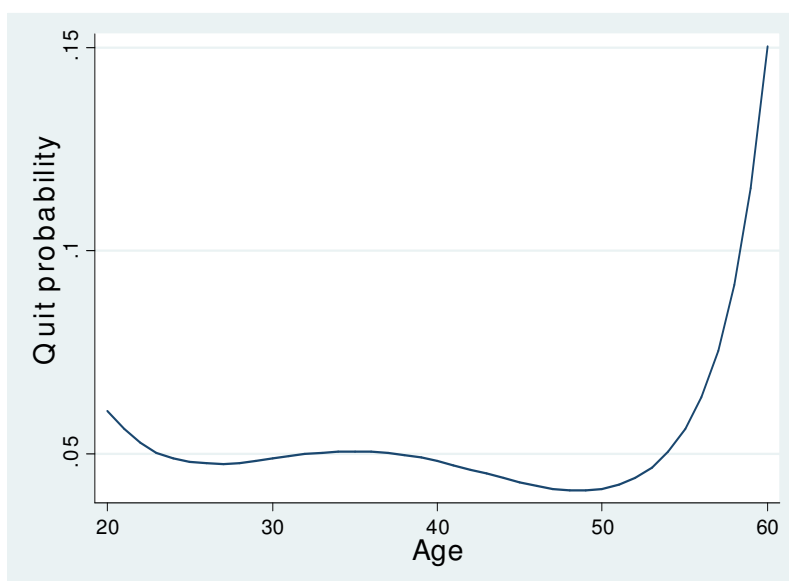
In this section, I present the results from three types of quit models. The first model is based on the company's personnel records. This type of model can be estimated by the company (or any company). The second type of model is based on the personnel records and the information in the employee surveys used at the level of the individual employee. This model cannot be estimated by companies unless they breach the implicit anonymity contract they have with the employees and by that destroy the possibility to conduct useful employee surveys in the future. The third type of model is based on the personnel records and survey information used at the business unit level. This model can be estimated by companies conducting employee surveys.

The main purpose of estimating the three types of models is to assess how well the different information packages can be used to predict employee quits. Hence, the models are constructed with the purpose of maximising their predictive power. A second-order purpose is to identify the

relations between particular variables available in the personnel records and the employee surveys and employee quits.

The estimation results of the first model, which is based on the information available in the firm's personnel records, are presented in the first column of Table 2. The results show that demographic variables such as age and gender are significant predictors for a quit. While it is easily seen that women are less likely to quit, the interpretation of the age effect is more involved, as the effect is captured by a fourth degree polynomial. For this reason, the age effect is illustrated in Figure 2, which shows the predicted quit probabilities for the "average" employee when the age variable takes on values in the range from 20 to 60.³ From the picture, it is clear that the youngest employees and employees in the mid-thirties have relatively high quit probabilities, whereas employees in their late twenties and those approaching fifty are unlikely to quit. It is also apparent from the figure that individuals aged sixty are very likely to quit as they start entering pension programmes, and this trend is continuing for individuals above sixty.

Figure 2. The quit age profile



Tenure is found to have a convex influence on the quit probability, which is a common finding in the literature (Farber, 1999). It is also established that there is some variation in quit probabilities across departments. Employees working in the branches have lower quit rates than the reference group "other", and employees in central staff positions are relatively more likely to quit. Employees

³ The average employee is a 44-year-old woman with 18 years of tenure. She works in one of the business units at job level 5.

in market functions have the same quit propensities as the reference group. Finally, in line with Card et al. (2012), it is established that employees with relatively higher wages (residuals) are less likely to quit.

Table 2. Logit estimates of employee quit behaviour

	Model 1	Model 2
	Personnel records	Personnel records and employee survey information
		(Individual level)
<i>Personnel records:</i>		
Wage residuals	-0.491*** (0.100)	-0.604*** (0.144)
Age	-1.574*** (0.273)	-0.486 (0.453)
Age ² /100	6.824*** (1.010)	3.107* (1.622)
Age ³ /1000	-1.277*** (0.161)	-0.729*** (0.251)
Age ⁴ /10000	0.087*** (0.009)	0.058*** (0.014)
Tenure	-0.088*** (0.004)	-0.098*** (0.006)
Tenure ²	0.002*** (0.000)	0.002*** (0.000)
Woman	-0.171*** (0.034)	-0.215*** (0.045)
Education: University (<i>see note</i>)		-0.098** (0.046)
Supervisor	-0.053 (0.063)	0.027 (0.074)
Departments:		
Branches	-0.188*** (0.034)	-0.331*** (0.046)
Central Staff	0.134** (0.065)	0.023 (0.087)
Market functions	0.051 (0.066)	0.010 (0.082)

Employee survey: Individual answers (scale 1-10)

I would like to be working in the bank in two years' time		-0.135*** (0.014)
I would recommend others to seek employment with the bank		0.044** (0.017)
I always look forward to going to work		-0.039** (0.017)
My salary (including allowances and bonuses) compared to what I could get in a similar position elsewhere		-0.060*** (0.013)
My general benefits (holidays, pension and other benefits) compared to what I could get in a similar position elsewhere		0.040** (0.017)
I feel good about the workload in my job		-0.032** (0.013)
The attention given to my professional and personal development		-0.033** (0.014)
The Bank has a good image		0.059*** (0.018)
Dummies for job level	YES	YES
Year dummies	YES	YES
Observations	62,845	43,637

Note: Information on education is not available in the personnel records, and for that reason it is obtained from the survey. The answer to the education question can take one of 7 different values, but the data reveal that the employees have problems identifying the right category, and their answers vary significantly across years. Based on the survey information, I construct one dummy called "university degree" comprising employees with college or graduate degrees. The university category accounts for 26 per cent of the individuals, but it is likely to be subject to significant measurement error.

The second model presented in Table 2 is based on the information conveyed in the personnel records and individual level job satisfaction scores from the employee survey. The presented model is tested down from a "full" model consisting of the variables from model 1, a university dummy (see note in Table 2) and the 38 variables coming from the employee surveys. The variables from the personnel records are maintained throughout, but the survey variables are tested down. The final model (presented in Table 2) includes only statistically significant survey variables. The significant survey variables are:

1. I would like to be working in the bank in two years' time
2. I would recommend others to seek employment with the bank

3. My salary (including allowances and bonuses) compared to what I could get in a similar position elsewhere
4. My general benefits (holidays, pension and other benefits) compared to what I could get in a similar position elsewhere
5. I feel good about the workload in my job
6. The attention given to my professional and personal development
7. The bank has a good image

The effects of the personnel record variables change only marginally when the survey variables are included. The age profile is somewhat altered, and the employees working in central staff positions are now determined to have quit probabilities similar to the reference group.

The effects of the survey variables are important. Many of the survey variables have an expected negative effect on the quit probability. For instance, when employees give a high score to the question “my salary (including allowances and bonuses) compared to what I could get in a similar position elsewhere”, they are less likely to quit. Furthermore, when people feel good about their workload, when they are looking forward to going to work and they feel that attention is given to their professional development, they are more likely to stay. Finally, those employees giving high scores to the question “I would like to be working in the company in two years’ time” have relatively low quit propensities.

More puzzling is that employees who give high scores when asked if they would recommend others to seek employment in the company and those with high scores on how they perceive the company’s image are significantly more likely to leave the firm. These results suggest that the firm’s external branding, which is a device normally used to attract employees, has an unintended negative retention effect. Another result, which at first appears puzzling, is that employees rating their general benefits (holidays, pension and other benefits) relatively high compared to what they could get in a similar position elsewhere are more likely to leave. There are two (likely complementary) explanations for this: These benefits are not highly valued and they are likely to vary only marginally within similar positions across companies. Additionally, the number of holidays and working hours, the pay, etc. are, to a large extent, outcomes of negotiations with unions at a national level.

The third set of models builds on the information in the personnel records in combination with the information in the employee surveys used at the business unit level. The first model of this type is presented in Table 3 (model 3). This model controls for the personnel records used previously and averages at the business unit level for the survey variables. Model 4 is similar to model 3, except that it contains both the averages and standard deviations for the survey variables. Model 5 is identical to model 4, but is estimated on the subsample of business units that have 10 or more employees. This final model is the most important model of the three, because it is the model which can be estimated by the firm. The reason is that the company is divided into as many as 1,014 unique business units across the years. The largest of these units consists of 373 employees and the smallest consists of just one person. This implies that in some of the smallest business units, there is almost no difference (if any) between the averages (and standard deviations) and the employees' individual answers. Hence, for the company to respect the implicit contract of not violating the anonymity of the employees, they only receive feedback (averages and standard deviations) from the survey for business units with 10 or more employees.

Table 3. Logit estimates of employee quit behaviour as modelled by a firm

	Model 3	Model 4	Model 5
	Personnel records and employee survey information (business unit level)	Personnel records and employee survey information (business unit level)	Personnel records and employee survey information (business unit level)
			<i>Groups sized 10+</i>
<i>Personnel records</i>			
Wage residuals	-0.583*** (0.101)	-0.658*** (0.104)	-0.742*** (0.112)
Age	-1.600*** (0.275)	-1.606*** (0.276)	-1.794*** (0.299)
Age ²	6.918*** (1.016)	6.955*** (1.023)	7.636*** (1.106)
Age ³	-1.291*** (0.162)	-1.298*** (0.163)	-1.406*** (0.176)
Age ⁴	0.088*** (0.009)	0.088*** (0.009)	0.094*** (0.010)
Tenure	-0.086*** (0.004)	-0.087*** (0.005)	-0.086*** (0.005)
Tenure ²	0.001***	0.002***	0.001***

	(0.000)	(0.000)	(0.000)
Woman	-0.162***	-0.166***	-0.158***
	(0.034)	(0.034)	(0.037)
Education: University	-0.080**	-0.091**	-0.093**
	(0.037)	(0.037)	(0.040)
Supervisor	0.006	0.005	-0.010
	(0.064)	(0.064)	(0.074)
Departments:			
Business units	-0.223***	-0.193***	-0.240***
	(0.040)	(0.040)	(0.046)
Central staff	0.004	0.053	0.009
	(0.069)	(0.069)	(0.073)
Market functions	0.029	0.113	0.068
	(0.069)	(0.069)	(0.076)
<i>Averages for business units</i>	YES	YES	YES
<i>Std. dev. for business units</i>	NO	YES	YES
Dummies for job level	YES	YES	YES
Year dummies	YES	YES	YES
Observations	62,663	62,083	52,015

The results in Table 3 show that the effect of the personnel record variables are very stable across the three models (models 3-5), and they mirror the results found in models 1 and 2. What is much less stable is the set of survey variables ending up in the final specifications for each of the three models (see detailed results in the Appendix, Table A2). In model 3, the following survey questions survive the testing down of the model:

1. I would like to be working in the bank in two years' time
2. My general benefits (holidays, pension and other benefits) compared to what I could get in a similar position elsewhere
3. I rarely look for other jobs outside the bank
4. The bank is an organisation characterised by sincerity
5. I feel that I would have many alternative job opportunities if I were to leave the bank
6. My job security
7. The professional cooperation with my colleagues
8. My opportunities for professional and personal development

When compared to model 2, only the first question, the intention to work in the company in two years' time, and the second question, general benefits, are present in both models. When comparing across models 3 to 5, only four of the mean variables are present in all three models. A similar finding pertains to the standard deviations, where only five can be found in both model 4 and model 5. Naturally, part of the explanation is that the survey questions are constructed to produce highly correlated answers within each of the domains: Overall satisfaction, loyalty, motivation, salary and benefits, corporate leadership, immediate manager, cooperation, conditions at work, career development and image. However, the lack of consistency between model 2 and models 3 to 5 questions if the models using the business unit averages can be used to learn about individual quit behaviour. Nevertheless, models 3 to 5 turn out to be important because they have higher predictive powers than baseline model 1 – an issue which will be discussed explicitly in the next section.

5. Discussion

The empirical results presented in the previous section established the relationship between personnel and survey data and quit probabilities. In this section, I will establish by how much the predictive power increases when the personnel data is supplemented with information from the employee surveys. I will also provide estimates of how much the firm can save by appropriately exploiting available survey information at the business unit level and how much the firm could gain if it decided to violate the employees' anonymity and use the survey information at the level of the individual employee.

5.1. Predictive performance

One way of evaluating the predictive performance of the models is to determine the mean absolute distances (the MADs) between the actual outcome and the predicted quit probability. That is, let $Quit$ be the realised value for the quit dummy and let \widehat{Quit} be the predicted quit probability, then the MAD is:

$$MAD = \frac{1}{n} \sum_{i=1}^n |Quit_i - \widehat{Quit}_i|$$

The MADs for the five estimated models from the previous section are presented in the first row of Table 4. The first model, which is based on the personnel records, has a MAD of 0.146. The second model supplements the information from the personnel records with individual level information

from the employee surveys and produces a MAD of 0.127. The remaining results in Table 4 show the MADs for the three models where the personnel records are supplemented with survey information applied as business unit averages and standard deviations, and these MADs are very similar to that of model 1.

At first sight, it appears as if the survey information used at the individual level leads to a significant improvement in the predictive power; however, we have to take into account that only a subset of employees provides complete survey information. Hence, the predictions based on the results from model 2 cover only 69.4 per cent of the employees. Because of this, it is relevant to look at the relative performance of model 1 and 2 for the subset of employees for whom predictions can be made in both models. When doing so, I achieve a MAD of 0.131 for model 1 and a MAD of 0.127 for model 2. Hence, model 2 is better, but its superiority is less pronounced.

One could also argue that the survey information should be used when available and that model 1 is the default. This implies that predictions from model 2 are used when available and predictions from model 1 are used when predictions from model 2 are unavailable. This mixing produces a MAD of 0.117 (covering all employees) for model 2, which is to be compared to the model 1 MAD of 0.146 or to the original model 2 MAD of 0.127 covering only 69 per cent of employees (see row 4 in Table 4). When similar exercises are done in relation to model 3 to 5, models 3 and 4 remain similar to model 1 in performance, while the MAD for model 5 drops to the relatively low level of 0.133. Thus, survey information is certainly valuable, and the mixing strategy, using the survey information when available, produces superior predictions.

Table 4. Evaluation of model predictions and coverage

	Model 1	Model 2	Model 3	Model 4	Model 5
	Personnel records	Personnel records and employee survey information (individual level)	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level)
					<i>Groups sized 10+</i>
Mean absolute distance (MAD)	0.146	0.127	0.145	0.145	0.147
Coverage (people)	62,845	43,637	62,663	62,083	52,015
Coverage (per cent)	100	69.4	99.7	98.8	82.8

MAD when supplemented with predictions from Model 1	0.146	0.117	0.145	0.144	0.133
Coverage (per cent)	100	100	100	100	100

In the following, I will present alternative performance and costs measures. The relative performances of these measures will be evaluated using the mixing framework. That is, I will calculate the measures using the predictions from the focal model and then supplement them with predictions from model 1 when required. The full set of results using this approach is presented in Table 5.

An alternative to the MAD is the mean squared distances (MSD):

$$MSD = \frac{1}{n} \sum_{i=1}^n (Quit_i - \widehat{Quit}_i)^2$$

This measure penalise more heavily the larger differences. The MSDs for the five models are presented in the second row of Table 5, and their relative performance rankings mirror those for the MAD.

A third measure is constructed to penalise failures to predict (FP) a quit:

$$FP = \frac{1}{\text{number of quits}} \sum_{i=1}^n 1_{quit(i)} * (1 - \widehat{Quit}_i)$$

1_{quit} is the indicator function taking on the value 1 if a quit is observed; 0 if not. This measure penalises for not predicting a quit, while the “costs” associated with not predicting that a person is retained is set to 0. This measure is in all probability the most relevant in the present context, because employee turnover costs are imposed on the company only when quits are actually observed.

The FP measures for the five models are presented in the third row of Table 5. Two interesting results are observed. First, model 2, which is based on both personnel records and survey information at the individual level, clearly outperforms model 1, which is based on the personnel records only. Models 3 to 5, based on the personnel records and using survey information at the business unit level, have intermediate performances. Second, the FP is 0.872 for model 1 and 0.867 for model 2. This implies that those actually quitting the firm have average predicted quit rates of around 0.13. But, if the predictions are made using model 2, they are on average 0.5 percentage point better than those made by model 1. This should be seen in the light of the median predicted

quit rate in model 1 being 6.5 per cent. Hence, those actually quitting have considerably higher average predicted quit rates, and model 2 is doing a relatively good job in identifying quitters.

5.2 Cost performance

While the MAD, MSD and FP summarise the models' predictive powers, they are not informative in terms of the monetary benefits of better predictions. Wasmuth and Davis (1983) argue that the cost of turnover for employees in the hospitality industry ranged from USD 500 to USD 5,000, with an average of USD 2,300 (most likely in 1983 prices). This conclusion is the result of a careful assessment of both direct and indirect costs associated with employee turnover. While the paper by Wasmuth and Davis (1983) also shows that it is difficult to determine the cost of turnover for particular employees, or even employee subgroups, they argue that the costs are proportional to the employees' salaries. Following this idea, a relevant cost-of-quit-measure should increase in the employee's salary and decrease in the company's ability to predict a quit, because being able to predict a quit allows the firm to undertake various preventive or cost-reducing actions. In this light, a relevant cost measure for employee quits is the wage-weighted FP (WWFP).

$$WWFP = \frac{1}{\text{number of quits}} \sum_{i=1}^n \text{wage}_i * 1_{\text{quit}(i)} * (1 - \widehat{Quit}_i)$$

The WWFPs for the five models are presented in Table 5, row 3. The rankings of the models are preserved, and the weighting by wage shows a reduction in the WWFP of DKK 2,238 (or USD 373) when moving from model 1 to model 2. This means that if the firm were to apply the survey information at the individual level (instead of just relying on the information in the personnel records), it would save on average DKK 2,238 per quitting employee or a total of DKK 2,350,795 (or USD 391,399) per year. If the firm instead applies the survey information available at the business unit level, such that the employees' anonymity is preserved, the company would save DKK 1,368 (or USD 228) per quitting employee. This amounts to a total cost reduction of DKK 239,491 or nearly USD 40,000.

Table 5. Model performance

<i>The performance measures reflect model-specific predictions supplemented with predictions from model 1</i>	Model 1	Model 2	Model 3	Model 4	Model 5
	Personnel records	Personnel records and employee survey information (individual level)	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level) <i>Groups sized 10+</i>
MAD: Mean absolute distance	0.146	0.117	0.145	0.144	0.133
MSD: Mean square distance	0.073	0.064	0.073	0.073	0.074
FP: Failure to predict	0.872	0.867	0.870	0.869	0.868
WWFP: Wage-weighted FP	346,629	344,391	345,708	345,274	345,261
RWWMAD: Rank-wage-weighted FP	77,122	51,768	76,309	75,148	64,716
Coverage (per cent)	1	1	1	1	1

Wasmuth and Davis (1983) also argued that the cost of turnover depends on the employees' job level. Hence, to make the cost-of-quit measure even more accurate, it is adjusted to account for the fact that it is more costly to lose high-level employees, who control resources and to a larger extent influence the work of other employees. One way to express this is to use the rank-wage-weighted FP (RWWFP) measure:

$$RWWFP = \frac{1}{\text{number of quits}} \sum_{i=1}^n (1/\text{rank}_i) * \text{wage}_i * 1_{\text{quit}(i)} * (1 - \widehat{Quit}_i)$$

The rank variable takes on the value 1 if the person is at the highest level in the firm (i.e. CEO), the value 2 if the person is at the second highest level and so on and so forth. This implies that the cost associated with failing to predict the CEO's exit is 1 times the CEO's salary, whereas the cost of not predicting the exit of a white-collar worker at rank 5 is 1/5 times their salary.

The RWWFP measures presented in Table 5 reveal some interesting results. First, the RWWFPs vary substantially more across models than was the case for the WWFP measures. This reflects the fact that model 2, which makes extensive use of the survey information, is much better at predicting higher-level quits than model 1, which contains no survey information. Additionally, model 5, using the survey information at the business unit level, performs much better than model 1. Second, the more realistic weighting of turnover costs clearly reduces the overall cost of turnover. Finally, because the importance of survey information is much more pronounced in the RWWFP measures, it has clear implications for how valuable the survey is. It can be established that the reduction in RWWFP when moving from model 1 to 2 is DKK 25,354 (or USD 4,225) per quitting employee, implying that the total cost reduction of using the survey information at the individual level relative to only using the personnel records totals the astronomic amount of DKK 26,631,241 (or USD 4,438,640) per year. If the survey information is used at the business unit level (model 5), the company would save DKK 12,948 (or USD 2,158) per quitting employee, totalling DKK 13,600,579 (or USD 2,266,763) per year.

The empirical analysis shows that the collaboration between the employer and the employees is very valuable. From the firm's perspective, the information from the survey results in a reduction in employee turnover costs that clearly exceeds the costs of conducting the survey. The calculations show that when the firm is using the personnel records in conjunction with the survey information aggregated to the business unit level for the units having 10 or more employees (model 5), turnover

costs are reduced by 16 per cent per year relative to the case where only the personnel data is used (model 1). The calculations also show that the firm foregoes profits corresponding to 17 per cent of employee turnover costs in a given year to maintain the long-term cooperation with employees. That is, if the firm breached the confidentiality agreement with the employees and used the survey information at the individual level (model 2), it would save 33 per cent of the employee turnover costs that year.

6. Conclusion

In this paper, I analyse an employment situation building on cooperation. The employer and the employees agree to implement a yearly job satisfaction survey where the employees answer truthfully on the survey questions and the employer agrees to maintain the employees' anonymity. Successful implementation of the survey is by no means trivial. Only in the case where the relationship between the employer and the employees is repeated and long-term can cooperation be achieved in equilibrium. Otherwise, both the employer and the employees have clear incentives not to cooperate.

The empirical results show that there are significant gains to be made from the employer-employee collaboration: The firm can reduce employee turnover costs by 16 per cent per year, as the employer can use the information conveyed in the survey to improve its predictive capability regarding employee quits, allowing for a reduction in employee turnover costs. These savings clearly exceed the costs of implementing the survey. A second important finding is that the employer is willing to forego profits corresponding to 17 per cent of employee turnover costs in a given year to be able to sustain the collaboration with the employees.

While the empirical results show significant gains from employer-employee collaboration, the estimate is likely to be a lower bound. The survey was originally implemented to elicit information from the employees about their job satisfaction. Such job satisfaction scores could be used directly as Key Performance Indicators (KPIs) for managers and, as such, play a role for how they are remunerated, or they could be used indirectly as input in promotion decisions. These additional uses of the survey information also provide benefits for the firm. Nevertheless, the estimates on the costs and benefits of employer-employee collaborations presented in this paper are likely to be the first of their kind in the literature.

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Appendix

Table A1. The employee survey

<i>Satisfaction</i>	Overall, how satisfied are you as an employee at your workplace? Imagine a place of work, which is perfect in all aspects. How far from or close to this ideal do you consider your place of work to be?
<i>Loyalty</i>	I would like to be working in the bank in two years' time I would recommend others to seek employment with the bank I rarely look for other jobs outside the bank I feel that I would have many alternative job opportunities if I were to leave the bank
<i>Motivation</i>	I feel motivated in my job I always look forward to going to work
<i>Salary and benefits</i>	My salary (including allowances and bonuses) compared to what I could get in a similar position elsewhere My general benefits (holidays, pension and other benefits) compared to what I could get in a similar position elsewhere My job security
<i>Corporate leadership</i>	The ability of Senior Manager to make the right decisions The ability of Senior Manager to inform the employees
<i>Immediate manager</i>	The professional skills of my immediate superior The leadership skills of my immediate superior My immediate superior is energetic and effective My immediate superior gives constructive feedback on my work My immediate superior delegates responsibility and authority so I can complete my work effectively My immediate superior helps me to develop personally and professionally What my immediate superior says is consistent with what he/she does
<i>Cooperation</i>	The professional cooperation with my colleagues The general atmosphere among my colleagues Social relations and interaction with my colleagues In my unit we are good at learning from each other
<i>Conditions at work</i>	My job objectives and work content The physical working environment at my place of work I feel good about the workload in my job I have sufficient influence over the setting of my job objectives I am able to observe and adhere to the core values I am satisfied with the way job objectives and work is distributed in my unit

<i>Career development</i>	<p>My work tasks present me with appropriate challenges</p> <p>My opportunities for professional and personal development</p> <p>The attention given to my professional and personal development</p> <p>My job enhances my future career opportunities</p> <p>My appraisal conversation supports my further development</p>
<i>Image</i>	<p>The bank has a good image</p> <p>I am proud to tell other people that I work for the bank</p> <p>Other people consider the bank to be a good place to work</p> <p>The bank has a good image</p>

Note: The scale used is a 10-point Likert scale with 1 corresponding to: low, not satisfied, do not agree and 10 corresponding to: high, satisfied, agree.

Table A2. Logit estimates of employee quit behaviour as modelled by a firm

	Model 3	Model 4	Model 5
	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level)	Personnel records and employee survey information (group level)
			<i>Groups sized 10+</i>
<i>Personnel records</i>			
Wage residuals	-0.583*** (0.101)	-0.658*** (0.104)	-0.742*** (0.112)
Age	-1.600*** (0.275)	-1.606*** (0.276)	-1.794*** (0.299)
Age ²	6.918*** (1.016)	6.955*** (1.023)	7.636*** (1.106)
Age ³	-1.291*** (0.162)	-1.298*** (0.163)	-1.406*** (0.176)
Age ⁴	0.088*** (0.009)	0.088*** (0.009)	0.094*** (0.010)
Tenure	-0.086*** (0.004)	-0.087*** (0.005)	-0.086*** (0.005)
Tenure ²	0.001*** (0.000)	0.002*** (0.000)	0.001*** (0.000)
Woman	-0.162*** (0.034)	-0.166*** (0.034)	-0.158*** (0.037)
Education: University	-0.080** (0.037)	-0.091** (0.037)	-0.093** (0.040)
Supervisor	0.006 (0.064)	0.005 (0.064)	-0.010 (0.074)
Departments:			
Business units	-0.223*** (0.040)	-0.193*** (0.040)	-0.240*** (0.046)
Central staff	0.004 (0.069)	0.053 (0.069)	0.009 (0.073)
Market functions	0.029 (0.069)	0.113 (0.069)	0.068 (0.076)

Employee survey (scale 1-10)
Averages for business units

I rarely look for other jobs outside the bank	-0.084*** (0.031)	-0.117*** (0.031)	-0.122*** (0.040)
The bank is an organisation characterised by sincerity	-0.171*** (0.047)	-0.185*** (0.044)	-0.207*** (0.061)
My general benefits (holidays, pension and other benefits) compared to what I could get in a similar position elsewhere	0.057*** (0.020)	0.042** (0.021)	0.056** (0.025)
I feel that I would have many alternative job opportunities if I were to leave the bank	0.102*** (0.025)	0.093*** (0.025)	0.120*** (0.034)
I would like to be working in the bank in two years' time	-0.176*** (0.039)		
My job security	-0.066** (0.031)		
The professional cooperation with my colleagues	0.160** (0.064)		
My opportunities for professional and personal development	-0.103*** (0.037)		
I am proud to tell other people that I work for the bank	0.120*** (0.038)		
Overall, how satisfied are you as an employee at your workplace?		-0.206*** (0.064)	-0.259*** (0.089)
I always look forward to going to work		0.110** (0.051)	0.206*** (0.064)
My immediate superior gives constructive feedback on my work		0.128** (0.053)	0.248*** (0.066)
My immediate superior helps me to develop personally and professionally		-0.179*** (0.055)	
The general atmosphere among my colleagues		0.130*** (0.048)	
I have sufficient influence over the setting of my job objectives		-0.120** (0.051)	
I have the opportunity to complete/present my own work		0.195*** (0.057)	
I would recommend others to seek employment with the bank			0.201*** (0.059)
The leadership skills of my immediate superior			-0.301*** (0.068)
My immediate superior is energetic and effective			0.121** (0.054)
The professional cooperation with my			0.242***

colleagues		(0.088)
My opportunities for professional and personal development		-0.257*** (0.060)

Std. dev. for business units

Overall, how satisfied are you as an employee at your workplace?	-0.180*** (0.054)	-0.297*** (0.073)
I would like to be working in the bank in two years' time	0.131*** (0.037)	0.236*** (0.047)
I would recommend others to seek employment with the bank	0.136*** (0.046)	0.283*** (0.064)
The leadership skills of my immediate superior	-0.104** (0.048)	-0.216*** (0.070)
My immediate superior gives constructive feedback on my work	0.147*** (0.057)	0.176** (0.070)
My job security	0.085** (0.039)	
My immediate superior helps me to develop personally and professionally	-0.122** (0.055)	
I have sufficient influence over the setting of my job objectives	-0.148*** (0.054)	
I am able to observe and adhere to the core values	0.196*** (0.061)	
I am proud to tell other people that I work for the bank	-0.135*** (0.052)	
My salary (including allowances and bonuses) compared to what I could get in a similar position elsewhere		-0.123** (0.049)
The ability of my senior manager to make the right decisions		0.126*** (0.043)
My opportunities for professional and personal development		-0.152** (0.067)

Dummies for job level	YES	YES	YES
Year dummies	YES	YES	YES
Observations	62,663	62,083	52,015

0029

PERFORMANCE MEASUREMENT SYSTEM DESIGN

DEVELOPING A NEW SYSTEM FOR DANISH
EMERGENCY DEPARTMENTS

ANDERS MØLLEKÆR, JACOB KJÆR ESKILDSEN

Title: (No more than eight words in length)

Performance Measurement System design: Developing a new system for Danish emergency departments.

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Healthcare, Performance measurement & management, Quality improvement, Emergency Departments.

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

The purpose of this study is to investigate the development of the new performance measurement system at Danish Emergency Departments.

In Denmark public hospitals receiving emergency patients are being merged in to larger as part of a major organizational re-structuring process. In addition these hospitals are merging all acute admission units into one joint Emergency Departments (ED's) [1]. Many different ways of organizing ED's are emerging and so are different ways of accessing the effectiveness and efficiency of the new ED's. As part of the reorganization process decision makers are starting to adopt and align organizational development strategies and performance measurement systems [2], [3].

1. Authority:, D.H.a.M., *Styrket akutberedskab - planlægningsgrundlag for det regionale sundhedsvæsen*. 2007, Danish Health and Medicine Authority: Danish Health and Medicine Authority.
2. Sørup, C., *Evaluation of emergency department performance – a systematic review on recommended performance and quality-in-care measures*. Scandinavian journal of trauma, resuscitation and emergency medicine, 2013. **21**(1): p. 62.
3. Neely, A., *Performance measurement system design: A literature review and research agenda*. International journal of operations & production management, 2005. **25**(12): p. 1228-1263.

Design/methodology/approach (mandatory):

A closed-end questionnaire was sent by email to the leaders and staff of the 21 ED's in Denmark. The questionnaire contains questions regarding the use of performances measures as a way of accessing the progress and value of the on going re-structuring process. In addition the questionnaire contains questions regarding the use, validity and relevance of the 16 most commonly internationally used performance and quality-in-care indicators[2]. Excluded from the study are all departments who do not receive emergency patients within the ED's framework (i.e. patients with a psychiatric and obstetric emergency).

Findings (mandatory):

Pending

Research limitations/implications (if applicable):

Write here...

Practical implications (if applicable):

Write here...

Social implications (if applicable):

Write here...

Originality/value (mandatory):

The study offers insight into the development of a new Performance Measurement System as tool for monitoring and evaluating the current re-structuring of emergency medical care

at Danish public hospitals, which are at the forefront of performance measurement within the Danish Healthcare Sector. It offers insight into

The measurement and use of performance indicators could improve quality of care and learning. Further more knowledge about the barriers for measuring and using indicators could help overcome challenges for future benchmark.

0030

ULTRA-ORGANIZATIONAL CO-OPETITION
DYNAMICS

DESIGNING MICRO-FOUNDATIONS OF
ORGANIZATIONAL PERFORMANCE

AUDREY DEPEIGE, STAVROS SINDAKIS

Ultra-organizational Co-opetition Dynamics: Designing micro-foundations of organizational performance

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Biographical Details:

Dr. Stavros Sindakis is a focused and forward thinking academic and professional with substantial experience in innovation and entrepreneurship issues. He has considerable experience in both business and marketing fields. His research interests lie in innovation and development of new customer-oriented services and exploitation of entrepreneurial opportunities in the knowledge intensive service industries.

Audrey Depeige is a postgraduate researcher in the field of Knowledge and Innovation Management. Her research and academic interests are on coopetition and innovation and relate more specifically to internal co-opetition, knowledge-based innovation, intra-organizational knowledge flows, organizational behavior.

Konstantinos is a PhD Candidate at Walden University of Minneapolis USA and has extensive teaching and research experience, mainly from his positions at the University of Central Lancashire, the University of London, and State University of New York Empire State College. Konstantinos has considerable experience in both Business Economics and International Management fields.

Abstract

Purpose

This paper analyzes important theoretical work conducted in the research streams of co-opetition and innovation as catalysts of organizational performance. It is noteworthy that while technological innovation and economic performances appear as beneficial outcomes of inter-organizational co-opetition, academic research has not systematically examined organizational performance outcomes in intra-firm co-opetition settings. This study therefore aims to explore the nature of co-opetitive dynamics within the firm. In light of this, knowledge processes contributing to enhance organizational performance and capabilities are presented in the paper.

Design/methodology/approach

The paper examines and compares co-opetitive dynamics in different contexts, by adopting a multi-level approach to help understand and analyze the complex phenomenon of intra-organizational co-opetition. In particular, existing academic contributions are examined, in an attempt to identify relevant links between co-opetition and innovation.

Findings

The knowledge-based perspective used to analyze the potential of co-opetition at the firm level brings a first representation of how knowledge value creation is achieved and sustained through KM oriented strategies. A framework for co-opetition dynamics within the organization is also introduced and focuses on intra-firm relationships that result in value creation.

Originality/value

This study complements previous research limited to inter-organizational settings. This is the first attempt to link internal co-opetition to firm's managerial practices. The paper thus contributes to develop the field of strategic management and brings additional insights for KM practitioners, by considering the impact of co-opetition on knowledge dynamics.

Keywords: co-opetition, intra-organizational, value creation, knowledge management, organizational performance

Article Classification: Conceptual paper

Introduction

Co-opetition is defined as the joint occurrence of cooperation and competition and has been gaining increasing interest from both academics and practitioners. Recent developments of the concept of co-opetition have been partly based on theoretical approaches such as resourced based view theory of the firm - which considers resource interdependence and heterogeneity as fundamental element of competitive advantage-; paradox theory, which internalizes the articulation of synergistically different dimensions; as well as on empirical contributions examining game theory and actors trajectories in co-opetitive games. As inherently linked to the interconnections between two or more actors cooperating and competing at the same time, the relationships, and complementarity between actors in co-opetitive settings (complementors) are perceived as a potential source of value creation, sharing, and capture. However despite the growing literature examining the study of co-opetition at an inter-firm level, the field of internal co-opetition has been little investigated in terms of the nature, dynamics and sustainability of the co-opetitive phenomenon (Tsai, 2002; Luo, 2005; Luo and al. 2006; Ritala and al, 2009; Ghobadi, Danesghar and Low, 2010) as well as how its performance implications (positive or negative) can be leveraged or prevented within organizations.

In this context, the authors try to provide a novel contribution to the understanding of co-opetition in an intra-firm context. The role of knowledge management practices in managing co-opetition is also analysed. The paper is structured as follows: first, we start by analysing existing academic contributions, which attempt to identify relevant links between co-opetition and innovation. In this regard, we also develop further the concept of knowledge-based innovation. In a second section, we introduce a framework for co-opetition dynamics within the organization and also examine the relationships that result in value creation. In the third part, we explain the importance of this framework to enhance its practical application as well as describe implications for the development and implementation of KM efforts within the organization. Finally, we discuss academic implications and identify avenues for future research.

1. Co-opetition and knowledge-based innovation

The key importance of knowledge in a highly competitive economy has been increasingly stressed out in recent academic research (Johannessen and Olsen, 2010; Amalia and Nugroho, 2011). Several studies highlight that co-opetition benefits lead to enhanced competitive advantage such as technological innovations and to increased technology diversity (Gnyawali and Park, 2009). Co-opetition strategy is especially relevant in knowledge-intensive industries (Bouncken and Kraus, 2013) as technologies become more complex and push R&D departments to face numerous challenges linked to costs, technological advancements, resources as well as risks and uncertainty. In this regard, the role of external knowledge, networking, and relationships appears to be a key driver of technological innovation (Martín-de Castro et al., 2011).

Taking the example of software industries, Biondi and Giannoccolo (2012) report co-opetition as emerging from specific needs raised by the customer, such as ensuring interoperability between services, covering market niches or sharing cost of research and development. Simultaneous cooperation and competition is most likely to occur in presence of complementarities between firms, should it be on the demand or on the supply side. co-opetition has been first modeled through the game theory (Nalebuff and Brandenburger, 1996) with rivals joining in alliances in order to neutralize potential threats from competitors (Tidstrom, 2008). In previous research, co-opetition is considered as a strategy focused on innovation, research, and development (Biondi and Giannoccolo, 2012). Initially it has been conceived as a strategy or goal to reach in order to achieve growth (Bengtsson, 2010). This is supported by empirical

studies illustrating the fact that, in situations of competitive relationships, firms tend to give increasing importance to knowledge and intangible assets (Martín-de Castro et al., 2011). In this regard, the need to re-think knowledge production, utilization, and renewal to enable increased sustainability of firms evolving in an increasingly complex and competitive environment has been pointed out (Carayannis, 2009). The transition to an ecological conception of knowledge mechanisms, as well as the role of the environment in knowledge production and innovation, are shown in Figure 1 below. This emphasizes the formation of a “win-win situation between ecology, knowledge, and innovation” (Carayannis et al, 2012, p. 1).

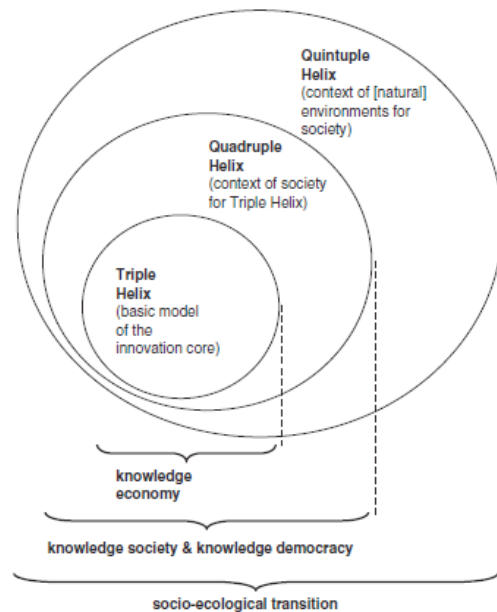


Figure 1. Knowledge production and Innovation in the Context of Knowledge Economy, Knowledge Society, and the natural environments of society (Carayannis et al., 2012)

Recent developments of knowledge-based frameworks constitute a useful understanding of the links between knowledge and firm’s innovation (Martín-de Castro et al., 2011). An integrated view of knowledge and innovation suggests that the knowledge-centred and innovation-centred understandings actually overlap (Carayannis and Campbell, 2009). Nevertheless, while numerous research articles explore the relationship between co-opetition alliances and value creation or innovation, intra-organizational perspectives of value creation in co-opetitive relationships have been left aside. Along with this, the adoption of a dialectic approach is considered as critical for understanding knowledge creation and innovativeness (Ritala and al, 2009). In the following section, we propose to examine the co-existence of cooperation and competition within the firm and its role in generating value creation.

2. Internal co-opetition dynamics: enabling a knowledge-creating ecology

Co-opetition is an area of research that extends far beyond the interaction between firms with few examples of studies focusing on co-opetition between different units within one organization, or between several employees of the same organization (Walley, 2007). This suggests a preponderance of the dynamics and interactions between actors (i.e. individuals, teams, departments, business units, subsidiaries), beyond the sole informational or contextual aspect of knowledge, as represented in Figure 2 below. This is in line with previous research indicating that co-opetitive relationships “*can only be*

captured if defined as a relationship between the same actors that are simultaneously involved in cooperative and competitive interactions” (Bengtsson et al, 2010, p. 200). The helical view of the micro-level of co-opetition proposed hereafter emphasizes the fact that it is necessary to overcome a hierarchical conception of the organization, which makes it “difficult to imagine, much less recognize and study, patterns of relations that are complex but not hierarchical” (Crumley, 1995, p. 3). Along with this, and keeping in mind the Quintuple Helix, it can be argued that, the relative interactional base of each actor (from an individual scale to larger groups) varies in response to the environment in which the relationship takes place, and to extended interdependencies (complementaring or conflicting). This is supported by research indicating that the degrees of cooperative and competitive interactions among individuals are function of the structure of interdependencies among them - positive or negatives (Ghobadi, Danesghar and Low, 2011). In addition, beliefs are also susceptible to affect the outcomes (Ghobadi and D’Ambra, 2011).

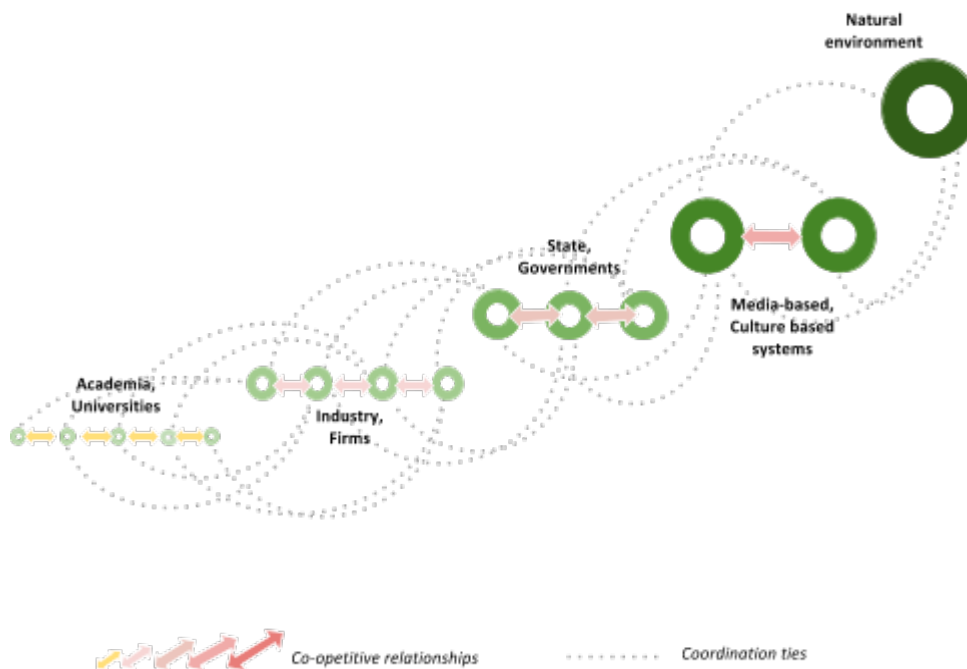


Figure 2. The helical architecture of global co-opetition: a representation of multi-level co-opetition scenaria

Sharing knowledge cannot only be defined as a functional sending-receiving relationship; rather it is embedded into a genuine social link. Rital et al. (2009) also report that closely knowledge is related to both individual and organizational aspects, including social and emotional components. It is noteworthy that competitive influences are usually ignored in the literature covering organizational cooperation. In a similar manner, the competition literature does not fully integrate cooperation as it is considered to hamper benefits that are gained through competition (Bengsston and al, 2010). This contrasts with research indicating an actual co-existence of cooperation and competition: new ideas are generated by knowledge sharing and cooperation, which may result in competition between these new ideas (Ritala et al., 2009). Findings also show that when competition increases, the utilization of knowledge increases as well. This leads us to the argument that knowledge flows between units are considered as intangible resources, where interactions between units (i.e departments, teams or individuals) - that are at the same time tight by competitive stakes - result in intangible benefits. These includes “happy accidents”, or in

other words, the unintended benefits of knowledge spillovers between employees, groups, functional domains, etc... (Carayannis, 2008).

The knowledge system in intra-firm co-opetition can be described as highly complex, dynamic, and adaptive, as in Carayannis and Campbell (2009), who further emphasize that the *“elastic integration of different modes of knowledge creation, diffusion and use should generate synergetic surplus effects of additionality”* (Carayannis and Campbell, 2009, p. 21). This representation is coherent with research indicating that the merge of cooperation and competition together would arise in a co-opetitive system of value creation (Padula and Dagnino, 2002). The authors advance this argument for intra-organizational co-opetition, showing that value creation of firms is premised by the knowledge base of actors. This leads to focus on processes through which the knowledge held by each party is exchanged (shared), integrated (combined) and utilized for successful innovation (Ritala, P. et al., 2009). As in Carayannis (2009), the presented knowledge-creating ecosystem is expected to be superior as it integrates different knowledge modes via the co-opetition knowledge flows dynamics, to which can be added co-evolution and co-specialization dynamics.

Actors can decide to cooperate or to compete based on the availability of resources involved, namely under which conditions they will share these resources (e.g. knowledge, time, budget, etc.) with each other, and how and to what extent benefits can be expected from either of the behaviour adopted (cooperative or competitive behaviour). In intra-firm co-opetition settings, actors are expected to be competing for intra-firm resources, such as funds allocation while on the other hand, projects, such as new product development, lead them to work on a cooperation mode (Dagnino, 2011). This relates to the multi-faceted nature of co-opetition, interactions at one level may influence interactions and outcomes at other levels: effects of complementarities and or/rivalries between individuals may have an outcome at the team or department level. Reversely, co-opetition between departments may have an impact on individual members of the said groups. A similar argument can be formulated about co-opetitive relationships between teams influencing both the departments and individual levels, or about co-opetitive tensions between business units, which outcomes are identified in individuals (micro-level). Furthermore, different levels of co-opetition may exist simultaneously at different levels (Tidstrom, 2008).

Co-opetition dynamics are based on complementarities and rivalries between involved actors, which also encompasses both costs and benefits for participants (Katsanakis and Kosyva, 2012). The cost and benefits can be related to the initial goals or objectives of each participating actor. This framework thus incorporates complementarity of knowledge between actors and also encompasses utility interdependence in relationship with organizational outputs. This takes into account the outputs expected by managers (objectives), the requests emerging from executive levels, as well as individual goals. In doing so, it involves to take into account the actors' multiple perspectives within the same framework. Processes of knowledge creation, as well as sharing, transfer and application, emerge from people-based mechanisms (Begona Lloria, 2007). Organizational knowledge has been alternatively conceived in the literature as an object, interpretation, and process. An alternative view to these conceptualizations is knowledge as a relationship, which highlights that human interaction is at the core of knowledge emergence. This perspective suggests that actors are freed from constraints and incompatibilities across boundaries and that knowledge can be viewed *“in terms of relationships and connectedness to other social actors and structures”* (Kahikara and Sørensen, 2002. p.5). Therefore, the authors define knowledge emergence as: *the process through which knowledge is created, as a result of the interactions between actors.*

Knowledge emergence derives from the cooperative side of co-opetition. On the other hand, knowledge

differentiation derives from competition. Knowledge differentiation is related to the allocation of new knowledge generation shares (Popov and Vlasov, 2011). Knowledge emerging from cooperative interactions modifies the existing organizational knowledge base. This requires knowledge workers to classify the new knowledge in terms of changes that are introduced: while capturing and appropriating new knowledge, individuals may either rename, proceed to meta-arrangements, add new knowledge sources or refine this knowledge (Schreiber et al. 1993; note: new knowledge sources may also include actors external to the firm, as in Figure 3). Consequently, interactions between individuals at this level rely on multiple objects of knowledge (differentiated knowledge). Here again, the authors define knowledge differentiation as *the process of breaking down new or existing knowledge into specific attributes, in order to capture the shared value generated by knowledge emergence*. To a further extent, actors within organizations interact and create additional advantage for the firm through mechanisms of knowledge evolution. On one hand, those lie on synergies between actors (complementarities that result in knowledge emergence), as well as on appropriation and individualization of value (rivalries that lead to knowledge differentiation). Knowledge evolution reflects the evolving and self-organizing nature of the combination of these two knowledge mechanisms in intra-organizational co-opetition. Based on an evolutionary approach, which sees knowledge mechanisms from a dynamic capabilities perspective, authors argue that the concept of knowledge evolution recognizes the evolving character of co-opetitive relationships. These are conceived as a degree- and level-varying equilibrium of forces, and take place between the firm's knowledge workers.

The concept of strategic technological learning (Carayannis, 2008) illustrates the development of organizational intelligence through mechanisms of knowledge creation, more than those related to knowledge possession. Internal forces of cooperation are found to have a negative effect on double-loop learning (Jashapara, 2003). On the other hand, against expectations, competitive environments are more likely to lead to double-loop learning by resulting in new priority settings and questioning existing assumptions. In other words, actors are in co-opetition triggered to respond to a paradoxical environment, and, as such, the emergence of new knowledge does not appear as inherently and exclusively linked to a single individual's learning ability, rather to the interaction between the actors. This is underlying pivot of co-opetitive relationships is of critical importance in contributing to enhance the firm's innovative capabilities through new knowledge creation and development. Understanding intra-firm co-opetition as a trigger of knowledge evolution places the different actors involved (teams, individuals) as interactional learning entities, thus setting a basis for creating and improving organizational routines (Carayannis, 2009). Furthermore, the learning occurs at several levels: at the relational level (the co-opetitive dyad between two actors) and to a further extent at the ultra-organizational level and extra-organizational level. In this perspective, the eventuality of a coexistence and co-evolution of different knowledge and innovation modes is emphasized (Carayannis and Campbell, 2010). Authors also highlight different processes of cross-learning based on different knowledge modes, which were presented earlier in Figure 2 (co-realisation, co-conception, co-creation). The intrication of the knowledge modes echoes possible integrations between different learning modes as conceptualized by Carayannis and Campbell (2010). The learning mode 2 describes links between knowledge production (which relates to the authors' knowledge mode names as co-creation mode) and the use of knowledge. These linkages are based on defined principles such as knowledge being produced in a context of application. Authors argue this is especially relevant in intra-organizational co-opetition as co-opetitive relationships emerge during realization of an organizational goal or mission. Others principles highlighted by Carayannis and Campbell include transdisciplinarity, heterogeneity and organizational diversity, as well as social accountability and reflexivity. The learning mode 3 goes beyond heterogeneity and diversity and suggests multi-level knowledge and innovation systems, and is based on knowledge clusters, innovation networks, and co-opetition in different configurations (Carayannis and Campbell, 2010).

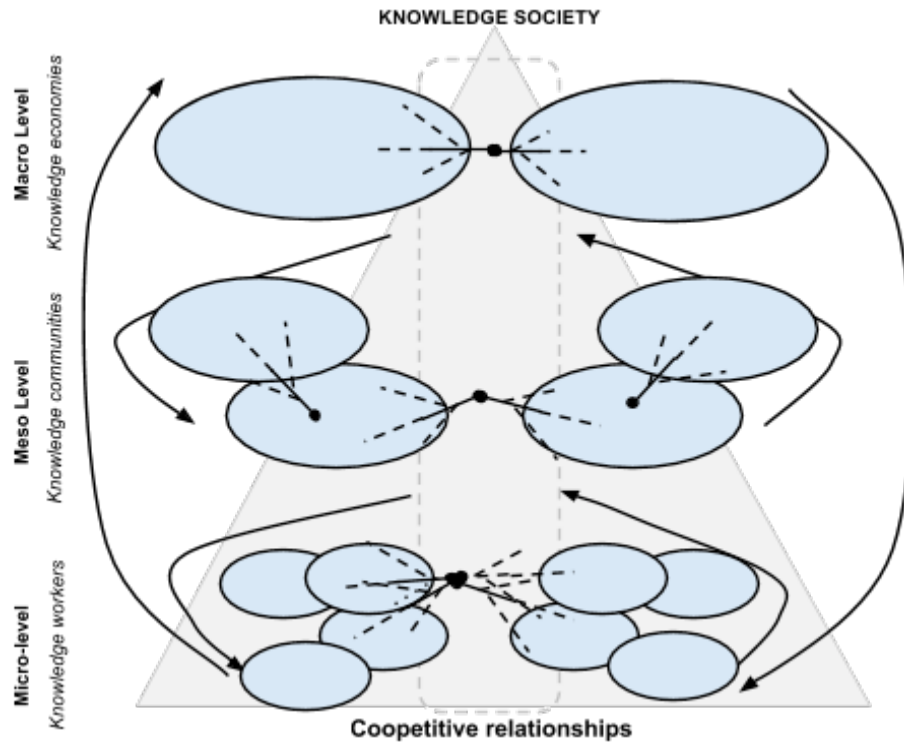


Figure 3. The knowledge ecosystem architectural blueprint: Dynamics of Ultra-organizational Co-opetition and Circuits of Knowledge (DUCCK Model)

Through this new framework, the authors suggest that the critical areas of co-opetition dynamics identified by Biondi (2012) can be juxtaposed at the intra-organizational level. This is particularly useful in considering limitations of theoretical benefits of co-opetition. From a corporate viewpoint, Biondi describes two critical areas of co-opetitive balance: the first one, entitled the “*the dark side of cooperation*”, (p. 446) presents actors deciding to implement cooperation even though the outcomes for customers (deliverables) are lower, because in this case, profits would be higher for both partners. A second key area is identified as the “*competitive trap*”, where actors take the decision not to implement cooperation, because even though the outcome for customers presents a higher value, it does involve decreasing profits for both partners. In other words, the nature of the co-opetitive relationship varies from an actor point of view (Tidstrom, 2008). The authors take Biondi’s findings into consideration to describe co-opetitive choices and their implications on the structure of co-opetitive equilibriums within the firm. It can be expected that actors who are in competition with another actor, at the same level, enhance the significance of current knowledge base and its evolution through new knowledge creation. This is perceived as a privileged source of differentiation and realization advantage of corporate goals. In a similar manner, two additional and potential “traps” can be identified: the acceleration trap and the differentiation trap (Carayannis et al., 2003). Those are related to excessive rivalries between actors (hyper-rivalry). The framework is usually used to describe excessive competition, which result in increased and accelerated change and declining competitiveness of the actors involved. A similar knowledge based phenomenon is creative destruction, which emphasizes the nature and life cycle of the firm, and is based on Schumpeter’s work. These aspects can adequately be translated into knowledge management systems and practices, which we will detail in the next section.

3. A co-opetition perspective of knowledge management practices

Cooperation and competition are not spontaneous mechanisms (Luo, 2005). Finding the right balance between cooperation and competition is crucial for companies, however it requires specific coordination and control processes as competitors usually share interest for the same resources (Loebbecke and Anghern, 2010; Ingram and Yue, 2008). In both inter- and intra-organizational governance forms, knowledge networks are set as the reference framework for knowledge management under co-opetition. This framework is funded by three main components: knowledge, knowledge agents, and knowledge networks (Loebbecke and Anghern, 2010). Understanding and analyzing co-opetition stakes within the firm is critical for managers (from an operational point of view) and corporate policy makers (from a regulatory point of view). The analysis of KM in co-opetition provides relevant insights in formulating recommendations and implications for the firm's capabilities development. This starts from the assumption that co-opetitive relationships may either occur as a planned strategy pushed by the organization (example of co-opetitive development teams), or as an emergent and natural part of business relationships (Tidström, 2008).

One implication of the paper for KM practices thus concerns corporate policies influencing the different behaviours of actors. This also accounts corporate KM strategy as framework for organizational knowledge flows in co-opetition. This is supported by previous research highlighting that KM practices must focus on securing new knowledge production, implement effective learning routines, and maximize efficiency of *"organizational intelligence processes with both internal and external foci"* (Carayannis, 2008, p. 29). A second implication is related to operational management of the balance between cooperation and competition. This particularly comes forward through policies aiming to reinforce the positive effects of inter-actor cooperation while maintaining a stimulating level of competition. This refers back to the fact that enablers *"behind knowledge creation are, in reality conditions or characteristics of an organizational context in which the management can deliberately intervene"* (Begona Lloria, 2007, p.676). In other words, KM strategy and managerial practices will need to consider both the interest of actors, as well as the outcomes generated by the exploitation of cooperative and competitive options. This implies to give specific attention to corporate strategies such as reward policies and budget/ cost allocation. It may actually be the case that corporate reward systems are based on the performance of each unit and so, have a direct impact on the nature of the relationship between different units (Tidstrom, 2008). Table 1 hereafter further illustrates the importance of managing the balance between cooperation and competition across actors within the firm, so as to enhance knowledge dynamics and capabilities of the firm at operational, tactical and strategic levels.

Knowledge dynamics	Learning		
	Operational	Tactical	Strategic
<i>Arbitrage</i>	Inability to enable learning across functional activities.	Inability to enable learning from one situation to another.	Inability to improve processes for deriving and implementing lessons learned.
<i>Serendipity</i>	Inability to take advantage of new knowledge as it becomes available.	Inability to leverage new knowledge across multiple situations or business events.	Inability to leverage new knowledge to reshape corporate strategy.
<i>Co-opetition</i>	Inability to balance competition and cooperation between departments or groups.	Inability to balance competition and cooperation across the entire organization.	Inability to balance competition and cooperation to identify and exploit competitive advantage.
<i>Co-specialization</i>	Inability to enable cross-functional cooperation.	Inability to enable shared learning across groups within the organization.	Inability to formulate an integrated strategy that includes all stakeholders in the organization.
<i>Co-evolution</i>	Inability to socialize new staff into knowledge sharing and transfer activities.	Inability to integrate new groups into knowledge sharing and transfer.	Inability to enable the organization to grow through shared experience.

Table 1: Operational, tactical and strategic inability to be addressed by organizations (Carayannis, 2008)

KM practices in co-opetition aim to: enhance the sustainability of co-opetitive relationships, promote specific management rules related to the recognition of desired behaviors, and enable the measurement of intangible outcomes generated by the co-opetitive balance. This last aspect underlines the fact that knowledge creation is often cited as a key driver for growth, however implies continuous investments that do not always result in tangible returns (Abbate and Coppolino, 2011). In this regard, it is argued that knowledge brokers within the company play an important role in the management of the co-opetitive equilibrium, as their primary mission is to facilitate connections between actors within the organization. It is especially relevant in intra-organizational co-opetition, as knowledge brokers are key in identifying areas of complementarities regarding knowledge assets, and capabilities that foster conditions for the emergence of new ideas. This idea of connecting people for mutual advantage comes close to motives underlying the implementation and management of a co-opetition strategy in intra-organizational settings. The implementation of new KM perspectives under co-opetition also reflects the need of emerging innovation in KM strategy formulation (Amalia and Nugroho, 2011). This is also supported by prior research results, highlighting that organizational innovation and related enabling schemes, are key in achieving successful implementation of technological innovations (Amalia and Nugroho, 2011). Those arguments lead to the conclusion that, co-opetition enables technological innovation through processes of knowledge emergence, differentiation, and evolution.

Discussion and Implications

The paper reviews relevant literature on co-opetition dynamics, innovation, and knowledge creation. A gap in the literature covering intra-organizational co-opetition has been identified showing that an integrated model, which describes co-opetition dynamics at the firm level, is needed. Several studies have pointed out the need of such a model, describing the antecedents and outcomes of co-opetitive dynamics (Walley, 2007; Ghobadi and D'Ambra, 2012).

This study is based on a multi-level approach to describe and analyze co-opetition dynamics in intra-organizational settings and contributes a better understanding of the phenomenon via the DUCCK model. The proposed model describes co-opetitive relationships between internal actors and mechanisms of value creation at the firm level. In the context of intra-firm co-opetition, this paper analyses co-opetition dynamics at different levels, and depicts how those concur to individual and organizational knowledge

mechanisms, such as knowledge emergence, knowledge differentiation and knowledge evolution. The knowledge-based perspective used to analyze the potential of co-opetition at the firm level brings a first representation of how knowledge value creation is achieved and sustained through KM oriented strategies. The argument advances theory aiming to reinforce organizational sustainability.

To further develop and enrich this study, other dimensions of value creation remain to be further explored as regards to the development of firm's organizational performance. This description of other possible sources of value creation in intra-organizational co-opetition represents a gap in current academic literature and stands as an interesting opportunity for future research. Measurement issues linked to the intangible value emerging from intra-firm co-opetition dynamics should also be examined. Finally, authors have also highlighted that few academic contributions have explored co-opetition at the intra-organizational level. In this perspective, more research needs to be carried out on the dynamics of intra-firm co-opetition.

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0031

MANAGING INTER-ORGANISATIONAL NETWORKS FOR CUSTOMER VALUE

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Managing Inter-organisational Networks for Customer Value

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Abstract

Purpose – This article takes as its point of departure the prevailing understanding of the need for businesses to engage in joint customer value creation. A framework for understanding inter-organisational networks creating and sustaining customer value through experience flow is developed.

Design – The article is conceptual and offers prescriptive advice on how to identify and organise inter-organisational networks.

Findings – The article moves beyond mere rational description and argues that organising businesses to meet market demands for experiences, in which relations between actors, activities and networks need to be balanced in terms of narratives, production and market couplings, is a complex process.

Originality/value – The contribution of this article is an interpretative framework and a research agenda that takes into account the social construction of organising joint customer experiences. Furthermore, the article proposes directions for further research and highlights managerial implications.

Keywords: Value networks, experience economy, interpretive perspective, organising, network theory.

Article type: Conceptual.

1. Introduction

Given today's global and highly competitive business environment, it is increasingly difficult to stay autonomous and competitive at the same time (e.g. Cambell and Wilson, 1996, p. 126). The single organisation's offering is rarely enough to create such sustainable customer value (Normann and Ramirez, 1994). Therefore, it has been suggested that organisations need to mobilise inter-organisational networks in an endeavour to create sustainable customer value (Herrala, Pakkala and Haapasalo, 2011). In addition to this need for inter-organisation relations, there is a growing interest for businesses to create memorable customer experiences (Gilmore and Pine, 1998; 1999). Although many industries may benefit from joint collaboration in creating customer value (e.g. Achrol and Kotler, 1999), networks have been found to be key driver of competitiveness and development (Normann and Ramirez, 1994) and creating new markets (Normann, 2001, pp. 24-25) as well as new capabilities in the management of market relations (e.g. Day, 2000). Furthermore, since customers' preferences for experiences often transcend the single organisation's ability to create sufficient excitement and individual interest that cut across different organisations (Scheff and Kotler, 1996, p. 54). What is more, scholars have argued that a weak understanding of the complex relationship contexts can lead to inefficient development of regional areas (Bourne and Simmons 2003; Reimer and Nagota 2004). In the light of this and a high failure rate of networks, especially among the type called strategic alliances where approx. 60% is estimated to fail (e.g. Podolny and Page, 1998; Bleeke and Ernst, 1993), it is surprising that only few studies exist on how local business networks are developed and managed (Murdoch, 2000). This calls for a better conceptualisation of networks for development of customer value. The purpose of this article is therefore to address the issues of developing interconnected offerings for the customers' benefit in collaboration between and among inter-organisational networks. In order to maximise customer value and achieve competitive advantages, this article aims at building a conceptual framework, and for that purpose, it proposes the following research questions: How can inter-organisational networks be identified and customer experience created? What are the major challenges of managing inter-organisational networks and what are the implications? This article draws on the literature on inter-organisational networks, particularly the research that deals with subjective and interpretative approaches. The interpretation processes among and between organisations are rather complex and need to be further developed in the realm of customer value networks. Therefore, the article positions itself in the string of literature on organisations as interpretation systems (e.g. Weick, 1979; Daft and Weick, 1984; Arndt, 1986, Das and Boje, 1993, Ring and Van de Ven,

1994). Discussing how such shared understanding is created in an inter-organisational network centered on developing an experience flow for customers together with the proposed network model provides a major contribution to previous work in the literature on sense-making.

Customer value is defined as an experience flow and refers to certain experiences that customers, e.g. tourists, local visitors, etc., have in a local area, e.g. rural districts, municipalities or geographically delineated areas such as islands (Csikszentmihalyi, 2000). Several researchers have argued for value being related to customer experience. For instance, Holbrook (2005) defined customer value as an “interactive, relativistic preference and experience” (p. 46). Vargo and Lusch (2008) argue along the same line customer value to be “idiosyncratic, experiential, contextual, and meaning laden (p. 7)”. In addition, an experience is created “when a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event” (Pine and Gilmore, 1998; Berry, Carbone and Haeckel, 2002). In this sense, value is something that is created together with the customers and not the output of some production process (Normann, 2001, p. 99). Especially in the tourism, where the experience is the sum of encounters with many providers (Hall and Hall, 2008, pp. 11-13), makes the non-sequential value-creating process difficult to explain by the traditional value chain model (Flagstad and Hope, 2001). It is not the individual business that makes customers want to come back or keeps them in a local shopping environment, but whether the experience is interconnected with the customers’ expectations throughout the entire shopping (e.g. Scheff and Kotler, 1996). Thus, customers’ journey through a series of interconnected experiences “Flow” becomes essential for participants in a collaborative network (see figure 1).

*** Insert figure 1 about here***

Furthermore, an inter-organisational network is defined as “the enduring transactions flows, and linkages that occur among and between organizations” (Eisenberg and Goodall, 2001, p. 291). More specifically, inter-organisational networks as a sense-making process is captured by Cynthia Stohl (1995) in her definition of a network, “an interactive process, shaped by multiple strands of activities [in which] the creation and interpretation of messages are built upon the associations, affiliations, and allegiances that bind individuals together” (Stohl, 1995, p. 23), This is in line with Arndt (1986) who argues that inter-organisational networks may be conceptualised as “the

management of meaning and the sharing of interpretation” (Arndt, 1986, p. 129). On a more concrete level, this article adopts Allee’s (2009, p. 3) definition of a value network as “any purposeful group of people or organizations creating social and economic good through complex dynamic exchanges of tangible and intangible value”. Value networks are integrated firms, in which each member supports the others in creating value in the shape of customer experience.

2. Identifying collective business opportunities

When creating an experience flow in an inter-organisational network, the selection of network partners is an important task, not least because it sort of sets the boundary for the kind of experience flow that it is possible to design. One way of selecting relevant network partners is to identify shared customer segments among the collective organisations. From such a network of partners, shared business opportunities may be developed (e.g. experience flow themes). When customer segments, business opportunities and network partners are all matched, an experience flow solution set may be formed, in which services and products are bundled together to provide customer value (e.g. Flagestad and Hope, 2001; see Table 1).

Insert table 1 about here

The selection of customer segments that are consistent with each partner will enable the network to create an experience flow that involves the individual organisation’s available service or product. Generally, aggregating potential customers into segments may be done through different methods such as either a priori or post hoc (Green, 1997). As for the former, local businesses may classify their customers before information has been collected about them. The latter involves customer research in order to decide on the type of needs, wants and desires that may be best addressed.

When partners are identified, the overall joint business opportunity must be developed. According to Venkataraman (1997), an entrepreneurial business opportunity is “a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them”. On a practical level, several have proposed procedures for innovating across the departments of an organisation, which may also be applicable for inter-organisational networks (Robbins, Judge and Campbell, 2010, p. 544; Baron, 2006, p. 116). Especially, the service blueprinting has also proven useful in an experience context (Pine and Gilmore, 1998) as well as across organisations (Bitner, Ostrom and Morgan, 2008). However, from an interpretative

perspective, the development of an opportunity may be far more multifaceted than putting possible resources to use between and among partners in the network, especially, if the environment is largely analysable (Daft & Weick, 1984). In such incidents, whether a business opportunity is going to be an economic success largely depends on the involved beliefs and actions targeted towards reaching specific or imagined ends (Sarasvathy, Venkataraman and Velamuri, 2002). Achieving such ends is a sense-making process, in which individuals with different skills, knowledge, practices and cultural backgrounds enact a shared reality (Weick and Daft, 1983). In other words, identifying a business opportunity in an inter-organisational network is a matter of combining opportunity construction with opportunity recognition and enactment (Vaghely and Julien, 2010). That is, organisational representatives must interpret possible opportunities for the customer experience flow and act on the opportunity as they try to make sense of what is going on.

3. Managing inter-organisational networks

Managing inter-organisational networks is difficult for a number of reasons. According to Zerrillo and Raina (1996) some major challenges relating network inertia are 1. Lack of investing in relationship specific assets e.g. training, knowledge sharing may hinder smooth running of network activities, 2. Lack of shared information among network participants makes it especially difficult for new or peripheral actors to contribute to the experience flow, 3. The mind-set of the individual participant may not be applicable to that of the collective network. There may be different, perhaps even incompatible, interpretation modes as also suggested by Daft and Weick (1984), 4. A poor image and reputation of an individual firm may result in some being disenchanted with the collaboration, 5. Being hesitant to share ideas and resources with others due to a lack of trust and commitment (see also Ring and Van de Ven, 1994). If issues are not solved it may cause network participants to disintegrate, which is counterproductive for the value-creating capabilities (Lorenzoni and Lipparini, 1999). The overall challenge for inter-organisational networks is thus to stabilise network relations and make retention possible (Aldrich, 1979; Ebers and Grandori, 1999). Network stability may be defined as “a condition in which inter-organizational relations in a bounded population remain the same over some specified time interval” (Aldrich, 1979, p. 332). In order to meet the challenge of creating stability in an inter-organisational design, the network can rely on culture and loose couplings as stabilising factors, as discussed in the following.

As a social system, an inter-organisational network is also a complex system that is both self-generating and self-reproducing. As pointed out by Capra (2002, p. 72), social systems are networks of communication that create meaning and provide further communication, which, in turn, and through multiple feedback loops, generates the entire network as a shared context of meaning. In this self-generating opinion-forming process, individuals create the identity of the inter-organisational network and, at the same time, generate the network boundary based on shared expectations, confidentiality and loyalty (Capra, 2002). Consequently, the development of a joint business opportunity for entrepreneurial collaboration corresponds to the social construction of a new social entity, in which both customers as well as the system of collaboration and competition are to be aware of their collective offer (Aldrich and Martinez, 2010). The convergence in the meaning of central symbols, messages and behaviours is equivalent to an emergent network culture (Araujo, 1990). According to Arndt (1986, p. 129), network culture provides three functions in inter-organisational arrangement: *demarcation*, *identification* and *control*. *Demarcation* is the process of establishing a network boundary. It is the process of distinguishing between those belonging to the network and those who are outside. *Identification* occurs when the network maintains its own identity; it is achieved by internal cohesion and the sharing of mutual understanding. Robert Heath (1994) has termed this the “zone of shared meaning”, in which visions, ideas, values, norms, etc. are articulated – decoded – in such a way that they make sense to each network partner. *Control* is achieved through the norms of the inter-organisational networks, which often complement or neutralise more formal agreements in the form of, for instance, contracts and work descriptions. Similarly, Aldrich and Martinez (2010) argue that it involves acquiring new routines and competencies and legitimises their collective endeavour. As far as the former is concerned, new roles must be learned and knowledge transferred under uncertainty, and as for the latter, the network must establish legitimacy between customers, as committed users of a new product or service, and win acceptance from other stakeholders (p. 396).

In an inter-organisational context the so-called boundary spanners are responsible for mediating information between the company and the environment (Huber and Daft, 1987). However, due to variation in interpretation, contact and political influence among individuals in the network, a central aspect of managing inter-organisational networks becomes the continual coordination of behaviour (Gandori and Soda, 1995). In this endeavour, network *responsiveness* has shown to provide coordination advantages and to facilitate more rapid adaptability (Kleinbaum and Stuart, 2013). According to this, responsiveness in the context of an inter-organisational network refers to

the ability of organisations to quickly reply both partners and customers while keeping network activities going. Responsiveness allows the inter-organisational network to counterbalance flexibility and stability. Responsiveness therefore relates to the concept of “loose coupling”, in which systems simultaneously achieve flexibility and stability (Glassman, 1973). A loosely coupled system is responsive in terms of having the ability to adapt to changes as well as uphold an individual identity (Orton and Weick, 1990). This means the network is made up of the intersection of several loosely coupled subsystems that affect each other “suddenly (rather than continuously), occasionally (rather than constantly), negligibly (rather than significantly), indirectly (rather than directly), and eventually (rather than immediately)” (Weick, 1982, p. 380). As pointed out by Orton and Weick (1990), the stability is achieved because flexibility toward environmental changes is handled locally and by relatively autonomous subsystems. Still, such an endeavour depends on the interpretations and the ability to “enact relationships” of the persons who serve as boundary-spanners (Heath, 1994, p 209). One approach to manage loose-coupled systems is through “collective mindfulness” (Weick and Roberts, 1993). Collective mindfulness involves exploration and interpretation of possibilities and is less concerned with decision-making processes and safeguards (Weick, Sutcliffe and Obstfeld, 2008). Although the concept was originally applied to high reliable organisations, e.g. nuclear plants, hospitals, etc., it is also useful in relation to value networks as well, the reason being that the acts of developing a business opportunity and creating a market are associated with complexity and risks, thus spotlighting network partners’ ability to discover and manage unexpected events. On a concrete level, this means that network partners need to continually focus on the processes: (1) preoccupation with failure, (2) reluctance to simplify interpretations, (3) sensitivity to operations, (4) commitment to resilience and (5) underspecification of structures. However, if effectively adopted, collective mindfulness may not only improve coordination between actors (Weick and Roberts, 1993), but also support the development of a network culture and improve system outcomes by loosening tight couplings (Weick, Sutcliffe and Obstfeld, 2008)

4. A balanced model of inter-organisational networks

In this section, the above discussion is summarised into a network model. Although a number of network models and constituents have been proposed over the years (e.g. Sfandla and Björk, 2013; Gandori and Soda, 1995), this section will translate the above discussion into inter-organisational application more suitable for an interpretative perspective.

*** Figure 2 about here***

Actors are the most important elements in the model, for without them there would be no activities or relations and thus no network. In this article, the definition of actors is very similar to that proposed by White (1992). An actor can be defined as a person or a social entity. What constitutes actors is shared identity activated by an event. Actors are the basis for acting toward a goal. Depending on the type of network, actors may either be defined by own choice, like partners in a value network, or through the eyes of others observing the actors, e.g. a local tourist organisation. No matter how actors are defined, the underlying organising principle can, according to White (1992), only be identified through interviews with the observers or with the actors themselves and the stories they provide. From an interpretive perspective, an actor's categorisation is important, because it contains the frame of reference for making the entire network meaningful. Based on this logic and the interaction with other partners in the network, a "generalised constructed reality" is emerging, consisting of bits and pieces of truth, which through interdependent action is shaped into meaningful constructions (Weick, 1983, p. 18).

Organisational representatives engage in joint ongoing activities, sometimes without really knowing the others involved. For instance, individuals may silently elect a leader for local innovation projects, such as finding new ways to promote local goods and services and taking charge of things and securing progression. However, activity is the common denominator of what actors do when they are actors in a value network and thereby sets the frame for their acting, i.e. performance, administration, development, etc. Although White (1992) calls this type of joint activity a discipline and argues that it sets the network boundary, this article, however, uses the term "activity" to denote an ongoing attempt to collectively create customer value. Furthermore, just as White argues, activity is part of a network, but not what constitutes the network in itself. Instead, activity is part of the network's social structures insofar that it is the result of getting things done. Consequently, network activity is the result of the actors' work with transforming an input into an output, i.e. their production. An important part of this process is to identify those actors that both creates and receives value in experience flow and make sure that everyone gets rewarded for their resource input to the flow.

The relation between network and activity concerns the position each actor has in the network based on their interconnected activities. Couplings are the strings of activities that create and coordinate the experience flow. This has implication for managing of mutual activities. As has been argued throughout this article, the coupling of the businesses activities into an experience flow

needs to be done in such a way as to create a lasting customer impression. The more diverse customers, the more it is necessary to have a more multi-directional approach to creating an experience flow. A value-added system of activities, rather than a linear chain will arguably provide a more complete and positive experiences. However, if such a system is going to be implemented it will require flexibility of the actors, which can only be provided through a loose coupled system. Furthermore, research in innovation shows that such loose connections are important sources for new knowledge (Burt, 1992). Consequently, activities should be organized in such a way that it is possible for actors to easily link up to other actors with which they have a weak connection (Burt, 1992). In the process of designing the experience flow, the service blueprinting might prove useable (see e.g. Bitner, Ostrom and Morgan, 2007; Pine and Gilmore, 1998), especially in a stable and predictable environment. However, in more equivocal situations interpretation processes becomes important so that events and cues may be translated into meaning for the actors (Daft and Weick, 1984). This requires more experimentation and testing of which activities (touch points) that go well together and which do not, in order to know how to support the creation of an effective and attractive customer experience. As suggested above, the collective mindfulness may help inter-organisational networks to achieve coordination of activities and may help encounter changes. It is especially important that issues of failure are articulated, so that no one feels it too abstract.

Through narratives, inter-organisational networks are created when organisational representatives enact their relationships (Heath, 1992). According to White (1992), ties make up a network, as they both create the connections between actors and their behaviour or as White (1992, p. 83) puts it: “Stories cite behaviour and behaviour guides stories”. Narratives are stories that recount something already happened and may refer to a set of actions or events that constitutes a unity of purpose between actors (e.g. Abell 2004). Such as explained in the previous section, stories of demarcation contain narrative elements specifying how and what make the network different. Identification involves stories of inclusion such as reasons to belong, statements of fascination, and on a deeper level the fantasies and dreams may provide direction for their mutual endeavour. Finally, control is visible through political themes highlighting what is to be expected of each other and to reinforce power structure. All in all, stories are equivalent to what Heath (1994) calls zone of shared meaning and provide the actors with the interpretative code and typifications to makes sense of their joint relations and the context in which they are emerged (see also Das and Boje, 1993).

The key to getting knitting the network is to allow participants the opportunity to make mutual sense of which activities are relevant to their collective and coordinated activities. The

outcome is according to Heath (1994, p. 226), what give network participants “perspective and let people know what is expected of them as they enact structure with others”. Network ties are then relations between narrative elements that, when put together, provide a coherent story that may be uniplex or what Granovetter would call weak, or multiplex, which is equivalent to his strong ties assessment. In this way, a story may contain elements that either strengthen or loosen the network connections as they express perception of social process and structure (White, 1992).

Finally, the network is developed and maintained by both actors’ stories and the way their activities are coupled. In the model, the network is the result of enactment of structure as actors try to predict, reduce chaos and make sense of their collective purpose. The network is thus made up of both stories, which are qualitative in nature, and loose couplings of touch point among interconnected activities. Consequently, the building of a value network depend on the fitting of activities in such a way that actors find the network efficient and are willing to accept the experience flow with its related consequences of sharing a business opportunity with others. However, if the network is going to be successful, activities have to be balanced by narratives containing stories that involve symbols and meanings. The degree of shared perception participants may have regarding important aspects of their mutual endeavor, e.g. confidentiality and loyalty may provide indication of the network’s performance.

Several propositions arise from the above conceptualization of actors, activities, and network management:

Proposition 1: The more actors are risk-taking, the more likely it is that the network will be developed and maintained.

Proposition 2: The more actors that are involved in activities of creating customer value, the better are the prospects of developing and maintaining the network

Proposition 3: The more attention given to the activity of the other actors, the better the prospects of coordinating network relationship.

Proposition 4: The more stories of demarcation, identification and control, the more likely it is that network relationships are developed and maintained.

5. Conclusion

The purpose of this article is to present a framework for understanding the collaboration in inter-organisational networks centred on creating customer value by drawing on the interpretative

literature. The framework is an attempt to put the joint creation of customer value on the research agenda in inter-organisational networks and to stimulate further research in the area. The article's contribution is as follows. First, the identification of a value network is an enactment process in which participants both have to create a market demand and a joint experience flow. The forming of inter-organisational networks is based on constructing an opportunity through shared recognition of the business possibilities. Second, managing an inter-organisational network is a matter of reducing inertia and retaining network stability, which can be countered by taking into account the social and cultural elements and argues that the driving force in creating customer value is a dynamic process of balancing the development of actors, activities and the network through the production, couplings and narratives. Finally, this research needs to be tested empirically, and further research clarifying and testing the framework is necessary e.g. examining the proposed propositions. Following the interpretative perspective, qualitative studies should explore the enactment of network relations through storytelling and investigate how narratives support the development of integrated customer experiences.

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Figure 1: Interconnected services in experience flow

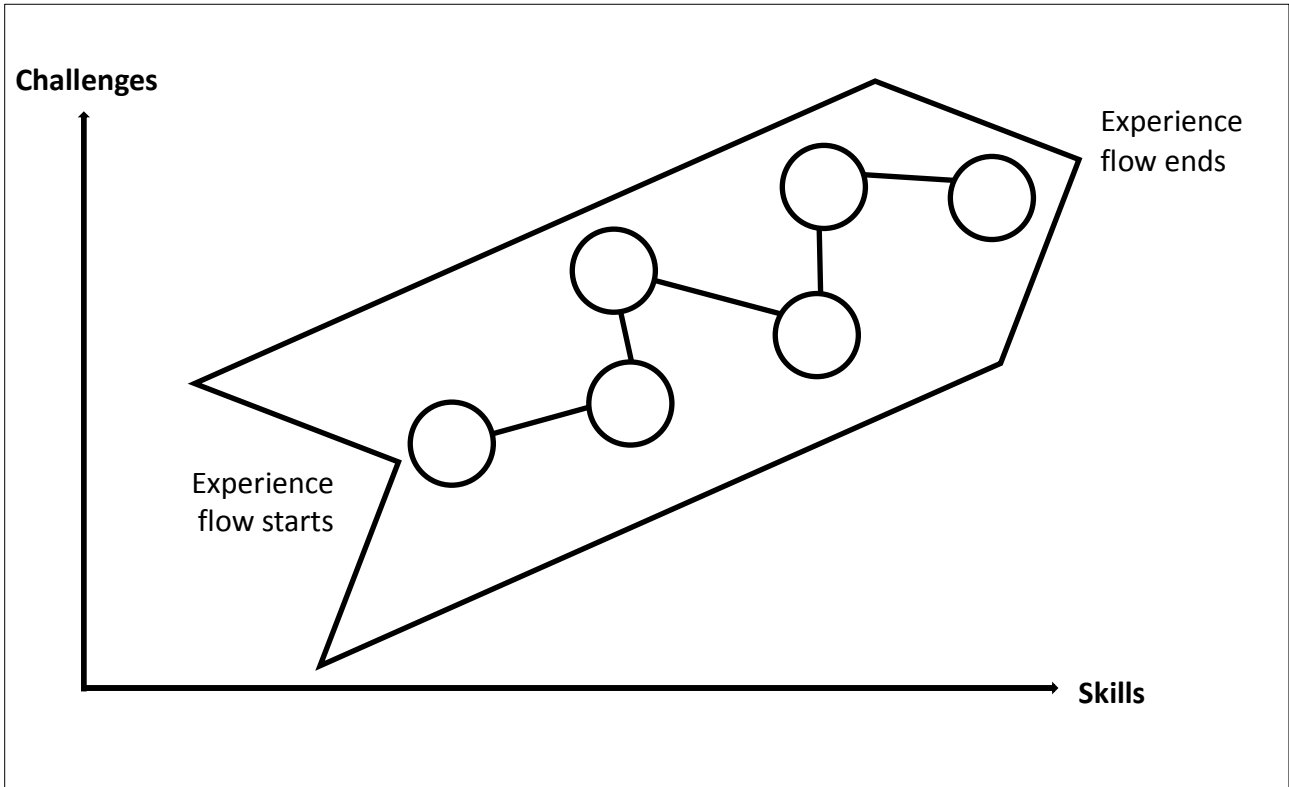
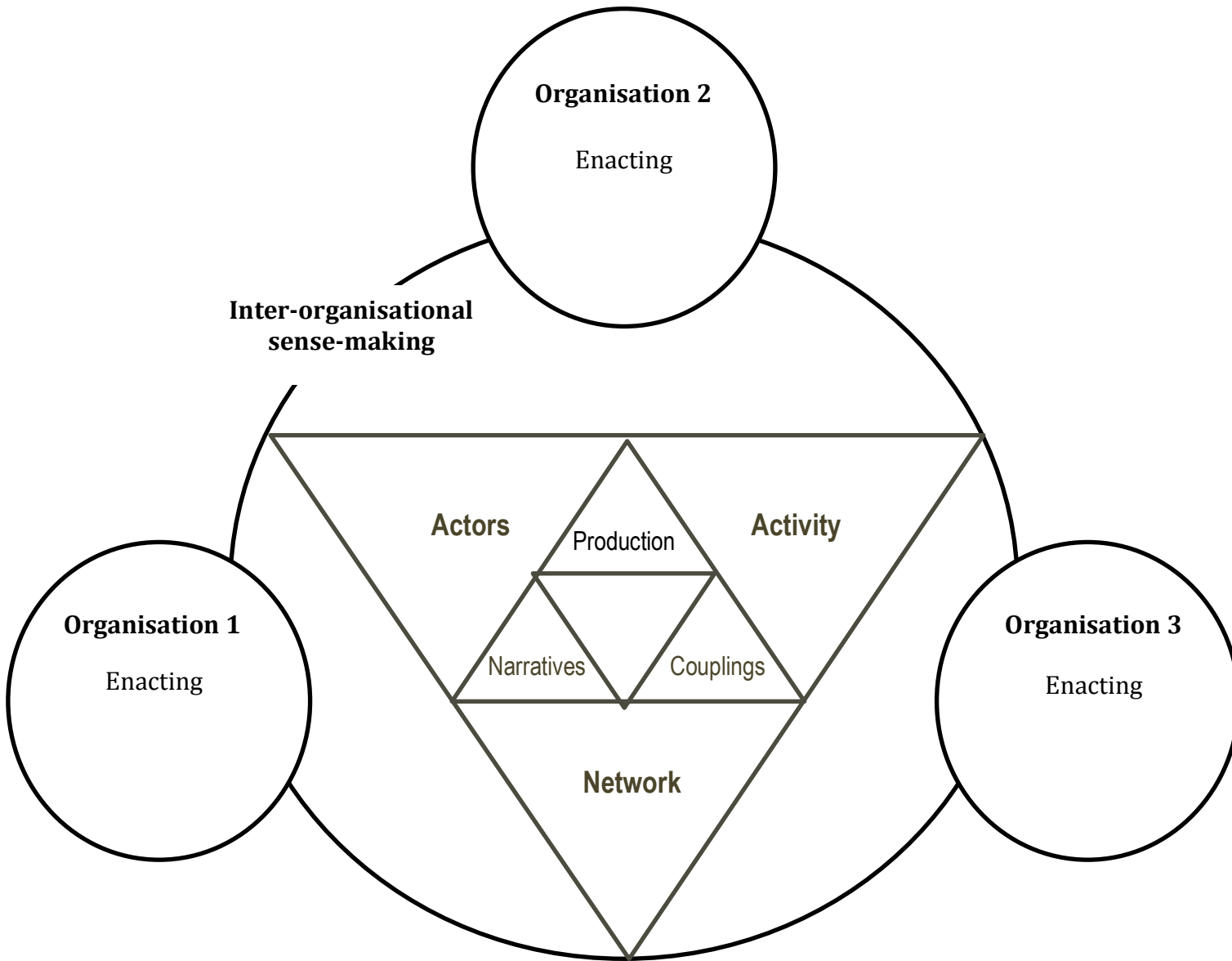


Figure 2: A balanced value network



Tabel 1: Staging an experience for relevant partners and customers

Business opportunity	Customer segments			
	A	B	C	D
Theme #1	Experience flow 1, 2, 3, 4	Experience flow 2, 3, 5	Experience flow 1, 2, 4, 6	No experience flow
Theme #2	Experience flow 1, 2, 4	No experience flow	Experience flow 3, 4, 6	Experience flow 2, 3, 5, 6
...				

0033

MANAGEMENT TOOLS FOR THE NEW WORKPLACE

LUKAS MICHEL

Title: (No more than eight words in length)

Management Tools for the New Workplace

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Room to move, agility, resilience, speed, management, management design, management diagnostic, learning

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

This presentation illustrates five business cases to share the experience from using the Performance Pyramid as a model, a diagnostic, and approach for leaders to initiate the transformation of their organizations into the knowledge era. This is why this matters:

- (1) High dynamics, complexity, uncertainty, and ambiguity characterize the turbulent operating environment for most businesses. Simultaneously, Generation Y type people with dominant knowledge work require a different workplace and management approach to be effective: «... *control and command are no more sufficient in a competitive environment where creativity, initiative, and collaboration of employees are important for business*». Simons (1995) Moreover, current change processes are slow and disruptive, traditional strategy implementation has proven inflexible, and risk management has not prevented organizations from failing altogether. «Many [of our tools] have lost their effectiveness, and some are falling by the wayside.» Hope & Player (2012). The new era needs different tools.
- (2) Traditional change assumes a burning platform. In the contrary, the transformation from industrial type management towards an approach that meets the needs of people in the knowledge era compares to the 'hot water and frog' analogy: the water heats up and the frog slowly dies. Over time, 'viruses' creep into organizations, unwillingly and unknowingly, limiting the potential and creativity of people, essentially hampering innovation and growth. Installing a new set of managerial principles is a transformation.
- (3) For any business leader, conducting conversations about soft issues such as new management models, culture, and leadership are difficult to manage and often a risky adventure. Without facts, such conversations often feel like 'eating soup with chopsticks' -lots of action with little result. Any transformation requires clarity on the destination and the starting point.

The good news is that both, management in the knowledge era and the capabilities to cope with turbulent times, require the same model and approach to get there: removing the viruses that keep the talent from using its full potential. This requires new tools for the new workplace: the Performance Pyramid, ability to act, and observation points to support the conversation.

Design/methodology/approach (mandatory):

Five business cases from organizations spanning a variety of industries with different sizes, at different life-cycle stages, and with different challenges illustrate the use of the Performance Pyramid as a tool to initiate the conversation about the managerial ability to act as a means to better cope with a turbulent environment.

The Performance Pyramid is a natural extension of the Performance Triangle (Michel, 2013), explaining managerial competency as the ability to act (Anzengruber, 2013). The pyramid with its four triangular faces relates speed, agility, and resilience to the managerial **ability to act**. Decision-making, at the bottom of the pyramid, adds the control perspective to the question of 'how do we manage our organization'.

Speed in organizations, representing the center of the triangles, results from people applying the Inner Game –the practices that transfer control to the learners: «*The greater the external challenges accepted by a company, team or individual, the more important it is that there is minimum interference occurring from within*». (Gallwey, 2000) Higher **agility** requires a culture with shared context, interactive leadership, and diagnostic decision-making systems – the corners of the triangles. Purpose, collaboration, and relationships establish a learning environment based on connectivity, representing the sides of the triangles. The strong bonding among people is a prerequisite for the **resilience** of an organization.

Over the last 10 years, we have used the AgilityINsights Diagnostic™ (AgilityINsights, 2014) as a tool to provide leadership teams with insights into where they stand with the transformation of their organizations into the knowledge era. The diagnostic provides up to 120 observations points related to the Performance Pyramid and serves as the conversation tool for Diagnostic Mentoring™ (AgilityINsights, 2014) -the approach that takes leadership teams on a self-discovery journey where they remain in control of the interpretation, the decision on how to get from here to there, and the transformation itself. Five business cases illustrate (1) the application of the Performance Pyramid as a model to create a higher ability to act and cope with turbulent times, (2) the use of a diagnostic tool to support leadership teams in the conversation about the right intervention points, and (3) how new forms of learning initiate the transformation.

Literature

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Findings (mandatory):

The five business cases share three findings: (1) Tips do not work. Management teams learn primarily through their own experiences, (2) it is a transformation. The change towards a people-centric approach to management fundamentally changes behaviors and capabilities, (3) It takes a new form of learning to 'work on the system'—rather than to continue with more 'leadership development'.

Research limitations/implications (if applicable):

The five business cases illustrate a small sample of organizations. With a higher number of participating firms, future quantitative research is required to generalize the findings.

Practical implications (if applicable):

The indications from over 100 organizations worldwide confirm that the new environment requires new tools.

Social implications (if applicable):

Write here...

Originality/value (mandatory):

This work is at a very early stage of using systematic approaches to understand what management teams can do to cope with an uncertain future. Selected business cases and early indications from the results of using the diagnostic tool guide next steps.

0034

AN EMPIRICAL EVALUATION OF A SUSTAINABLE STRATEGY MODEL

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An empirical evaluation of a sustainable strategy model

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En empirical evaluation of a sustainable strategy model

Abstract

Purpose: To evaluate a (sustainable) strategy model explaining what organizations should focus on in their strategy work, under which circumstances the strategy is implemented, and how this is related to performance.

Methodology: The partial least squares technique for structural equation modelling using survey data.

Findings: We find support for the proposed model since it fits the data well.

Keywords: Strategy, competitive advantage, strategy process, execution, performance culture, productivity, Flexibility, innovation

Article Classification: Empirical paper

Introduction

Through time, there have been many different perspectives on strategy, and it has been popular to categorise them (Chaffee, 1985; Mintzberg and Lampel, 1999; Drejer and Printz, 2004; Whittington, 2001). All of these different perspectives contribute to the understanding of strategy. Many of the opposite positions have emerged on the basis of astonishment at or critique of existing theories and viewpoints, as for example deliberate vs. emergent strategies or content vs. process strategies (Mintzberg and Waters 1985; Chakravarthy and Doz, 1992). Each different strategy perspective contributes to explain the complex phenomenon of strategy, and most perspectives include identifiable strategy practices (for example Porter, 1980) and a view on strategy practitioners (for example Whittington, 2001). These (different) assumptions are important for understanding the making of strategy, and they will facilitate an understanding of the background of the theory and the practices developed, what the different practices can be used for and how they can be used. In practice a strategy process is making use of more than one strategy practice and mostly these different practices (Friis and Koch, 2010) are from different strategy perspectives.

In a previous paper we have combined various approaches to strategy in order to create a solid and causal (sustainable) strategy model there is able to explain what organizations is (or should be) focused on in their strategy work and how this is related to their performance.

The focus of this paper is to validate the model on a sample collected among 713 responses from Danish companies to a questionnaire covering all aspects of the proposed model.

The strategy model

With point of departure in the traditional strategy approach (Ansoff, 1965; Porter, 1985), the dynamic capability approach (Teece et al., 1997; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2003), the strategy process approach (Whittington, 2001) and the SAP approach (Whittington, 2006), we are addressing the challenges of strategizing in organizations. These approaches are used to address the topic of actors at different levels in organizations strategizing: top-managers, middle managers and employees, and what kind of firm level resources, routines and capabilities they draw upon, and are there a connection between the involvement of different levels in strategizing and the performance of the organization.

We have identified five strategy areas an organization needs to focus on when strategizing. The areas are related to two veins of strategy research: the content of the strategy focusing on productivity, flexibility and innovation (Drejer and Printz, 2004), and the process planning (Chakravarthy and Lorange, 1991) and implementing the strategy where the focus is on execution (Hrebiniak, 2006; Joyce. et al., 2003) and the performance culture (Joyce. et al., 2003) in which the process is going on. So in general it can be argued that strategizing is about having strategy content with goals or some kind of directions and a process in which the strategy is created and executed.

The content of the strategy

We argue that there are three (generic) strategy areas related to the strategy content an organization has to take into consideration, and that are productivity, flexibility and innovation. They have all been the subject of research and investigations e.g. in explaining the necessary strategic focus regarding the evolution of companies (De Wit and Meyer, 2010). In the light of the need for more efficient use of the resources, higher complexity in the environment and the speed of changes in technology and customer preferences companies today must be aware of productivity, flexibility

and innovation at the same time and find the most value creating balance between these three subjects. (Drejer and Printz, 2004, Bolwijn and Kumpe, 1990).

Productivity is about the organisations focus on enhancing the existing resources and concentrate mostly of the strategically energy on quality and continuously improvements. The area is traditionally seen in organisations with stable environments with not that many changes in technology and customer preferences, and with few inventions and new innovations. Nevertheless a lot of organisations in every kind of industries have for a long time had this inside-out view (De Wit and Meyer, 2010) focusing on optimising the supply chain through lean management or other kind of productivity improving tools (Christopher, 2011). A major inspiration source in this area has been the EFQM Excellence model, which has a holistic perspective on organization development, but still in the newest version has focused on quality and productivity (EFQM, 2013).

Flexibility is about the market. The focus of shifts in customer preferences have for many organisations been the most important issue regarding strategy. Close contacts to main customers and systematically handling of complaints or appraisal of the products have been the main driver for changes. The strategy in those organisations is focusing on building reliable systems intercepting signals from former, present and future customers. In strategy terms it is also referred to as relational marketing doing customer relationship management (Clegg et al., 2011). It is an outside-in perspective (De Wit and Meyer, 2010) trying to adapt to customers changing preferences. Many traditional market oriented researchers focus on the importance of listen to the customer's needs and expectations and have argued that the only way to success is to follow the market and customer (Porter, 1980; De Wit and Meyer, 2010). Later this has been moderated and evolved so the customer now must be a part of the way companies work with every kind of development.

Innovation is here defined as (more) radical changes that drastically influence the value creation process. Fast changing industries, many new technologically inventions, fast changing customer preferences or heavy rivalry among competitors are all circumstances leading to a need for focus on innovation (Abell, 1999). A lot of effort has been put into this area through focusing on improving organisations ability to be more innovative and in concepts like Blue Ocean Strategy (Kim and Mauborgne, 2004) etc. It is of great importance for organisations to be able to renew their product portfolio not just once, but constantly be aware of the innovation possibilities regarding the market,

the technology and/or the competitors. To avoid declining and promote development, working with strategy must include an evaluation of the level of the products maturity and their risk of being obsolete together with focus on keeping the ability to change high through the performance culture in the organization.

The strategy process

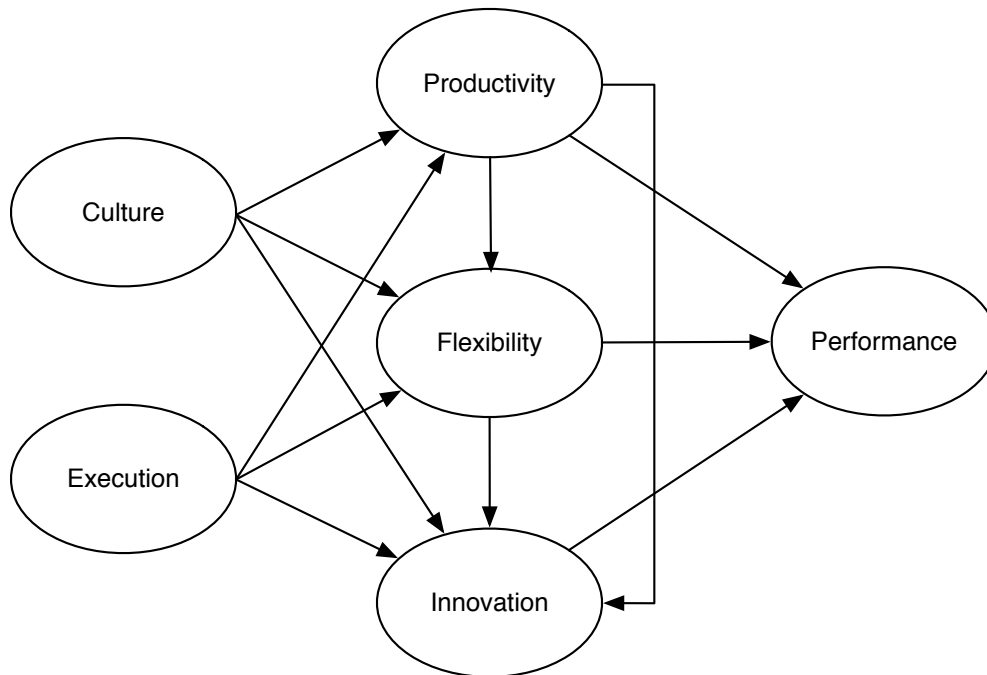
When we look at the strategy process we argue that it can be related to two areas: execution and performance culture.

Execution is related to the firm's ability to discuss growth possibilities and development trends and how involved different parties in the organization are in the strategy process and in fulfilling the strategy through a high communication level and by maintaining and develop the necessary management and employee competencies regarding executing the strategy (Hrebiniak, 2006; Joyce et al. 2003).

Performance culture is about achieving a committed and engaged organisation determined to get strategically results. It requires that the employees can relate to the demands and expectations they meet and a solid relationship between the goals and the communicated strategy. It is important that both the goals and the strategy are being adjusted continuously to fit with the changing environment and new strategically challenges (Joyce et al., 2003).

So working with strategy the focus must be on both the content of the strategy termed in productivity, flexibility and innovation, and on execution of the strategy, the actual implementing activities and how the different actors are involved in the process. This is shown in figure 1 in the conceptualized version of the sustainable strategy model.

Figure 1 – The sustainable strategy model



The interconnectedness is visible, that the strategy content is depending upon the strategy process and vice versa. Further, the three circles in the middle is the strategy content and generically is about productivity, flexibility and innovation. Strategy process is about the performance culture and executing the strategy. The five areas are all important in the strategy work but are in much strategy literature seen as separated areas or as counterpoints. Here we argue that the success of the strategy is depending upon the interplay between the five areas presented leading to performance.

In the following the proposed model will be tested based on a sample of 713 responses from Danish companies to a questionnaire covering all aspects of the proposed model.

Sampling

Normally questionnaires are distributed to specific respondents in organizations as for example the CEOs or the middle managers. Especially when the research topic is strategy this is the case for how it is normally done. Here we include the employees as respondents. This means that we have asked CEOs, middle managers and employees about strategy.

Second, the performance is defined by the respondents in the organizations, and not by the identifying the organizations on the beforehand with over above average performance compared to the industry.

Based on the proposed model a questionnaire was formulated and pilot tested among 70 middle managers and employees and minor adjustments were done in regard to the formulation of the questions. All in all 25 questions were used and form for the model previously presented.

The questionnaire was distributed electronically to respondents in many different companies and the respondents were encouraged to distribute the questionnaire to other respondents in their organization.

Methodology

The sustainable strategy model is estimated with the statistical technique Partial Least Squares (PLS). PLS has been chosen since the focus is on predicting member satisfaction and loyalty and PLS is a technique well suited for this purpose (Jöreskog and Wold 1982). Furthermore it is not sensitive to skewed distributions and multicollinearity as other structural equation modeling techniques tend to be (Cassel, Hackl et al. 1999; Kristensen and Eskildsen 2010). The PLS model consists of three parts: inner relations, outer relations, and weight relations (Wold 1980; Fornell and Cha 1994). The inner relations depict the relations between the latent variables as shown in (1).

$$(1) \quad \boldsymbol{\eta} = \mathbf{B}\boldsymbol{\eta} + \boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta}$$

In the inner relations $\boldsymbol{\eta}$ is a vector of the latent endogenous variables and \mathbf{B} the corresponding coefficient matrix (Fornell and Cha 1994). $\boldsymbol{\xi}$ is a vector of the latent exogenous variables, $\boldsymbol{\Gamma}$ the corresponding coefficient matrix and finally an error term, $\boldsymbol{\zeta}$, is included. The second part of the model is the outer relations (Fornell and Cha 1994). This part of the model define the relationship between the latent variables and the manifest variables and in contrast to LISREL these can both be reflective and formative by nature (Jöreskog and Wold 1982). Since the analysis performed here is based on reflective outer relations only this situation is mentioned in the following. The general formula for reflective outer relations is shown in (2).

$$(2) \quad \begin{aligned} \mathbf{y} &= \boldsymbol{\Lambda}_y \boldsymbol{\eta} + \boldsymbol{\varepsilon}_y \\ \mathbf{x} &= \boldsymbol{\Lambda}_x \boldsymbol{\xi} + \boldsymbol{\varepsilon}_x \end{aligned}$$

Here \mathbf{y} is a vector of the observed indicators of $\boldsymbol{\eta}$ and \mathbf{x} is a vector of the observed indicators of $\boldsymbol{\xi}$. $\boldsymbol{\Lambda}_y$ and $\boldsymbol{\Lambda}_x$ are matrices that contain the λ_i coefficients which link the latent and the manifest variables together and $\boldsymbol{\varepsilon}_x$ and $\boldsymbol{\varepsilon}_y$ are the error of measurement for \mathbf{x} and \mathbf{y} , respectively (Fornell and Cha 1994). The weight relations are the final part of the PLS model. In PLS each case value of the latent variables can be estimated through the weight relations shown in (3) as linear aggregates of their empirical indicators.

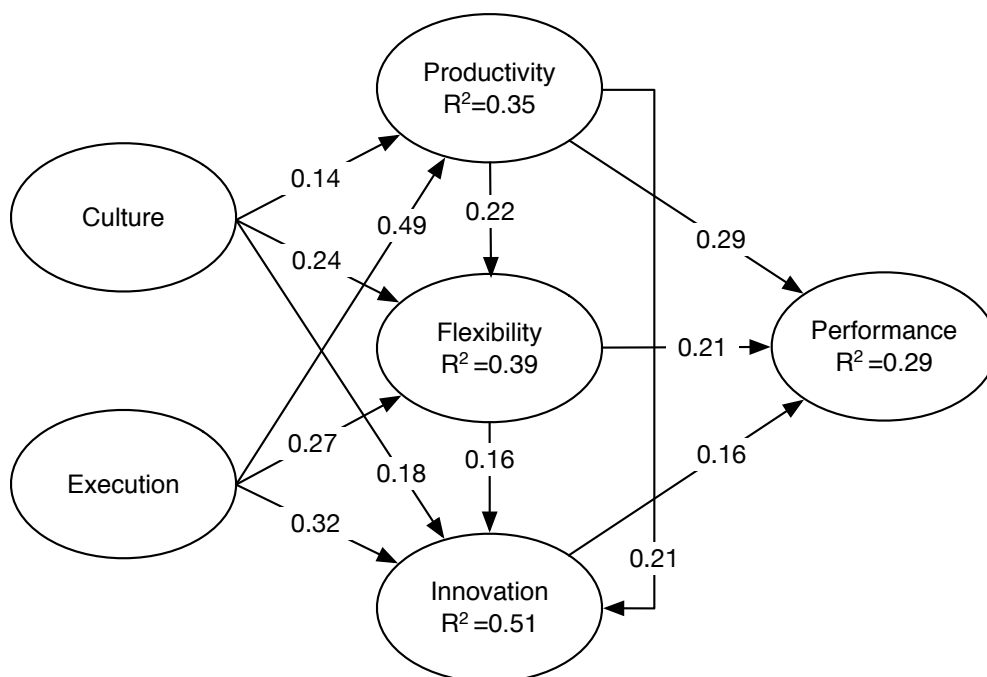
$$(3) \quad \begin{aligned} \hat{\boldsymbol{\eta}} &= \boldsymbol{\omega}_\eta \mathbf{y} \\ \hat{\boldsymbol{\xi}} &= \boldsymbol{\omega}_\xi \mathbf{x} \end{aligned}$$

In the following the results of the analyses are reported.

Empirical results

The results from the PLS analysis are shown in figure 2 and table 1 below. All the path coefficients shown in figure 2 are significant and the model appears to fit the data well.

Figur 2: Empirical model



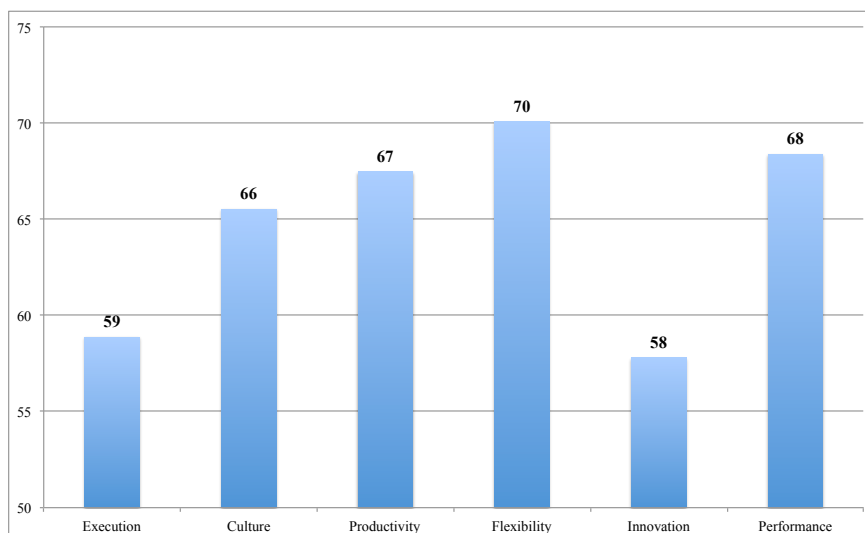
As table 2 indicates the latent variables possess sufficient internal reliability given the size of the Rho's. Furthermore the discriminant validity of the model is satisfactory since the average variance extracted (AVE) in all instances are higher than the squared correlations among the latent variables (Fornell and Larcker 1981).

Table 2: Model results

	R2	AVE	Rho
Execution		0.598	0.899
Culture		0.595	0.817
Productivity	0.345	0.672	0.860
Flexibility	0.392	0.666	0.857
Innovation	0.509	0.578	0.905
Performance	0.294	0.651	0.849
Goodness of fit	0.487		

The R^2 values are fairly satisfactory resulting in an overall fit of the model of 0.487, which in this context is also satisfactory. The sample consists of three distinctly different organizational groups and it is reasonable to assume that the R^2 values would have been higher had the three groups been analyzed individually. This would also have had an effect on the overall goodness of fit of the model.

Figure 3: Index scores



In figure 3 the index scores of the seven latent variables are shown rescaled to 0-100. From this figure it is evident that the respondent believe that “Execution” and “Innovation” are the areas in which Danish companies are facing the largest challenges.

Discussion and concluding remarks

Previous strategy research is pointing at different issues for succeeding with strategy. Hrebiniak is focusing on obstacles for strategy implementation (Hrebiniak, 2006). Joyce et al. (2003) have identified some primary and secondary factors of importance for an organizations strategy. This indicates that there are some areas there are more important for success than others. Two of the most important areas are performance culture and sound execution. They argue that innovation is less important, if you have the opportunity to make mergers. By including innovation as part of the strategy areas it indicates that it is something the organization needs to take serious in the strategy work and that it will have impact of the performance especially in the long run. Focus has mainly been on the productivity and the flexibility. Only in recent years innovation has been integrated as a vital part of the strategy work.

A lot of effort has been made to increase the productivity and chasing customers – mostly the well-known customers on the existing market. Not many market expansions or launching new products have been in focus. So strategically organizations have to balance three strategic challenges in order to stay competitive and that is to stay productive, be flexible to the market and to be innovative. This is a very challenging task, and therefore it is important to get knowledge about how organizations address this challenge.

The model tested in this paper shows that the five strategy areas are interrelated in a complex causal pattern ultimately affecting performance. The test was based on a sample consisting of asked both CEOs, middle managers and employees. Future research needs to look into if these three groups have the same view of the strategic landscape and whether or not there exists distinctly different clusters across traditional demographic characteristics. Finally it would be interesting to compare the results reported here with a similar study conducted in a different culture setting.

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0035

INCREASING FLEXIBILITY AND
PERFORMANCE ORIENTATION WITH
RELATIVE-PERFORMANCE-
CONTRACTING

FRANZ WIRNSPERGER

INCREASING FLEXIBILITY AND PERFORMANCE ORIENTATION WITH RELATIVE-PERFORMANCE-CONTRACTING

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ABSTRACT

Increasing uncertainty and volatility in the environment lead to the requirement of management control systems with higher flexibility and predictability. Traditional management control systems based on a “command and control” paradigm are increasingly ineffective to balance the tension between flexibility and predictability demands and use according to recent research compensating processes to achieve the required flexibility (Frow, Marginson, & Ogden, 2010). Practise is leading science with the development of new Performance Management practices which use more frequently relative targets and relative measurement as core elements of a control system (e.g. Advanced Budgeting, Beyond Budgeting). Due to the complexity of Management Control Systems (MCS), comprehensive research from MCS as a total package perspective is very difficult and new approaches therefore still lack scientific support. As a consequence, there is an acute need for research on how organizations have adopted operational procedures to deal with increasing uncertainty (Otley, 2012). Therefore, main focus on this paper is the question, how relative targets and measurements can lead to performance enhancing effects within a MCS. Based on a literature review and building on the MCS definition of R. Simons (Simons, 1995) and a longitudinal case study as illustration, the paper develops and describes the effects of the Relative Performance Contracting (RPC) concept, a concept for the design of management control elements utilizing a relative design pattern which is leading to an alternative way of performance contracting. The paper provides a theoretical explanation for how the RPC concept simultaneously creates higher flexibility and performance orientation by building on grounded contractual-, organizational- and behavioural theories. The concept also builds on the most recent status of research with respect to the effects of balanced use of MCS and the related creation of dynamic tensions (Mundy, 2010) and provides a theoretical extension of existing research findings about how to create a control context which furthers the creations of conditions for a balanced use of MCS.

JEL Classification: M40

Keywords: relative performance contracting, performance measurement systems, dynamic tensions, management control system, beyond budgeting

St. Gallen, April 2013

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LIST OF ABBREVIATIONS

Approx.	Approximately
BBRT	Beyond Budgeting Round Table
EBIT	Earnings before tax and interest
e.g.	Exempli gratia
Etc.	Etcetera
GST	Goal-Setting Theory
MCS	Management Control System
MO	Market Organization
p.	Page
PDCA	Plan, Do, Check and Act
PMS	Performance Management System
RoS	Return on Sales
RPC	Relative Performance Contracting
SDT	Self-Determination Theory

1. Challenges in today's performance management systems

Due to the increasing volatility and unpredictability in the external environment of businesses, new challenges arise in the steering and control of a company. This is particularly reflected in the growing need for flexibility and adaptability (Simons, 1995). Traditional management control systems (MCS)¹ are strongly influenced from the “command and control” paradigm which is primarily based on Tayloristic organisational principles² and the budgetary control philosophy³. However, as a consequence of the complexities and uncertainties companies encounter nowadays, MCS based on the command and control paradigm are pushed to their limits. Very often, increasing efforts for planning and steering do not result in corresponding improvements of management control and are not contributing to the achievement of a higher degree of flexibility.

In this regard, a fundamental reorientation is suggested by the representatives of the Beyond Budgeting model (e.g. Hope & Fraser, 2003a) who are organized within the Beyond Budgeting Round Table (BBRT)⁴. A key difference of the Beyond Budgeting Models control design compared to a “traditional” MCS with the classic budget as the main control instrument is the relative design of control elements implemented through relative targets and relative measurements as well as a flexible form of resource allocation. In the context with compensation systems this core design principle of the Beyond Budgeting Model is also referred to as a “Relative Improvement Contract” (Hope & Fraser, 2003b, p. 109). While the radical approach of the Beyond Budgeting Model is met in general still with scepticism, the increasing volatility and uncertainty in the environment however is – supported by the activity of consulting companies - leading in practice to the appearance of pragmatic approaches for a more flexible planning and steering of organizations (e.g. Greiner, 2005).

Science is lacking behind this trend in practice, which is evidenced by an admitted lack of research regarding the question of how organisations can design their MCS to cope with the challenge of increasing volatility and low predictability (Otley, 2012, p. 254). In the same context Otley also cites the relative targeting and measurement principle introduced by the Beyond Budgeting Model as an interesting, and “the only one attempt to address this issue in the management control literature” (Otley, 2012, p.256).

The paper builds on a broad definition of an MCS using R. Simons' definition who defines an MCS as “formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities” (Simons, 1995). The core research theme which Simon triggered with his seminal research work summarized in his book “The Levers of Control (1995)” is focused on the issue of how a MCS has to be structured to enable innovation enhancing flexibility while acting at the same time constraining to avoid the risks of value destruction or misallocations of resources. Even though control and flexibility are often seen as conflicting dimensions, Simons describes how the simultaneous existence and use of positive/enabling and negative/constraining control systems is creating positive, value creating dynamic tensions and thereby enabling an effective implementation of strategies in an organization. While several

¹ Also referred to as Performance Management Systems (PMS)

² Based on the work of F.W. Taylor (1856-1915), one of the founder of the scientific management discipline

³ Based on O.J. McKinsey (1889 – 1937)

⁴ A research and membership organization with the goal to spread the Beyond Budgeting Model

empirical studies have further investigated the phenomenon of dynamic tensions and identified the balanced use of MCS as a key, there is still gaps in the detailed understanding of what drives a balanced use and in particular whether a specific MCS design pattern can be identified which promote the creation of dynamic tensions.

Some researcher have meanwhile also started to research aspects of the Beyond Budgeting Model (Bourmistrov & Kaarboe, 2013; Ostergren & Stensaker, 2010). The effects of the relative performance contracting however, which is often described as the core design pattern and heart of the beyond budgeting model (Pfläging, 2006, S32), remains scientifically un-researched and from a theoretical standpoint very poorly documented. Empirical evidence on this relative control design pattern is reduced to only a few case studies which lack theoretical foundation and scientific reliability.

2. Objectives and research question

Under the circumstances mentioned above, the following research question can be deduced: How can relative targets and relative measurements – the key elements of the described relative performance contracting concept - lead to performance enhancing effects within an MCS?

Taking system theory into account and the view of MCS as a package operating in a cybernetic loop, the research question is further structured into the following four sub-question around the classical PDCA Cycle⁵: How can relative targets lead to a performance enhancing effect within the targeting and planning process of an organisation (PLAN)? How can relative MCS design support a more flexible decision making about allocation of resources thus improve the effectiveness of implementation of plans (DO)? How can a relative measurement system improve control within a MCS (CHECK)? And finally, how can a relative management control design pattern enhance the system condition for creation of learning loops (ACT)?

Further question arise regarding the effects of the relative management control design pattern on the interaction of the individual management control system. Can the relative control design pattern help to create positive dynamic tensions in the entire MCS and thus enhance the ability of the organization to promote at the same time flexibility and predictability and thereby performance within an organisation? Most importantly, can this design pattern and its effects be described by and deduced from existing scientifically grounded contractual, organizational or behavioural theories? And finally, can the relative MCS design pattern be connected and integrated into existing findings of the MCS Literature building on the Simon's Lever of Control Concept and the findings around the effects of a balanced use of MCS creating positive dynamic tensions?

In response to this research question, the target of this paper is to develop a theoretically sound description and explanation for the functioning of a relative "MCS-design pattern", in the following referred to as the Relative Performance Contracting (RPC) concept. Based on a qualitative research approach, a triangulation is conducted by combining a long term case study, a literature review and a theoretical deduction from well-known theories to deduct a concept for the design of a MCS which is characterized by a relative control design pattern. Herewith, a theoretical contribution to the management control literature will be made by building on the

⁵ Plan, Do, Check, Act cycle approach from Dr. W. Edward Deming

MCS literature stream around the effects of different use of controls and adding new theoretical insights into how to create positive dynamic tensions within a MCS.

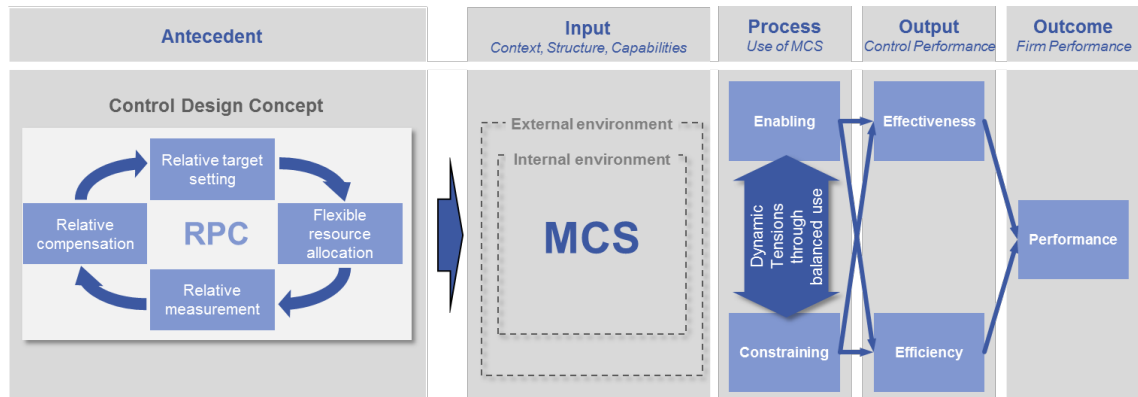


Figure 1: Overview Research Model

Source: own visualisation

3. Current state of research

In his paper “Performance Management under conditions of uncertainty: some valedictory reflections“ (Otley, 2012) Otley defines the topic of „Control under conditions of uncertainty“ as one of the most important research areas in MCS research. He comes to the conclusion that the increased uncertainty leads to a new awareness on our limited capabilities to control everything. He identifies the method of relative performance measurement, which resulted from the beyond budgeting movement, as an interesting new idea. Compared to the wide spread classic budgeting process with fixed targets, the new approach focuses more on the progress of the horizontal value creation process and, interestingly, adjusts targets in hindsight, based on changed context conditions. However, this raises the question “how a cybernetic loop, which is a crucial part of every control system, can work without any clear [fixed] targets?” (Otley, 2012, p. 260).

A more and more important direction in the management accounting literature is the discipline of behavioural accounting. This area is very multidisciplinary and explains human behaviour not only from an economical perspective. Instead, it takes also sociological and psychological approaches into account. With this new perspective, the concept of the unlimited rationality of actors and the idea of strictly self-interest affected behaviour is surmounted.

In regard of the classical budget, there has been a lot of research in the area of behavioural management accounting due to its high importance and relevance in practice. One of the most important publications which is associated with the foundation of the research streams of behavioural accounting is the work from Chris Argyris with the title “The impact of budget on people“ (1952). Another important contribution comes from Schiff and Lewins with their paper “The Impact of People on Budgets“ (1970). Further important cornerstones are the papers from Hofstede (1968) with the title „The Game of Budget Control“ and Anthony Hopwoods contribution regarding the dysfunctional behaviour in connection with a rigid use of budget targets (Hopwood, 1972).

In the beginning of 2000, the article “Beyond Budgeting: How Managers Can Break Free from the Annual Performance Trap” (Hope & Fraser, 2003a) lead to a new discussion on the classic

instruments of the budget. The beyond budgeting representative from the BBRT evaluate the problems of dysfunctional behaviour triggered by the classic budget similar as the representatives of the behavioural accounting approach. Both see the dysfunctional behaviour as a symptom of a fundamentally flawed economic thinking pattern of superiority of a “command and control” organizational control approach. Still, the BBRT goes a bit further with its radical recommendation to abolish the budget completely and describes, based on a continuous improvement thinking, a new management model characterized by 12 generic principles. However the scientific exploration of the Beyond Budgeting Model is still in a very early stage. Generally speaking, the Beyond Budgeting Model is still lacking good empirical evidence and theoretical foundation and therefore does not receive serious support in the scientific community. The classic budget therefore probably remains the most used management control system in practice, even though it is at the same time probably the most criticised instrument. Recent research on this phenomenon (Libby & Murray Lindsay, 2010) has shown that many companies that are using the budget have over time changed the way they use the budget and have learned to compensate the negative aspects of the formal budgetary approach with informal control mechanisms (Frow, Marginson, & Ogden, 2005, 2010).

This issue of how to use management control systems is a further relevant literature stream for this paper. The most prominent and known research contribution in this respect comes from R. Simons. In his book “Levers of Control” (1995), he summarized 10 years of research work and defines MCS as a „formal, information-based procedures, manager use to maintain or alter patterns in organizational activities“. He establishes a new control theory, in which the conflicting demands of “freedom and constraint”, “empowerment and accountability”, “top-down direction and bottom-up creativity” and “experimentation and efficiency” must be balanced. The challenge of balancing these areas are the core task of a good MCS. Through a balanced and simultaneous use of positive/enabling and negative/constraining control systems, dynamic tension are created, leading to performance increases and thereby successfully guide the implementation of strategy within organizations.

Several empirical studies have used this framework to research how organizations use their MCS to simultaneously encourage innovation and learning and exerting control over how goals are achieved (e.g. Bisbe & Otley, 2004; Marginson, 2002; Tuomela, 2005). Also, the phenomena of dynamic tension has moved in the researcher scope of interest. There is an increased focus on empirical studies with evidence that, based on existing interrelation between the levers, the increased use of one lever enhances the benefit from the increasing use of the other levers (Widener, 2007). Similarly, Henri (2006) has empirically demonstrated that the dynamic tensions arising from the interrelation between the lever of control facilitate the development of organizational capabilities such as innovativeness, organizational learning, entrepreneurship, and market orientation and thereby contribute together to organizational performance (Henri, 2006). While this study identifies the balanced use of MCS as a driving force for the creation of dynamic tensions, it does not explore how organizations can achieve a balanced use of MCS. This topic is addressed by a case study of J. Mundy (2010), which derives “factors – internal consistency, logical progression, historical tendency, dominance, suppression – that influence an organisation’s capacity to balance controlling and enabling uses of MCS” (Mundy, 2010). It further concludes that “the way in which the interactive lever of control combines the other

levers and controls constitutes a critical differentiator for organisations by enabling them to develop and exploit unique organizational capabilities” (Mundy, 2010). This paper builds on the MCS definition from R. Simons and the most recent status of research on the creation of dynamic tensions through a balanced use of MCS and extends it, by presenting a potential concept for the design of a MCS (the RPC concept) which supports the creation of a balanced-use of MCS.

4. Research method

In a qualitative research approach, a new central design concept for an MCS is developed by the reflection of observed phenomena and causal relationships from a case study and their systematic interpretation on the basis of existing theories with the help of a multi-level triangulation. In addition the effects of the concept will be described by deducting propositions from referencing observation with most recent research findings, building on the LoC Framework of Simons (1995) and the most recent findings about the creation of condition for a balanced use of MCS and corresponding dynamic tensions from J. Mundy (2010). The reflection is made on the foundation of observations of the change of the MCS in an multinational industrial company called FastCo over a period of 10 years. Here, the fact is exploited that the author was a member of the Executive Management Team of the case study company. As a consequence, he had access to all the information of the company and was able to keep close track of all events, causal relationships and changes over the entire observation period. Due to this unique constellation, there is the risk of a bias in the interpretation of the case study. On the other hand, there is not very often a chance like that to have such a close look and proximity of the observer. This will open new possibilities to new solid and sound findings never researched before. The scientific objective of this research project is to develop prescriptive design knowledge while the case study serves for illustration purposes.

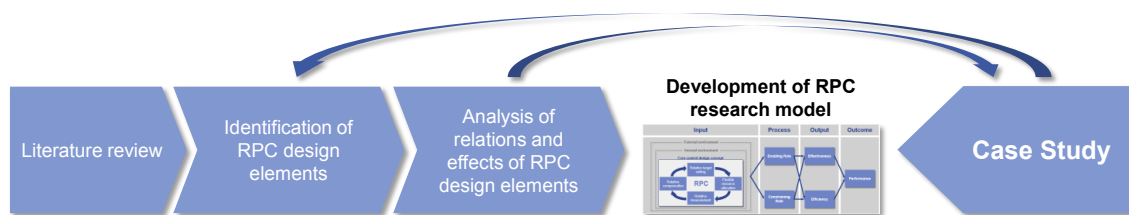


Figure 2: Research Design

Source: own visualisation

5. Theoretical foundation

Through the connection and grounding of the effects of the RPC concept with scientifically accepted and empirically proven theories a solid theoretical model for the RPC will be established, based on which also further empirical research studies or experimental studies can be conducted.

In the course of the literature research for the research project the following theories have been identified as highly relevant.

5.1. System Theory

The System theory forms a fundamental basis for the theoretical grounding of the effects of the RPC concept. A System is defined as a structured sum of elements, between which relationships can be established (Ulrich 1970). Based on the System Theory the structures of an organization can be explained and analyzed as systems which is used to manage complexity by means of a steering loops. Targets are compared with actual achievements and based on the analysis of deviations either measures are corrected (single loop learnings) or targets are adjusted (double loop learnings). The System Theory therefore describes the mechanisms of a self-regulating steering loop for the purpose of management of complexity respectively reduction of complexity.

The effect of the design elements of the RPC concept, (1) relative targets, (2) delegation of responsibility for execution of targets, (3) relative measurement and (4) link of compensation with relative targets is closely connected with the complexity reduction effects described by the System Theory. Through delegating the responsibility for execution down into the organization, the need for intervention into the steering system is essentially reduced to exception. The effort for definition of corrective measures is thereby significantly reduced. With the relative targets and measurement and the linkage of the relative targets to the compensation system the steering loop with respect to taking measures and being held accountable for those measures is being closed in a simple and automatic way. Due to the relative design (relative to context), targets are automatically adjusted as context factors change and therefore are less difficult / complex to maintain and need less steering effort. The System Theory serves as basis for the explanation of this described effects.

5.2. Principal-Agent-Theory

The Principal-Agent-Theory has its origin in the new institutional economics and concerns the relationship between the principal (e.g. the owner) on the one side and the agent (e.g. the management) on the other side. Based on the assumption of a self-interest centered behavior of the agent and incomplete information (i.e. general information advantage for the agent) the principal-agent problem describes a situation where the agent is not acting in the best interest of the principal and therefore controls need to be implemented to mitigate the principal-agent problem which produce in turn the so called “agency-costs”.

The RPC concept proposes a relative design of targets and measurement, ideally benchmarking and measuring against market and competition development which are usually the ultimate perspectives of the agent. This introduction of the external perspective therefore leads to higher level of congruency of agent and principal perspective. Based on the Principal-Agent Theory advantages in terms of control effort can therefore be deducted since in such a context of congruent perspectives/interests a self-interest centered behavior of the agent would also serve the best interest of the principal. In addition it can be argued, that relative targets and measurements are generally providing more information richness since they include input and output factors and also take (uncontrollable) external context factors into consideration. Based on the higher information-richness disadvantage of the agent can be reduced or eliminated again triggering positive effects based on the Principal-Agent Theory.

5.3. Goal Setting Theory (GST)

Basic premise of the GST is that targets are directly steering the behavior of people by creating tensions which are being reduced through the efforts put in to achieve the targets, thereby creating motivation. The Theory describes how targets can influence performance by giving direction, influencing intensity and endurance of activities and by stimulating the search for problems solving strategies. Also increasing target difficulty and clarity (up to a certain maximum) promote higher performance. Further a high identification produces even more positive effects on performance (Locke & Latham, 2002). Moderating effects such as commitment, importance of the targets, self-confidence, feedback and complexity of the task impact the degree of performance improvement which again influences the satisfaction level and the readiness to take on even higher targets. A fundamental line of argumentation using GST builds again on the relative targets. The focus on relative numbers and the consideration of (non-controllable) context factors leads to higher levels of acceptance and identification with the targets which in turn leads according to the theory to a positive influence on motivation (see also Weber, Linder, & Hirsch, 2004) In general relative targets are also more clear and – if benchmarked against the top performers – also more ambitious and therefore lead according to the GST to positive motivation effects. In addition relative targets also have positive influence on the moderator “commitment”, “goal importance” and “feedback” since relative targets usual lead to a higher intuitive logic and legitimacy of targets while relative measurements carry a higher information richness and enhance feedback quality.

5.4. Self-Determination Theory (SDT)

According to SDT a higher degree of self-determination is leading to more satisfaction, creativity and higher readiness for performance. SDT distinguishes between extrinsic and intrinsic motivation whereby the positive effects are primarily attributed to intrinsic motivational factors.

According the Cognitive Evaluation Theory (Deci/Ryan 1985), a sub-theory of the STD, context situation which facilitate and promote a feeling of competence during the execution of tasks lead to an increase in intrinsic motivation because of the satisfaction of an underlying general psychological demand for competence of human beings. „Accordingly, for example, optimal challenges, reflectance promoting feedback, and freedom from demeaning evaluations are all predicted to facilitate intrinsic motivation” (Deci/Ryan, 2000).

If used correctly relative targets and measurements in combination with a link to the compensation reduce subjectivity and the probability for suboptimal targets or unfair and demeaning evaluation and thereby create exactly the required conditions for high intrinsic motivation according to SDT. Moreover the SDT also delivers the explanation model for the advantage of the flexible resource allocation design-element of the RPC. This design element leads to a higher degree of empowerment which is a well-researched and proven factor for increased intrinsic motivation and according to several empirical studies also proven to promote learning capabilities. (Ryan & Deci, 2000).

6. The relative performance contracting concept

The RPC concept is deducted from observation of cause and effects of the changes of the MCS of a case study company over a period of 10 years. For ease of reference and in order to keep

the required anonymity of the research side the case study company will be called FastCo. The RPC describes a design pattern of an MCS consisting of the following 4 design elements: 1) Relative Target Setting, 2) Flexible Allocation of Resources, 3) Relative Measurement and 4) Relative Compensation. Each of the elements has a specific control function/objective which is achieved by implementing specific design attributes of the respective design elements (see also appendix 1). Relative Targets setting is effected by a) setting targets in form of a required change of an input/output relation and/or through b) setting a priori targets relative to a variable context factors (e.g. delta growth rate compared to market growth or delta EBIT growth rate compared to peer group etc.). Flexible allocation of resources is achieved through a) delegation of decision power and b) through a decoupling of forecasts from assessment of target achievement. Relative measurement is achieved through comparing actual results expressed in relative terms with a) external benchmarks and/or b) internal benchmarks and/or c) through comparing actual trends to (normalized) historical trends. The 4th design element of Relative Compensation is effected through linking the variable part of the (core) compensation system to the achievement of relative targets. While each of the design elements and design attributes of the RPC concept fulfils an independent function, the entire effect of the concept is postulated to be achieved only through the interaction of all 4 elements. In the following part of the paper the detailed effects of the RPC are derived and described through a process of deduction from observation of the FastCo Case and triangulation of these observations with grounded theory as well as with MCS research findings building on Simons Lever of Control concept in general and specifically the research stream on the effects of different use of MCS with the paper of J. Mundy (2010) about “Creating dynamic tensions through a balance us of management control system” representing the most recent reference of research findings.

6.1. The FastCo Context

FastCo has a long history of strong emphasis on values and corporate culture which is a reflection of the conviction and belief system of the owner of the company. Through this strong cultural orientation the belief System had a strong influence on the entire MCS of FastCo. The business model of FastCo is characterized by a high vertical integration of the value chain with a direct sales system providing a full range of product solutions to the professional end users. A high differentiation of its product solutions in the market has resulted in a significant global brand recognition with the target customers in the end market of the company.

Organizationally the entire R&D function is organized in 8 Business Units along technological demarcations. The Business Units interact in a matrix with the geographically organized Sales and Marketing Organization (MOs) which ensure one face to the customer and supply the entire range of products form all Business Units as a differentiated solution package to the customer. Manufacturing is yet again organized in a global organization interfacing in a matrix with the business units.

Driven by the specifics of the organizational set up, the companies MCS was for many years characterized by a centrally driven steering process, utilizing a detailed planning and budgeting process as a core MCS. Increasingly however, the company was dissatisfied with the effectiveness and efficiency of the entire steering system. What is according to the behavioral accounting literature classified as dysfunctional behavior (e.g. Hopwood, 1972) could be most clearly ob-

served in the annual planning and budgeting process which, in spite of several rounds of bottom-up and top down review cycles, on a regular basis ended up with a (centrally desired) top line plan but, due to various tactical influences during the planning process, with a lack of ambition at the bottom line. All in all however FastCo delivered consistently growth and financial results which were solid and a good average compared to comparable industrial peers of the relevant industry.

6.2. The foundation for the RPC concept at FastCo

A first comprehensive benchmarking exercise conducted by the in-house consulting department of FastCo in early 2000 resulted in a broader awareness within the organization that the relative financial performance – mainly benchmarked at Return on Sales (RoS) level - was rather average. This contrasted with the wider felt perception that the company was financially rather performing at the upper level compared to relevant competition and industrial peer companies. The entire process of benchmarking was embedded in the more holistic strategy review process of FastCo which also covered comprehensive competition reviews. As a tangible result of these discussions a first time clear financial vision (vision 2008) was agreed upon derived from a desired RoS level but expressed and communication throughout the organization also as absolute profit and sales level (stretched) targets. A second and third process of vision and strategy development (vision 2015, Strategy 2020) was conducted in the following periods (2006, 2012), again as integrated element of a strategy review process. In its latest version (Strategy 2020) targets are only expressed in relative terms as a desired performance against a relevant peer group of companies and against the relevant market. This was also a learning from a very volatile external environment induced by the financial crisis in 2008/2009 which rendered e.g. fixed vision targets of vision 2015 premature obsolete.

Yet another development happened in early 2000 in the company's process landscape. A push for IT system harmonization and process standardization led to a more horizontal process perspective and the formation of process KPIs. In order to ensure a practical integration of the process KPIs a Balance Scorecard (BSC) Concept was introduced a few years later. The BSC (internally called Value Cockpit) gave intuitive clarity about how the process dimension is interacting with the strategy of the organization in order to produce the desired customer satisfaction and financial result.

6.3. Relative Targets and Relative Measurement

For FastCo MCS the above outlined changes in the formulation of a top down vision based on relative benchmarking and the introduction of stronger process perspective and KPIs had several implications. The external benchmarking increased the awareness of the current performance level and stimulated competitive spirits in comparing to best in class competitors and peers. The participative element and interactive process of development and communication of the vision led to a high clarity of direction and a high acceptance of the ambition levels even though targets were more ambitious. The introduction of process based KPIs and their integration by means of the BSC strengthened the diagnostic control system. The entire measurement system was now based on relative measurement which were benchmarked against a preset ambition level (e.g. productivity targets in %) or if this was not meaningful or easy to establish, they were

benchmarked against comparable internal actual performance benchmarks or against the own history. This was leading to an intuitively much clearer and structured perspective about the level of performance and the progress made and also lead to an improved quality of debate about cause and effect of actions taken. Reflecting on this experience of the introduction of relative targets and relative measurements at FastCo against some of the earlier outlined fundamental Theories the following propositions are formulated:

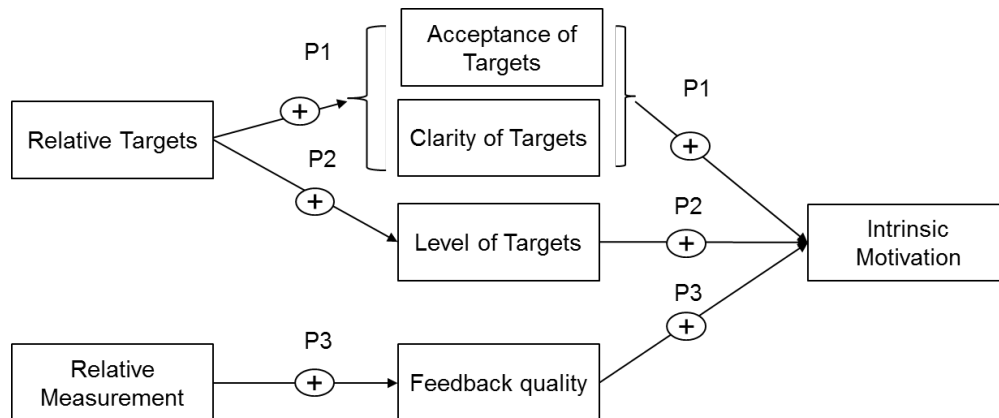


Figure 3: Proposed effect of RPC Design Elements based on Goal-Setting Theory
Source: own visualisation

Proposition 1: *Relative targets lead to higher acceptance and higher clarity of targets which act according to Goal-Setting Theory as mediators for increased intrinsic motivation.*

Proposition 2: *Relative targets used in a ranking system lead to a higher target levels which act according to Goal-Setting Theory as mediator for increased intrinsic motivation*

Proposition 3: *Relative Measurement lead to higher feedback quality which acts according to Goal-Setting Theory as mediator for increased intrinsic motivation*

The system of relative targets and measurements was introduced in an evolutionary mode. The BSC was used as a conceptual frame and locally adapted to reflect local priorities. The core planning and budgeting process however was left unchanged during this period although it was increasingly clear that the information richness of the relative targets and measurement was for most of the functions – especially the MOs whose market environment is generally quite volatile - more useful than the fixed numbers from the budgeting process. The dissatisfaction with the entire effectiveness and efficiency of the planning and budgeting process therefore further increased. It was clear that the coordination and prognosis function of a planning and budgeting process was indispensable, however the relatively high effort and the still evident tactical behavior and unsatisfying outcome in form of a relatively low bottom line ambition level was clearly not satisfactory. A possible reason for the dysfunctional tactical behavior was seen in the linkage the compensation system to the fixed budgets.

6.4. Relative Compensation

The core compensation system for the company was linking the performance of the local organization to a single compensation factor (Bonus factor) which was used as a multiplier for a nominal variable compensation amount which varied by position but was a significant compensation element for every employee. Traditionally FastCo was relying on team compensation therefore the performance factor of the local MO was the decisive driver of the variable compensation for all employees of the respective MO. Employees in the corporate center were to a high degree linked to a bonus factor of the entire group and thereby followed the same team based concept. The decisive KPI for the bonus factor of the MOs was the degree of plan achievement of the (absolute) local profit contribution. After the introduction of the relative targets and measurements it became increasingly clear, that the fixed plans were no more as relevant as before.

In order to reflect the higher relevance of the “growth perspective” FastCo management decided therefore to de-link also the calculation of the local bonus factor from the plan achievement and link it instead to the *growth* of the profit contribution over prior year. This way the calculation of the bonus factor was following more the principle of the relative measurement. Without the plan as reference an alternative system to define a target growth level which should ideally demand the same degree of difficulty for all MOs needed to be invented. For this purpose a clustering concept was introduced, clustering MOs in a combination of absolute profitability levels and relative profitability levels. These dimensions were perceived the most important driver for the “degree of difficulty”. Eventually a system with 5 clusters emerged with different levels of target profit growth curves against which the achievement of the future actual profit growth would be measured and bonus factors derived. A 6th cluster was defined for the “exception MO” which would not fit into the logic of the other 5 cluster due to special situation such as severe turn-around situations or start-up/lack of history circumstances. For this 6th cluster an individual target would be set similar to the “old” planning process but in a much more concentrated interactive discussion amongst top management only. Already during the development phase of the system it was evident, that the logic of “continuous improvement” in form of target growth curves was convincing and once introduced, the system immediately got high acceptance from the MOs. Also the usual tactical/dysfunctional behavior during the planning and budgeting process was noticeably reduced, since for compensation reasons, the Budgets were not anymore the relevant yardsticks. All what mattered was to grow profitably.

This situation also put a different perspective on the entire planning and budgeting processes for the MOs. The new compensation system remained unchanged in place from 2005 until 2012. In the course of an upgrade of the steering system in 2012 the system was further refined, eliminating the clustering and introducing continuous target growth curves instead, which reflect the same successful principle but on an even more continuous basis (see appendix 2a,b,c). The de-linking of the compensation from fixed plans helped to align perspectives of top and middle management and of shareholder and top management and brought over time a behavioral change into the entire management process of the organization.

By having an orientation from higher visionary top down targets and from external and internal benchmarks and by changing the paradigm for compensation from “hit or exceed plan” to “grow as much as possible” the planning and budgeting discussion shifted from *what target level* to achieve to much more *what to do to grow more / faster*. The emphasis of the top management role in parallel also shifted from controlling and influencing the correct ambition level

to coaching and influencing the MOs on the implementation of concrete content and change initiatives. This observation of the behavioral change in the organization with delinking compensation from fixed targets leads to formulation of the following proposition:

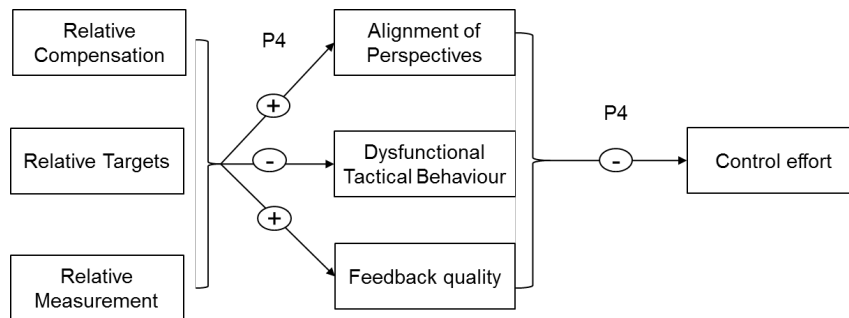


Figure 4: Proposed effect of RPC Design Elements based on Principle-Agent Theory
Source: own visualisation

Proposition 4: *Relative targets and measurement in combination with linking compensation to those targets and measurements leads, building on Principle-Agent Theory, to higher alignment of perspectives of management and shareholder, reduced dysfunctional tactical behavior and higher feedback quality which in combination lead to a reduced control effort within an organization.*

6.5. Flexible allocation of resources

In spite of the positively perceived changes coming from the introduction of the relative target and measurement system and the adaptation of the compensation system there was still wide felt dissatisfaction with the required effort for the annual planning and budgeting processes. Traditional procedures still were time consuming while the benefit of the resulting plans and budgets was now with a new relative measurement and compensation system – especially for the MOs - even more questionable. In addition changes in the environment usually rendered the agreed upon plans and budgets very fast inappropriate anyway. Formal and informal compensating steering initiatives and substitute process like special approval processes for investments deviating from pre-set plans / budgets or process to encourage management in MOs to faster reactions in downward / upward market cycles therefore were already in place to make the management process more flexible.

It was clear that the planning process was an important steering process for the entire organization to ensure motivation, coordination and proactive outlook/prognosis to anticipate challenges and opportunities. However, the motivation function had already been substituted by the system of relative target setting and relative compensation. In addition the strong reliance on central control and steering processes was intuitively not consistent with the core cultural principles which called for “taking self-responsibility” and indirectly suggesting a high trust based control system. As a result in 2004 the management decided to replace the traditional budgeting process with a new rolling forecast (RF) process. The core design elements of the RF process was a full delegation of the entire planning process to MOs with no central coordinated approval process any longer and a trimester based bottom up forecast of highly aggregated financial key figures, for which corporate controlling provided a standard process and tool for consolidation. The

purpose was to facilitate a flexible and fast adjustment of targets and measures to changed context conditions (coordination function), while simultaneously providing an overview of the trend and latest estimate for the outlook in a timeframe and frequency adjusted to a natural decision rhythm of the entire organization (prognosis function).

The biggest challenge in the implementation of the process was to transform a traditional organizational behavior from a fixed plan nature, where a plan is considered a commitment and the most important tool for performance contracting to a more adaptive and flexible RF process where the forecast is the most recent and best estimate based on actual trends and realistically to be expected impacts of measures / initiatives of corrective or accelerative nature within the forecasted timeframe. A clear conceptual distinction needed to be made between the forecast, a (stretched) target and a commitment which was now not tight to a fixed plan any longer but more a value build on the trust of top management that the line managers and respective teams of the MOs were motivated and capable of executing the right measures to drive the results towards the stretched target. This usual contrast of a higher ambition with a realistic outlook continuously created desired dynamic tensions and motivation to improve.

The motivational function of the traditional budgeting process was provided by the prior introduction of the relative targets and measurements in combination with the linkage of the core compensation system to those targets and measurements. Performance contracting in the sense of ensuring high commitment to ambitious targets was in this process not performed any more through a “command and control” type process but through ensuring high intrinsic motivation through relative targets and a high level of empowerment (RF Process) in combination with exercising control through a high degree of self-regulation achieved through the transparency and objectivity of relative measurement and the linkage of the entire system to the core compensation system. Clarity of behavioral standards – commitment being one of it - and enforcement of those is another key control mechanism. Together these aspects complete the RPC concept.

At FastCo the implementation of the replacement of the traditional budget with the RF process was perceived again very positively as a logical consequence of the earlier introduced changes to the core MCS. The transformation of the organizational behavior and the learning of the management of the dynamic tensions created through the RF process took several rounds of exercising. There were no compensation consequences for a high target any more, therefore targets were set more from a motivational perspective. What mattered was how much progress was made and the discussion therefore was much more focused on understanding the true progress of the respective business relative to its environment, relative to competition, relative to peers or relative its own past to gain a much broader judgment of true progress as compared to narrow process of evaluating plan/budget achievement.

Through conscious steering of the management review discussions⁶ and over time as the management could fully judge the control mechanism of the new system a common understanding for a positive management of the dynamic tensions between ambitious targets on the one side and a “brutal fact based” open and realistic judgment on progress on the other side emerged,

⁶ Management Review Process took place monthly in the Executive Board of FastCo in an approximately 2-3 hour discussion as well as 4 times a year with the extended Executive Management Team which carried full line responsibility for all group functions in a Full day review of the performance of all function.

which can be best described as a highly focused and entrepreneurial discussion free of tactical or political influences. As a result the true performance orientation of the entire management process increased, as on the one side the motivation to strive for high ambition was fostered through a fair and balanced discussion free of demeaning judgments or distrust while on the other hand the true performance was much more transparent than before with much less room to hide behind a tactically influenced number.

Through reflection of the observed behavioral changes at FastCo triggered by the introduction of the “Flexible Resource Allocation” (RF Process) element of the RPC concept and building on “Self-determination Theory” the following propositions are deduced:

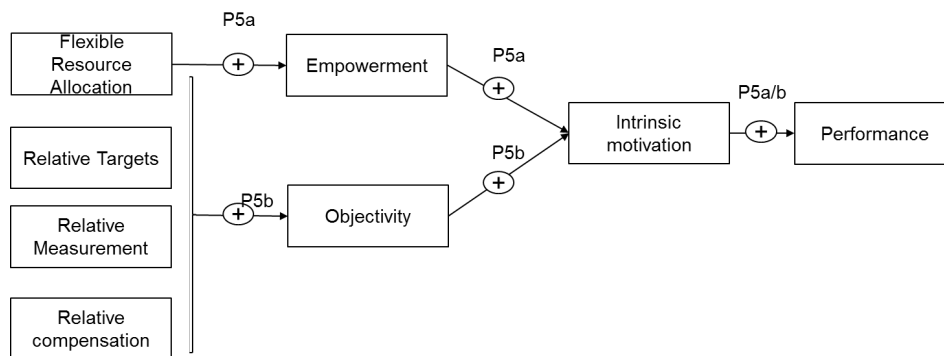


Figure 5: Proposed effect of RPC Design Elements based on Self-Determination Theory
Source: own visualisation

Proposition 5a: Flexible resource allocation by means of a delegation of decision power leads to higher intrinsic motivation mediated according to self-determination theory by a higher level of empowerment.

Proposition 5b: The application of the entire RPC concept leads to higher intrinsic motivation and higher performance mediated by a higher perceived objectivity of the entire RPC concept.

6.6. Effects of RPC Design elements

While the management at FastCo needed a few rounds of management review discussion to adjust to the new situation, it was very fast clear that this new system was successfully overcoming the perceived dissatisfaction with the entire planning and budgeting process. In fact with the implementation of the RF and delegation of the entire planning into the local organization a significant effort reduction was achieved, both in the center and in the local organizations. At the same time the local organization was enjoying a higher degree of entrepreneurial freedom while the center was not feeling less, but even more “in control” of the situation as ambitions for bottom line improvement went up, entirely driven from a (intrinsically motivated) bottom up process. Also flexibility in the process and speed of reaction clearly improved through the delegation of the process into the local organizations. The system was applied and refined from 2005 onwards and also proved very helpful throughout the financial crises 2009 were especially fast and coordinated actions were required due to an unprecedented market induced drop in sales of FastCo. In 2011

the (Euro) currency crisis revealed some weaknesses of the steering system of FastCo as the system was traditionally buffering currency impacts and some other major cost blocks like material prices volatility and parts of logistic costs volatility in the center. Due to the increasingly high volatility of these cost elements the steering system was adapted throughout 2012. Through these changes the RPC concept was even further enhanced as responsibility for all cost elements (inclusive currency influence) is now decentralized and further refinements to the relative compensation systems give even stronger self-regulating impulses for financial value drivers such as investment into sales growth and management of working capital. A review of financial results of FastCo 5 years pre- and post-implementation of the RPC concept (=t0) shows a significant increase in profitable growth and a much higher outperformance of the relevant market in the 5 years following the implementation of RPC (see also appendix 3). Being a qualitative paper this is not claiming to be an empirical prove for the effects of the RPC concept. Together with the qualitative description of the concept it serves however as an indication for positive effects of the concept. Especially as during this period no other unusual organic (e.g. innovation) or inorganic (e.g. M&A) growth initiatives can be identified for FastCo. Synthesizing and reflecting the experience made at FastCo with the implementation of the RPC Concept and its application over a prolonged time period the following propositions are derived.

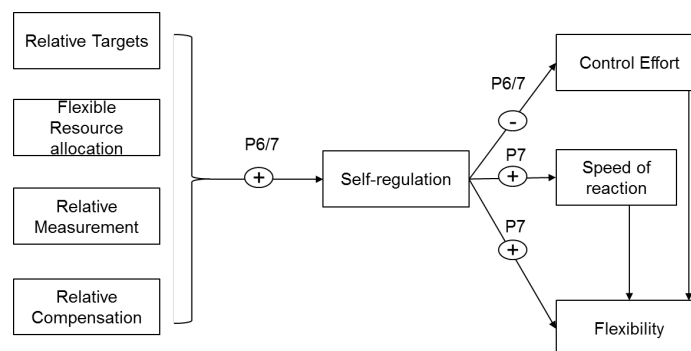


Figure 6: Proposed effect of RPC Design Elements based on System Theory
Source: own visualisation

Proposition 6: Building on system theory, the application of the RPC concept has a positive influence on the self-regulation ability of an organization which acts as a mediating factor for reduced control effort in the entire MCS.

Proposition 7: The application of the RPC concept leads to a higher degree of automatic reaction to changes in the organizational context (= self-regulation) which positively influences the speed of reaction to events and simultaneously leads to more flexibility of the organization.

Reflecting on proposition 1 through 7 it becomes evident that the RPC is through higher intrinsic motivation, more empowerment and reduced control effort primarily influencing the positive/enabling MCS elements which are attributed by Simons to the belief system and the interactive control system. According to Simons LoC Concept an effective MCS requires however a balance of enabling/positive and constraining/negative use of control systems to create perfor-

mance enhancing positive dynamic tensions. At this point the focus of the paper is shifting on to how the RPC is simultaneously also enhancing the constraining aspects of a MCS.

Already during the deduction of the effect of the Flexible Resource Allocation design element through the implementation of the RF concept a creation of dynamic tension was described. In her paper “Creating dynamic tension through a balanced use of management control systems” Julia Mundy derives based on a qualitative case study research 5 factors which influence the ability of a company to balance the use of a MCS which in turn leads within the observed case study of her paper but also according to previously conducted empirical studies (for example Henri, 2006) to dynamic tensions and thereby to improved performance (see also appendix 4).

Mundy’s research work, specifically the deduction of those 5 factors is, to the knowledge of the author, the most recent and advanced work with respect to how to create dynamic tensions through a balanced use of Management Control Systems. The findings of this research work have been used as theoretical input statements against which observed patterns of the use of MCS and the change of its use over time at FastCo were matched. The core proposition is that RPC fosters a higher consistency of the entire MCS and leads to a significantly enhanced role of the interactive control system while also supporting the creation of other factors. Due to space limitation in this paper at this point reference is made to appendix 5a and 5b for a more detailed reflection on how the RPC concept supports/ facilitates the creation of the factors described in Mundy’s research as influencing a balanced use of MCS. The findings are summarised with the following proposition:

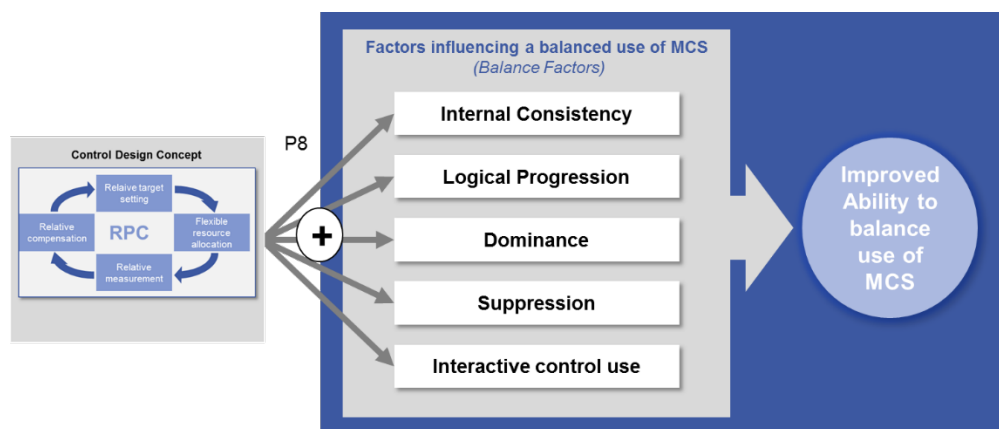


Figure 7: MCS literature based explanation model for RPC effects
Source: own visualisation

Proposition 8. *The implementation of the RPC concept fosters the creation of factors influencing a balanced use of MCS thereby improving the ability of an organization to effectively balance the use of MCS.*

7. Conclusion

The conceptualization of a pattern of MCS control design around relative elements and the deduction of the proposed effects is targeted at helping to bridge a perceived gap between theory and practice within the topic of management control design. The RPC offers a theoretical explanation for how to design an MCS to cope with the increasing challenge of higher volatility and

unpredictability in an effective and efficient way. The observed behaviors and the deduced propositions can be linked conclusively to empirically grounded theories and provide a logically sound explanation for a MCS which positively supports intrinsic motivation and flexibility while at the same time reducing the control effort. In a logical consequence the model supports a higher performance orientation.

At the same time, the design concept takes a holistic perspective on an MCS and thereby contributes to the recognized need for theoretical and empirical research of the MCS from a package perspective. While empirical research for the effect of a comprehensive change of an MCS like observed at FastCo over a period of 10 years will remain very difficult to realize, the current paper offers propositions for effects of specific management control practices such as relative target setting or relative measurement which can be the basis for further empirical research. Finally the deduced proposition and theoretical statements for the effects of the RPC design elements with respect to the creation of conditions for a more balanced use of MCS extend the existing literature stream and are also aimed at providing additional impulses for further empirical research. In addition the case study gives a practical context and an illustration of an evolutionary change process of an MCS, which should serve as inspiration for practitioners to reflect the deduced conclusions and derive ideas for individually adjusted MCS change initiatives within their own context conditions. Especially aspects like relative measurements and linkage of relative measurements to compensation are elements which can – according to the experience of the authors - be transported rather easily into different context situations and which have the potential to trigger further a positive progression of adjustments in a low-risk, evolutionary mode.

Having highlighted the aspired contribution of the current paper, also the limitations have to be mentioned. As theoretical paper no claim can be made on empirical evidence. Furthermore the entire concept was developed reflecting upon one single case study which weakens the foundation for generalization. Also the possibility of bias of judgment has been mentioned again since the author was a long term member of the top management of the company. While conscious efforts have been made to eliminate bias, naturally judgment will still be influenced by this long term relation to the case study company. This fact has however to be weighed against the benefit of unique insight into the impacts of a significant change of the MCS over a long observation period. Further limitation with respect to the generalizability of theoretical findings arise from the specific context conditions of the case study company. Specific business model context condition may have an influence on the transferability of findings. Those factors have not been analyzed further due to the space constraint in this paper. Also cultural development programs have been in place at the case study company for many years providing a coherent and well developed belief system as an additional control system to stand on. The current paper does not theorize or conceptualize in any way the potential influence of this assumed relatively high development level of the belief system of FastCo on the successful change process of the MCS at FastCo. As to the opinion of the author, this aspect has had a positive influence and provided the openness to changes of the MCS in the first place. It further provided a conducive cultural basis for a fast learning process and adoption of a productive interactive process during the implementation of the RF process.

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APPENDIX 1

Design element	Function	Relative design attribute	Effects of relative design	Supporting Theories
1.) Relative target setting	Achieve high intrinsic motivation and alignment towards targets	<ul style="list-style-type: none"> a) Change of input / output relation b) A priori fixed targets or ambition level relative to a variable context factor (preferably extra organizational context factor) 	<ul style="list-style-type: none"> ▪ Increase objectivity of target setting process ▪ Reduced tactical behavior ▪ Facilitates external view and alignment with perspective of owner / shareholder ▪ Promotes clarity and consistency of messages ▪ Facilitates self regulation of targets and long term relevance ▪ Reduced complexity and maintenance effort ▪ Leads to high ambition and increased acceptance / identification 	<ul style="list-style-type: none"> ▪ System Theory ▪ Principle Agent Theory ▪ Contingency Theory ▪ Goal Setting Theory
2.) Flexible allocation of resources	Flexible adjustment of targets and measures to changed context	<ul style="list-style-type: none"> a) Delegation of decision power b) De-coupling of projection from assessment of target achievement 	<ul style="list-style-type: none"> ▪ Increased empowerment leads to increased intrinsic motivation, identification and acceptance of responsibility ▪ Improved utilization of competency ▪ Reduced complexity and fast reaction through delegation 	<ul style="list-style-type: none"> ▪ System Theory ▪ Self-determination Theory ▪ Contingency Theory
3.) Relative measurement	Measurement of results in relation to relative targets	<ul style="list-style-type: none"> a) Actual results compared to external benchmarks (competition, market) b) Actual results compared to internal benchmarks b.) Actual trends compared to (normalized) historical trends 	<ul style="list-style-type: none"> ▪ Increase transparency ▪ Increased ambition ▪ Improved feedback quality 	<ul style="list-style-type: none"> ▪ Contingency Theory ▪ System Theory ▪ Goal Setting Theory
4.) Relative compensation	Alignment of compensation with value creation	<ul style="list-style-type: none"> a) Use relative targets as target level for variable part of compensation system 	<ul style="list-style-type: none"> ▪ Leads to self regulating closure of control cycle ▪ Increased objectivity ▪ Increased identification ▪ Alignment of perspectives with owner/shareholder 	<ul style="list-style-type: none"> ▪ System Theory ▪ Principle-Agent Theory ▪ Contingency Theory

Figure 8: The RPC Concept - Overview

Source: own visualisation

APPENDIX 2a

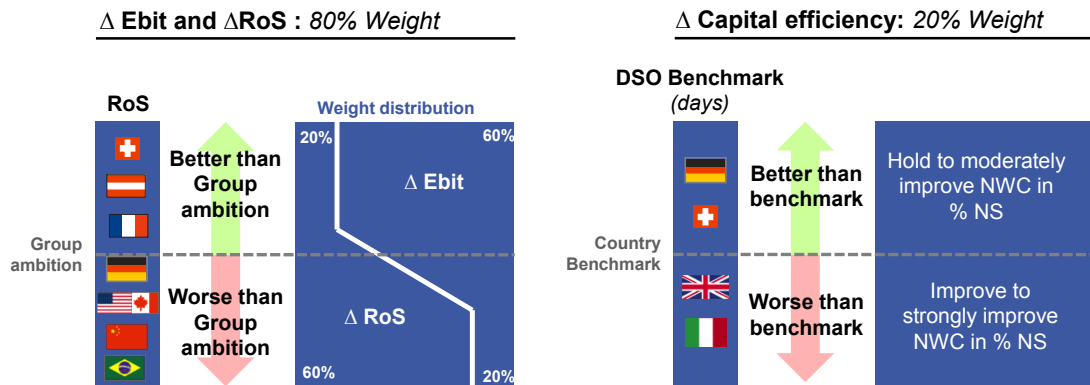


Figure 9: Core design of Fast Co MO Compensation Scheme

Source: own visualisation

APPENDIX 2b

Required RoS%pts. change vs. prior year

RoS (@ AER)	RoS Weight	Δ RoS%NS (@ PER) Bonus Factor						
		0.0	0.5	1.0	1.5	2.0	2.5	3.0
30.0%	20.0%	-0.3%	-0.2%	0.0%	0.1%	0.5%	0.9%	1.3%
27.5%	20.0%	-0.3%	-0.1%	0.0%	0.2%	0.6%	1.0%	1.4%
25.0%	20.0%	-0.3%	-0.1%	0.1%	0.2%	0.6%	1.1%	1.5%
22.5%	20.0%	-0.3%	-0.1%	0.1%	0.3%	0.7%	1.2%	1.6%
20.0%	20.0%	-0.2%	0.0%	0.2%	0.4%	0.8%	1.3%	1.7%
17.5%	20.0%	-0.2%	0.0%	0.2%	0.4%	0.9%	1.4%	1.9%
15.0%	25.0%	-0.2%	0.1%	0.3%	0.5%	1.0%	1.5%	2.0%
12.5%	30.0%	-0.1%	0.1%	0.4%	0.7%	1.2%	1.7%	2.2%
10.0%	35.0%	-0.1%	0.2%	0.5%	0.8%	1.3%	1.9%	2.4%
7.5%	40.0%	0.0%	0.3%	0.6%	1.0%	1.5%	2.1%	2.7%
5.0%	45.0%	0.0%	0.4%	0.8%	1.1%	1.8%	2.4%	3.0%
2.5%	50.0%	0.1%	0.5%	0.9%	1.4%	2.0%	2.7%	3.3%
0.0%	55.0%	0.2%	0.6%	1.1%	1.6%	2.3%	3.0%	3.7%
-2.5%	60.0%	0.2%	0.8%	1.4%	1.9%	2.7%	3.5%	4.2%
-5.0%	60.0%	0.3%	1.0%	1.6%	2.3%	3.1%	3.9%	4.8%
-7.5%	60.0%	0.5%	1.2%	1.9%	2.7%	3.6%	4.5%	5.4%
-10.0%	60.0%	0.6%	1.4%	2.3%	3.1%	4.2%	5.2%	6.2%
-12.5%	60.0%	0.8%	1.7%	2.7%	3.7%	4.8%	6.0%	7.1%
-15.0%	60.0%	1.0%	2.1%	3.2%	4.3%	5.6%	6.9%	8.2%
-17.5%	60.0%	1.2%	2.5%	3.8%	5.1%	6.5%	8.0%	9.4%
-20.0%	60.0%	1.4%	2.9%	4.4%	5.9%	7.6%	9.2%	10.8%
-22.5%	60.0%	1.7%	3.5%	5.2%	7.0%	8.8%	10.7%	12.5%
-25.0%	60.0%	2.1%	4.1%	6.1%	8.1%	10.3%	12.4%	14.5%
-27.5%	60.0%	2.5%	4.8%	7.2%	9.5%	11.9%	14.4%	16.8%
-30.0%	60.0%	2.9%	5.7%	8.4%	11.2%	13.9%	16.7%	19.4%

Profitable ↑
 ↓ **Unprofitable**

Above Group RoS Ambition ↑
 ↓ **Below Group RoS Ambition**

Figure 10: Detailed Bonus Factor Table for ΔRoS Component

Source: own visualisation

APPENDIX 2c

Relative Profitability: Δ RoS curve

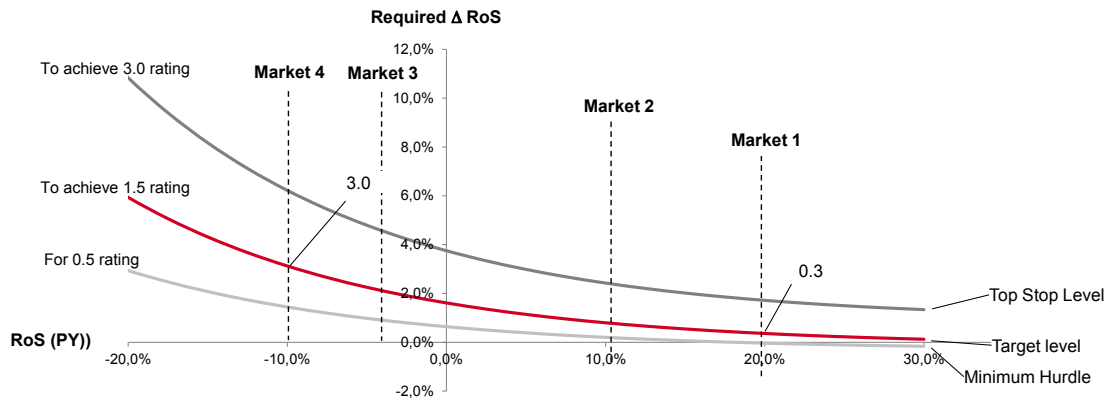


Figure 11: Illustration of continuous Bonus Curve for Δ RoS

Source: own visualisation

APPENDIX 3

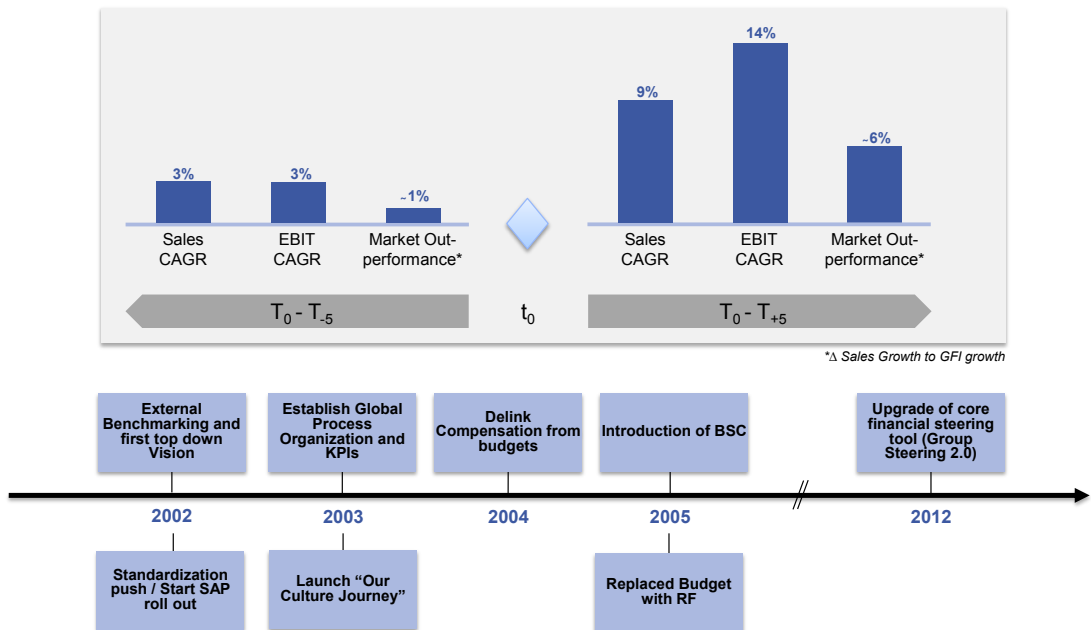


Figure 12: Result development prior and after RPC implementation

Source: own visualisation

APPENDIX 4

Factor influencing ability to balance use of MCS (Tension drivers)	How does the factor work	Supporting Literature
Internal consistency	Clear and coherent messages about the importance of particular imperatives and priorities (e.g. clear vision and purpose) expressed through the belief system need to be consistently reflected in other control system elements (boundary, diagnostic, interactive system)	Flamholtz, 1983; Wiedner, 2007; Pearce and David, 1987; Roberts 1990; Chenhall and Euske 2007
Logical Progression	Factor is particularly relevant in change situation; interactive controls should be used before changes are hardwired in belief, boundary and diagnostic systems since change is more likely to lead to desired outcome	Simons, 2000; Bonner et al., 2002; Abernethy & Brownell, 1999; Chenhall & Euske, 2007; Kober et. al, 2007;
Dominance	One or more of the levers persistently determine the use of the remaining levers, regardless of the specific organizational circumstances (e.g. strong emphasis on diagnostic system will inhibit innovation long-term). This can negatively influence capability to balance. Dominant use can on the other hand be channeled into shaping rather than inhibiting emergent strategies but has to be adjusted to changing organizational circumstances. Dominance can also derive from preference of individual managers.	Armstrong, 2002; Ittner & Lackner, 1998, Seal, 2001; Ahrens & Chapman, 2004; Chenhall & Euske, 2007; Wouters & Wilderom, 2008
Suppression	Suppression is the flipside of dominance and means that one or more levers are underutilized / not used when they should be used to create positive dynamic tension (e.g. lack of open discussion. It is less likely when managers encourage employees to bring their local knowledge into the decision-making process (Ahrens & Chapman, 2004)	Seal, 2001; Ahrens & Chapman 2004; Wouters & Wilderom, 2008
Appropriateness of Interactive Control use	Interactive process play a crucial role in crating and maintaining balance in MCS because they have a strong information processing capability (integrating accounting , operational, strategic concerns), (Chapman, 1997), but also can destabilize by calling key operating paradigms into question. Successful deployment of interactive control level is complicated due to dependency of many individual and organizational factors, including cultural attributes, perceived usefulness of MCS and power relations.	Chapman, 1997; Alvesson & Kärreman, 2004; Euske & Riccaboni, 1999; Naranjo-Gil & Hartmann, 2007

Figure 13: Factors influencing ability to balance MCS

Source: own visualisation

APPENDIX 5a

	Consistency	Progression	Dominance	Suppression	Interactive control use
Relative Target Setting	RPC leads to a more intuitive connection to the artifacts of the believe system (e.g. vision, mission, strategy) and provides ideal precondition for a seamless connection with diagnostic system, thereby fostering consistency within the MCS	The definition process of relative targets forces an intensive discussion (e.g. use of interactive control) upfront to define the right measurement			The definition process of relative targets forces an outside in view and triggers intensive discussion (e.i. use of interactive control) upfront to define the right measurement
Flexible allocation of resources	Delegation of responsibility gives high freedom with respect to how to achieve a target which is a necessary requirement and consistent with the strong reliance on belief based controls and relative targets and measurements (diagnostic controls) within the RPC..		Relative measurements are multidimensional and facilitate (even demand) a comprehensive delegation of responsibility and accountability thereby reducing the probability of dominance of a control lever	Delegation of responsibility in the context of the RPC eliminates the risk of command and control based steering with heavy central agenda ownership and tendency of tactical behavior (i.e. suppression of the real issues).	

Figure 14: Causal relation – RPC and Balance Factors (I/II)

Source: own visualisation

APPENDIX 5b

	Consistency	Progression	Dominance	Suppression	Interactive control use
Relative measurement	Relative measurements integrates more control levers simultaneously (e.g. input/output include elements of belief system (input) and boundary (output)) and thereby automatically ensures consistency throughout MCS.		Relative measurements are multidimensional and facilitate (even demand) a comprehensive delegation of responsibility and accountability thereby reducing the probability of dominance of a control lever	Relative measurements are more rich in information content and produce more transparency thereby reducing the risk of suppression of control levers	Relative measurements reflect a change in context and thereby trigger more relevant discussion and a more natural and appropriate use of interactive controls
Relative compensation	Relative targets and relative measurement allow a neutral and comprehensive assessment of performance including changes in important context factors. The link of compensation to relative targets forms an important element of the boundary system and is closing the system control loop in a consistent way.	Closing the cybernetic control loop with the linkage of relative compensation to relative target triggers a more comprehensive and natural continuous improvement focus which is conducive to an appropriate progressive use of control levers (e.g. interactive use first....)			Connection of Compensation with relative target triggers self regulation "by design" and deployment of interactive controls become more part of the system and less dependent on individual and organizational factors

Figure 15: Causal relation – RPC and Balance Factors (II/II)

Source: own visualisation

0036

EXPLORING THE IMPACT OF NATIONAL CULTURE ON PERFORMANCE MEASUREMENT (PM)

IHSSAN MAAMOUN JWIJATI, UMIT S. BITICI

Exploring the Impact of National Culture on Performance Measurement (PM)

Keywords: performance measurement, national culture

Topics: Behavioural Operations, Performance Measurement, and Management, Managing Change in Operations

The purpose of the research presented in this paper is to explore the impact of national culture on the performance measurement design and use. Using performance management systems (PMS) by organizations interested in expanding their operational boundaries beyond the stagnant economies is vital for competitiveness. Will PMS created in one culture work in another culture? In other words, can the successfully implemented PMS be transported across different cultures?

Qualitative inductive research approach was applied, sample culture were chosen using Hofstede's national culture framework and Chinese, Italian Syrian, and UK cultures were used. Semi structured interviews in indigenous manufacturing SMEs were used.

The findings have found a relationship between national culture dimensions (such as power distance, and uncertainty avoidance), and the PMS processes of design and use. Although National Culture seems to have some influence on the design and use of PMS in organisations, there are some strategic characteristics of the organisation which can also influence the design and use of the PMS, such as governance structure, personality and outlook of the leadership.

Exploring the impact of national culture on performance measurement

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Purpose:

Traditionally, measuring performance in organizations used to be achieved by monitoring financial performance only, until a time when the inadequacy of this approach was questioned by scholars such as (Johnson & Kaplan, 1987). The use of 'balanced' performance measures was advocated by many scholars such as Kaplan and Norton (1992), Neely (1996), and implementation had high failure rate according to Neely & Bourne (2000).

Culture according to Bourne, et al., (2000), is one of the important drivers or factors of successful implementation of PMS, however, most of these studies have been conducted from an organisational culture view point Henri, (2006), and because of our vague understanding of the impact of national culture, Otley, (2003) has called for more research to be performed to understand the impact of national culture. In addition, as we move deeper in to the 21st century we are seeing new forms of work emerging, particularly with globalisation, advances in ICT technologies as can experienced with global multinationals operating in different cultural settings as well as networks of smaller organisations collaborating in global networks (Bititci et.al., 2011). Furthermore, with the increasing impact of the emergent markets, organizations' need to conduct and manage businesses in other countries is more than ever, hence each organization should be able to cope with its internal and external environment in any country, as internal contextual factors are impacted with individuals' behaviour and culture.

Therefore, exploring the impact of national culture on PM will help us making contribution to the existing literature on performance measurement by (i) understanding the impact of national culture on the lifecycle of performance measurement systems, (ii) investigating the existence of any moderating factors which might impact the behaviour of national culture in organizations. The methodology used is qualitative inductive method, through semi structured interviews with the top SME managers of four distinctive national cultures.

National Culture

National culture (NC) has been defined by Hofstede as 'the collective programming of the mind which distinguishes the members of one human group from another' (Hofstede & Hofstede, 2005). The definition implies the particularity of a group with distinctive set of values and behaviours. The behaviour could be through distinctive solutions of problems, and reconciling dilemmas (Schein, 1985). Our research is employing the Hofstede's model, with its five dimensions of power distance (PD), uncertainty avoidance (UA), individualism vs. collectivism, masculinity vs. femininity, and long vs. short-term orientation. Although Hofstede's model had been criticised, but it has been widely used.

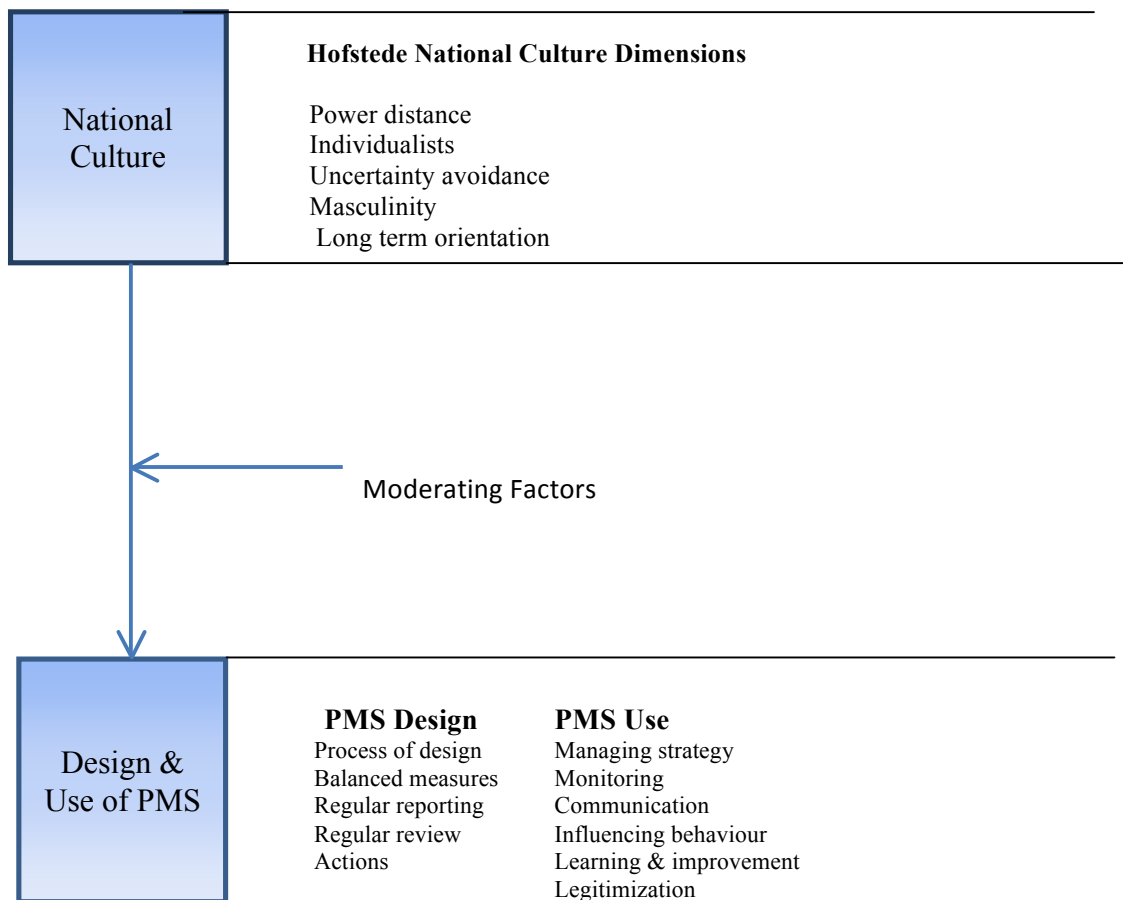


Figure 1 – Theoretical framework

Theoretical framework

In the theoretical framework (Fig 1.) , national culture through one of its dimensions could impact the design and use of PMS, however, the impact may be influenced by moderating factors. The impact of national culture is observed on the process of PMS design, the nature of the PM, the extent of recording, the degree of reviewing and the nature of the actions taken. Additionally, types of uses are observed in different cultures, and the relationship between the type of PMS use and the national culture is sought.

Performance Management Systems

According to Bourne et al., (2000) that the phases of the development of PMSs can be divided into three main phases, design, implementation and use. Illustrating the different phases in brief due to the limited nature of the paper, the design is identifying key objectives to be measured and designing performance measures, insuring that strategy should be used as reference point when designing the performance measures in the design process. Implementation is defined as the process of putting the measurement system and procedure in place, collecting and process data. This involves processes as installing software performance measurement software, launching the PM activity, etc. The use, according to the typology suggested by Henri (2006) is comprised of four

types: monitoring, attention focusing, strategic decision-making and legitimization. Monitoring is the use of performance measurement information for reporting and external disclosure. Stakeholders use PMS reports for diagnostic control. Attention focusing where PMS reports fosters organizational dialogue, where top management use reports for communicate and set targets. Strategic decision making for examining the strategy in place, deciding whether to retain or change the present strategy. In legitimization, top managers use performance data to justify and validate managerial decisions, and may be used to promote self interest and enhance their power authority.

Methodology

In order to explore the impact of national culture on performance management systems, inductive qualitative research method was employed, as its more suitable for answering iterative, flexible, where the researcher's positions forms an integral part of the research process, with the research needing 'why', and 'how' questions Voss, et al., (2002) and Barratt et al., (2011).

The type of qualitative research method used is multi-case study approach because it allows the researcher to explore the way companies in different cultures design, implement, and use their performance systems. The criteria for choosing different national cultures is based on Hofstede's diagram of PD-UAI matrix as Hofstede suggested that there is an empirical evidence regarding the relationship between the country's position within the PD-UAI matrix and organizations' methods of behaviour. Four cultures were chosen one from each quadrant in the PD-UAI matrix.(Hofstede & Hofstede, 2005). The empirical study involved two Chinese, two Italian, two Syrian and two Scottish manufacturing SMEs. For each company we collected information about PMS, PMS processes . These cultures are Chinese, Syria and UK cultures. The fourth quadrant suggested countries like Germany, Austria, but because of logistics, Italy was selected.

SMEs was chosen for the size of organizations, as we expected large companies policies, practices, and other factors to impact the influence that could be resulting from national culture. Additionally, in order to ensure that the chosen organizations representing their individual cultures, only indigenous were chosen for the case studies. Additionally, trying to reduce the impact of top management experience on the design, implementation, and use of PMS, the education and experience of the case studies' top management, were either more than ten years of practical experience or they had management graduate education. All the case studies were having similar organization size, all were privately owned, all have industrial background, with some differences in the firms' years of operations. Finally, insuring -as much as possible- the clear impact of national, all case study organizations were chosen from manufacturing sector reducing the occupational culture's impact.

Wherever possible, interviews were held with the general managers and when it was not possible, top management team was interviewed. In one of the Chinese interviews, the decision maker was accompanied by members of his middle managers, where they participated in the discussion and added important information to the interviews. In one of the Syrian organizations, the decision maker was interviewed alone in the beginning, and later on the researcher was given time with two of the middle managers. It should be mentioned that the setting was left to the organizations involved, with the researcher expressing his wish to increase the scope, the length of the interview when the research needed more depth. In the UK, only the managing directors were met. In order to ensure

subjectivity of the information, the interview result was triangulated with other information sources.

In preparation for the company visits, a research protocol was designed. The research protocol was discussed between the authors and elaborated upon, and any question regarding the content was answered. Initially, the research protocol was piloted and tested on one UK organization, then the results of the interview was discussed, and minor changes were acted upon the research protocol, and then employed on the other case studies.

The data collection method used is semi structure interviews, observations, and archival sources, and this justified by the inductive nature of the research, and the nature of the exploratory research. The semi-structured nature of the interviews added richness to the research findings as the researcher(s) asked more explanation to the emergent information. Notes collected from interviews were prepared in a report form, with observations from researcher mentioned, and relevant data from different sources such as internet sites, or media reports were included in the report. Visits to the company headquarters helped in clarifying the nature of interactions of organizations.

Interviews were conducted by one researcher in three cultures, and conducted by another collaborating researcher for the fourth culture. Indigenous languages were the languages employed for each culture reducing translation errors. The number of researchers was ranging from one to two in the four cultures with interviewers discussing their notes on the interview. The length of the interviews depended on achieving the aim of the research ranging from two to three hours.

Findings

It seems that there is a pattern emerging across these eight cases with respect to the impact of national culture, PMS design and use. These patterns may be summarised as follows.

China Culture:

Chinese companies with family organization culture, PMSs are designed by the top management board, with little input from the middle managers. The PMSs is formal, with formal meeting discussing the results of measurement. The use of PMS has been observed is mainly in managing strategy, in monitoring, communication, influencing behaviour, but not used in learning and development. The reason could be attributed to family culture, where this could be attributed to employees' obedience, stemming from the Chinese cultural value of vertical social order. Employee's willingness to cooperate and make the measurement process workable, and this could be to the Chinese cultural value of individual 'face' and reputation. The results resemble the results found by (Li & Tang, 2009).

Italy Culture:

The Italian culture, we can see two organizations with two different organization cultures. The first organization having incubator culture, while the other is having family culture.

Logo is having deliberately designed PMS, designed by middle management, with balanced measures, and we are witnessing a highly used system in managing strategy, monitoring, communication, and learning and behaviour.

in Valbona, typical family culture, where the measures are designed by the top management, where its financial measures, there is resistance in implementation, while the PMS use is mainly for monitoring, and legitimization.

Syria Culture:

In Syria, PMS used were mainly financial, but it was observed that the comprehensive use of PMS is reserved for the top manager. Middle managers used the measurement in their daily activities, but cross cooperation between managers was limited. The reports are kept with the top management, who in turn keep it under lock and key. There PMS is used in legitimisation, which make some middle managers resistant of the measurement process, but it could said that the PMS is the main benefactor of the measurement, and trying keeping the result hidden from other managers, probably because knowledge is power.

UK Culture

In the UK, we have two organizations, we different culture, in Linn productions, the organization is incubator, while in Guided missile it is guided missile culture. The two culture are decentralized, but Linn has more person emphases, while Houston is more of high task emphasis. This has impacted their measures, with Linn having fully balanced measures, additionally, Linn has more advanced use of their PMS. Linn use their PMS in all the uses except legitimization. While Houston, has less developed measures, informal use of PMS results, and they use the PMS in monitoring their activities, communication, influencing behaviour but limited learning and improvement.

Impact of high power distance on PMS

It seems that high PD culture is associated with command and control use of PMS. In command and control design and use of PMS where the systems are designed by top management only, the role of middle management is diminished. This seen in Daaboul, Cherry, Valbona, and Dumpling organizations, the impact of high power distance lead to PMS designed by top management, with little or no middle management participation. The reaction of middle management ranged from compliance to resentment, depending on the degree of employees' individuality. It has been observed that in China, when the individuality is low, there is more compliance to the top management. The only case that had some participation from the middle managers among the low PD was Sama case, and this is seems to be attributed to the focus of the company's strategy on gaining market share, and educational level of these managers.

Impact of engaging strategy on PMS use:

It seems that organizations which are shifting decision making to the middle management is having better developed and used PMS. For example, in Linn products, the performance measures are designed by middle managers, the use of measures is through daily meeting, where performance results are shared, elaborated and decisions taking. Engagement has resulted in ownership of PMS design, implementation and use. However, is the high degree of use related to the flexible nature of the organizational culture? More research should address the impact of flexible organizational culture on the design, implementation and use of PMS.

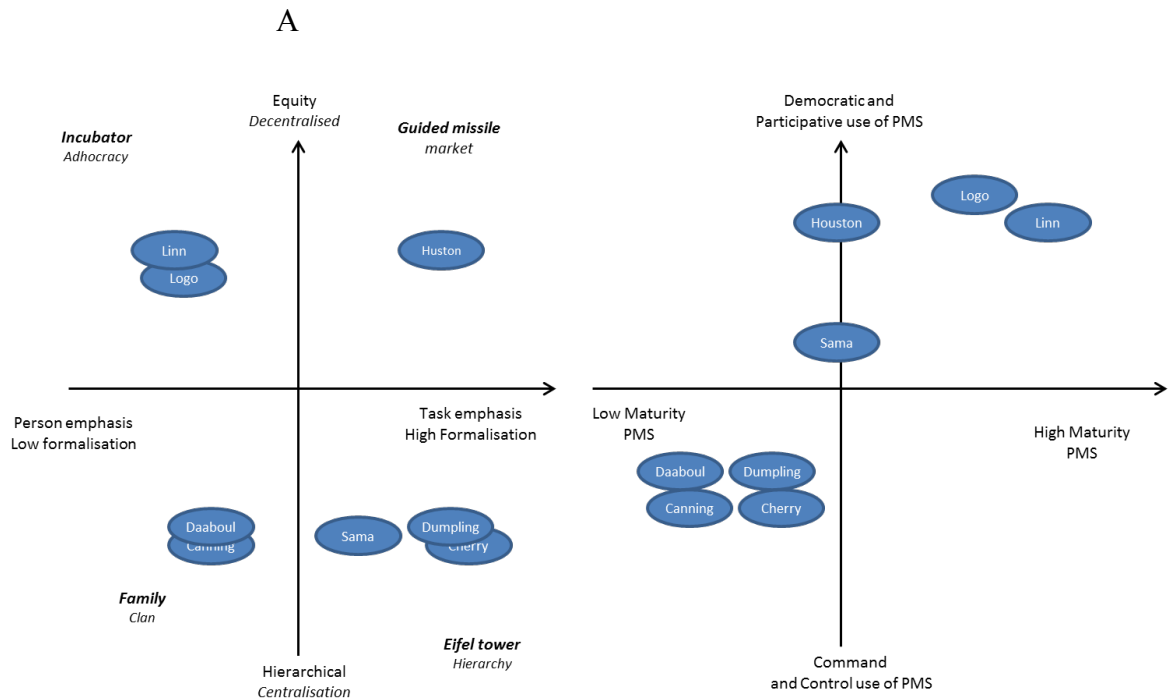


Figure 1 – A: Case studies plotted on a Trompenaars organizational culture framework
 B: Case studies plotted with respect to the maturity level of the PMS against level of participative use of PMS.

Table 1 : Summary of the results

Design of PMS	Linn Products	Houston	Dumpling	Cherry	Sama	Daaboul	Logo	Valbona
Process of design	Initially designed by consultant but the measures evolved as the company used and learned	Designed by management team	Inherited with change	Designed by the board deliberate	Designed by the top manager... deliberate	Inherited by current TM with limited change	Consultant developed by managers in a decentralised way.. Little involvement from TM	Deliberate by top management /owners
Balanced measures	yes	Not fully... mainly financial and customer	Mostly financial	Mostly financial	Not fully... mainly financial but some key customer and operational measures are not there	Limited to financials and operational cost and productivity	Balanced measures including innovation	No... mainly financial with some operational measures
Regular reporting	daily	daily	daily	daily	daily	daily	Yes... daily	Yes...

Regular review	Daily operational ... monthly strategic	Ad-hoc	Weekly review Different meetings at different levels	Weekly reviews incl. quality meetings	No policy... top manager reviews when he feels like it	daily	No formal top management reviews...	Yes... for top management
Actions	From daily meetings	Ad-hoc	Top manager collectively making decisions and giving actions top down deployment with little consultation	Top manager collectively making decisions and giving actions... top down deployment with little consultation	Top management driven ... boss to individual ... Reward and discipline	No clear actions	managers use it for their daily business	No specific process

Relevance/contribution:

In high PD cultures one of the purposes of PMS is legitimisation, while in low PD cultures legitimisation is not a purpose for PMS. While in low uncertainty Avoidance is associated with more democratic use of PMS

Although NC seems to have some influence on the design and use of PMS in organisations, some strategic characteristics of the organisation also influence the design and use of the PMS...e.g.

- Where innovation is a competitive requirement we are observing a more decentralised behaviour within the organisation that is accompanied with more empowered/delegated design and democratic use E.g. Logo
- Governance structure of the organisation and possibly its history can affect the design and use of the PMS... e.g. Dumplings
- Personality and outlook of the leadership has an impact on the use of PMS

Concerning the design of PMS... uncertainty together with Collectivism can impact the way performance information is communicated/shared in the organisation... where high uncertainty avoidance with in-collectivism displaying more secretive behaviours (e.g. Syrian organizations)

PMS in high power distance cultures are of low maturity systems, command and control system. The more engagement will have more democratic systems.

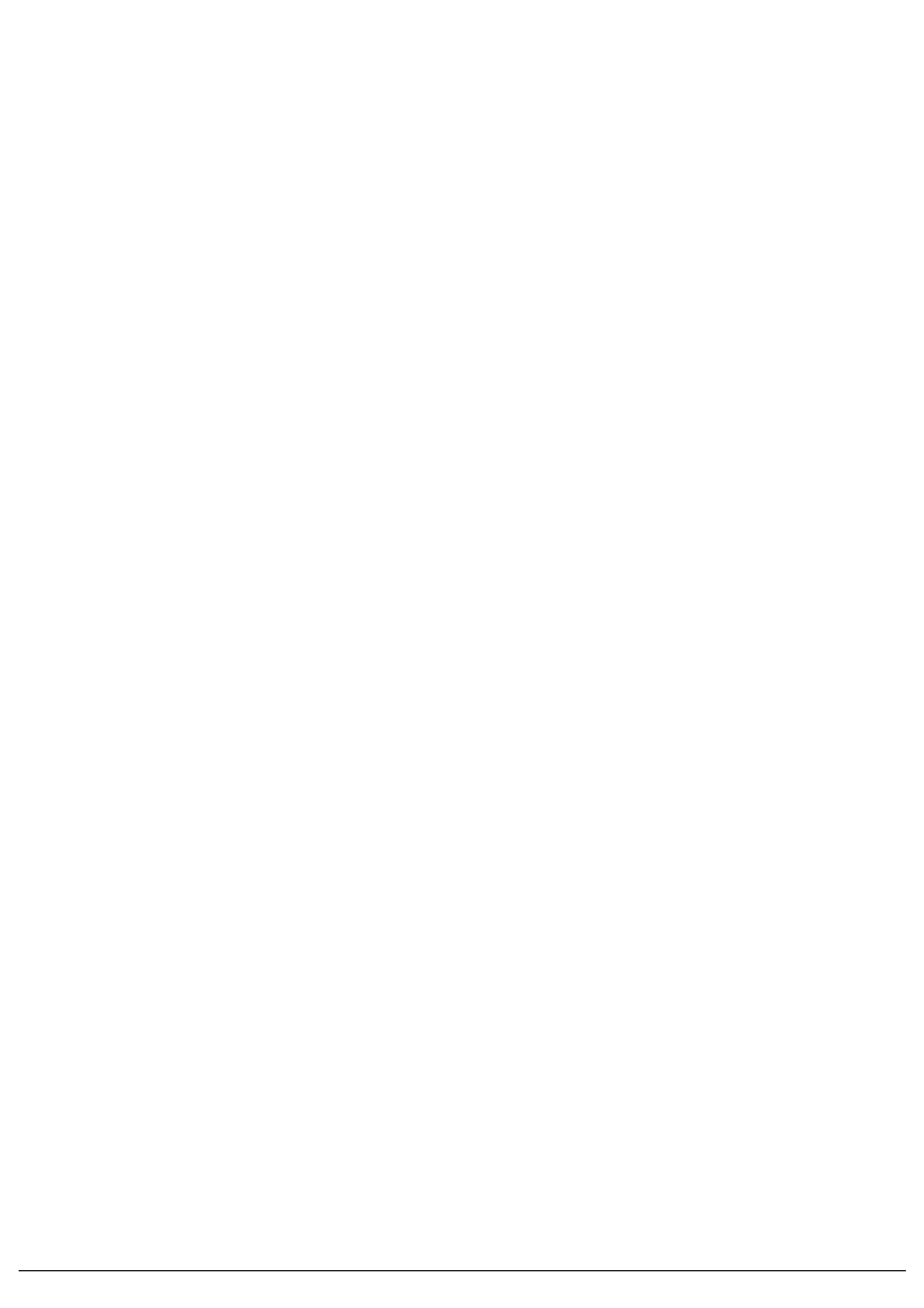
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THE SERVICE OF PERFORMANCE MEASUREMENT OF PUBLIC SERVICE

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The service of performance measurement of public service

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Abstract

Purpose: The purpose of this paper is to identify main rationales and rationalities in discussions on public service performance measurement.

Design: The paper is a conceptual paper based on a literature study on public service performance measurement theory and critiques.

Findings: The paper finds that the theoretical perspectives on the potential impact of public service performance measurement offer a range of contradictory propositions. Its alleged benefits include public assurance, better functioning of supply markets for public services, and direct improvements of public services. But the literature also demonstrates the existence of significant concern about the actual impact, the costs and unintended consequences associated with performance measurement. The paper concludes with suggestions on how to deal with the many rationales of performance measurement in the public sector.

Originality: The value of the paper is to identify different rationales and rationalities at play in the discourse on public services performance measurement. It shows that public services performance measurement is informed by the rationalities that operate within a particular field and are made rational through this. These rationalities may sometimes conflict and at different times take precedence in the formulation and implementation process.

Introduction

Nowadays, states spend more attention, time and money on performance measurement and evaluation in the public sector than ever before (OECD, 1996; Power, 1997; van Thiel et al., 2002). Result-based management is the talk of the day at all levels of the public sector; at local, regional, national and even supra national levels. Schools and universities, hospitals and nursing homes, local governments and other administrative agencies are all involved in producing data and information on performance results and, if possible, impact. Michael Power (1997, 2003) has coined concepts as “the audit explosion” and “the audit society” to describe this development.

Power and others criticize this development. Thus, a number of critiques which suggest that public service performance measurement may in fact have no significant impact or even lead to negative effects on performance. Powers (1997, 2003) have argued that performance measurement serves as “rituals of verification” which promotes the interests of political masters and their mistresses rather than public service. Another area of concern is the cost of performance measurement. Hood & Peters (2004:278) note that performance measurement is likely to “distract middle- and upper-level officials, create massive paperwork, and produce major unintended effects.” Critics also argue that performance measures stifles innovation by rewarding conformity rather than risk-taking (fx. van Thiel et al., 2002).

Thus, the scholarly discourse on public services performance measurement suggests a range of contested and contradictory propositions. Its alleged benefits include public assurance, better functioning of supply markets for public services, and direct improvements of public services. But the literature also demonstrates the existence of significant concern about the actual impact, the costs and unintended consequences associated with performance measurement.

The purpose of this paper is to identify main rationales and rationalities in the scholarly discourse on public services performance measurement. I will show that different rationales and conceptions of rationality are at play in this discourse. I will conclude with some suggestions on how to deal with the many rationales of performance measurement in the public sector. This question is important because, although not without problems, performance measurement indeed can be of value to the public sector.

The paper begins with a brief historical synopsis of performance measurement of public services and some comments on the importance of a focus on its rationales and rationalities. This is followed by an analysis of the purposes or rationales of public services performance measurement as this is put forward in the scholarly literature. This is followed by a discussion of the rationales of the critiques of public services performance measurement, i.e. its limitations and costs. Finally, I conclude the paper with suggestions on how to deal with the many rationales of performance measurement in the public sector.

Thus, the paper is a conceptual paper based on a literature study on public service performance measurement theory and critiques. In addressing the rationales and rationalities of public services performance measurement I am guided by a pragmatist approach trying to understand performance measurement and its rationales as a form of activity. I will argue that rationality is not a unitary measure of behavior, but has many degrees and multiple dimensions. Hence, rationality should be seriously engaged with as a concept and that all facets of this multifaceted concept need to be explored.

The rationales of public services performance measurement

The paper finds that the theoretical perspectives on the rationale and potential impact of public services performance measurement offer a range of contested and contradictory propositions. Its alleged benefits include public assurance, better functioning of supply markets for public services, and direct improvements of public services. But the literature also demonstrates the existence of significant concern about the actual impact, the costs and unintended consequences associated with performance measurement.

Historical synopsis

Performance measurement of public services has been part of the political agenda within the public sphere since their adoption in middle of the 20th century. The quest to measure and improve public service performance dates back to the twentieth century (Ewoh, 2011). In 1938, the International County Management Association (ICMA) published *Measuring Municipal Activities: A Survey of Suggested Criteria for Appraising Administration*, which recommends different types of information that local governments might use in monitoring and evaluating the delivery of public services. In the 1970s, the ICMA issued two publications; *Measuring the Effectiveness of Basic Municipal Service: Initial Report* (1974) and *How Effective Are Your Community Services?* (1977). These publications provided technical assistance to municipal governments on how to gather and analyze data on local performance. They described aspects of local government effectiveness measurement, including criteria for selection of measures, uses for such measurement, identification of measures for different services.

From the 1980s and onwards, we have witnessed a proliferation of the discourse on public services performance measurement. The New Public Management (NPM) movement which called for governments to show its efficiency and effectiveness in expending public resources as well as prove that substantive results have been generated by its activities. Market-type mechanisms such as privatization and competitive tendering were introduced in the public sector. The faith in private sector management instruments in New Public Management attributes a high priority to measuring outputs and outcomes ideally meant to make public services more effective. Input management is replaced by a result-based orientation. This is facilitated through contracts being drawn up between governments and the organizations providing public services. The contracts articulate which task has to be carried out and what the executive agent will receive as a reward.

In the 1980s, private sector organizations experimented with various productivity techniques such as benchmarking and Total Quality Management (TQM) as the performance management field expanded to examine other aspects of service quality, customer satisfaction, and managing by results. This led several governments to publish accounting standards or to recommend that units of governments at all levels should adopt measures designed to encourage agency heads and program managers to monitor program quality and outcomes as part of an overall system aimed at improving the quality as well as the credibility of major public programs.

As this brief historical synopsis shows, public services performance measurement may serve several purposes and build upon several rationales. The literature suggests at least three main theoretical perspectives on the purpose of performance measurement of public services: One perspective sees it as a means of ensuring that public services meet minimum standards. Performance measurement is regarded as a means of providing public assurance. Thus, this perspective echoes the rationale in accountability and quality management. A second perspective conceptualizes public service performance measurement as a response to absence of competition and contestability which drive improvement in private goods markets. Public service performance measurement is regarded as

compensating for the absence of effective competition in supply markets. Thus, this perspective echoes the rationale in privatization and draws on economic theory. The third perspective views public service performance measurement as an agent of public service improvement. It echoes the technical rationale in managerialism and borrows from the business management literature, in particular theories of strategic change and innovation management.

Addressing the rationales and rationalities of public services performance measurement provides an analysis of performance measurement in terms of conflicting rationalities. Rationality is not a unitary measure of behavior, but has many degrees and multiple dimensions. Hence, rationality should be seriously engaged with as a concept and that all facets of this multifaceted concept need to be explored. Performance measurement is not “rational” (or irrational) *per se*, but is *made* rational. Rationality is ascribed by those who encounter a technique or a tool on the grounds that it meets the requisite warranty for its operation (Toulmin, 2001). In other words, a technique or technology like performance measurement is rational in context. To become an acceptable and accepted technology, performance measurement must be able to address reasons for their introduction and appropriateness.

In the following I will describe the three perspectives and corresponding rationales in more detail.

Performance measurement for assurance: A bureaucratic rationale

One perspective on public services performance measurement sees it as a means of providing public assurance. A number of scholars (fx. Newman, 2001; Davies & Martin (ed), 2008) have linked public services performance measurement to a loss of faith in traditional forms of professional expertise, and have argued that performance measurement is a means of ensuring that public services meet minimum standards.

This perspective echoes the rationale in accountability and quality management. It states that failures in areas such as child protection combined with less deferential attitudes on the part of service users and increasing risk aversion in the wider population, mean that citizens and their elected representatives are now unwilling to rely on teachers, clinicians, social workers, and other experts to safeguard the interests of pupils, patients and the general population. The result has been a shift away from relations based on trust in status to a much greater reliance on explicit, codified standards and practices. According to this view, performance measurement serves a powerful socio-political function, providing policy-makers with a way of being able to exert ‘control at a distance’ (Hogget, 1998) over increasingly decentralized and dispersed forms of service delivery to which functions traditionally provided directly by the state have been hived off. The data gathered by performance measurement has proved useful to governments wishing to monitor the performance of these semi-autonomous delivery organizations and provided these organizations with the information they need to exert control over “frontline services” (Humphrey, 2003).

Thus, this perspective on public services performance measurement echoes the rationale in accountability and quality management. According to Townley (2008), this is a bureaucratic form for rationality that stresses classification, calculation and standardization as ways to “rationalize” public services. In this perspective, public services performance measurement is a means of ensuring that public services meet minimum standards. Hence, public services performance measurement is a means of providing public assurance.

Performance measurement for effectiveness: An economic rationale

A second perspective on public services performance measurement sees it as compensating for the absence of effective competition in supply markets. Some scholars (fx. Ammons, 2002) have linked public service performance measurement to the faith in private sector management instruments and have argued that public services performance measurement is a means to compensate for the absence of effective competition in supply markets.

According to this view, because dissatisfied service users are unable to go elsewhere and taxpayers cannot act like shareholders to keep in efficient providers in check, the role of performance measurement is to manage supply markets to safeguard their interests. Providers invariably have access to more accurate, up-to-date, and comprehensive information about costs and quality than the users of services and commissioners. In these circumstances performance measurement may assist the functioning of supply markets by generating and disseminating comparative performance data which enable both commissioners and service users to make informed choices about which providers to access. Performance measurement acts as a counterweight to producer interests in order to safeguard the needs of users and taxpayers. Price controls limit the scope of budget maximization by providers, thus helping to ensure efficient service provision (Martin, 2010). And several countries (fx. The Netherlands, Sweden and France) have introduced national benchmarking schemes to facilitate performance comparisons (Smith, 2007). In these countries, public sector organizations are not monopoly suppliers of major public services, but operate in quasi-markets in which they face competition from other public agencies or from private corporations. Performance measurement can play a role in ensuring that these markets operate effectively.

Thus, this perspective echoes the rationale in privatization and draws on economic theory. According to Townley (2008), this is an economic form for rationality that stresses effectiveness and maximization of expected utility as ways to “rationalize” public services. Public service performance measurement is regarded as compensating for the absence of effective competition in supply markets. Hence, public services performance measurement is intended to make public services more effective in the absence of competition.

Performance measurement for public service improvement: A technical rationale

A third perspective on public services performance measurement sees it as an agent of public service improvement. In recent years, governments around the world have been urgently seeking ways to secure improvement in their public services. Some scholars (fx. Boyne 2003; Boyne et al., 2010) have linked public service performance measurement to the interest in public service improvement and innovation in their public services.

According to this view, public service performance measurement is regarded as a way to secure improvement and innovation in public services. Many governments now explicitly define the purpose of public services performance measurement as means of public service improvement. Performance measurement can play a role in promoting best practice and assist those responsible for public services to achieve better outcomes for citizens.

Thus, this perspective echoes the technical rationale in managerialism and draws on management theory. According to Townley (2008), this is a technical form for rationality that stresses technical efficiency and innovation as ways to “rationalize” public services. In this perspective, public services performance measurement is an agent of public service improvement.

Critique of public services performance measurement: Alternative rationales

Thus, public services performance measurement may serve several purposes. But set against these purposes, critiques state that public service performance measurement has failed to live up to their promises. Townley (2008) reports evidence of a list of disappointments: distorted operational goals; creative reporting of measures; routinization of measures with little impact and practices; encouragement of a “measurement mentality” rather than a focus on learning and innovation, irrational expectations of what targets may achieve.

Thus, a number of critiques states that public services performance measurement may in fact have no significant impact or even lead to negative effects on performance:

One kind of critique of public services performance measurement is directed towards its bureaucratic rationale, i.e. the proposition that public services performance measurement is a means of providing public assurance. Based upon empirical evidence, Power (1997, 2003) argues that performance measurement consists of self-serving “rituals of verification” which serves the interests of political masters and mistresses rather than the performance. Regulators need to make public organizations “auditable”. As a result, performance is “not so much verified as constructed around the audit process itself” (Power, 1997:51). Thus, performance measurement may provide false reassurance. Evaluation of audit reports shows a tendency to focus on procedures rather than actual performance, and on the absence or presence of performance measures rather than their quality and content (OECD, 1996; van Thiel & Leeuw, 2002). For example, Martin (2010) points to the fact that the introduction of composite performance measure in UK public services has been criticized for their vulnerability to categorization errors and their disregard of important external influences on performance. In education, systems of service measurement and quality assessment is introduced which are electronically sophisticated, but theoretically elementary and imperfect. Hence, public services performance measurement may not have the bureaucratic rationale of assuring minimum standards that it is intended to have.

Another critique of public services performance measurement is directed towards its economic rationale, i.e. the proposition that public services performance measurement is a means of providing effectiveness. With reference to the evidence Martin argues that the costs of public service monitoring are not easily quantified, and it is difficult accurately to gauge indirect and opportunity costs. Direct costs in terms of staff and finances are often not reported. Further, performance measurement may create high levels of stress and anxiety. But the negative impacts on staff sickness, demotivation and retention remains large unknown. The benefits of public services performance measurement are similarly delusive. Given that performance measurement regimes are for the most part mandatory and applied comprehensively, there is rarely a counterfactual against which to measure progress in its absence. Additionally, performance measurement may create incentives which distort organizational priorities and individual behaviors. Martin (2010) reports evidence of creative reporting of measures and distorted operational goals. Thus, he argues that “performance monitoring is likely to distract middle- and upper-level officials, create massive paperwork, and produce major unintended effects” (Martin, 2010:44) Hence, public services performance measurement may not have the economic rationale of providing effectiveness that it is intended to have.

A third critique of public services performance measurement is directed towards its technical rationale, i.e. the proposition that public services performance measurement is a means of providing public service improvement. Townley (2008) reports evidence of routinization of measures with little impact on practices and encouragement of a “measurement mentality” rather than a focus on learning and innovation. Martin has examined the empirical studies of the impact of performance

measurement of public services on public services improvement. He concludes that most studies focus on just one sector (usually schools or local government services) and assessed the impact in terms of senior managers' perceptions of the performance of their organization or performance indicators. Much of this concludes that performance monitoring in schools have led to changes in management systems and teaching practice in the schools, but that the relationship with improvements is complex, contested and contingent. For example, it is contested and contingent in the sense that perceptions of impact seem to vary widely among different types of informants. Hence, public services performance measurement may not have the technical rationale of improving public services that it is intended to have.

Consequently, there are a number of critiques which states that public services performance measurement may in fact have no significant impact or even lead to negative effects on performance. Critiques call it a "paradox of performance measurement" that an increase in performance measurement in the public sector may in invalidate conclusions or even negatively influence that performance. This entails that performance measurement may in fact provide false reassurance and create extra financial and other costs (van Thiel & Leeuw, 2002; Clarke, 2008). The performance measurement paradox takes many forms and can be the unintended result of a number of variables, such as government demands, the type of task, the vagueness or contradictory nature of objectives. Public services have many, often contradictory goals. Consequently, performance measures are usually not neutral but contested measures in the public sector, both between politicians, between professionals and between politicians and professional.

The critiques of public services performance measurement state that the rationales of public services performance measurement are in fact irrational. Rationalizations that might be offered as practice fails to conform to theory are those that according to Mintzberg (1994) accompany any unsuccessful introduction of a management technique and include faith ("there is no problem"); salvation ("it is the process that counts"); elaboration ("just wait and see"); reversion ("back to basics"); and pitfalls ("it's them, not us"). All of these have a degree of plausibility. But are we then faced with the eternal optimism of an administrative mind? According to Townley, the critique is based on an embedded or contextual form of rationality which states that rationality is a context dependent rather than an absolute concept. This perspective or conception of rationality entails that rationality is embedded in the context in which it occurs and acquires meaning in reference to that context. Thus, it challenges a fundamental dimension of rational action in its disembedded form; its universalist assumption that rationality entails general measures and its temporal assumption that rationality precede action.

The service of performance measurement of public service

I have analyzed public services performance measurement in terms of a series of conflicting rationalities that are brought to play in the attempt to flesh out what it involves. This analysis is stimulated by an encounter with performance measurement as a "rational" technique, and some of deficiencies or "irrational" consequences. Performance measurement is recommended as a rational tool, part of the rational panoply of effective management and organizational functioning. Its legitimacy is its rationality. Public services performance measurement is promoted to serve several purposes. No rational individual could deny that their objectives are desirable and rational. Nonetheless, critiques state that public service performance measurement has failed to live up to their promises. The critiques suggest that public services performance measurement primarily serves the interests of political masters and mistresses rather than public service.

The analysis of public services performance measurement in terms of its rationale and rationality shows that rationality does not inhere in a tool or technique *per se*. Thus, a focus on rationales and rationalities provides an entrée to performance measurement that avoids the position of being “for” or “against” public services performance measurement. With regards to performance measures my argument is a simple one: Performance measures do not work. They are made to work (Townley, 2008). A performance measurement system is a theoretical construct, operationalized in a set of concrete practices. Thus, it is ascribed. Its rationality is ascribed by those who encounter it on the grounds that it meets the requisite warranty for its operation. To become an acceptable and accepted technology, performance measures must be able to address reasons for their introduction. They typically focus on “what is the goal, purpose, objective of what we do?” (a bureaucratic rationale), but simultaneously prompt questions like “how to be more effective?” (an economic rationale) and “how to improve service?” (a technocratic rationale). On the other hand, they also prompt contextual questions like “how do these measures help us – or not help us – here and now?” (contextual rationality). All these rationalities are brought into play to render a “rational” technology like performance measurement rational. Because the concept of performance in public service is multi-dimensional, public services performance measurement has multiple rationales and multiple forms of rationality. As Flyvbjerg (2001) argues, the rationality of a technology is produced in and through the action of those engaged in coming to terms with its operation. This is an ongoing activity. The act of engaging reason is to challenge reasons. It lays the foundation of questioning why certain types of reasoning are dismissed as lacking credibility. Thus, the function of reason is also to reflect on reason’s constraints. Public services performance measurement is informed by the rationalities that operate within a particular field and are made rational through this. Hence, the service of reasonable public services performance measurement is to serve multiple forms of rationality – and to recognize their contradictory and contested character.

Conclusion

The paper has identified main rationales and rationalities in the scholarly discourse on public services performance measurement. Performance measurement is recommended as a rational tool, part of the rational panoply of effective management and organizational functioning. Its legitimacy is its rationality. Nonetheless, critiques state that public services performance measurement has failed to live up to their promises and, therefore, is irrational. The critiques suggest that public services performance measurement primarily serves the interests of political masters and mistresses rather than public service.

A focus on rationales and rationalities provides an entrée to performance measurement that avoids the position of being “for” or “against” public services performance measurement. The paper shows that different rationales and conceptions of rationality are at play in this discourse. Because the concept of performance in public service is multi-dimensional, public services performance measurement has multiple rationales and multiple forms of rationality. These rationalities may sometimes conflict and at different times take precedence in the formulation and implementation of public services performance measurement systems. Public services performance measurement is informed by the rationalities that operate within a particular field and are made rational through this. Hence, the service of reasonable public services performance measurement is to serve multiple forms of rationality – and to recognize their contradictory and contested character. Then, although not without problems, performance measurement indeed can be of value to the public sector.

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DISCIPLINED COLLABORATIVE PERFORMANCE AS THE ROAD TO RESULTS

AN EDUCATIONAL LEADERSHIP STUDIO CONCEPT
AS A CATALYST FOR IMPROVED K-20
ACHIEVEMENT

MARY JO HALL

Title: Disciplined Collaborative Performance as the Road to Results: An Educational Leadership Studio Concept as a Catalyst for Improved K-20 Achievement

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Structured Abstract:

Purpose: The purpose of this practical application case study is to record the evolution of a concept for convening and catalyzing a group of education doctoral students to connect and to coordinate around common problems-of-practice using a structured process to impact the current skills gap. The goal was to develop leaders who could personally lead and influence others in finding and eliminating K-20 achievement problems-of-practice.

Design/methodology/approach: The original design began with dialogue among the author, three faculty members from a small, private university in North Carolina and the former director of a public school leadership academy. The group mix evolved over time and as a result of three unique phases for design, development, and delivery.

The design for the concept used tools, techniques, and methods from a variety of disciplines including Quality Management and Design Thinking. The delivery integrated experiential activities with keynotes and leadership development assessments.

Findings: Many lessons were learned along the journey including:

- A structured, disciplined approach using tools and techniques for problem-finding, rough-and-ready rapid prototyping, and fast development of multiple iterations can reduce the concept-to-launch time
- Engaged performance requires “skin-in-the-game”
- While a multidisciplinary approach is advocated, it is difficult in practice

Originality/Value: The very nature of the concept, a studio as a practice field for experimentation and discovery, is customization and originality. The value is being able to learn from and to leverage the design of others.

Keywords: Strategic Performance, collaborative co-design, work-as-learning, design thinking, agile experimentation, network learning

Article classification: Case Study

Title: Disciplined Collaborative Performance as the Road to Results: An Educational Leadership Studio Concept as a Catalyst for Improved Student Achievement

Introduction

This case study is the story of the design, development, and delivery of an Educational Leadership Studio, held in July 2013 in North Carolina. The venue itself was a customized session that evolved over two plus years. The initial team consisted of five people, three faculty members of a private university and two practitioners, including the author. We started dialogue and ideation in July 2011. We generated a concept which morphed into a studio metaphor and, eventually, an onsite session for over 75 doctoral students. Within two months of start-up the team grew to 12 and included the directors of educational doctoral programs from two other universities.

Before elaborating on what happened during this time, it is important to understand **why** a small team was driven to undertake such a huge endeavor. Within the confines of the School of Education, there was success at the undergraduate and masters levels and the university's first doctoral program was in the works. So, what really drove the creation of the Studio?

The overarching driver for the Studio was the passion team members had for creating a system that enables the educational success of every person in North Carolina and beyond – but, particularly, K-20 students.

A second driver is the belief – based on research and experience – that a key component of school success is forward-thinking leadership practiced on a daily basis by professionals assuming responsibility at every level of the educational structure. But most importantly, a belief that the Ed.D. is the degree needed by those leading education at the highest levels.

A third driver is the appreciation for how the world has changed – a global economy; disruptive technology evolving daily altering the way people gather, use, and share information; shifting demographics; and, in general, an environment many refer to as VUCA (Volatile, Uncertain, Complex, and Ambiguous). This changing world dynamic reinforces the team's belief that to stay current and relevant everyone must continually build their skills and capacities.

And, finally, a fourth driver is the internal motivation every member of the team had to **MAKE THINGS BETTER**. This sense that ordinary folks can connect around a common goal or problem and, with collective resources, intellect, and energy, do something truly extraordinary was shared by everyone in the team.

But while these drivers moved the team forward, there were other forces tugging to continue with the status quo. These restraining forces included time, resources, people, and/or money constraints; the unknown; and the general fear that comes with tackling a challenging conundrum. Luckily, at the end of the day, the driving forces were much stronger than the restraining forces.

So WHAT is the vision that we developed to close the skills/achievement gap through a different approach to leading change? In essence, it was a concept to bring the doctoral students together to experience the energy and learning that surfaces in a well-structured, collaborative co-design environment so that participants might then have the skills, impetus, and motivation to design a venue to work on problems-of-practice. Thus, not only would the doctoral students be demonstrating educational leadership within the context of their degree curriculum, but, also, doing it in such a way as to fit specific work needs aimed at making a larger impact on K-20 education.

When the discussions for this concept started, the team did not really know what “it” was going to be – a conference, an institute, or a workshop or even “who” would be involved. But through extensive sharing, dialoguing, piloting, drafting, summarizing, reflecting, and posting, the major components for this “it” evolved. Primary among these components were:

- A user/customer focus – it had to be relevant to the participants
- A practice field for demonstrating leadership skills for a changing world – and connected to the doctoral curriculum
- Innovative best-practices for collaborative co-design for problem-finding and solution generation
- Technology integration – 24/7 connections and access, archival capability, and social components for building relationships, collaborating, co-designing, and sharing
- Partnerships to span boundaries – between and among universities, associations, industry, etc.

Phase I – Getting Started

During this phase the faculty team had extensive dialogue on the nature of leadership, especially educational leadership, change, connected problem-solving, and learning. Some assumptions held by the team were documented as part of the structural framework for the design and included the following:

Leadership:

- *Leadership is a two-way process that evolves as individuals work in groups (large or small) and/or with followers on common goals*
- *Leadership is doing the right things; management is doing things right (Peter Drucker)*
- *Extraordinary leadership is a journey of choice by those with the courage to enter unknown territory*
- *Leadership is needed at every level in every organization, community, and group, e.g., it is distributed*
- *Leadership is encouraged when individuals have a purpose and are given autonomy (Daniel Pink)*

Learning:

- Learning is a visceral experience, not just a mind activity
- Learning is a social experience

- Learning is the process of turning external information and experience into internal knowledge (Dave Meier)
- Learning is not the consumption of information. True learning is, and always will be, a supreme act of knowledge creation on the part of the learner which happens when information is taken in and integrated into the context of where an individual lives and works and is filtered thru personal experience (Dave Meier)
- Most people learn far more when actively engaged in working with others to create knowledge (Dave Meier)

After going through various iterations for the vision, we realized that a traditional conference was not the approach that fits with the ongoing dialogue and the assumptions. During one of the team’s presentations on the strategic direction one member had a big AhHa and exclaimed, “This was not a conference or an institute – it is a studio for experimentation!” This reference resonated with everyone on the team who could easily “see” the metaphor. This led to sharing visual images and they included:

- Canvases, not just on the wall but stacked against the walls
- All sorts of paints – oil, water-based
- Myriad tools like brushes and pens
- Drafts, sketches, and completed works
- Solvents and other clean-up solutions, and
- Personal paraphilia like old coffee cups, dirty aprons, rags and food wrappers.

This was quickly contrasted with a formal conference room with a huge table and large chairs and impressive pictures on the walls. One is messy; one is organized and neat. One is for discovering unknowns and experimentation. The other is for final discussions of a known solution.

In line with the original assumptions about leadership and learning and this new metaphor, the team defined the studio as follows:

A studio is	A studio is not
A team sport	An individual sport
An action tank for doing and learning	A think tank for pondering and pontificating
A practice field for leadership	A space for thinking about ideas related to leadership
Collaboration around a common goal or problem of practice	A presentation in isolation
A vehicle that serves as a catalyst to generate new insights and solutions between and among people based on evidenced-based research	A vehicle that creates awareness of what others have done by sharing cases, research, and ideas
Developing rough-and-ready models/pilots/prototypes real time	Hearing about models/pilots/prototypes that others designed
Co-designing	Consumption
Everyone listening, thinking, asking questions, and actively engaged in doing	Everyone listening and thinking/contemplating and maybe having someone else doing

A framework that involves the whole body and movement, e.g., a visceral experience	Sitting and getting, e.g., BICs (Butts in chairs)
Content and information within context of the participants' goal or problem-of-practice	Content within the context of the presenter's goal or problem
A community networked via relationships connected for cooperation and collaboration	Isolated individuals working on different parts of a challenge

The Phase I design of the Studio was based on a 3-tiered approach aligned with the 3-year Ed.D. process.

Cohort/Year	Tasks and Activities
3 rd year	Primary responsibility for design and coordination for each annual Studio, including both the face-to-face (F2F) and the virtual components.
2 nd year	Primary responsibility for development and delivery
1 st year	Primarily in a learning mode

With this concept a Strategic Direction was drafted (Appendix A), a pilot was scheduled for July 2013, and the theme became “**Leading Change in a Changing World.**”

Phase II – Continuing the Discovery Journey

As the saying goes, “Life Happens.” With the Phase I strategic direction in place, the focus for the faculty became preparing for the first cohort. Time passed without further movement on the studio, but one milestone loomed - July 2013. In early September 2012 the cohort became a reality and added a fresh and important dimension to the design mix – participants with real needs, ideas, and motivations. It was quickly realized that while the “notional” Phase I design looked great on paper, it needed more input from students. Thus, a small team of faculty and students was formed to design a gameplan for the fast approaching studio experience. The plan changed to modeling a studio pilot for the doctoral students from the three universities to determine if they were interested in a “studio.” If they were interested, then it was determined they needed to design future studio experiences. Additionally, the content moved to a focus on 21st Century Skills and participants were changed to only doctoral students. The goal was buy-in and commitment from the students to be the designers and to invest in the sustainability of a studio as part of their doctoral experience.

Using the 21st Century Skills as a basic context for the new Phase II Studio, the design team developed a list of optional experiences (Appendix B). The activities for the participants included a variety of techniques and methods from the Human-Centered Design and Quality Management repertoires such as:

- Force Field Analysis to understand WHY a new model of learning is necessary

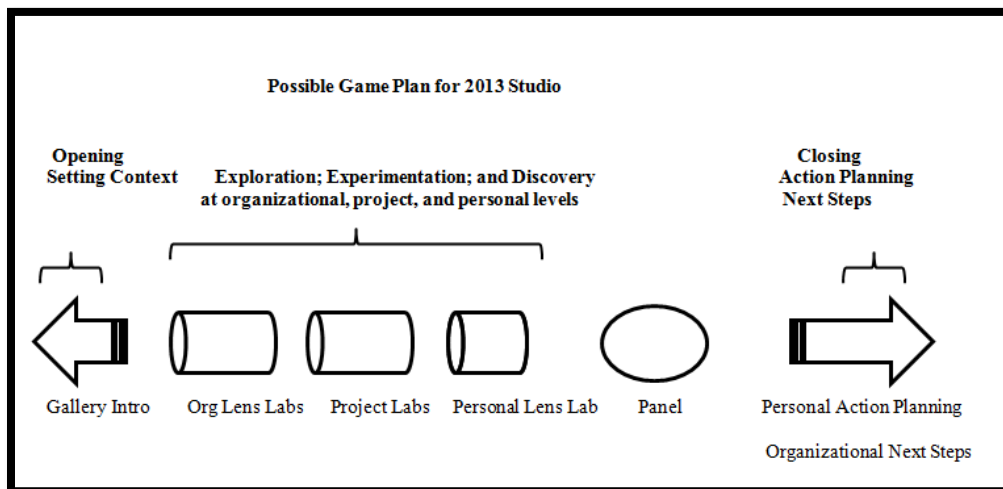
- Starburst as a way to set the stage and to lay the foundation for new learning
- Read-a-book-in-an-Hour and a Concept Poster to learn more about the PlanDoStudyAct improvement cycle
- Cover Story, Stakeholder Map, and Empathy Map to envision the future, and
- Graphic Gameplan to develop action plans for the next steps.

Once again, however, life happened and there was a lull in the Studio development. Based on the doctoral curriculum requirements and time commitments of work, the winter months slipped away. There was also another new addition to the Studio content mix – the Carnegie Project on the Education Doctorate (CPED). The CPED places emphasis on differentiating between the outcomes and expectations for doctoral candidates: for those that choose to be scholarly practitioners (Ed.D.) and for those who want to do research (Ph.D.). Additionally, CPED recommends that Ed.D. preparation programs incorporate skills that better align with the K-20 schools such as the Science of Improvement.

With this new twist and well into spring 2013, Plan C evolved. The Plan C design included a segment on leading change with a consultant administering the Change Style Indicator, the executive director for the CPED discussing networks and the ideas behind The Science of Improvement, and the students from all three universities sharing their “problems-of-practice” in a formalized Gallery Walk.

With overarching objectives of the Studio to be as experience-based as possible and to have a flow to help participants connect the pieces into a logical build for an integrated structure, the team went back to the “drawing board.” After several discussions a Venn diagram was developed. The components included personal leadership (personal change style), team leadership (the students problems-of-practice), and organizational leadership (incorporating Improvement Networks).

To develop the flow the designers used a gameplan structure idea from *Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers* and diagrammed it:



Phase III – Implementing a Studio

While every aspect of creating a Studio session is vital to the success of the experience, implementation is where the rubber meets the road. The design can look great and be perceived as a success on paper, but it is only a vehicle. The question is: Will this venue enable the participants to arrive at their destination? The final agenda for the July 2013 Educational Leadership Studio is posted as Appendix C. Given the number of universities, individual presenters, speakers, designers, and iterations involved, the Studio was executed surprisingly well. One aspect of emphasizing the studio model is the expectation for discovery, experimentation, trial-and error, etc. Thus, a bump in the road here and there is the norm.

There were numerous highlights, lots of engagement, high levels of energy, and extensive sharing and connections. As with most experiential learning venues, the surprise TakeAway for the participants was how much they learned from each other by sharing their practices and ideas.

Other Lessons Learned:

- As with many organizational projects, the practice is to focus on discussing the ideas within a small group to achieve perfection prior to sharing with others. A lesson learned is to incorporate the rough-and-ready rapid prototyping practice of design thinking and to learn from that experience. Design thinking promotes multiple iterations with the users to gather information continually rather than a long, extended dialogue with a few.
- High performance requires “skin-in-the-game” – or, as Mary Kay Ashe often stated, “People will support that which they create.”
- Change initiatives that minimize resistance and maximize engagement involve a structured, disciplined approach and support for the transition.
- Moving from a concept to process, e.g., from talking/dialogue to measureable actions/results can be facilitated by using collaborative decision-making tools and techniques as a creative approach to problem finding/solving.
- Various disciplines have unique interpretations for processes and measuring results. They literally have their own unique language. While we talk about multidisciplinary teams and boundary spanning, it is in fact very difficult in daily practice to leave one’s functional zone.

Summary:

At the end of day, the bottom line is about creating the environment to catalyze change that enables problems to be recognized and solved and, simultaneously, make continuous improvement. A saying that sums up the 2013 pilot Studio onsite experience is something like this: ***Ordinary lives are punctuated by extraordinary moments – moments that really count.*** A visual depicting this experience includes all 80 plus participants from the studio pilot literally in the sky and connected in a huge web via clasped arms and banners that read ***Better Together, Scholarship and Practice, PDSA, Working on high-leverage PoPs one cycle at the time,*** etc. Underneath them is a map of North Carolina. On top of the map are children and schools reaching up to them. The idea of networked education leaders using a structured process to obtain results that can be measured with K-20 achievement is powerful.

It takes discipline and hard work to make a truly measurable difference in student achievement. It also requires using a disciplined approach that combines problem-finding, problem-framing, intentional discovery, boundary spanning, collaboration, and real-world experiments to gain insights and to find solutions. As Dr. Deming frequently said, “It does not happen all at once. There is no instant pudding.” The experiences described in this case study were seeds for connecting, collaborating, and co-designing around a noble cause. With support from Ed.D. students and faculty at the three universities, the seeds of the 2013 Educational Leadership Studio can be nurtured and the resultant network can be a force multiplier for student achievement across the state. Designing and executing a unique results-oriented concept is truly an extraordinary moment – one that has the potential to impact the future in a way that can be measured.

Appendix A: Phase I Educational Leadership Strategic Direction

STUDIO VISION

The Educational Leadership Studio is a working place for creative and innovative leadership directed at enabling K-20 students to achieve extraordinary results as American citizens in a global economy.

STUDIO MISSION

The Educational Leadership Studio provides a convening platform for practitioners and policymakers to connect, communicate, collaborate, and co-design around problems-of-practice using research-based tools and methods appropriate to the context.

TAGLINE: Convene, connect, communicate, and co-design within context.

STUDIO BELIEFS: The Education Leadership Studio is based on these beliefs:

Extraordinary leadership is a journey of choice	Being purpose-driven enables success	Dissonance is a necessary state-of-doing
-Leadership is needed at every level -Leading is learning made public -Leadership builds on experiences with feedback and self-reflection	-Leaders use data to guide direction - Disciplined and consistent action focused on targets drives results -Lasting improvement occurs incrementally over time	-Leaders employ effective problem-solving methods -Leaders seek productive conflict -Polarity management invites further opportunities to lead

STUDIO OFFERINGS AND SERVICES

The Educational Leadership Studio is a practice lab for the four C's (Convene, connect, communicate, and co-design within context) providing many opportunities for doctoral students to demonstrate leadership using strategy, data and learning; building collaborative relationships; and integrating educational theory, application, and practice. The Studio provides virtual and face-to-face networking opportunities for participants to connect continuously with know-how and know-who. The Studio is a venue for participants to collaborate using myriad innovative tools and techniques. It is also a place for participants to publish research, practices, and ideas on interest-based topics, on leadership adventures with problems-of-practice, and on emerging trends in leadership-learning. As participants and colleagues share ideas and build relationships, the Studio will become a clearinghouse for problem-solving tools, coaching/mentoring, and peer advisory opportunities.

STUDIO CLIENTS

- University students

- Superintendents, senior leaders, principals, and teachers (public and private)
- Higher education faculty
- Practitioners, partners, patrons, and policymakers
- Anyone interested in forward-thinking leadership

STUDIO STAKEHOLDERS

- Policymakers
- Partners
- Investors
- Regional Education Superintendents' Association
- Local Education Funds
- Leadership Development Programmers
- University Educational Leadership Faculty

STUDIO GOALS

Convening - To create value-added venues and to manage touch-points for clients who choose to be extraordinary leaders

Connecting – To create opportunities for multidisciplinary professionals to connect in order to collaborate on leadership-learning experiences that transfer back to their daily practice, e.g., working-on-their-work

Communicating – To foster an environment and to provide an infrastructure for multiple communication channels both in-person and online that constantly connect clients with both know-how and know-who

Co-design within context – To provide structure and experiences for clients to connect, to collaborate, and to co-design methods for gaining further insight into authentic problems-of-practice and to leverage successes so that participants can exert local leadership to close the K-20 achievement gap

TO MEET THE EDUCATIONAL LEADERSHIP STUDIO GOALS, THE DESIGNERS AND PARTICIPANTS MUST

- Model and propagate 21st century skills and other emerging trends for engaging in leadership that results in meeting the goals and vision for closing the K-20 skills gap
- Design, develop, and deliver venues that create opportunities for interactive, multi-disciplinary leadership experiences focused on the mission and goals
- Build and maintain a viable business model that clearly identifies and acquires resource streams for both content and process, incorporates appropriate governance and operations systems, and leverages the internal capabilities of the three universities
- Create and communicate a unique and compelling brand advancing an extraordinary leadership adventure of discovery, risk-taking, and results

Appendix B: Phase II Suggested Activities for introducing a studio concept using The 21st Century Learning Framework, principles of the design thinking discipline, and other tools for collaborative co-design

1. Agenda Item: Attending the reception and/or dinner with a Working Session

Aim: To set the stage for WHY a new Learning model is necessary and the role of educational leadership in change

Activity: FFA – Force Field Analysis

Reference:

<http://www.gogamestorm.com/?p=402>

2. Agenda Item: Lab #1, Setting the stage and laying the foundation – 90 minutes

Aim: To create a higher degree of awareness and understanding of the 21st Century Learning Framework

Activities: Starburst segmented by the major components of the framework and a Gallery Walk for specific questions

References for activities:

http://www.mindtools.com/pages/article/newCT_91.htm

<http://www.brighthubpm.com/project-planning/123141-effectively-using-starbursting-in-the-project-initiation-phase/>

<http://serc.carleton.edu/introgeo/gallerywalk/what.html>

<http://www.facinghistory.org/resources/strategies/gallery-walk-teaching-strateg>

References for content:

<http://www.p21.org/overview/skills-framework>

<http://www.wvwc.edu/academics/gradprograms/ME/pdf/Framework%20for%2021st%20Century%20Learning.pdf>

http://www.p21.org/storage/documents/P21_Framework.pdf

Caveats: Requires some understanding of the topic – which can be in form of blog, web session, etc. prior to the Studio

3. Agenda Item: Lab #2, Introducing the Design Discipline and various tools available – 120 minutes

Aim: To develop an awareness of the discipline of design and the vast array of tools and methods available for leading change

Activity: Read-a-book-in-an-hour followed by a Concept Poster and report outs

Books that need to be available for reading:

Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers by Gray, Brown, and Macanuso

Innovating for People: Handbook of Human-Centered Design Methods by LUMA

ToolTime by David Langford

Visual Meetings by Dave Sibbet

Mindtools web site – (may need different instructions for a web site)

Reference:

<http://www.gogamestorm.com/?p=419>

4. Agenda Item: Lab #3, Envisioning a different future - 90 minutes

Aim: To enable participants to have a common picture of a new future

Activity: Cover Story – LUMA and/or Grove version

References:

Innovating for People: Handbook of Human-Centered Design Methods

Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers

<http://store.grove.com/Cover-Story-Vision>

<http://www.gogamestorm.com/?p=365>

5. Agenda Item: Lab #4, Understanding people affected by the issue – 60 minutes

Aim: To understand people and the system as part of our role in analyzing challenges and opportunities in leading change

Activity: Stakeholder Mapping

References:

Innovating for People: Handbook of Human-Centered Design Methods

<http://www.lmcuk.com/management-tool/stakeholder-mapping>

6. Agenda Item: Lab #5, Creating modified personas using an Empathy Map - 60 minutes

Aim: To build a shared understanding of the user by summarizing the mindset, needs, and goals of stakeholders/constituents based on extensive inquiry

Activity: Empathy Map

References:

Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers

http://www.cooper.com/journal/2001/08/perfecting_your_personas.html/

<http://www.usability.gov/articles/newsletter/pubs/092005news.html>

<http://www.reesshad.com/prototyping/goodwin.pdf>

7. Agenda Item: Lab #6, Developing a graphic game plan - 90 minutes

Aim: To enable the participants to move from ideas and concepts to actions

Activity: Graphic Game plan

References:

Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers

http://store.grove.com/Graphic-Gameplan_2

<http://www.gogamestorm.com/?s=graphic+gameplan>

Appendix C: Phase II Agenda for Educational Leadership Studio/July 22-24, 2013

Monday July 22, 2013

Time	Activity
3:00	Registration & Concept Poster Set-up in Gallery (Directory & easels in Conference Center-2 nd Floor)
5:15	Studio Photo (by the pool outside Conference Center)
5:40	Use of TWITTER during Studio #edlstudio
5:45	Ice breaker Activity
6:00	Dinner
6:35	Transition/Restroom Break
6:44	Introduction of Expert Consultant
6:45	<i>"The Personal Leadership Journey: Finding Self in a Sea of Change"</i>
8:15	Introductions of CPED Director and Experience Facilitator
8:17	Guided table discussions
8:40	Adjourn and Preview for Tuesday
8:45	Gallery Walk (optional) Please use #edlstudio when tweeting

Tuesday July 23, 2013

Time	Activity
8:00	Continental Breakfast/Networking/ Gallery Open
9:00	Welcome; overview of the day/tweets
9:05	Guided Reflections
9:30	Formal Opening of the Gallery
9:45	Logistics of Gallery Walks
9:55	Meet the Artist Session I: Dialogue and Inquiry
10:50	Transition for Gallery Walks
10:55	Meet the Artist Session II: Dialogue and Inquiry
11:55	Lunch
12:25	Transition Time/Check emails/Restroom
12:35	Guided Reflective Activity from Gallery Walks
1:30	Transition Time
1:35	<i>"Network of Scholar/Practitioners"</i>
4:00	Adjourn and Preview for Evening and Next Day
6:30	Social (by the pool)
8:00	Departures

Wednesday July 24, 2013

Time	Activity
8:00	Continental Breakfast and Informal networking
9:00	Welcome; overview of the day/tweets
9:05	Guided Reflections

9:30	Transition to Next Session
9:35	<i>“Networks using the Science of Improvement and Connecting Around Common Problems-of-Practice”</i>
10:55	The Education Leadership Studio: Noble Cause/Core Values (a call to action)
11:10	Transition Time/Break
11:20	Discussion/Response to Call; Network of Scholar Practitioners
11:50	Working Lunch
12:20	Teams to Develop Next Bold Steps: Activity
1:30	Final Thoughts & Closing Remarks
2:00	Farewells and Departures

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THE CRIPPLED BOTTOM LINE – MEASURING SUSTAINABILITY

RAINE ISAKSSON, MIKAEL JOHNSON, RICKARD GARVARE

The Crippled Bottom Line – Measuring Sustainability

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Abstract

Purpose

Global development is not sustainable. Yet, both academia and practitioners are struggling with making sense of what sustainable development is. Sustainability can be assessed in the dimensions Profit, Planet and People. One of the problems with the approach is that these dimensions cannot be added while there are conflicting priorities. Another problem is that performance seldom is related to global system boundaries. The purpose of this paper is to study how sustainability on an organizational level could be operationalized while being linked to global boundaries.

Methodology

Sustainable Development and sustainability definitions are reviewed to identify main stakeholders. Main processes required for sustainability are identified based on People and Planet as stakeholders. People value defined as utility is compared to Planet harm as carbon emissions and People harm as prices of products. The proposed theoretical concept is examined on the business level looking at the process of providing housing and cement manufacturing.

Findings

The relative indicators with focus on People utility compare to Planet and People harm seem to be relevant for measuring the level of sustainability.

Practical implications

The practical implications of the results could be important in that the proposed approach with relative indicators linked to global limits could help companies work with sustainability.

Originality

In spite of the inherent logic of adjusting consumption to existing means there is little written about the practical implications for organizations.

Keywords: Sustainability reporting; Sustainability KPI; Triple Bottom Line; Profit-People-Planet; Eco Efficiency; Relative KPI; Value per harm.

Research paper

Introduction

Humanity uses the equivalent of 1.5 planets to provide the resources we use and to absorb our waste (Living Planet Report, 2010). There are numerous definitions of Sustainable Development (SD), which poses a difficulty for operationalization. Many companies are transparent about their climate and SD goals (Pivotgoals, 2014). However, in many cases it is not clear how company goals relate to global limits as described for example by Rockström et al. (2009). Within the complex issue of SD global warming is relatively easy to understand and to link into human activities. It could be expected that at least for carbon emissions it should be possible to operationalize SD. The consultancy company PWC has calculated that carbon emitted per US\$ of GDP has to be reduced 6% per year until 2100 (Winston, 2014). Linking climate change to business could therefore be used as an example of how to go from academic discussions to required actions. As we see it, working with SD poses two main challenges. The first one is to get a good enough definition of what SD is. The other one is to translate the “what” of SD into “how” we work with SD, linking it to generic change management.

Methodology

We identify definitions for SD and sustainability based on reviews by Jacobs (1995) and Ciegis et al. (2009) and analyze these for stakeholder focus. We have dealt with SD and sustainability as synonyms. People and Planet are identified as main stakeholders to focus on. People value as utility is compared to Planet harm with focus on carbon emissions. The proposed relative indicators and their applicability are tested at a general level for the processes of housing, transporting and producing food. This is linked to a general logic of improvement described as understanding, defining, measuring, communicating and leading change (Isaksson and Hallencreutz, 2008). A sub-process of housing, cement manufacturing, is examined on the business level.

Understanding and defining SD

Jacobs (1995) mentions more than 300 definitions and Ciegis et al. (2009) elaborate the topic further. In Table 1 we have reviewed definitions based on Jacobs (1995) and Ciegis et al. (2009) with the addition of Eco Efficiency, The Triple Bottom Line and The Natural Step, which we believe could contribute to SD definitions. A general reflection on the definitions of SD is that they are rarely action oriented. Instead their structure and content is almost always with focus on “what is?” Both academia and practitioners might have obstructed the evolutionary process of SD in the search for La-La Land where they hoped to find the perfect definition of “what is”. Lélé argues that as the meaning of SD was not clear and broadly accepted that there is a risk that SD will be dismissed as a fad or co-opted by forces opposed to the change needed:

...if SD is to be really "sustained" as a development paradigm, two apparently divergent efforts are called for: making SD more precise in its conceptual underpinnings, while allowing more flexible and diversity of approaches in developing strategies that might lead to a society living in harmony with the environment and itself (Lélé, 1991:618).

Table 1. Definitions and descriptions of SD reviewed for stakeholder focus.

<i>Reference</i>	<i>Definition</i>	<i>Stakeholders</i>
Catton, 1986	The improvement in the population’s quality of life while taking into consideration the ecosystem’s regenerating capacity	Humanity (today), nature
Conway and	Sustainability of economy is the ability to maintain productivity	Business

<i>Reference</i>	<i>Definition</i>	<i>Stakeholders</i>
Barbier, 1991		
Elkington (1999)	The triple bottom line captures an expanded spectrum of values and criteria for measuring success: economic, ecological, and social.	Society, nature, business
Goodland and Ledec, 1987	SD as the transformation of economics, optimizing the economic and social benefit obtained at present without jeopardizing the possibilities for obtaining such benefit in the future.	Society, natural resources
Harwood , 1990	Sustainable economy as a system that can endlessly develop towards greater benefit for people, greater efficiency of resource use, and balance with the environment that is friendly to people and other species	Humanity (today and tomorrow), natural resources, nature
Holdgate, 1993	Development is understanding of the potential of resources	Natural resources
Kothari, 1990	Sustainability is an empty term, because the current model of development destroys nature's wealth and hence is non-sustainable. And it is ecologically destructive because it is ethically vacuous, not impelled by basic values, and not anchored in concepts of rights and responsibilities	
Munasinghe, 1993	The process of increasing the spectrum of alternatives allowing individuals and communities to realize their aspirations and potential in the long perspective, at the same time maintaining the regeneration ability in economic, social, and ecological systems	Society, humanity (today and tomorrow), nature, natural resources
Newton, 2003	Sustainability is reached when a social structure can be maintained profitably and indefinitely, without degrading the systems on which it depends.	Society, business, natural resources
Pearce and Giles, 1993	SD is related to the society's development whose costs are not placed on future generations	Society, humanity (today and tomorrow)
Pearce et al., 1989	The creation of a social and economic system that guarantees support for the following aims: increase in the real income, the improvement of the level of education, and the improvement in the populations' health and in the general quality of life.	Humanity (today)
Pirages, 1977	Sustainable growth means economic growth that is supported by the physical and social environment.	Business, society, humanity (today), nature
Radermacher, 1999	The definition of sustainability should include the following elements: a) globalization, b) a long period of time (since environmental consequences are of long-term character), d) external effects, e) environmental policy, f) the approach "from the cradle to the grave".	Nature (no clear identification of stakeholders)
Repetto, 1985	...at the core of the idea of sustainability, then, is the concept that current decisions should not damage the prospects for maintaining or improving living standards in the future...This implies that our economic systems should be managed so that we live off the dividend of our resources, maintaining and improving the asset base so that the generations that follow will be able to live equally well or better.	Humanity (today and tomorrow)
Rio Declaration on Environment and Development, 1992	Long-term continuous development of the society aimed at satisfaction of humanity's need at present and in the future via rational usage and replenishment of natural resources, preserving the Earth for future generations	Humanity (today and tomorrow), natural resources.
Solow, 1991	Sustainability is simply a matter of distributional equity, about sharing the capacity for well-being between present people and future people.	Humanity (today and tomorrow)
Sorlin, 1997	Carrying capacity	Natural resources
WCED, 1987	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs	Humanity (today and tomorrow), natural resources
Weitzman, 1997	Sustainability is the measure of future consumption	Business

<i>Reference</i>	<i>Definition</i>	<i>Stakeholders</i>
Eco Efficiency, 2000	Many business leaders, inside and outside the WBCSD, often express eco- efficiency as creating more value with less impact or doing more with less. Academic experts and practitioners term eco-efficiency the synthesis of economic and environmental efficiency in parallel, where the prefix eco stands for both economy and ecology.	Business
World Development Report, 1992	“Sustainable development is development that continues”	
Robert, 2000, The Natural Step	In order for society to be sustainable, nature’s functions and diversity are not systematically subject to: I. increasing concentrations of substances extracted from the Earth’s crust; II. increasing concentrations of substances produced by society; III. physical impoverishment by over-harvesting or other forms of ecosystem manipulation; and IV. resources are used fairly and efficiently in order to meet basic human needs worldwide.	Nature, humanity (today and tomorrow)

In Table 1 the identified stakeholder groups have been defined broadly as: Humanity, nature, natural resources, society and business. Humanity stands for collective values without looking at how individuals are organized but divided in focus of those living today and focus on future generations. Nature describes natural values per se without focus on utility for humans. Natural resources could be those from nature, such as eco-system services but also non-renewable natural resources, such as fuels and minerals. Society is seen as the organized communities at different levels, from local to global. Businesses are profit-seeking organizations. Results from the review of the definitions and descriptions are summarized in Table 2. Only for 20 out of the total 22 definitions was it possible to clearly identify stakeholder groups.

Table 2. Summary of stakeholders identified and proposed stakeholder needs.

<i>Stakeholder</i>	<i>Number of hits</i>	<i>Stakeholder need</i>	<i>Comment</i>
Humanity today	11	A good life respecting human rights	Could be assessed with indexes such as the Human Development Index (HDI, 2013) and the Happy Planet Index (HPI, 2013)
Humanity tomorrow	8	A good life respecting human rights	The indexes above could be used in a predictive form
Nature	7	Level of habitat and biodiversity preservation	Could be measured by the level of area in its natural form and level of species
Natural resources	8	Level of natural resource capital	Could be measured using the Ecological Footprint (EF, 2013)
Society	5	Prosperity in peace with democratic and equal treatment of all members	HDI
Business	6	Profit	GNP and GNI in total and per capita

The assessment is qualitative and approximate, and some of the stakeholder groups overlap. The indication is that many of the definitions are similar and that humanity today is in focus. The most widely spread definition is: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). It has a focus on humanity today and tomorrow. If preserving nature has a value of its own, outside the use it has for humanity, is a philosophical question without any obvious answer. Even from an anthropocentric view nature should be preserved when using the WCED-definition. Destruction of nature risks the destruction of natural resources reducing the possibility for future generations to meet their needs. It could be argued that out

of the identified stakeholders humanity and nature should be in focus (Isaksson and Garvare, 2003).

Value based indicators for People, Planet and Profit

With focus on humanity and nature this means giving priority to People and Planet over Profit. In a resource constrained world it could be argued that what counts is making best use of resources, which is what Eco Efficiency is about (WBCSD, 2000). With value defined as sales value this would correspond to the ratio Profit/Planet. An example of this is the sales value per carbon emissions. Globally we could calculate the GNP/CO₂-emissions with the purpose of defining objectives. The figures presented are approximate and serve as an example to appreciate the magnitude of change required. In 2011 GNP in PPP was 80 trillion US\$ (World GNP, 2011). World carbon emissions in 2011 were 34 billion tons (World Carbon Emissions, 2011). This gives a ratio of about 2500 US\$ of value production per ton of CO₂-emissions. Assuming that we in 40 years need to reduce carbon emissions with 80%, the ratio becomes 12500 US\$/ton of CO₂, assuming zero growth. With a yearly GNP growth of 4% we end up with a target of almost 60000 US\$/t of CO₂. If we use the figure of 6% per year of carbon reduction per US\$ of earnings quoted by Winston (2014) the 2050 figure becomes 23000 US\$/ton of CO₂. Earning 20000 to 60 000 US\$ per ton of carbon dioxide emitted is a challenge for most organizations. It is likely that requirements on reduction will vary from business to business but as a starting point a factor 10 improvement in Profit/Planet (CO₂) in 40 years could be used as a baseline that company targets could be linked to.

With focus on People instead of Profit the value would be utility instead of sales value. We could possibly use People/Planet indicators for the main global processes with the purpose of setting clear goals. The process of building, including the life cycle of building use and demolition, is estimated to consume 40% of global energy used and produce 40% of man-made carbon emissions (WBCSD, 2008). Building, producing food and transporting are important value producing processes for People that have a significant impact on Planet. We could for these processes test the stages understand, define, measure, communicate and change proposed by Isaksson & Hallencreutz (2008). The purpose is seeing if we can come up with indicators that make sense, see Table 3.

Results from Table 3 indicate that the logic of a ratio based indicator consisting of People value per Plant and People harm might work. The indicator values in Table 3 are largely unknown and qualitative but could be compared with what is found in sustainability reports. In order to enable a more accurate comparison between theoretically proposed People/Planet indicators and indicators actually used we could look at more narrow process. An example could be global cement production, an important sub-process for building.

Table 3. Three global processes and visualized change based on a structure proposed by Isaksson and Hallencreutz (2008). The term “reasonable” is used to indicate a level that still needs to be agreed upon.

<i>Stage</i>	<i>Producing shelter</i>	<i>Transporting</i>	<i>Producing food</i>
Understand – role in global sustainability	Agreement on the importance of building solutions for sustainability.	Agreement on the necessity of sustainable transport solutions.	Agreement on the focus of providing everybody with sufficient calories.
Define main user value and main harm produced	People value: Space in m ² of ”reasonable” living area per person used over a year. Main Planet harm is carbon emissions.	People value: For personal transports the value is person*km of ”reasonable” transport. Main Planet harms are	People value: Edible and ”reasonably” healthy MJ of energy. Planet harm: Energy, Nitrogen and water use

<i>Stage</i>	<i>Producing shelter</i>	<i>Transporting</i>	<i>Producing food</i>
Indicate People value/Planet harm and People value/People harm ratio	People harm. For a large part of the global population, price of housing is an important harm factor. Yearly m ² living space per CO ₂ -emission and per price.	energy consumption and carbon emissions. Main People harm could be seen as time used. Person*km per energy consumption, carbon emissions and time.	and also effect on biodiversity. People harm could be seen as price paid. MJ of edible energy and person per energy, Nitrogen, water and price.
Measure – Assess current performance and set benchmark	Living space target? Current performance? Carbon emissions target is 80% reduction until 2050.	Person*km target? Current performance? Carbon emissions target is 80% reduction until 2050. Target for time used per km?	Daily MJ target could be about 9MJ. Current performance? Carbon emissions target is 80% reduction until 2050. Nitrogen and water use should be considerably reduced. Target for MJ/price?
Communicate	Communicate to companies forming part of the supply chains		
Change	Set policy, vision, goals based on planetary and system limits and requirements, strategy and follow up clearly related to chosen measures. This requires target both for level to be achieved and rate of change.		

People, Planet and Profit indicators in global cement production

Relative indicators based on People, Planet and Profit have been defined based on Isaksson et al. (2010) and are then compared with existing indicators for the five largest cement producers in the world, see Table 4. The proposed main People value indicator is building value in compressive strength potential (at 28 days measured in MPa) times tons of cement produced. Carbon emissions are defined as main Planet harm and price of cement as main People harm. The Global Reporting Initiative guidelines (GRI) are used by many cement plants and provide a format for sustainability reporting, but they do not explicitly require People results (Isaksson and Steimle, 2009). The GRI guidelines indicate sales value and its distribution as the main Profit indicator (GRI, 2013). None of the studied companies report sustainability in terms of utility. Carbon intensity as sales value per carbon emissions is not reported either. The one estimated value of 148 US\$/ton CO₂ is very low and is a risk since current average global business performance is 2500 US\$/ton CO₂ with the objective being a 10 to 20 fold improvement. However, working in the supply chain with focus on m²/ton CO₂ could provide a solution. In this case focus should be on reducing produced tonnage and improving cement performance in concrete, while seeing that using houses require little or no energy. Only CNBM (China) provides data on sales prices and some indication on strength performance, which makes it possible to calculate a value for user building value per price with the result being 1MPa/US\$, which relatively seen is a good result from the consumer perspective.

Table 4. Sustainability performance based on cement sustainability reports compared with proposed relative indicators for Profit, People and Planet.

<i>Indicators</i>	<i>People value</i>	<i>Profit - Sales value and distribution</i>	<i>People harm</i>	<i>Planet harm</i>	<i>Main relative indicators for cement</i>	<i>Comments</i>
Proposed	Building	Revenue and	Price	Cement	MPa*tons/ CO ₂ -	Type of report

<i>Indicators</i>	<i>People value</i>	<i>Profit - Sales value and distribution</i>	<i>People harm</i>	<i>Planet harm</i>	<i>Main relative indicators for cement</i>	<i>Comments</i>
	potential of cement in compressive strength (MPa)	distribution of it among stakeholders as recommended by GRI		CO ₂ -emissions	emissions; MPa*tons/price: Sales value/CO ₂ -emissions	and other comments
Lafarge (France)	Sales value. Tons not explicitly given but can be calculated (160 Mt); No cement quality information.	Yes, for cement and group total; Reference to GRI.	No, but average price can be calculated, 89 USD/t.	Total and specific emissions per ton cement.	Not reported. Sales value/CO ₂ -emissions can be calculated as 148 USD/ton CO ₂ ; 603 kg CO ₂ /t cement.	2012 Sustainability report based on GRI (Global Reporting Initiative) -52 pages.
Holcim (Switzerland)	Sales value; Tons cement produced (148 Mt); No cement quality information.	Yes, group total only; Reference to GRI	No	Group total emissions and spec. emissions for cement.	Not reported. 595 kg CO ₂ / t cement.	For 2012 only a 6 page performance data leaflet is found.
CNBM (China)	Tons cement (and clinker) produced (220Mt); cement strength class reported.	Yes, group total only; Reference to GRI.	Yes About 56 US\$/t.	Not reported (use of tons of Chinese std. coal).	Not reported. An approximate MPa*tons/price can be calculated based on 55 MPa at 28 days (1 MPa*t/US\$).	Social Responsibility Report 2012 – 54 pages.
Anhui Conch (China)	Tons cement (and clinker) produced (149Mt);	No	No, but can be estimated from sales figures to 50 US\$/t	No	Not reported.	As part of yearly report 2012 – total 274 pages.
Heidelberg (Germany)	Only tons produced (89 Mt).	Yes; Reference to GRI.	No	Total and specific emissions per ton cement.	Not reported. 645 kg CO ₂ /t cement.	2011-2012 Sustainability report based on GRI - 44 pages

Conclusions and discussion

The proposed sustainability indicators of People value/Planet harm and People value/People harm have been translated to indicators for housing, transporting, producing food and producing cement. It has been demonstrated that both value and harm can be related to global limits. For main global processes it should be possible to agree upon target utility values. These could then be related to carbon emissions, which would enable formulating goals that are linked to global limits. Companies within the business could then use these global goals as references. It should be possible to work with other main Planet harm indicators such as water consumption, loss of biodiversity, Nitrogen emissions etc. using the same logic. Results are indicative. However, using relative indicators – the Crippled Bottom Line - in combination with absolute global limits seems to be a promising way of going from discussion of what sustainability is to working for it.

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TRANSFER OF PERFORMANCE INFORMATION AS A DRIVER OF NETWORK PERFORMANCE

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Transfer of performance information as a driver of network performance

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Structured Abstract

Purpose – The paper studies how the transfer of performance information between network partners affects overall performance of a collaborative network. The purpose is to reveal what motivates organizations to open and share their performance figures to network partners, what impacts they expect to attain and what have they reached with this in practice?

Design/methodology/approach – Empirical data was gathered from a single case network by interviewing a total of 16 managers of the partner companies. Interviews were carried out in two phases, in 2010 and 2012. The latter interview round focused on the long-term impacts of the provided performance information.

Originality/value – There is little empirical evidence on the impacts of network-level performance measurement. The paper provides valuable empirical evidence about the performance impacts of a) network-level performance measurement and b) transfer of measurement information within the network.

Practical implications – The study shows that inter-organizational transfer of performance information improved managers' awareness of shared targets and status of networked operations. This has led to improvements in both reported and perceived performance. Thus, results encourage organizations to engage in network-level performance measurement and sharing of performance information to their network partners.

Keywords – performance information, network performance, knowledge transfer

Paper type – Academic Research Paper

1 Introduction

Collaboration between companies has increased in recent years due to the turbulent operating environment. Through collaboration, companies aim at sharing resources and exchanging information, reducing risks, costs, and enhancing the skills and knowledge of their network partners (e.g. Bititci et al., 2004). Due to this, network-level performance measurement (PM) has attained increasing attention (Bititci et al., 2012; Yin et al., 2011). It is considered as a useful approach in guiding network actors to pursue common targets and to boost the success of collaboration. However, there is little empirical evidence on the impacts of PM on network-level performance. Cousins et al. (2008) and Mahama (2006) have explored this topic. Both examined supply chain relationships and found out that PM indirectly enhanced perceived network-level financial and non-financial performance by improving co-operation and socialization. These findings are encouraging, but more research in this area has been called for (Franco-Santos et al., 2012; Pekkola, 2013).

To address the prevailing knowledge gap on the impacts of PM on network-level performance this paper studies how the transfer of performance information between network partners affects overall performance of a collaborative network. The study aims to reveal what motivates organizations to open and share their performance figures to network partners, what impacts they expect to attain and what have they reached with this in practice? Empirical examination was conducted in a collaborative network, which is defined as advanced and demanding form of collaboration (Camarinha-Matos et al., 2009). It involves a joint process where the entities share information, resources, and responsibilities to plan, implement, and evaluate activities to achieve a common goal (Camarinha-Matos et al., 2009).

The literature is rich on inter-organizational knowledge transfer, which argues that knowledge transfer is a key determinant for learning and network performance (Spekman et al., 2002; Easterby-Smith et al., 2008). The literature on knowledge transfer has mainly focused on factors impeding and stimulating transfer (e.g. Albino et al., 1999; Laihonen, 2014) and the quantitative impacts of transfer (e.g. Boumarafi and Jabnoun, 2008). It has been shown that inter-organizational knowledge transfer and learning have firm-level performance impacts in case of strategic alliances (Jiang and Li, 2009; Meier, 2011). However, lack of empirical evidence from other types of networks than strategic alliances and sharing of network-level performance information prevail (Franco-Santos et al., 2012; Pekkola, 2013). Furthermore, there is no previous research focusing particularly on the performance impacts of inter-organizational transfer of performance information, which is the main focus on this study.

The rest of the paper is organized as follows. Section two develops the theoretical framework. Section three describes the empirical study carried out and section four presents the results. Section five analyzes the main findings and section six concludes the discussion.

2 Theoretical framework

2.1 Three perspectives to performance impacts

Management needs up-to-date and accurate information in order to guide organization towards its targets and proactively respond to challenges posed by the environment (Nudurupati et al., 2011). This information enables monitoring performance, identifying weak areas, enhancing employee motivation, improving communications and strengthening accountability (Simons, 2000). Nudurupati et al. (2011) define performance information behavior as “people’s behavior with performance information”. The literature underlines that in order to foster performance-driven thinking and behavior, management needs to be trained to interpret and analyze measurement results, define action plans and monitor the results of actions (Neely et al., 1995; de Waal, 2004). Specific and clear performance measures and targets are associated with reduced confusion about strategic direction leading to better goal commitment, behavior and performance (Webb, 2004).

Franco-Santos et al. (2012) categorize consequences of PM into three categories: 1) consequences on people’s behavior, 2) consequences on organizational capabilities, and 3) consequences on performance (Figure 2).

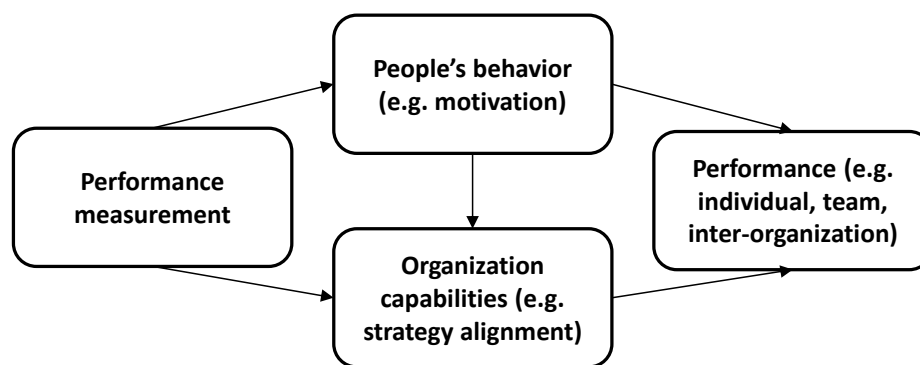


Figure 2. Impacts of performance measurement (modified from Franco-Santos et al., 2012).

According to Franco-Santos et al. (2012) consequences on *people’s behavior* refer to the actions or reactions of employees to measurement (e.g. motivation, participation) and their underlying cognitive mechanism (e.g. perceptions). Impacts on *organizational capabilities* refer to consequences associated with specific processes, activities, or competences that enable the organization to perform and gain competitive advantage (e.g. strategic alignment or organizational learning) (Franco-Santos et al., 2012). Authors found a strong agreement on the impact of performance information on organizational communication processes, organizational routines and management practices. Also Papalexandris et al. (2004) report beneficial effects on communication processes at all levels of the organization.

Impacts on *performance* comprise the effects on financial and non-financial results at various levels of the organization (e.g. firm performance, managerial performance, or team performance). Franco-Santos et al. (2012) classified these impacts into two groups: reported performance and perceived performance. Reported performance includes both financial (e.g. accounting performance, market performance) and non-financial performance (e.g. customer satisfaction). Also perceived performance includes the viewpoints of financial and non-financial

performance but is based on individuals' perceptions of firm performance (e.g. performance outcomes, performance improvement, strategic goals achievement, and customer performance).

2.2 Inter-organizational knowledge transfer

The increased complexity of modern business environments has increased the importance of and interest in inter-organizational knowledge transfer (e.g. Easterby-Smith, 2008; Martinkenaite, 2011; Phelps et al., 2012). In general, knowledge transfer is defined as the transfer of knowledge from one unit to another (e.g. Albino et al., 1999; Argote and Ingram, 2000). Inter-organizational knowledge transfer refers to a transmission process where knowledge is transferred across firm boundaries (Collins and Hitt, 2006; Meier, 2011). Martinkenaite (2011) provides an integrative framework for analysing inter-organizational knowledge transfer. This framework is built on three dimensions: antecedents of transfer, knowledge acquisition and consequences of transfer (Figure 3).

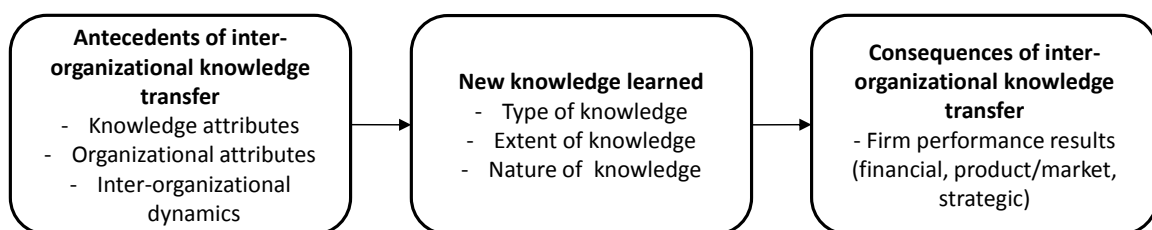


Figure 3. Framework of inter-organizational knowledge transfer (Martinkenaite, 2011).

Martinkenaite (2011) defines antecedents of inter-organizational knowledge transfer as knowledge attributes, organizational attributes and inter-organizational dynamics. Tacitness, complexity, specificity and institutional embeddedness are key antecedents of knowledge transfer in inter-organizational setting (Martinkenaite, 2011). It is well-known that tacit knowledge is more challenging to transfer than explicit knowledge (e.g., Simonin, 1999; Argote and Ingram, 2000). The ambiguousness of knowledge also hampers the transfer (e.g. Simonin, 2004; Coff et al., 2006). In addition, the value of transferred information matters – the more valuable the information, the more interested the receiver is (Gupta and Govindarajan, 2000).

By organizational attributes Martinkenaite (2011) refers to absorptive capacity, motivation to teach and learn, and intra-organizational transfer capability. Absorptive capacity (Cohen and Levinthal, 1990) of the recipient is defined by its prior knowledge, trust and cultural compatibility among partners, adaptability of the recipient and the amount and quality of communication (Lane et al., 2001). Steensma et al. (2005) show that the more willing the donor firm, the greater the opportunity of the receiver to internalize knowledge. A shared context (i.e. similarities in organizational culture, values, and technical skills) expedites the transfer by reducing the ambiguity (Albino et al., 1999). Inter-organizational dynamics concerns power issues, trust and risk, social ties and structures of inter-organizational relationships (Easterby-Smith et al., 2008).

As the consequences, or performance implications, Martinkenaite (2011) recognizes financial performance, product/marker performance, and strategic performance. In this approach learning is seen as a mediator of performance and knowledge transfer as a two-stage process that involves acquisition of new knowledge and exploitation of that knowledge. Logic behind

this is that transfer does not create performance. Instead, knowledge acquisition, that is, “the extent, type and nature of the new knowledge learned” (Martinkenaite, 2011, p. 55), mediates the performance results.

2.3 Conceptual framework

Knowledge management literature considers fairly extensively antecedents of knowledge transfer and issues related to knowledge acquisition. On the other hand, performance management puts a lot emphasis on design, implementation and use of performance measures (Bourne et al., 2000) but has left the underlying knowledge processes with fairly modest attention (cf. Nudurupati et al., 2011). By combining the viewpoints of these disciplines it is possible to better understand how PM systems, performance information, learning, and performance relate to each other’s (Figure 4).

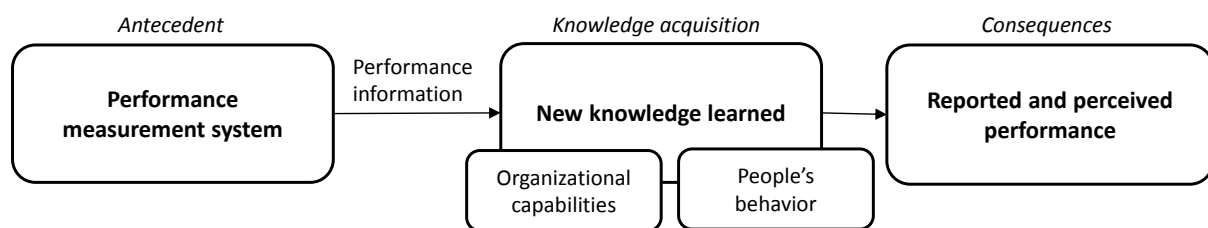


Figure 4. Conceptual framework - impacts of inter-organizational transfer of performance information.

The framework recognizes three aspects where performance impacts of inter-organizational knowledge transfer can be detected: people’s behavior, organizational capabilities, and reported and perceived performance. It also pinpoints that measurement system and provision of performance information do not tell directly what to do and how to improve performance. Instead, those enable learning, which enables performance improvement. If performance improves, it implicitly indicates that the organization has learned and applied the information acquired. Hence, knowledge acquisition and learning are seen as mediators of network performance (cf. Martinkenaite, 2011).

3 Methodology

The impacts of inter-organizational knowledge transfer on network performance were studied in a longitudinal research setting where the data was gathered from a single case network by interviewing network partners. The studied collaborative network consists of the main company manufacturing kitchen fitments and reselling firms selling these kitchens to consumers. The resellers are independent firms with a full responsibility for their own businesses.

A network-level PM system was designed and implemented in 2009 with a purpose of providing new information about network-level performance and improving information flow between partners. The PM system was built on a basic idea that all network partners have access to the measurement data and can compare their own results to other partners’ performance and network-level information. During the PM system design process, IT system was developed to support information provision and transfer.

For the purpose of this study, a total of 16 managers of the partner companies were interviewed. Interviews were carried out in two phases. The first set of interviews was held in autumn 2010. At this phase the new measurement system was being used for one year. The interviews were semi-structured and focused on interviewees' perceptions on the measurement system and its utilization. The second interview study was carried out in 2012. This time interviews focused on the long-term impacts of the provided performance information. The top management team (CEO, sales director, production directors and financial director), two sales managers and four representatives of reselling network were interviewed. The interview transcripts were analyzed and the recognized impacts were categorized according to the framework of Franco-Santos et al. (2012).

4 Results

4.1 The impacts on people's behavior

The findings reveal that the transfer of network-level performance information has increased interviewees' understanding about their own business and its success factors. An important feature of the measurement system is the possibility to compare one's own performance to network-level averages. This provides a baseline for analysing own information and helps to interpret, understand and learn from the results. This also encourages communication between partners and facilitates learning from the experiences of other network partners.

"After comparing own company's performance to network performance I understood that my company is performing at the average level." (Reseller, 2010)

"It is easier for them (network partners) to support and help others, when they have an understanding of the current state of operations in their own reselling unit and network averages." (Sales manager, 2012)

The top-management interviewees considered in 2012 that network-level information has promoted performance-driven culture. Performance information has had an important role both in the management of partner organizations as well as decision making at the network-level. The interviewed network partners found performance information useful for self-monitoring, learning and decision support and aligning their operations with the network strategy. Learning from the new performance information had also increased their goal commitment. The network partners were more aware and involved with the shared objectives and were better able to evaluate their own performance in relation to network strategy.

The interviewees' perceptions were in 2012 that network-level performance information has increased the openness and transparency between the network partners. Moreover, this has led to an increase in cooperation and participation. In consequence, the interviewed participants described that trust between the network partners has increased and hence affected positively to a network culture.

4.2 *The impacts on organizational capabilities*

To ensure the efficient utilization of performance information, some structures and processes are needed, because the new performance information needed to be integrated into management routines of the network. Based on the interview results, two enabling structures were identified. These had significantly promoted information use and network-level communication.

First, interviewees emphasized in both interview studies the usefulness of a monthly meeting where managers of network partners gather together to discuss about the new performance information and try to interpret and learn from this information. With the network-level performance information it is possible to make decisions concerning the whole network and define development targets to improve overall performance. Second, another regular meeting utilizing the network-level performance information is a meeting between the main company's sales manager and resellers. In these meetings, the focus is on a single network partner but with the new performance information it is now possible to compare performance of resellers, evaluate reasons behind certain results and recognize the needed development activities. Meeting practices were considered as tools for increasing trust, promoting commitment to network objectives and advancing inter-organizational knowledge transfer.

“The new meeting practice and especially more in-depth and comparable information has increased trust and openness between the sales manager and resellers. This makes discussion and decision making more structured and open between the network partners.”(Sales manager, 2010)

New measures, more open discussion atmosphere and comparable information have also supported decision making, which is more straightforward when it is based on reliable information.

“Before, decision making was based on the few informal measures and tacit knowledge, but now we have facts that we can use for managing the network. It is also easier to explain and justify why certain decisions are made.”(Reseller, 2012)

New PM system has also supported and clarified the definition of network roles and responsibilities. This relates also to a changed role of the measurement system. It is now considered more as a learning and management tool than control mechanism. Management structures have enhanced interaction and knowledge flow among network partners.

4.3 *Performance*

The empirical evidence shows that reported network-level financial performance (e.g. profit margin, incomes) has not significantly improved after systematical use of new PM system and performance information. According to interviewees, the detected financial improvements were more as a consequence of changes in market environment.

However, network partners reported a notable improvement in financial figures. At the network-level, partners were able to reduce reclamation costs (30%) and marketing costs (15%). These improvements affected directly and positively to network's profit margin.

“I compared the reclamation costs to the network-level average and realized that my company suffers from high reclamation costs. After that I started to ask others (network partners) for advice and tips to reduce these costs.” (Reseller, 2010)

“I noticed that my firm uses quite a lot of extra for marketing (in addition to chain marketing) compared to other partners and the gained impacts on customer volume were unsubstantial.”(Reseller, 2010)

Furthermore, the results of network’s satisfaction survey in 2011 witnessed that network partners were more satisfied with communication and information transfer between partners than previously. This was further supported by the results of the interview study in 2012, which showed that the new measurement system and shared performance information have increased transparency of operations and enabled more focused development of network processes, like the development of joint service processes and shared marketing campaigns.

5 Analysis

The paper contributes by providing valuable empirical evidence about the performance impacts of a) network-level performance measurement and b) transfer of measurement information within the network. The paper also brings more depth to the analysis of impacts by combining the research fields of performance management and knowledge management.

The empirical examination revealed that inter-organizational knowledge transfer has improved managers’ awareness of shared targets and status of networked operations. This has led to improvements in both reported and perceived performance. Thus, the results encourage organizations to share their performance information to network partners. This finding cannot be generalized to any context but offers support to previous studies arguing that performance and PM need to be studied as a shared phenomenon, which necessitates and is enabled by inter-organizational knowledge transfer (cf. Franco-Santos et al., 2012; Bititci et al., 2012; Easterby-Smith et al., 2008).

The literature indicates that inter-organizational knowledge transfer and learning have firm-level performance impacts in case of strategic alliances (Meier, 2011). This study provides evidence on the impacts of knowledge transfer in a collaborative network and adds to the literature on strategic alliances (cf. Brouthers et al., 1995; Camarinha-Matos et al., 2009). The results support findings of Cousins et al. (2008) and Mahama (2006), who have found evidence that PM enhances both financial and non-financial performance indirectly by improving cooperation and socialization (i.e., trust and commitment) within the network.

The empirical evidence suggests that transfer of performance information between network partners leads to shared learning and performance improvements at all levels of the system. Thereby, the results indicate that PM system can act as a valuable antecedent for inter-organizational knowledge transfer as the conceptual framework hypothesized. Measurement system defines, in a very concrete form, the joint purpose, objectives and a common language for network partners. Thus, it reduces ambiguity, builds trust and creates an enabling structure

for inter-organizational learning and knowledge acquisition (Easterby-Smith et al., 2008; Martinkenaite, 2011).

The empirical findings showed that network-level PM and shared performance information have valuable roles as knowledge integrators and promoters of learning and thereby, together with users compose a social system that could significantly improve performance (cf. Bititci et al., 2012). This kind of joint learning endorses the maturity of a network. It supports the development of network-level processes, practices and structures by encouraging partners to share information, resources, and responsibilities to plan, implement, and evaluate activities to achieve a common goal (cf. Pekkola et al., 2013).

As a managerial implication, the results encourage organizations to pay more attention on individuals' mental models and attitudes towards PM. Through them, it is possible to build a performance driven and knowledge-based management culture, which would yield performance improvements not only on the short run but also in the long-term. It all comes back to a question: what do people do with the performance information? (cf. Nurudupati et al., 2011). Collaboration is a one way to create and sustain competitive advantage but it requires that the focus of network management is on the service provided, not on the individual organizations (cf. Laihonen et al., 2014). Otherwise, the system will not optimize the customer's benefit. Finally, it is important keep in mind that the network needs to be managed in order to achieve the intended objectives (cf. Yin et al., 2011; Bititci et al., 2012).

6 Conclusions

The paper combined ideas from the performance management and knowledge management literatures and composed a conceptual framework that considered PM system as an antecedent of inter-organizational knowledge transfer. The provided performance information was seen as an enabler of knowledge acquisition and learning between network partners. Knowledge acquisition and learning were considered as mediators of network performance.

In the empirical part of the paper, impacts of inter-organizational transfer of performance information were studied from three perspectives in a collaborative network. The results were encouraging. The inter-organizational knowledge transfer improved managers' awareness of shared targets and status of networked operations and led to improvements in both reported and perceived performance. Thus, the results encourage organizations to engage in network-level PM and sharing of performance information to network partners. These drive learning and performance improvement. The results also indicate that PM system can act as antecedent for inter-organizational knowledge transfer. This supports the hypothesis of conceptual framework.

The paper increased understanding about the phenomenon of network performance and provided new insights on the importance of inter-organizational knowledge transfer in networked performance management. Interesting themes for the future research would be to examine how the turbulent operating environment or maturity of the network affects inter-organizational knowledge transfer. The main limitation of the paper relates to having only one case network. On the other hand, it is also a key strength of the paper: a deep understanding about the studied network and access to previously untouched information provided a much-

needed possibility to examine the research question in a unique case environment (cf. Yin, 2009).

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IMPACTS OF UNIFIED COMMUNICATIONS ON WORK

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PAPER
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ABSTRACT

The evolution of communication technologies are enabling generational changes in notions of work. New devices allow employees to collaborate, participate, and work in a way that is no longer location or time dependent. This research examines enterprise motivations for designing their workplaces of the future around connected, familiar, and people-centric computing experiences leveraging unified communications (UC) technologies. Unified communications as an enabler for workplace redesign for higher-performing organizations started in 2007 and reached a modest level of maturity by 2010 but the consumerization of this technology (bring your own device) explosion in 2013 has put this topic back into the mainstream. This research documents the business motivators and presents data about business outcomes in a case study approach that is driven by metrics. Specific outcomes are measured in terms of increased productivity, talent attraction and retention, reduced sick leave, reduced communications costs, reduced IT and administration costs, reduced carbon footprint, lower real estate costs, and reduced travel and training costs. Cost savings and competitive advantage in areas such as talent acquisition will add to the debate over work-life balance and work-life integration. Unified communications makes the employee accessible from anywhere at any time and muddies traditional boundaries between work and life. Further areas that need to be addressed include the impact of UC technologies on long term productivity, trust building, and privacy.

Keywords: Collaboration, Future, Organizational Design, Telework, Unified Communications, Work, Workplace

Article Classification: Research Paper

Impacts of Unified Communications on Work

Introduction

Unified Communications (UC) is a relatively modern idea that multiple communication media such as voice, video, and instant messaging should work together with technologies such as presence and data sharing to better support business processes (McCharles, 2013). A practical example would be to give employees a tool that would enable them to initiate a scheduled or ad hoc virtual meeting, on any device, to any user or group of users, using voice, instant messaging, video, or web conferencing, perhaps using a technology such as Skype or Lync. In the emerging Internet of Things it also might also mean enabling a sensor system to “find” humans who need to work together to solve a real-time problem reported by the sensors.

It is estimated that the global UC market was valued at US\$ 22.8 billion in 2011 and that it will grow to US\$ 61.9 billion by 2018 (Transparency Market Research, 2013). Survey data shows that as of April 2014 approximately 44% of North American enterprises had already deployed a unified communications solution and that another 26% were planning do so over the next two years (Finneran, 2014).

Theoretical momentum for unified communications arose as a natural byproduct of real-time communication services being developed that ran over a common Internet Protocol (IP) on a common packet-switched network. UC started getting commercial attention in 2000 when the Session Initiation Protocol (SIP) standard was accepted by the telecommunications industry (3GPP, 2000) and when Day, Rosenberg, and Sugano (2000) published their model for a presence server. SIP provided a common way to control media sessions over IP networks so they could be unified at a technical level. Presence provided a way for end-users to see who was online and what kind of communication state they were in.

By 2006 most of the major telephony vendors had entered the market with Voice over IP products that were replacing the traditional on-premise PBX but they were not yet unlocking the full potential of unified communications. IBM then released a unified communications middleware platform (Sametime 7.5) in 2006 and Microsoft followed with its own UC product (Office Communications Server) in 2007. By early 2008 CIOs were increasingly looking at the potential for UC and trying to make a business case for its deployment (Edwards, 2008).

The difficult economic environment of 2008 led a lot of analysts to propose that unified communications could be a catalyst for reducing the costs of communications while enabling employees to be more productive (Kelley & Parker, 2009). Others had noted that changing workplace dynamics meant that more employees were working remotely and that UC could be an enabling technology to support these workers (Frost & Sullivan, 2008). Hydari's (2008) work on UC platforms highlighted a concern that CIOs had about unified communications products being too proprietary to effectively unify major communications technologies.

This paper examines the business model claims for Unified Communications that were being made in the 2009 timeframe and follows what was actually realized from a large implementation undertaken at the Microsoft Corporation that was the enabling force for a major redesign of its corporate workspaces and the evolving nature of its employees' work styles. Because the implementation was done by a UC vendor implementing its own technology solution the interesting questions Hydari raised about platform convergence are not addressed; however, this is called out here as an important issue for future research as UC deployments grow.

What is Unified Communications?

Not long ago Unified Communications also included another “C”, which was collaboration (UC&C). However, the collaboration component is now assumed as being the motivator behind UC. The core technologies of UC are presence, instant messaging, voice, video, and conferencing. It can also include components of what used to be called Unified Messaging, such as email, faxes, and voice mail. Some vendors have lately enhanced their UC offerings with text to speech, voice recognition, and business intelligence. In the Bring Your Own Device (BYOD)/Work-Life Balance (WLB) world UC has expanded to reach virtually all endpoints, including mobile phones, tablets, and wearables. Various researcher have employed a number of methods to study BYOD/WLB including the case studies (Cousins & Varshney, 2009; Ruppel et al., 2013; Shen & Fluker, 2013), structured and semi-structured interviews (Sarker et al., 2012) and survey data (Yun et al., 2012; Silic & Back, 2013). Industry verticals such as the medical field have added hooks between their UC systems to Electronic Health Records (EHR) and Hospital Information Systems (HIS) (Dunbrack et al., 2008; Thomson, n.d.; Rawcliffe, 2014) A typical depiction of the elements of a UC ecosystem is shown in Figure 1.

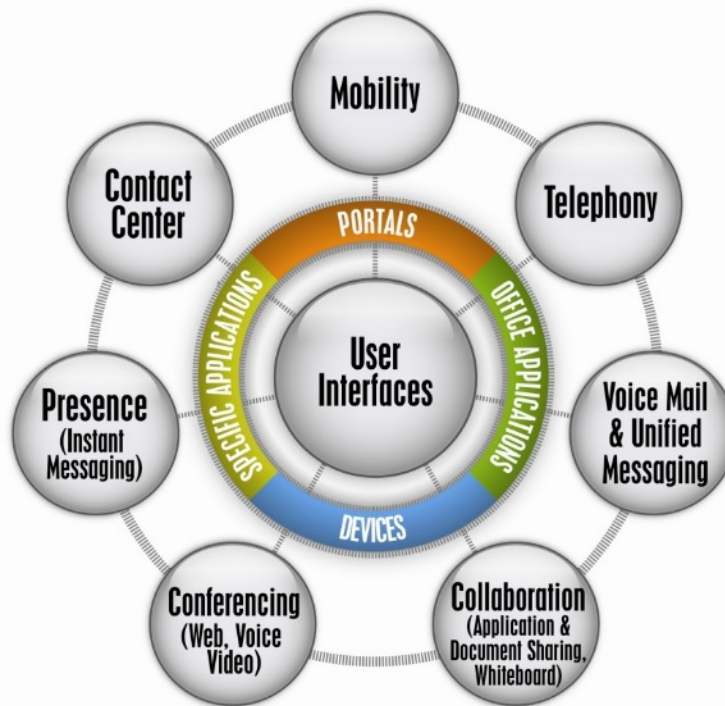


Figure 1: Elements of Unified Communications¹

The current state of UC technology is that communication technologies “unify” in a converged platform managed by a single vendor. Microsoft, Cisco, IBM, ShoreTel, Mittel, and many others have such offerings. However, it is rare that UC products from different vendors can interoperate with each other and as a result the solutions in the market, even those from open source vendors, are largely proprietary in nature. In 2010 the Unified Communications Interoperability Forum (UCIF) was formed to provide a framework for crossing proprietary boundaries but, despite having common technology building blocks such as IP, SIP, XMPP or SIMPLE (for presence), the industry itself has not unified its solutions and the goal is still years away. Thus, desktop phones from Cisco, videoconferencing solutions

¹ Adopted from <http://jenangel.hubpages.com/hub/Unified-communications#> (accessed 05 May 2014).

from Avaya, instant messaging from Microsoft, and presence information from Google are unlikely to work together at this time.

Business Motivators for UC

Industry analysts have delivered most of the research on the business drivers for UC (MacVittie, 2012; IBM, 2013; NEC, 2012; ORACLE, 2013; VERIZON, 2012). Although the results vary a bit as to weighting in the mean they typically focus on improving productivity while reducing costs. Figure 2 presents Finneran’s (2014) findings on the key business drivers for UC in the United States as of April 2014.

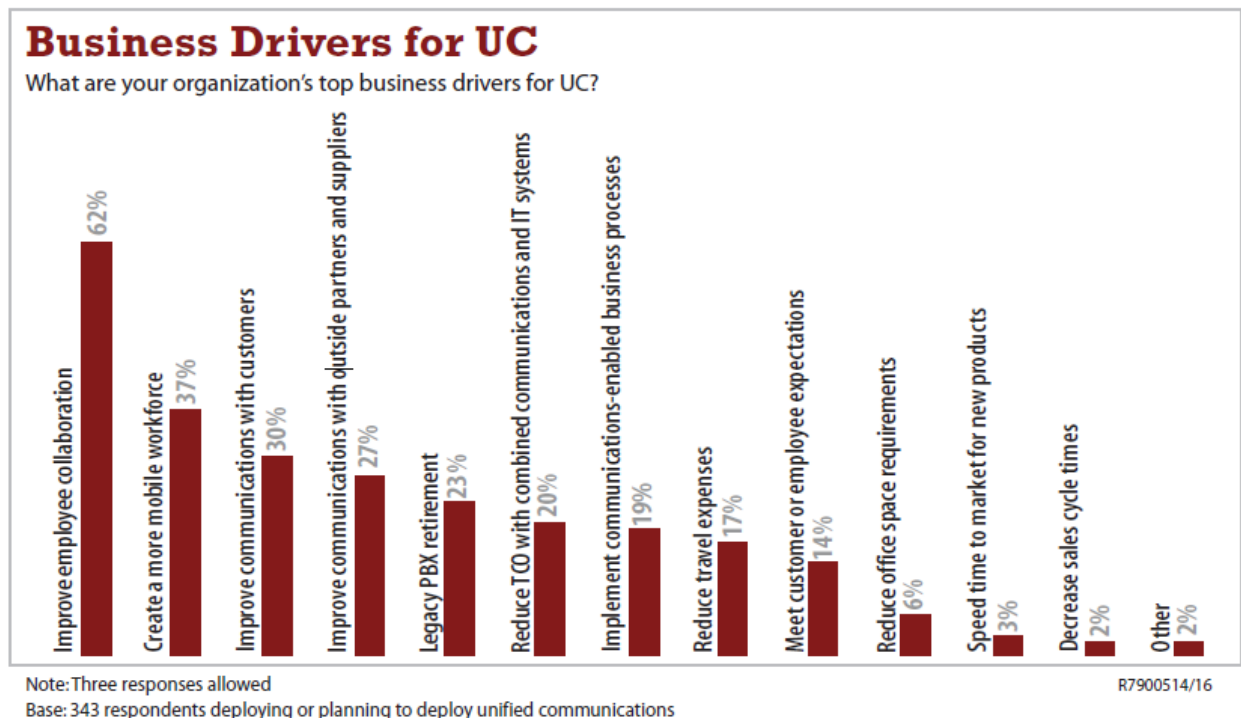


Figure 2: Business Drivers for Unified Communications – Adopted from Finneran (2014)

CIOs like to talk about the productivity gains of UC but they expect to pay for the systems with costs savings (Eastwood, 2013) or new revenue (Olavsrud, 2014). New revenue models were usually not contemplated in 2008 so the focus was on cost savings and of those there were four primary sources (Lazar, 2008; Potter, 2008):

- Reduced travel costs
- Reduced conferencing costs
- Real estate consolidation
- Replaced TDMs (PBX lines) with SIP Trunks (UC lines)

In 2008 there was enormous pressure on companies to reduce travel costs as the economic news worsened. The desire was to use video conferencing and other UC tools as a substitute for travel. Audio, video, and web conferencing costs were another CIO cost-cutting target – for a large corporate these costs could run in the millions of dollars for toll-free and landline calls that could be driven close to zero if the traffic would travel over IP. The recession and changing work styles led enterprises to reconsider the role of the physical office space and environment required for each employee with an

eye on more efficiently managing office space. PBXs and their dedicated TDM lines were expenses that vendors were arguing would go down as they were replaced by UC servers and more general-purpose SIP trunks.

Workplace Redesign

McKinsey published an influential piece in 2005 that challenged executives to not just cut operating costs but to sustain them over the long-run and suggested that meaningful workplace redesign was a source of sustainable cost reductions (Nimocks, Rosiello & Wright, 2005). Katzenbach (2008) followed up with a specific program of aligning workplace redesign and cost management with desired long-term organizational and behavioral outcomes. These and other strategy consulting firms were pressing this message of workplace redesign hard before the economic collapse so a number of companies already had workplace redesign taskforces in place before the recession.

In 2008 Cisco's Workplace Resources team reported the results of a survey of its employees that discovered that office spaces were being utilized less than 40% of the time on a typical business day (CISCO, 2008). Once the Cisco campus wireless LAN was in place more than 40% of its employees were connecting only via WiFi—and therefore less tied down to their office. Cisco also experienced a dramatic increase in the number of employees working from home or from non-traditional workplaces; by 2008 more than 20% of the workforce was working remotely at any given time.

The recession hit just as unified communications products were being released; the resulting collision resulted in a sudden interest in UC not only to reduce costs but also as a transformative enabler for workplace design. Workplace resources, HR, and facilities teams got the message from McKinsey, saw the changes in their own workforces, and some of them decided to bet on UC.

Microsoft Case Study – Setting the Context

From 1986 to 2003 Microsoft used a one size fits all approach to work and to workplace design. Starting in 2003 it created a Workplace Advantage (WPA) team that would look at creating workplaces that would increase innovation and productivity while also showcasing Microsoft products. The Workplace Advantage team decided to leverage research-driven design principles that were grounded in data and would produce measurable outcomes (MICROSOFT, 2013).

The WPA process was built on interviews with Microsoft leaders, surveys of employees, observational studies, and benchmarking. The work was sponsored by Facilities, HR, Finance, and Sales. The WPA team used focus groups to validate the findings and to help define the vision and future direction of Microsoft's workplace strategy.

The WPA research phase, completed in 2009, resulted in the articulation of corporate values about the principles of work. The major principles were:

- Each employee needs the right environment and the right tools to be successful
- The workplace should inspire productivity and innovation
- The workplace should foster interaction and collaboration
- Any Microsoft employee should be able to work in any Microsoft office
- Technology (particularly Microsoft technology) would be the enabler

Microsoft baselined employee survey data in 2004 and compared it with 2009 data and discovered that, except for Asia, employees had indeed changed their work patterns (Figure 3). Like Cisco, Microsoft found that its employees were not camped in their offices working but rather spent significant portions of their day either in meetings or mobile. The static results for Asia were attributed to regional cultural norms that highly valued in-office visibility.

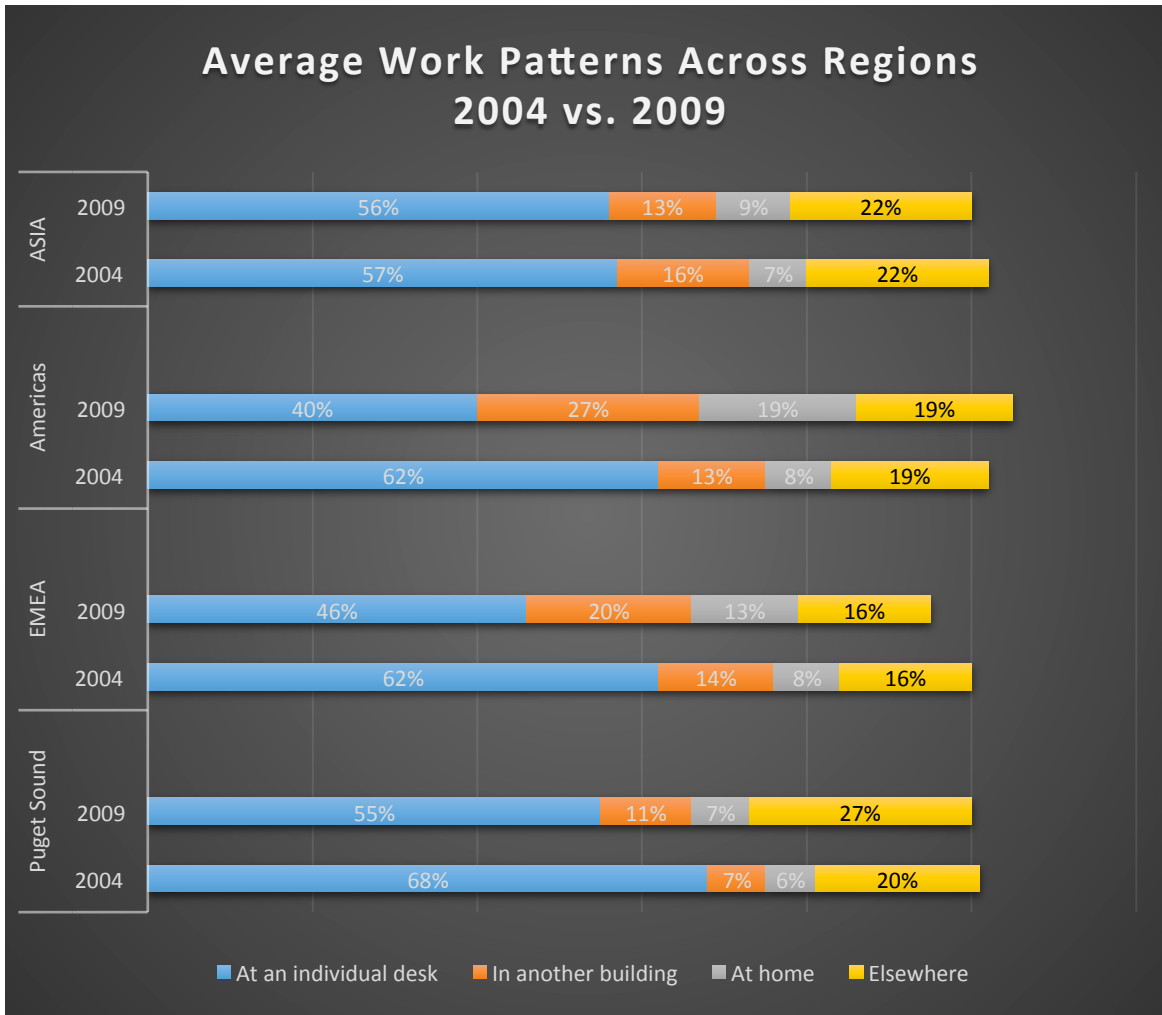


Figure 3: How Work Patterns Changed at Microsoft, 2004-2009

Microsoft also discovered that work styles varied by role. Surveys showed clearly definable patterns for how people in certain roles worked and collaborated. Figure 4 shows that Microsoft had identified 5 distinct employee roles that utilized workplaces differently.

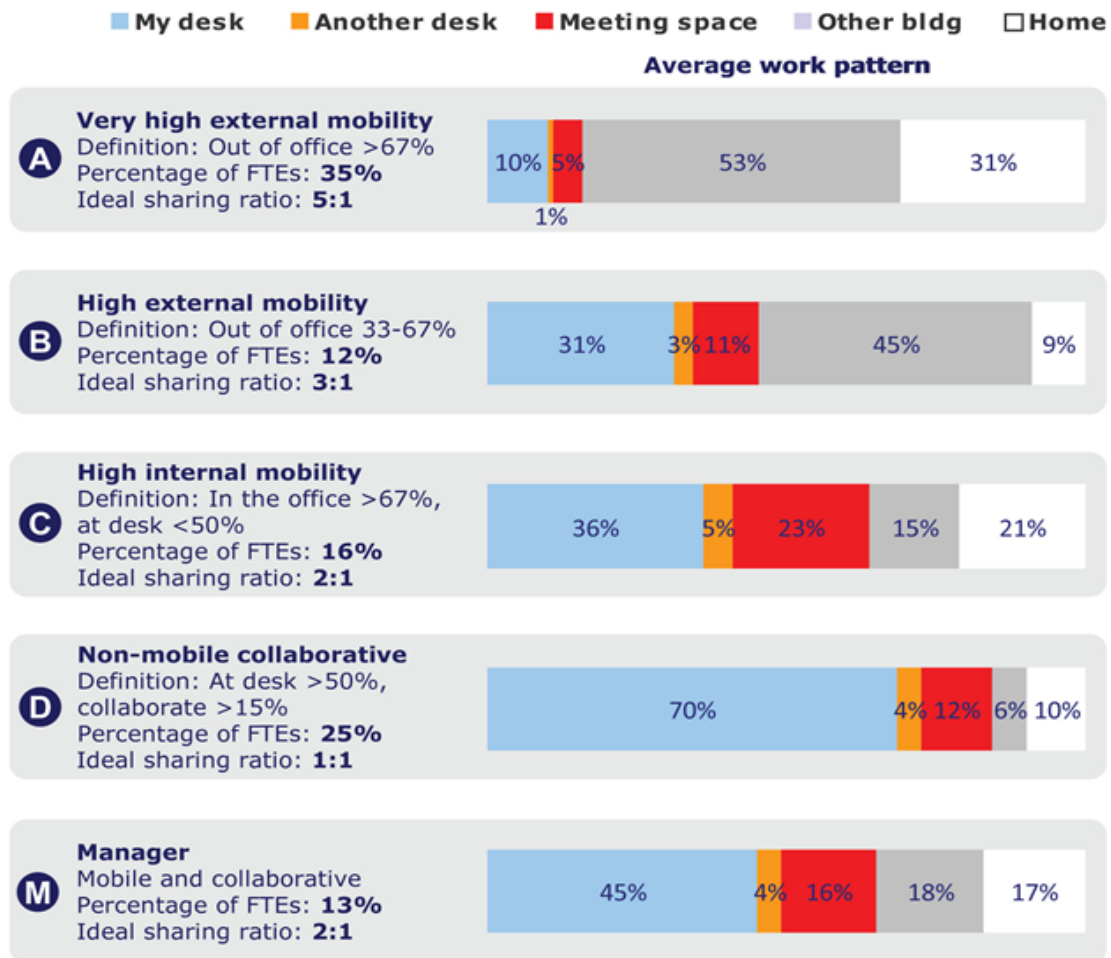


Figure 4: Microsoft Work Styles by Role

These results allowed workplace planners to more efficiently allocate space between offices, collaboration areas, and meeting rooms². As a result, Microsoft was able to build a workplace model that helped inform how to most efficiently invest in real estate. Table 1 below shows the real estate guideline impact that directly resulted from this research.

² See <http://perkinswill.com/work/workplace-advantage.html> for examples of the redesigned workspaces

Work Styles	WORK STYLE	DEFINITION	ANCHOR SPACE
	<ul style="list-style-type: none"> • Work style A • Work style B • Work style C • Work style D • Work style M (Manager) 	<ul style="list-style-type: none"> • Out of the office >67% • Out of the office >33% • Regularly in the office, but away from desk >50% • Works at a desk in the office >50% • Often away from a desk, but frequently has private conversations 	<ul style="list-style-type: none"> • Unassigned desk at 5:1 ratio • Unassigned desk at 3:1 ratio • Unassigned desk at 2:1 ratio • Workstation assigned 1:1 ratio • Unassigned workstation + a private room at a 2:1 ratio
Space		PREVIOUS	NEW GUIDELINES
	<ul style="list-style-type: none"> • Individual Space • Open Collaborative Space • Misc Support Space • Customer Space 	<ul style="list-style-type: none"> • 31% • 24% • 13% • 27-32% 	<ul style="list-style-type: none"> • 18% • 35% • 15% • 27-31%

Table 1: Workplace Advantage Guidelines

Microsoft – Workplace Advantage and UC

Despite the recession of 2008 Microsoft was able to produce strong financial results that year. However, the recession caught up with Microsoft in 2009 and it experienced declines in revenues and profits. As a consequence, Microsoft implemented cost management targets across the company that in part relied on considerable cost savings through the Workplace Advantage program.

Microsoft had released a new unified communications product (Office Communications Server - OCS) in 2007 and the Workplace Advantage team saw UC as a way to keep people connected, to improve their collaboration, to increase employee satisfaction, and to improve overall productivity. It would also provide Microsoft a chance to showcase its own technology and remove the competitors' products it had been using for voice, video, and conferencing. Offices deploying OCS under the new program were called "UC-enabled WPA sites."

Microsoft, which largely relies on a team approach to work, also wanted its employees to exchange individual control of their workspace for a team control approach (Figure 5). This meant increasing the amount of open meeting spaces but also creating some small focus rooms where people needing concentration rather than collaboration could work. Microsoft also built on a neighborhood concept where cross-functional teams were close to each other and had shared spaces they could utilize as needed. Since many of these team members would not be working in the office every day the meeting spaces need to be UC-enabled so remote workers could join as needed.

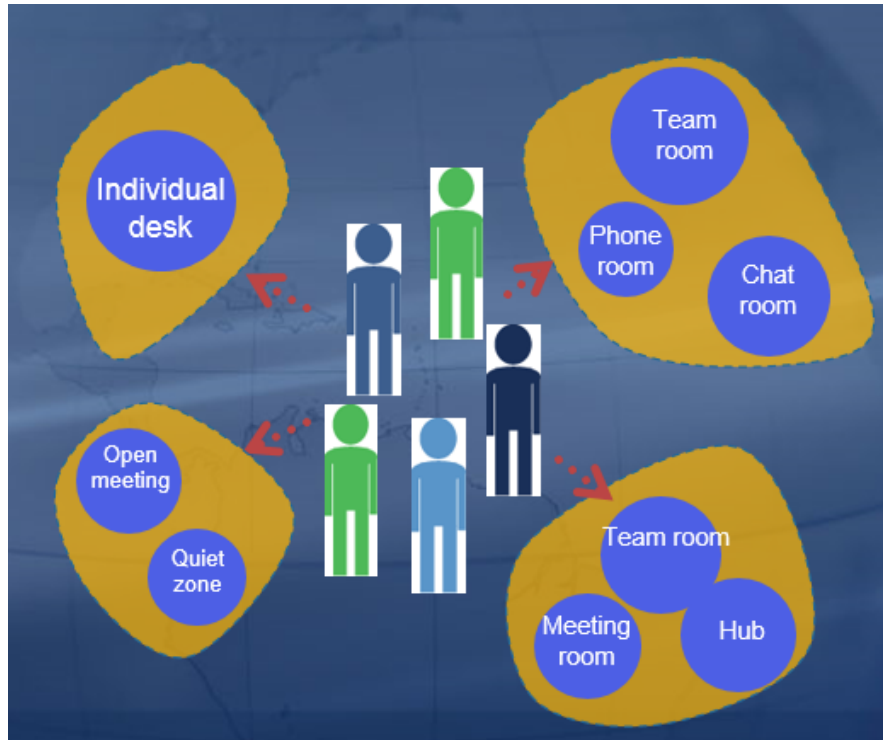


Figure 5: WPA Flexible Workspaces Model

Microsoft's UC goals in the WPA program were built around 3 tangible outcomes. First, it wanted to see overall gains in employee satisfaction as measured in the company's annual workplace health index survey. Second, it needed to realize cost savings from reconfiguring and updating the real estate footprint. Microsoft also wanted quantifiable reductions in carbon dioxide emissions.

Most employees already had a laptop computer. Microsoft IT provided every employee with OCS on their laptops and a softphone device (typically a headset). Most computers by that time already had a video camera built in or available as an accessory. Campus WiFi was upgraded to handle the additional bandwidth requirements for on-campus mobile workers and upgrades were made to edge network security so that remote workers could more easily connect to others via OCS.

The Workplace Advantage model and OCS allowed Microsoft to reconfigure its workspaces so they were smaller but more desirable for workers who were actually present for work. Based on the estimates shown previously in Table 1, the WPA team projected reducing the number of workstations from 90 to 56 in an upgraded Edinburgh office and enabling the accommodation of 890 people with 580 desks in a new building in its Thames Valley Park campus in England. The unanswered question until they rolled the WPA sites would be whether employees using UC and these redesigned spaces would feel connected and productive.

WPA and UC: Outcomes

Results for the UC-enabled pilot WPA worksites was a 10% increase in overall employee satisfaction with their work environment. Observation studies determined that collaboration increased 26% in UC-enabled WPA worksites. Other studies estimated a 10% improvement in individual effectiveness and a 7% improvement in team effectiveness. These outcomes were in-line with WPA's projections.

Microsoft IT later estimated that increased productivity resulted in \$114 million in productivity gains for the company (MICROSOFT, 2009).

On the financial side, UC-enabled WPA worksites enable Microsoft to dramatically reduce its real estate footprint and reduce operating costs by 8% - a substantial figure when applied to the over 35 million square feet of real estate under management across over 700 sites. Allocated space per employee has declined 31% (from 172 to 118 square feet), annual communications savings were estimated at \$1,744 per employee – coming largely from a dramatic reduction in conferencing service costs – and travel savings amounted to approximately \$93 million (MICROSOFT, 2009).

Conferencing cost savings were predicted and, like at many companies, were used to offset the investment needed to deploy the UC solution. Microsoft had almost 900,000 conference calls in 2009, with the average call having 5 participants. About 750,000 of the conference calls had fewer than 10 participants and the costs of providing the service had been accelerating. With the advent of the UC solution 96% of the conferencing service calls were eliminated, with the remaining used for larger conferences that the UC solution did not comfortably manage.

Microsoft’s experience with hitting the financial metrics for the UC-enabled WPA project are consistent with what industry surveys have shown. Figure 6, based on Finneran’s (2014) survey, suggests that the analytical tools behind the deployment of UC projects generate reliable and predictable results.

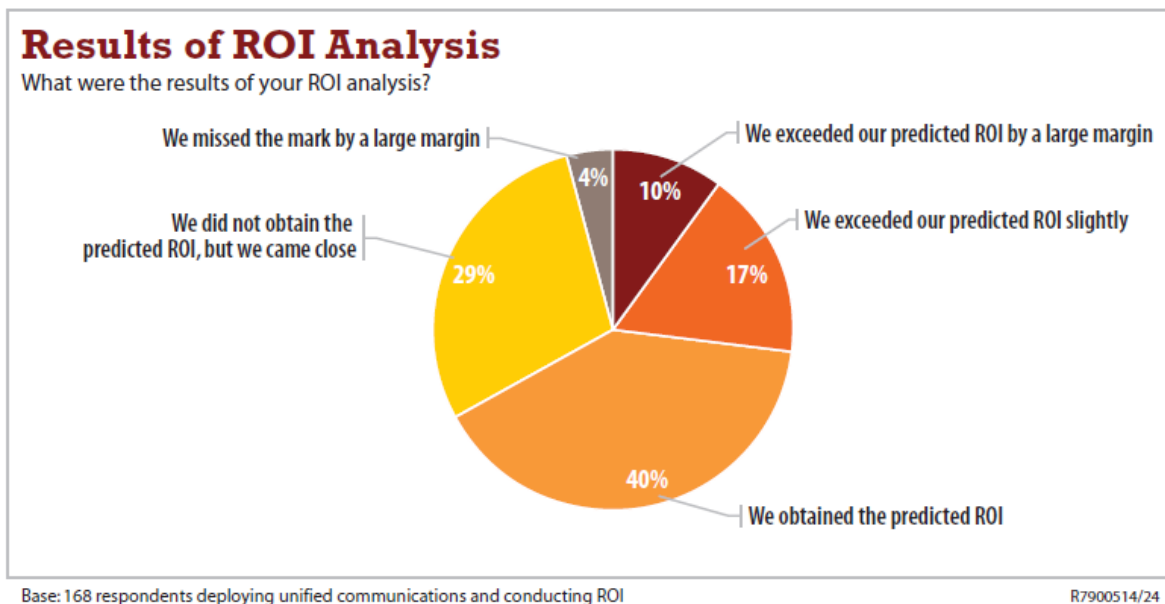


Figure 6: ROI Results from UC Deployments – Adopted from Finneran (2014)

In addition, the environmental outcome of UC-enabled WPA was that by reducing travel, space, and encouraging telework Microsoft estimated it reduced its corporate footprint of carbon dioxide emissions by 10%.

Conclusion and Further Research

Unified Communications is an enabling technology that allows enterprises to design their workspaces in a way that enhances community and collaboration while empowering individuals to work wherever they

need to and with whatever technology is at hand. The economic payback, both in bottom line savings and in performance enhancement, is tangible and measurable. Microsoft's UC-enabled WPA program did indeed deliver on its 2008 promises. It has since updated the role-based model to include offshore and embedded contractor scenarios.

But unified communications also raises new questions about productivity, trust, and privacy. In the late 1990s, Drexler and Sibbet (2009) published a comprehensive model of team performance that shows the predictable stages involved in both creating and sustaining teams. They argued that face-to-face communication was the best way to establish trust on a team, while synchronous and asynchronous technology tools enabled the team to sustain performance over longer periods of time built on this trust foundation. They argued that the side conversations, outside of the structure of a formal session, were vital to building trust as people built relationships over meals, for example, establishing their humanness. As teams learn to operate in a distributed fashion through unified communications, it will be important to test this hypothesis again. Can unified communication technologies enable and promote these side conversations? How much time should distributed teams spend together face-to-face? Can this be eliminated as the technology improves? Does it matter what the nature of the project is? Unified communication technologies easily enable the recording and storage of all interactions. What are the privacy implications of recording employees' conversations and interactions? These are some of the further questions that need to be explored.

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CORPORATE SUSTAINABILITY REPORTS IN THE APPAREL INDUSTRY

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Triple Bottom Line and Firm's Sustainable Performance Measurement

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Structured abstract

Purpose: This research deals with the way sustainability has been taken into account in terms of performance measurement by the firms and it aims to describe how Triple Bottom Line (TBL) has had been taking into account regarding the firm's performance measurement.

Design/methodology/approach

The research is both descriptive and quantitative. Three hypotheses establish associations among the degrees of use of TBL indicators and their different degrees of use in firms. We used Confirmatory Factor Analysis (CFA) to validate the scale and Structural Equation Modelling (SEM) to represent the final measurement model.

Findings

The survey gathered 149 industrial companies. The results pointed out that there are positive associations among the degree of use of Environmental indicators and Social indicators and also that Economic, Environmental and Social indicators have different degrees of use in firms. On the other hand, a positive association between the degree of use of Environmental and Social indicators and the use of Economic Indicators was not confirmed.

Practical implications:

The findings suggest how to measure sustainable performance for industrial companies using and also highlight the differences in the degree of use for the three dimensions of TBL.

Originality/value:

Besides offering another possibility for sustainable performance measurement, the study also suggest attentiveness on the use of TBL approach; apparently there is no such a balance in these dimensions, as it is commonly referred in both academic and professional discussions.

Triple Bottom Line and Firm's Sustainable Performance Measurement

Type: Research Paper

Keywords: Performance Measurement; Performance Management; Sustainability; Triple Bottom Line.

1. Introduction

Sustainability, despite its inherent difficult to be properly defined (Lélé, 1991; Glavič and Lukman, 2007) has become a major issue when seen from an organizational perspective. As pointed out by several authors (e.g. Atkinson et al., 1997; Neely et al., 2002; Epstein and Roy, 2003), since sustainability has had its role increased in several aspects of management, one issue has arisen: how to better understand the way sustainability has been taken into account in terms of performance measurement by the firms. In order to find an answer to this question, several studies have dealt with how companies could turn firm's sustainability performance into a systematic and effective way (Veleva and Ellenbecker, 2001; Warhust, 2002; Azapagic, 2004; Singh, Murty, Gupta and Dikshit, 2012; Krajnc and Glavič, 2005; Searcy, 2009).

Once it has become clear the need for a paradigm shift towards sustainable performance measurement, a new way to define organization's sustainable performance has advanced, the Triple Bottom Line (TBL) approach (Elkington, 1998; Harris, Wise, Gallagher and Goodwin, 2001; Pava, 2007; Norman and McDonald, 2003; Colbert and Kurucz, 2007), which adds both social and environmental dimensions to the traditional economic results to measure a firm's sustainable performance.

In this fashion, this paper aims to describe to describe how TBL approach has been taken into account regarding firm's performance measurement. In order to do so, the instrument for data collection was threefold: for economic dimension, six BSC's financial indicators, according to Henri (2009); for environmental and social dimensions, respectively nine and twenty two indicators from Global Reporting Initiative (GRI) (2008). The empirical research had a sample that summed up 149 companies, all associated of the Centre of the Industries of the State of São Paulo (CIESP), Brazil.

The paper is structured as follows. The next section enfolds the main concepts on sustainability, sustainable performance measurement and indicators and the study hypotheses. In the following section we describe the research methodology. In the sequence we show the main results and analyses that were carried out and the papers is finished with the conclusions and recommendations.

2. Sustainability and the Triple Bottom Line Approach

Possibly the most known definition related to this theme is the Brundtland Commission's, that states that sustainable development (SD) "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Despite its importance, there have been some difficulty and controversy on defining what sustainability really is (Lélé, 1991; Doppelt, 2008), and also how to translate it into business frameworks and practices.

Possibly due to its complexity, one of the basic concepts of sustainability that is overall recognized is the "Triple Bottom Line" (TBL) (Elkington, 1998). According to Elkington (1998), TBL approach could lead an organization to perform economic prosperity, environmental quality and social justice simultaneously. McDonough and Braungart (2002) emphasize that many executives are getting to know this three concepts, including TBL issues as a way to add value to their products or services.

Despite some researchers' resistance to this concept, to whom the concept is impossible to be put into operation (MacDonald and Norman, 2004; 2007), TBL has gradually been accepted among organizations (Elkington, 1998). Some studies reinforce this movement (Ho and Taylor, 2007; Hubbard, 2009).

3. Sustainability Performance through indicators

In some sense, performance measurement has been noticed as a fundamental key to the managerial control process in any kind of business (Olson and Slater, 2002). One point of departure for measuring organisation's – whether sustainability-oriented or not – performance is the use of indicators. The OECD (Organisation for Economic Co-Operation and Development) defines them as “a parameter, or a value derived from parameters, which points to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter” (OECD, 2001, p. 133). In this fashion, indicators would have two major functions: (i) to reduce the number of measures and parameters that could be traditionally required to show an accurate status of a situation; and (ii) to make the communication of the results simpler to the users (OECD, 2001). And as seen before, they can be split into economic, social and environmental, according to the TBL approach.

3.1. Economic Indicators: Balanced Scorecard

The Balanced Scorecard (BSC) was created by Kaplan and Norton, in the early 1990s. The BSC is defined as a way to integrate strategy and action, through a communication process, including objectives, goals, initiatives and indicators, both financial and non-financial (Kaplan and Norton, 1996).

BSC consists in four perspectives, setting the interrelationships among performance indicators that could lead to a more complete view of a company's activities (Kaplan and Norton, 1996). As per Kaplan and Norton (1996, p. 150), “[a] good Balanced Scorecard should have a mix of outcome measures and performance drivers. Outcome measures without performance drivers do not communicate how the outcomes are to be achieved”. Simons (2000) also stresses that a well-designed BSC should allow a balance between short and long-term objectives and also outcome (lagging) and process (leading) measures, besides establishing both objective and subjective measures.

Some authors explored BSC through statistical analysis, with regard to the validity and reliability of the model (Bouliane, 2006; Henri, 2009). In one of these studies, Henri (2009), investigating 383 top management teams of Canadian manufacturing firms, establishes a set of 20 indicators that would be representative of a typical BSC composition. Table 2 presents the indicators that belong to the Financial Perspective of BSC, according to Henri's proposal (2009), used as proxy for representing economic indicators in this study.

Table 1: Economic Indicators used in the survey

TBL Dimension	Indicator	Code*
Economic Indicators	Operational income	BSCF1
	Sales growth	BSCF2
	Return-on-investment (ROI)	BSCF3
	Return-on-equity (ROE)	BSCF4
	Net cash flows	BSCF5
	Cost per unit produced	BSCF6

* Code created for the purposes of this research.

Source: created by the authors, based on Henri (2009).

3.2. Social and Environmental Indicators: Global Reporting Initiative

The Global Reporting Initiative (GRI) Reporting Framework is intended to serve as a generally accepted framework for reporting on an organization's economic, environmental, and social performance (GRI, 2008). The (GRI) is a network with experts and representatives from various sectors of society present in over 40 countries around the world and it has been determining the guidelines to sustainability reporting with the participation of several important stakeholders (GRI, 2008).

Table 2 presents the social and environmental aspects defined by the GRI guidelines. These aspects are "the general types of information that are related to a specific indicator category, e.g., energy use, child labour, customers" (GRI, 2008) and will be used as a proxy for the data gathering in this research.

Table 2: Social and Environmental Indicators used in the survey

TBL Dimension	Indicator	Code*
Environmental Indicators	Materials	GRI_ENV_A
	Energy	GRI_ENV_B
	Water	GRI_ENV_C
	Biodiversity	GRI_ENV_D
	Emissions, effluents and waste	GRI_ENV_E
	Environmental aspects of products and services	GRI_ENV_F
	Environmental compliance	GRI_ENV_G
	Transporting	GRI_ENV_H
	General environmental issues	GRI_ENV_I
Social Indicators	Employment	GRI_SOC_A
	Labour/Management Relations	GRI_SOC_B
	Occupational Health and Safety	GRI_SOC_C
	Training and Education	GRI_SOC_D
	Diversity and equal opportunity	GRI_SOC_E
	Investment and procurement practices	GRI_SOC_F
	Non-discrimination	GRI_SOC_G
	Freedom of association and collective bargaining	GRI_SOC_H
	Child Labour	GRI_SOC_I
	Forced and Compulsory Labour	GRI_SOC_J
	Security Practices	GRI_SOC_K
	Indigenous Rights	GRI_SOC_L
	Community	GRI_SOC_M
	Corruption	GRI_SOC_N
	Public Policy	GRI_SOC_O
	Anti-competitive behaviour	GRI_SOC_P
	Compliance	GRI_SOC_Q
	Customer health and safety	GRI_SOC_R
	Product and service labelling	GRI_SOC_S
Marketing communications	GRI_SOC_T	
Customer privacy	GRI_SOC_U	
Compliance of products and services	GRI_SOC_V	

* Code created for the purposes of this research.

Source: created by the authors, based on GRI (2008).

4. Study hypotheses

This study aims to describe how TBL approach has had been taking into account regarding the firm's performance measurement. Here we present the three study hypotheses:

H₁: There is a positive association between the degree of use of Environmental indicators and Social indicators in firms;

H₂: There is an association between the degree of use of Environmental and Social indicators and the use of Economic Indicators in firms; and

H₃: Economic, Environmental and Social indicators have different degrees of use in firms.

5. Methodological Aspects

The study is both descriptive and quantitative, using a survey-type research project, conducted with managers of industrial companies. Despite the non-probabilistic sampling, this can be considered as a homogeneous group, with at least one common characteristic, as belonging to the same industry, as recommended by Flynn *et al.* (1990).

The research universe was the set of companies associated to the Centre of Industries of São Paulo State (CIESP). To each company was sent an invitation letter by the Board of Social Responsibility from CIESP with instructions to access the electronic questionnaire.

In order to reach the purposes of the study, the instrument for data gathering was threefold: for economic dimension, six BSC's financial indicators, according to Henri (2009); for environmental and social dimensions, respectively nine and twenty two indicators from Global Reporting Initiative (GRI) (2008), and also questions regarding companies' characteristics, as shown before in Tables 1 and 2. To each of these indicators the respondent should identify its degree of use, respecting a seven-point scale, with "1" being "not at all" and "7" as "at a great extent", with verbal anchors at the extremes.

In this study the chosen indicators were used as observed variables of latent variables (constructs) and treated as a scale. Also the relationship between constructs were hypothesized and defined. The multivariate technique used was Partial Least Squares Structural Equation Modelling (PLS-SEM or PLS path modelling), a second-generation technique primarily used to develop theories in exploratory research (Hair Jr. *et al.*, 2014).

From Shook, Ketchen, Hult & Kacmar (2004) initial analysis of SEM usage in Strategy Research to Robin's editorial (2012) in a special issue of Long Range Planning devoted to the use of PLS-SEM, this technique is growing in importance and relevance in Strategy Research. Basically a SEM model is composed of two main components: the measurement model (or outer model) and the structural model (or inner model). The measurement model is used to display the relationships between the constructs and the indicators and the structural model displays the relationships between the constructs.

In any SEM approach the measurement model is validated using Confirmatory Factor Analysis (CFA). CFA is useful to test hypothesis based on past evidence and/or theory and requires a strong knowledge of observed measures that define the latent variable. Conversely from Exploratory Factor Analysis (EFA), CFA provides a greater emphasis on theory testing and also offers a robust set of analytic procedures, not available on EFA (Brown, 2006). Since CFA is focused only on the link between the factors and their measured variables, in the context of a Structural Equation Modelling (SEM) represents the measurement model (Byrne, 2009).

PLS-SEM was used for model measurement and the constructs were hypothesized as reflective. Reflective models are the most used measurement model in social sciences and have its roots on classical test theory. This measurement model is useful when the hypothesis of causality is generated from the construct to the indicators. The structural model was assessed in their key results: significance and relevance of relationships, predictive accuracy, effect size and predictive relevance. Data were analysed using SmartPLS 2.0 (M3) (Ringle, Wende and Will, 2005).

6. Results

6.1. Sample characteristics

Brazil is currently the 9th economy in the world and it can reach the 7th position by the year 2020 (Euromonitor, 2012). It is also known for representing the first letter of the five countries from the BRICS acronym. São Paulo State is one of the 27 Brazilian federative units and responsible for more than 31% of Brazilian GDP. It is also known for the best infrastructure, the largest labour force and the most powerful technological and industrial park. Its industrial sector is the largest employer in the country, more than 2.5 million people.

The survey gathered 149 companies. We can highlight their main characteristics as: the predominance of transformational industrial companies (87.2%); mostly of them are micro, small and medium companies, with annual revenues less than \$ 60 million (73.2%) and number of employees less than 99 (59.1%). Of these companies, mostly, only 11.4% are negotiated in the open market. They mostly have domestic (79.9%) and private capital (99.3%).

6.2. Assessment of measurement model

The estimation of a measurement model imply in the definition of relationships between the indicators (observed variables) and the construct (the latent variable). To perform the assessment of a certain measurement model, several criteria of reliability and validity must be evaluated. The complete assessment of a measurement model includes the composite reliability to evaluate internal consistency, individual indicator reliability and average variance extracted (AVE) to check convergent validity, Fornell-Larcker criteria and cross-loadings to assess discriminant validity (Hair Jr., Hult, Ringle and Sarstedt, 2013).

Composite reliability (ρ_c) is measured from 0 to 1 and higher values are equal to higher levels of reliability. As a rule of thumb values between 0.7 and 0.9 are considered satisfactory. Indicator reliability and AVE are common measures of convergent validity. Indicator reliability is measured by its outer loading and the expected measure is above 0.7. AVE should be above 0.50. Finally discriminant validity is assessed by two measures: Fornell-Larcker criteria and cross-loadings. Fornell-Larcker criteria compare the squared root of the AVE of each construct to the correlations with other latent variables (or constructs) and the value of AVE should be greater. All indicators presents outer loading above 0.7 and cross-loading confirmed discriminant validity. All parameters fitted or exceeded the minimum threshold. Table 3 presents the results of AVE and composite reliability for each construct:

Table 3: AVE and composite reliability for each construct

Latent Variable	AVE	ρ_c
BSC_FIN	0.5677	0.8866
GRI_ENV	0.6450	0.9420
GRI_SOC	0.5961	0.9298
Reference Values	> 0.50	> 0.7 ~ 0.9

Source: created by the authors.

All indicators presents outer loading above 0.7 and cross-loading confirmed discriminant validity. Table 4 shows the squared root AVE (bold) compared to the latent variable correlations:

Table 4: Correlations among constructs

	BSC_FIN	GRI_ENV	GRI_SOC
BSC_FIN	0.753		
GRI_ENV	0.486	0.803	
GRI_SOC	0.505	0,745	0.772

Source: created by the authors.

All parameters fitted or exceeded the minimum threshold suggested by the literature, what validates the proposed scale. Thus, the results suggest that it is possible to consider a firm's sustainable performance through a set of 24 indicators, six for economic; nine for environmental and also nine for social performance, as presented in Table 4.

Table 4: Triple Bottom Line performance measurement and indicators for each dimension

Economic Dimension	Environmental Dimension	Social Dimension
Operational income	Materials	Labour/Management Relations
Sales growth	Energy	Occupational Health and Safety
Return-on-investment (ROI)	Water	Training and Education
Return-on-equity (ROE)	Biodiversity	Non-discrimination
Net cash flows	Emissions, effluents and waste	Freedom of association and collective bargaining
Cost per unit produced	Environmental aspects of products and services	Child Labour
	Environmental compliance	Forced and Compulsory Labour
	Transporting	Security Practices
	General environmental issues	Compliance

Source: created by the authors.

6.3. Assessment of structural model

In SEM the structural model is used to confirm the relationships hypothesized between the constructs. Several results are used to confirm or reject the hypothesis of a certain relationship and the most common are the size and significance of path coefficients, the coefficients of determination (R^2), predictive relevance (Q^2) and effect sizes (f^2). The structural model is presented on Figure 1.

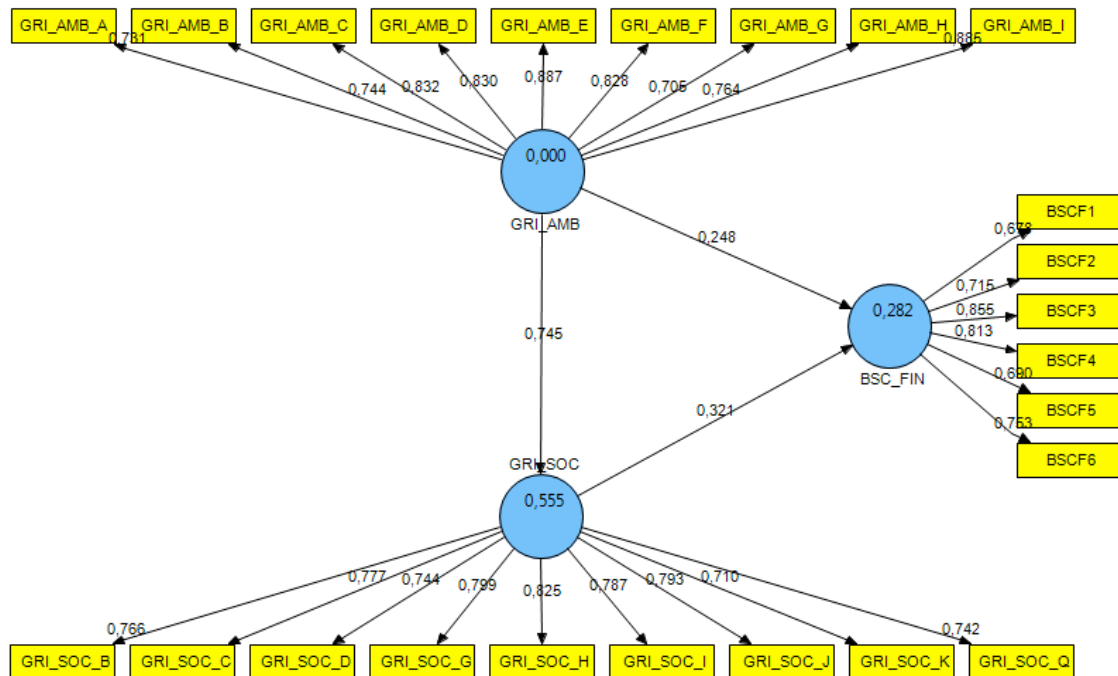


Figure 1: Structured Model

The size and significance of a structural model in PLS-SEM is assessed by bootstrapping that generates an empirical t value. The results for the significance testing results of structural model path coefficients are presented on Table 5.

Table 5: Significance testing results of structural model path coefficients

	Path coefficients	t Values	Significance level
GRI_ENV → BSC_FIN	0.248	8.369	p > .01
GRI_ENV → GRI_SOC	0.745	18.572	p > .01
GRI_SOC → BSC_FIN	0.321	2.928	p > .01

Source: created by the authors.

The path coefficients in a PLS-SEM can be interpreted as the hypothesized relationships between the constructs and must be interpreted relatively to one another. In this study all the relationships are significant at a level of 1% and the effect of GRI_ENV on GRI_SOC is higher than the effect of GRI_SOC on BSC_FIN and the smallest effect occurs on GRI_ENV related to BSC_FIN.

To assess the predictive relevance (Q^2) in PLS-SEM the common procedure is blindfolding. Values of Q^2 higher than zero suggest that the model has predictive relevance for a certain endogenous constructs. The coefficient of determination R^2 (the most commonly used measure to evaluate the structural model) is also a measure of predictive accuracy of a certain model. The value of R^2 ranges from 0 to 1 and values of 0.75, 0.50 and 0.25 can be described as substantial, moderate or weak (Hair Jr. et al, 2013). Table 6 presents the values of Q^2 and R^2 for the hypothesized model.

Table 6: Results of R^2 and Q^2 values

	R^2	Q^2
BSC_FIN	0.282	0.132
GRI_SOC	0.555	0.321

Source: created by the authors.

The final assessment of a PLS-SEM structural is the effect size (f^2). Effect size is useful to analyse the relevance of constructs in explaining how much a predictor construct contributes to the R^2 value of a target construct in the structural model. Results from 0.02, 0.15 and 0.35 can be interpreted as small, medium and large effect sizes (Hair Jr. et al., 2013). Effect sizes are presented on Table 7.

Table 7: Results of f^2

	f^2
BSC_FIN	0.379
GRI_SOC	0.497
GRI_ENV	0.562

Source: created by the authors.

6.4. Hypotheses results

The results pointed out that: H_1 : There is a positive association between the degree of use of Environmental indicators and Social indicators in firms, was confirmed; H_2 : There is an association between the degree of use of Environmental and Social indicators and the use of Economic Indicators in firms; was not confirmed, and H_3 : Economic, Environmental and Social indicators have different degrees of use in firms, was confirmed.

7. Conclusions and recommendations

7.1. Academic implications

In brief, performance measurement is multidimensional and complex. Although this or other framework could not be considered a complete or ideal solution to measure a firm's sustainable performance, it can be seen as another path in order to recognize the importance of sustainability for companies' management.

Thus, this study aims to propose and validate a framework for measuring a firm's performance from Triple Bottom Line (TBL) perspective. The proposed model is not expected to be considered as the only possible approach to support the assessment of TBL in organizations but is intended to be a minimum set of indicators that could provide managers, policymakers and researchers subsidies to identify gaps and opportunities to enhance the overall performance of a certain organization on regard of sustainability. Furthermore, the balance on TBL dimensions is rarely discussed and it seems to be something highly important to be done.

7.2. Practical implications

This research indicates that the use of the TBL performance indicators can be done in different ways and degrees. It is also important to emphasize that several other factors can also influence the sustainable performance assessment, such as: industry, company size, local regulation, stakeholders' efforts, competitive scenario, company lifecycle, amongst many others that could be used as moderators and/or mediators in the proposed model, generating a broader comprehension of TBL in practice and its impact on managerial aspects of every company, given an unique nature of every business.

This minimum set of indicators is intended to be used by industrial companies as a reliable instrument to sustainable performance assessment of the current stage of the TBL deployment and provide alternative approaches to address specific issues related to the environmental, social and economic sustainability.

7.3. Further research

This study has its limitations, mainly related to the non-probabilistic sample and to the specific context in which it was done, Brazilian industrial companies. Additionally, the indicators used as proxies are merely generic indicators employed as a way for make it possible for all the firms to participate in the research. Future researches could also investigate the fitness of the model for particular companies, and also take into consideration variables that could moderate or mediate the sustainable performance assessment.

As a sequence to this work, besides the possibility of counting on a larger sample and replicating this instrument in other circumstances, we suggest an investigation on the reasons for the use of this or that indicator over others and on what basis it occurs in order to enhance the quality and robustness of these indicators, as suggested by Singh et al (2012).

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0044

ROLE OF PERFORMANCE MEASUREMENT IN DEVELOPING INDUSTRIAL SERVICES

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ROLE OF PERFORMANCE MEASUREMENT IN DEVELOPING INDUSTRIAL SERVICES

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Structured abstract

Purpose – The purpose of the study is to examine the current role of performance measurement in maintenance services and determine how the performance measurement should be developed to support the needs of networked maintenance.

Design/methodology/approach – The empirical evidence is based on two case networks operating in the field of industrial maintenance. The first case network operates in the energy industry, while the second operates in the mining industry. Both network consists of machine supplier companies, performance partner companies and system supplier companies.

Findings – As a result of the study, a framework and suggestion for performance measurement for service value in maintenance (including the customer, service provider and equipment provider) are presented. The significant novelty of the research is based on combining network, service and value perspectives in performance measurement.

Originality/value – The literature calls for new measurement models and frameworks that support these new management challenges. This research creates a framework for practical applications. The framework helps to identify possible development needs and increase

understanding of the requirements when cooperation in a maintenance network deepens, moving from machine partner towards value partner.

Keywords – Performance measurement, value, maintenance, service

Article classification – Research paper

1 Introduction

Today, small and medium-sized enterprises are competing in globalised and turbulent markets. To survive in such a competitive environment, companies have to collaborate with each other with the objective of meeting customers' needs more effectively and efficiently (Bititci et al., 2004; Bititci et al., 2012). Companies operating in networks require information regarding the functionality and value of the network (Kaplan et al., 2010; Bititci et al., 2012). Traditionally, operations management literature has addressed the subject of value when considering manufacturers' strategies for adding value to their customers (Lightfoot et al., 2013). When operating in networks, each organization's role and value input has to be taken into account. For example, Ulaga and Chacour (2001) have investigated how value is created in networks and concluded that it is created through relationships, not just by delivering products and services. This requires a lot of shared information throughout the network.

Lack of network-level performance management may have many consequences that could improve the performance of individual companies in a way that will lead to sub-optimizing or even decreasing the performance of the whole business network (Kulmala and Lönnqvist, 2006). In order to be successful, it is important for the network to continuously evaluate and enhance the performance of the individual partner as well as the entire network (Kaplan et al., 2010). In general, it can be said that the existing literature shows a need for in-depth empirical studies concerning the design of a performance measurement system as well as knowledge and tools that facilitate and improve the performance management of a network. The aim of the present research is to provide new information to fill the research gap and to support the management of a network (Kaplan et al., 2010; Bititci et al., 2012). The current studies also highlight the need to understand what value end customers derive from services, as the value is perceived and determined by the customer on the basis of value-in-use, not by the producer (Vargo and Lusch, 2008).

This research focuses on industrial services, particularly maintenance services. The competition in international markets has led to a situation where industrial maintenance services are increasingly outsourced (Muchiri et al., 2011). As a result, competition that once existed between companies has shifted to competition between networks. Kalliokoski et al. (2003) have recognized that a maintenance partner plays the following five kinds of roles: 1) machine supplier (delivering a piece of machinery or equipment that fits the customer's technical specification); 2) system supplier (delivery of a system, e.g. a production line, which is usually designed for the specific customer's process); 3) maintenance partner (continued supplier involvement during the continuing life cycle of the delivery); 4) performance partner (operating

the customer's technical process by taking partial responsibility for the performance of the system) and 5) value partner (involved in the customer's business, e.g. through operating and maintaining agreements, where the customer pays a pre-determined price for the actual output of the system)(Kalliokoski et al. 2003). This categorization represents a continuum in which suppliers become more and more integrated into the customer's value creation process. Thus, partners have a common interest to develop industrial services. These interests relate, for example, to achieving profitable growth, building synergies and offering an optimal value proposition. However, the management challenge lies in how to manage the transition between these evolution steps. Many companies refer to 'developing a new mindset' in the organization as the main challenge in establishing new 'roles'. Thus, the aim of the study is to examine the following:

- What is the current role of performance measurement in managing the networked maintenance services?
- How should the performance measurement be developed so that it supports the needs of networked maintenance?

2 Theoretical background

2.1 Value perspective in services network

The basic nature of value can be discussed by examining the following two general meanings of value: 'value-in-use' and 'value-in-exchange' (Vargo et al., 2008). The traditional view of value creation is related to a goods-dominant logic, which is based on the value-in-exchange where the value is created by organizations usually through the exchange of products and goods (e.g. Vargo and Lusch, 2004). In general, value-in-exchange can be regarded as a short-term trade-off between organizations' sacrifices and benefits. The alternative view of value creation, 'value-in-use', is related to a service-dominant logic where the roles of producers and customers are not distinct, meaning that the value is co-created (Vargo and Lusch, 2008; Vargo et al., 2008).

Service-dominant logic offers an alternative point of view for evaluating an organization's strategic positioning to consider its operations from a network-oriented perspective that would facilitate the exploration of new value-creation mechanisms in an industrial context (Hallikas et al., 2014). Moving the locus of value creation from exchange to use means transforming the understanding of value from one based on units of an organization's output to one based on processes that integrate resources. Manufacturing-centred ideology is facing challenges in the form of business models driven by the requirements of B-to-B customers for more complex product-service systems (Hallikas et al., 2014). According to the definitions of the service systems found in the literature, such systems are assumed to comprise interactions between the manufacturer, supplier and customer as well as the exchange of some intangible value inputs and functions (e.g. Goldstein et al., 2002). A service system can be seen as an arrangement of resources (including, e.g. people, technology and information) connected to other systems by value propositions (e.g. Spohrer et al., 2007). The organisations' roles in value creation in service systems, i.e. the proposition and provision of service, are intermediary to the value co-creation process. A service system's function is to make use of its own resources and the resources of others to improve its circumstance and that of others (Vargo et al., 2008).

While maintenance operations and services have been moving from businesses focused on goods and products to purposes associated with partnerships and service provision, the role of value creation and value networks has been emphasized in literature (Lusch et al., 2010). A value network can be seen as formally or informally connected operators interacting together in order to co-produce services and co-create value by combining their resources and knowledge. A value network has structural integrity because each member organization has competences (used to offer and provide services to others) and information that can be shared through the network (Lusch et al., 2010). The value delivered through the service and value networks is usually formed by the needs of the customer organization or the final user of the services. In this process, the value of that service can be considered to consist of different value inputs (e.g. safety, flexibility, reliability and price). Furthermore, the perceived total value for the customer and service provider can be considered as the sum and right combination of these value inputs (e.g. Ojanen et al. 2012; Ali-Marttila et al., 2013). However, in the maintenance-based service networks the conceptualization of the value creation process should pay more attention to the value outcome created by the whole network instead of focusing solely on the value outputs that individual network partners receive. In this context, performance measurement and management play a significant role.

2.2 Performance measurement and management in networks

If companies aim to create and sustain a competitive advantage through networks, the structures of the network need to be understood and managed, otherwise the objectives will not be achieved and the network will fail (Verdecho et al., 2009). Networks are usually traditionally organized and managed as single organizations; however, this is not an appropriate approach in the network context (Kaplan et al., 2010). In order to develop and manage a successful business network, continuous performance measurement in both the single network partner and the entire network is needed to organize the collaboration successfully (Pekkola, 2013; Pekkola, 2013). In addition, to understand how a performance measurement system in a network has developed and is used, it is necessary to capture its context, process and content (Cuthbertson and Piotrowicz, 2009). It is important to define the conditions in which the measurement takes place. Performance measurement can also be seen as a tool that produces the necessary network-level information, promotes network management effectively and enhances the success of collaborative processes, i.e. by decreasing organization-level sub-optimization (Verdecho et al., 2009; Bititci et al., 2012). Comprehensive network-level performance measurement systems can provide essential information to the entire network, manage the processes of the network and guide the network partners towards common goals (Kulmala and Lönnqvist, 2006; Kaplan et al., 2010; Bititci et al., 2012).

On the other hand, the management and measurement of the network is very complicated because the network consists of individual firms that have only transactional ties to the network. The literature (Kaplan et al., 2010) presents several critical success factors and characteristics that play a key role in the network of success and which are also related to the measurement and management of performance measurement:

- *Commitment* refers to the willingness of the trading partners to exert effort on behalf of the relationship.

- The network partners should *trust* each other.
- *Coordination* is related to boundary definition and reflects the set of tasks each network member expects the others to perform.
- *Communication quality* should be timeless, accurate and complete.
- *Participation* refers to the extent to which the partners engage jointly in planning and goal setting.
- The firms in a strategic partnership are motivated to engage themselves in a *joint problem*.

Despite the previously mentioned challenges, a crucial component of a service system is the customer and the value s/he perceives; the overall aim of the service system is to provide added value for the customer (Vargo and Lusch, 2008; Spohrer et al., 2007).

Based on prior literature, the existing models and framework concentrate on condition monitoring and measuring the performance of individual network members. Overall, there are various models to monitor the different parts of the maintenance process (Muchiri et al., 2011). However, the network provides value that the current models do not take into account. The value provided by the network can be both financial (direct or indirect) and non-financial value (Liyanage and Kumar, 2003). Intangible non-financial values can be as important as tangible values and thus there is a need to understand the intangible values which create the perception of benefit and/or sacrifice for the customer of the network (Toossi et al., 2013). Therefore, to deliver services organizations can adopt performance measures that reflect outcomes aligned with customers. These are then linked in measures of individual organizations and complemented by a set of more emotional measures that demonstrate value to the customer (Baines and Lightfoot, 2014).

3 Research approach

The results of this study are based on a case study research project. Because of the exploratory nature of the research, the case study was deemed appropriate in terms of the importance of the phenomenon in practice as well as the lack of existing theory. Seven organizations operating in the mining and energy industries form two networks that were used as cases. Both of the networks included companies with the following three different roles: a maintenance customer company, a maintenance service provider company and an equipment provider company. These networks were chosen as cases because they were interested in developing performance measures for monitoring the value created in the network.

In the first phase, the current state and context of the maintenance network was identified by analysing the vision and targets for cooperation. After developing this pre-understanding of the current state, the different value inputs and their importance in each network partner's role were clarified together with the two networks. After that, similar research processes were used in both networks to ensure scientific transparency and repeatability. The research process included the following three main phases: defining the vision and goals of the network, defining

the success factors of the network and defining the measures of the network. The data included written assignments completed by the representatives of the participating companies as well as documented focus group meetings. The data was analysed in terms of content analysis. In order to validate the findings, case triangulation was used. First, the research process was carried out with the energy network, after which the results will be validated in the mining network. The validation of the results is still a work in progress and therefore the preliminary results are presented in this paper. The analyses were conducted at the network level as well as the individual organization level.

In addition to case triangulation, researcher triangulation, theory triangulation and data triangulation were used to validate the findings. The research was conducted and data was analysed; four researchers cooperated in terms of content analysis, after which the common view was discussed. Theory triangulation was employed as well. By employing different theoretical frameworks, the goal was to be able to produce new understandings. Although the study belongs to the performance measurement and management research stream, maintenance and service operations management research was also used to integrate existing theory with new contexts. Data triangulation was used by collecting more than one source of data. The previously mentioned written assignments focused on the success factors of the network as well as current measures, including their weaknesses and strengths. The topics of the focus group meetings were selected based on written assignments and the analysis of the previous meeting. Thus, although the topics and issues were decided beforehand, the discussions were informal and facilitated with supporting questions and the researchers' comments.

4 Findings

4.1 The current role of performance measurement in maintenance services

The increase of maintenance outsourcing indicates that companies believe that they can achieve added value from a new kind of network and cooperation models. In addition, previous studies have proven that companies can improve their profitability and overall competitiveness through incorporating new services systematically into their business. The starting point of this study was to understand the role of performance measurement in maintenance services.

The findings of the empirical evidence (picture 1) demonstrate that while maintenance service partners (especially the machine supplier and solutions providers) cooperate on a purely transaction basis with others, they also cooperate when they are planning annual stoppages. Hence, this machine supplier and the solutions providers do not have any joint measures for measuring the success or value of the operations. The machine and service providers described the situation as follows:

We just deliver the machine or service that we are promised. Of course we ensure that the customer is satisfied and the machine works as promised (service provider).

In this role (machine supplier), we do not need joint measures. But if networking becomes more mature, then we need measures to support collaboration and evaluate its value.

The results reveal that at the performance partner level, the service provider has measures that customer is imposed in maintenance contract. The target and control levels are jointly discussed and elaborated between the service provider and the customer. If the performance partner is not able to fulfil the promises, there are identified sanctions that they have to pay to the customer company. These measures focus on the efficiency and effectiveness of the maintenance process as well as the output of the process.

When we do the agreement with the performance partner, we discuss and agree the measures (maintenance costs, technical OEE, loss of production), sanctions and meeting and reporting practices (customer company).

The case participants were not able to name case of value network partners, where the collaboration is structured and managed systemically. In this case environment, the traditional view of value creation emphasized value created by organizations, usually through the exchange of products (e.g. Vargo and Lusch, 2004) and services. In general, value-in-exchange can be regarded as a short-term trade-off between organizations' sacrifices and benefits. Based on the empirical findings, the companies are not yet prepared and mature enough for network-wide information sharing as network-level performance measurement and matured collaboration is favoured instead (cf. Pekkola et al. 2013).

However, the maintenance partners emphasize that their target is to be a value partner for the customers despite the role they play with the customer. The participants highlight that there is a need for tools that measure the value of a maintenance service or the machine for the customer. Based on this need, a framework for measuring the value of maintenance cooperation was elaborated with the assistance of the case companies.

4.2 The framework for measuring value of maintenance cooperation

In maintenance services as well as service production in general, the main challenge is to measure how customer needs are fulfilled through experience and valuation (cf. Goldstein et al., 2002). Ulwick and Bettencourt (2008) reveal that difficulties in measuring customer value tend to arise due to the existence of non-functional value components. Customer perceptions of such value are difficult to address before the realization of the service delivery, the value of which is strongly related to the problem-solving process in which the customer is engaged (Ulwick and Bettencourt, 2008).

Based on the empirical needs, this study presents a framework for measuring the value of cooperation and networking. The framework is based on the five roles of maintenance cooperation defined by Kalliokoski et al. (2003), the value creation literature in general and on the case participants' perception and performance measurement. The suggestions form the basis of the framework and describe the mechanisms and principles regarding the measurement of the value of the maintenance cooperation (figure 1).

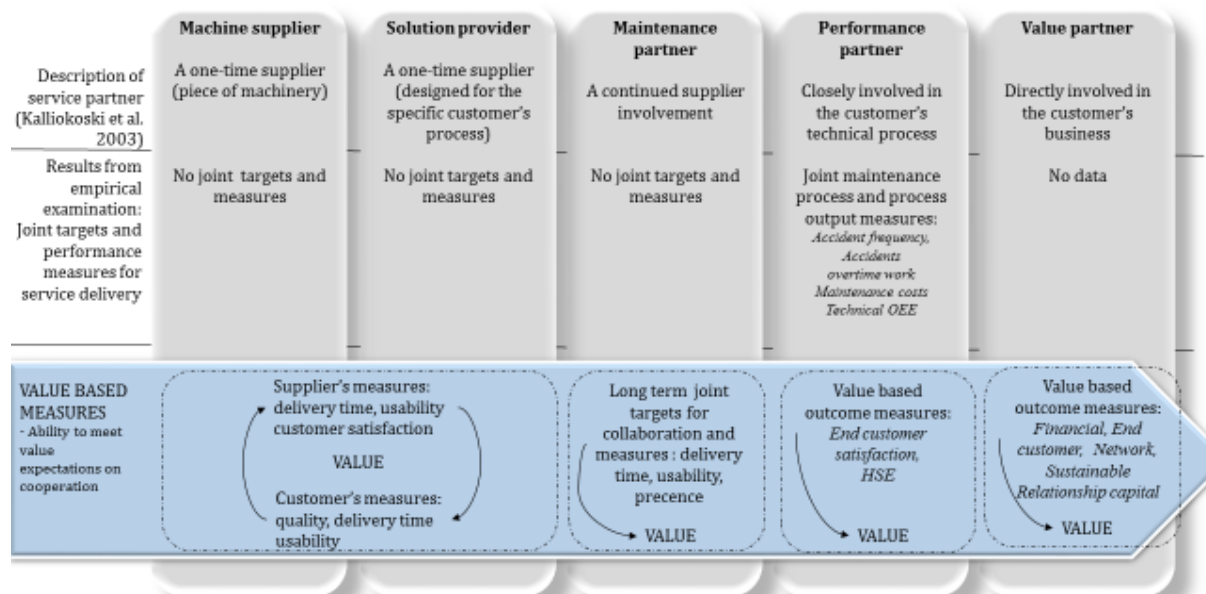


Figure 1. The framework for measuring the value of maintenance cooperation

- *Machine supplier and solution provider cooperation* – The machine and solution suppliers have to understand the customer's product and service expectations. These expectations are often related to the promises the supplier made to the customer. Neely et al. (2011) state that service delivery can be effectively hidden from the customer and that the business thus has to work hard to educate the customer about the value of the service delivered. The role of the supplier then would be to understand and measure the customers' value creation processes embedded in the customers' practices and contexts. Therefore, the machine/solution provider should measure these expectations (e.g. delivery time, usability, discharge level, customer satisfaction) to ensure that value is created in cooperation.
- *Maintenance partner cooperation* – Maintenance partner cooperation involves maintenance of a machine or product line during the life cycle. The partners should create joint targets and measures for this cooperation and thus ensure that cooperation creates desired value. In this way the maintenance partner can indicate that the service is valuable to the customer company. This discussion is also linked to the following question: is it more valuable to the customer to purchase corrective maintenance where maintenance is carried out after fault recognition, or predetermined maintenance where the maintenance is carried out in accordance with established intervals of time?
- *Performance partner cooperation* – The cooperation is more structured and there are already measured joint goals for the efficiency and effectiveness of the maintenance processes. In addition to these measures, the partners should be able to evaluate and measure the value created by this cooperation (outsourcing) for both participants. For example, the measurement could focus on issues such as the end customer satisfaction and cost/saving benefits for the participants. Comprehensive measurement requires that all measures are linked together so that the causal linkages between firm-level

measures and network-level measures can be formed. The network value measures should be common to the entire network (cf. Pekkola, 2013).

- *Value partner networking* – Value partner networking can be defined as a more advanced and demanding form of maintenance collaboration. It involves a joint process where the entities share information, resources and responsibilities to plan, implement and evaluate activities in order to achieve a common goal (Camarinha-Matos et al., 2009). In this form of collaboration, the value of collaboration should be measured more systematically in order to ensure mutually beneficial collaboration. For example, the following five value dimensions were defined as being important for the measurement of the network value: financial, end customer, network, sustainability and relationships (cf. Saunila et al., 2014).

5 Conclusions

This study increases understanding of the measurement of value in maintenance services. The competition in international markets has led to a situation where industrial maintenance services are outsourced; thus, there is a need for theory that elucidates how the actual value of such cooperation can be demonstrated to the partners and end customer. Despite the increasing amount of literature on performance measurement in networks, theory that reflects the complexity and dynamism when value is delivered to customers through maintenance cooperation is still lacking. The study extends the literature on performance measurement of value from individual organizations to a network level. As a main contribution, the study presents a framework and suggestions regarding how to measure value in maintenance services. In terms of a practical contribution, this research contributes to practice by presenting a framework that can be used as a tool when developing measurements for monitoring and analysing maintenance cooperation. It also increases understanding of how to manage the transition between these evolution steps and helps to develop a 'new mindset' in the organization by establishing new 'roles' in cooperation.

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0045

EXPLORING PERFORMANCE MEASUREMENT SYSTEMS IN A SERVICE CONTEXT

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Exploring Performance Measurement Systems in a Service Context

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Abstract

Purpose – The current study focuses on the experiences of organisations that provide different types of services, with regard to the design and implementation of a performance measurement system (PMS). This study also examines the perceptions of the benefits and the generated value that can be achieved when implementing a PMS in a service context.

Design/methodology/approach – The empirical part of this study is based on interviews concerning the perceptions of the design and implementation process of a performance measurement system, as well as the benefits and the created value of the PMS. The empirical data is based on 28 interviews in 10 organisations, including five public sector, three knowledge-intensive and two industrial organisations.

Findings – According to the public sector and knowledge-intensive organisations, the design and implementation process enhances the understanding of internal actions and performance measurements in general, whereas the industrial organisations highlight an enhanced understanding of the customer interface and customer value. Industrial organisations seem to be pioneers with regard to linking customer value to the performance measurement, when compared to the other studied branches.

Practical implications – The study suggests that particularly in public sector organisations there is a need to define the intended purpose and responsibilities of a PMS and to focus more on understanding the customers when seeking effectiveness.

Originality/value – The research approach is exploratory, especially in the field of performance measurement, since there are only a few empirical studies thus far that have examined performance measurement in a service context.

Keywords: Performance measurement system, Performance management, Measurement, Service, Service operation

Paper type: Research paper

1. Introduction

Despite the long history of research on performance measurement, existing studies are not well linked to the discussion of service operations (Jääskeläinen et al., 2012). Some studies have suggested that performance measurement systems are designed and implemented in a way that matches organisational objectives, rather than focusing on the uniqueness of the service business (Amir et al., 2010). The organisational approach does not capture the special nature of service processes, and a measurement connection to the actual service process does not exist (e.g., Bititci et al., 2012; Chenhall, 2003; Jääskeläinen et al., 2012). According to Jääskeläinen et al. (2012), there is a need for conceptualisation, classification, and frameworks that can be used for identifying common features and differences between service operations with relation to measurement-related needs and requirements. The current study focuses on the experiences of organisations that provide different types of services, with regard to the design and implementation of a performance measurement system (PMS). This study also examines the perceptions of the benefits and the generated value that can be achieved when implementing a PMS in a service context. Furthermore, this study explores the differences between the organisations that provide different types of services. This study will address the following research questions:

- How do the design and implementation of a PMS differ in public, knowledge-intensive, and industrial organisations?
- How do the benefits and created value of a PMS differ in public, knowledge-intensive, and industrial organisations?

The results of the interviews concerning the design and implementation of a PMS indicate some interesting differences between the studied branches. According to the public sector organisations, the design and implementation process enhances the understanding of internal actions and performance measurements in general, whereas the industrial organisations highlight an enhanced understanding of the customer interface and customer value. The industrial organisations are pioneers with regard to linking customer value to the performance measurement, when compared to the public organisations.

The study also reveals some interesting insights into the desired benefits of a PMS among the organisations that offer various services.

2. Literature

2.1. Development of a performance measurement system for service organisations

The literature contains a wide array of practical and managerial process models for the design and implementation of a PMS (see e.g. Kaplan and Norton, 1996; Simons, 2000). In general, the development of a PMS can be divided to three main phases: design, implementation, and use of performance measures (Bourne et al., 2000). The first task in designing a PMS is related to the identification of the purpose of measurement, which is related to the objectives of the organisation. In general, the design phase can be subdivided into identifying the key targets to measure and designing the measures themselves (Kaplan and Norton, 1996). It is important to design the measures to encourage behaviour that will support the strategy of the organisation (e.g. Bourne et al., 2000). In the service context, the level and nature of customer participation in service operations sets a starting point for measurement. The customers often have a central role in service operations, and thus the level of customer participation affects the choice and definition of the measurement objectives. In practice, this may mean that customer expectations and their fulfilments should be measured (e.g. service quality and availability).

Implementation is the phase in which systems and procedures are put in place to collect and process the data (e.g. who collect data, who reported results) that enable the measurement to be done regularly. This may involve computer programming to trap data already used in the system and to present them in a meaningful form (Bourne et al., 2000; Cunha et al., 2008). There is some evidence that a performance measurement system that lacks information technology does not support the management practices as efficiently and effectively as possible (Bititci et al., 2012; Nudurupati et al., 2011). Information technology systems facilitate the gathering of measurement data, carry out calculations, and provide useful reports and visualisation of the data.

The literature presents numerous other purposes for the use of performance measurement (Bourne et al., 2000; Kaplan and Norton, 1996), including: leading employee activities, communicating about important targets, identifying problems and development needs, and motivating employees. The basic function of measurement is to provide information about the factors considered important for the management performance of an organisation. Hence, measurement systems should not be too complicated to serve the practical needs of management. Measurement in itself cannot determine social practices. It is therefore essential to inform and train the employees and managers in order to ensure their commitment and the efficient use of measurement systems (Wisniewski and Ólafsson, 2004). For example, Ukko et al. (2007) show that the use of a PMS may benefit an organisation in the following ways: improving the quality and content of the conversations that managers have with the employees (i.e., processing and dealing with work issues becomes easier), establishing new routines (e.g., new meeting practices), and enhancing information sharing.

2.2. Challenges in a measurement of service operations

Traditionally, performance measurement literature has mainly focused on the internal efficiency surrounding the production component of the service industry. However, recent studies have shown that regardless of whether the products or services deliver the value to the customer, the organisation should view the value chain from the customer's perspective, i.e., how the customer uses the product and/or service throughout its life (e.g. Bititci et al., 2012; Ng and Nudurupati, 2010; Vargo and Lusch, 2004). It is necessary to understand what value customers derive from services, as the customer perceives and determines the value on the basis of the value in use. (Pawar, 2009; Vargo and Lusch, 2004, 2008). Furthermore, the customer often only realises the value of the service or product when they use it (Pawar et al., 2009).

Focusing on the value of the delivered service also requires fresh and innovative thinking on how to configure, measure, and manage organisations (Bititci et al., 2012; Laine et al., 2012; Ng and Nudurupati, 2010). The fact that the value of a service is perceived and determined by the customer on the basis of value-in-use highlights the role of the customer in the measurement of service operations. So far, the majority of customer-facing measures, such as on-time delivery, flexibility, responsiveness, accuracy of documentation, and even customer satisfaction, tend to focus on value-in-exchange rather than on value-in-use-through-life (Bititci et al., 2012).

Amir et al. (2010) show that an organisation designs and implements a PMS in a way that matches the organisational objectives, rather than focusing on the uniqueness of the service business. The organisational approach does not capture the special nature of service processes, and the measurement connection to the actual service processes does not exist (Chenhall, 2003; Jääskeläinen et al., 2012). Jääskeläinen et al. (2012) conclude that generic contingency factors are also important factors to acknowledge in the service context, and the purpose of measurement—in addition to the mission, strategy, and objectives of an organisation—always affects the choice of what to measure. However, when designing a PMS, a number of essential service-specific contingency factors affecting performance measurement should also be taken into account (Jääskeläinen et al., 2012), including: customer involvement in service provision, the role of intangible inputs, varying level of demand, output complexity, focus on impacts, and repetitiveness of service process. Furthermore, Amir et al. (2010) show that the clear relationship of the influence of the contextual variables on PMS attributes has implications for theory and practice. Instead of focusing on broad distinctions between services, it is more constructive to identify the different categories of services and to study the challenges within each group. This approach facilitates the sharing of ideas and understanding of suitable performance measurement techniques for each service type (Amir et al., 2010).

The current study explores the perceptions of the design and implementation process of a PMS, as well as the benefits and the created value of the PMS between public sector, knowledge-intensive, and industrial organisations. Whereas the services of the public sector can be characterised by tax-based funding, multiple stakeholders, non-profit orientation, and seeking for long-term effectiveness (Lönqvist and Laihonen, 2012; Sillanpää et al., 2010), the industrial services (e.g. engineering services)

are usually complex and require a variety of organisational capabilities to deliver value to the customer (Neely, 2008).

3. Methodology

The empirical part of this study is based on interviews concerning the perceptions of the design and implementation process of a PMS, as well as the benefits and the created value of a PMS. The empirical data is based on 28 interviews in 10 organisations, consisting of five public sector, three knowledge-intensive, and two industrial organisations, during August-September 2013. As background information, all 10 organisations participated in the action research project (2011-2012) that aimed to explore how the performance measurement system can be designed and implemented in organisations that offer different types of services.

The responsible person for the measurement development project was interviewed in nine out of 10 organisations; in one organisation, the responsible person had shifted to another company. One member from the development group of the PMS was interviewed in all 10 organisations. In nine out of 10 organisations, one member outside of the development group was also interviewed. The main objective was to determine whether the perceptions of the people in organisations that operate with different types of service functions differ with regard to, for example, the purpose of a PMS and the desired benefits.

4. Findings

The study focused on two main research questions regarding the differences related to implementing a PMS across the organisations that offer different services. The first research question asked, *How do the design and implementation of a PMS differ in public, knowledge-intensive, and industrial organisations that provide different types of services?* Table 1 presents the main findings and the differences. Regarding the purpose of a designed PMS, it can be stated that the industrial organisations are oriented to understand more about the customers and their value determination process. They explore the possibilities for new customers and new services, whereas the public and knowledge-intensive organisations focus on the internal development and reporting the effectiveness to stakeholders by utilising the PMS. The hierarchical and complex organisational structures may account for why the customer approach did not exist as strongly as with industrial organisations.

The findings also saw differences among the design processes of a PMS. The industrial organisations had a clear vision of the purpose of the measurement system, and the main challenges included technical issues like automatic data processing and the creation of an integrated and compact system. In contrast, the public sector organisations had different opinions about the purpose of a PMS even within a project group, and some personnel groups were not familiar with the measurement. In the knowledge-intensive organisations, the measurement of effectiveness was considered somewhat problematic, and thus, the persons responsible for implementing the PMS highlighted the need for external support. The challenges in the implementation phase were somewhat similar among the types of organisations. Transmitting the information about the PMS was considered challenging in all of the organisations. Due to the complex organisational structures, the general information of the launched PMS was considered

difficult to attain in the public organisations, and the implementation was still at the starting phase. The knowledge-intensive organisations saw the PMS as a tool for the managers only, and thus, transmitting the information to other employees was seen as challenging. The data gathering and processing were considered as challenging, especially in the public and knowledge-intensive organisations, and thus, more sophisticated systems and training for the employees are required.

Regarding the factors that foster the design and implementation process of a PMS, the external support was perceived as essential in all organisations. The willingness to understand more about the customers' needs and value creation process were the main reasons for implementing the PMS in industrial organisations. The mandatory reasons for the performance measurement were seen as a fostering factor in other organisations. The managers and employees showed a level of commitment to the PMS, and the industrial organisations had carefully defined employee and management responsibilities. In these organisations, the perceptions between the project group members and non-members were mostly aligned. In the public sector organisations, the level of commitment between the managers and employees varied among the different organisations. An ambiguity concerning the organisational level, i.e., who should manage the design of a PMS, may be one reason for the varied commitment levels. Furthermore, the perceptions between the project group members and non-members differed mainly on the purpose of use and the expected benefits of a PMS. This was to some extent the case in all branches, and demonstrates a need for more effective sharing of information and discussion around the performance measurement.

The customer needs and customer value creation process were guiding factors for the design of a PMS in industrial organisations. In the public sector organisations, the design focused on the key concepts of effectiveness. However, some interviewees of public organisations had difficulties understanding these concepts. Overall, the design and the implementation process of service organisations, enhanced the understanding of performance measurement, target setting, and the utilisation of measurement information in the public sector organisations and knowledge-intensive organisations. The understanding of customer value and effectiveness was also improved to some extent in these organisations. In the industrial organisations, the understanding of customer needs and value creation process enhanced considerably.

Table 1. Perceptions of the design and implementation process of a PMS

	Public organisations	Knowledge-intensive organisations	Industrial organisations
Intended use of a PMS	<ul style="list-style-type: none"> - A practical tool for different management levels - Development and improvement of operations - Presentation of effectiveness to policy makers 	<ul style="list-style-type: none"> - Utilisation of measurement information in marketing - Development and improvement of operations - A tool for management - Presentation of effectiveness to financiers 	<ul style="list-style-type: none"> - Enhance understanding of customer interface - Development of service business ➤ Finding new customers and services - A practical tool for different management levels ➤ For both strategic and operative decision-making
The main challenges in a design process	<ul style="list-style-type: none"> - Information systems - Legislation - Different opinions of the purpose of PMS in project group - Overlapping development projects - All of the personnel were not familiar with measurement 	<ul style="list-style-type: none"> - Problems surrounding the measurement of effectiveness complicated the selection of measures - Excessive outsourcing of the project coordination 	<ul style="list-style-type: none"> - The everyday needs of customers hampered the PMS project - The clarification and compactness of the measurement system - Information systems; more automatic processing of data
The main challenges in the implementation process	<ul style="list-style-type: none"> - Due to challenges in the design process, the implementation has not yet been completed in all organisations - Complex organisational structures - Sharing the information about the PMS to other employees 	<ul style="list-style-type: none"> - The design process was mainly done by the executive team - Both the members of a project group and the outsiders called the more effective information to other employees - Challenges in getting the data ➤ Employees do not input data; more training and communication required 	<ul style="list-style-type: none"> - Challenges in getting data ➤ Mainly IT-based , but partially connected to employees - Sharing the information about the PMS to other employees
Factors fostering the design and implementation process	<ul style="list-style-type: none"> - External support - Mandatory reason for the measurement by the cities - The synergy from other similar types of projects 	<ul style="list-style-type: none"> - External support - A need to develop the reporting because of a duty - Willingness to understand the effectiveness of the operations 	<ul style="list-style-type: none"> - External support - Willingness to understand more about the customers, their needs and value creation
The level of commitment of managers and employees	<ul style="list-style-type: none"> - Varied significantly among organisations - Lack of clarity regarding which organisational level would manage the project - Managers and employees had positive attitudes toward a PMS and expected benefits ➤ Not realised yet, which caused suspiciousness among the employees 	<ul style="list-style-type: none"> - Project group was committed - Managers did not expect substantial input from employees, since the system was designed for top management use - The knowledge about the PMS was insufficient, which may indicate problems in its implementation 	<ul style="list-style-type: none"> - Both the managers and the other project group were highly committed to the project - Both the employees and managers had clear responsibilities in the design process

Table 1. Perceptions of the design and implementation process of a PMS (continue)

	Public organisations	Knowledge-intensive organisations	Industrial organisations
Perceptions of project group members versus non-members	<ul style="list-style-type: none"> - Perceptions were surprisingly similar, although the non-members had lower knowledge of a project - Perceptions are more connected to the organisational position - Somewhat different perceptions surrounding the purpose of the expected benefits 	<ul style="list-style-type: none"> - Due to the lack of knowledge of non-members about the project, only a few contradictions existed - The contradictions were connected to the issue as to whether the PMS was designed for the mandatory external reporting or for internal development 	<ul style="list-style-type: none"> - No contradictory perceptions - Knowledge of the non-members of the PMS was on a low level
A customer focus of a PMS	<ul style="list-style-type: none"> - Some interviewees had difficulties understanding the aspects of effectiveness 	<ul style="list-style-type: none"> - The effectiveness was a starting point for the project - Focus on customer feedback and reliability of delivery 	<ul style="list-style-type: none"> - A PMS was designed focusing on a customer value <ul style="list-style-type: none"> ➤ Understanding the customer value increased considerably - Customer perspective is considered both directly and indirectly
Lessons learned during the design and implementation process	<ul style="list-style-type: none"> - Enhanced understanding of internal actions and external environment - Emphasising the customer value through the effectiveness - Enhanced understanding of the performance measurement 	<ul style="list-style-type: none"> - Emphasising the customer value through the effectiveness - Enhanced understanding about performance measurement - Enhanced understanding between the measurement and reporting - Understanding the new aspects of measurement - Understanding that a measure needs a target 	<ul style="list-style-type: none"> - Enhanced understanding about the customer interface, needs and value creation - Understanding the aspects of measurement <ul style="list-style-type: none"> ➤ No need for Euros in every measure

The second research question asked, *How do the benefits and created value of a PMS differ in public, knowledge-intensive, and industrial organisations that provide different types of services?* Table 2 presents the main findings and the differences. It seems that the primary purpose of a PMS is associated with its expected benefits. In the public organisations, the expected benefits are connected to the productivity and effectiveness of the PMS, in the knowledge-intensive organisations to the effectiveness, and in the industrial organisations to the financial performance and customer value. The PMS project was expected to generate both direct and indirect benefits in all three branches. Based on the interviews, the public sector organisations gained a deeper understanding from their operational environment, the knowledge-intensive organisations from the effectiveness of their actions, and the industrial organisations from the value creation process of their customers.

Table 2. The benefits and a value creation of a PMS

	Public organisations	Knowledge-intensive organisations	Industrial organisations
Expected benefits of a PMS	<ul style="list-style-type: none"> - An identification of productivity and/or effectiveness - Improving the reporting and communication - Enhanced understanding of internal actions and external environment 	<ul style="list-style-type: none"> - Identification of effectiveness to the financiers - Improving the resource allocation - Improving the reporting and decision-making processes 	<ul style="list-style-type: none"> - Improving financial performance - Enhanced understanding of customers' needs - Improving the decision-making process
Achieved benefits of a PMS at time of interviews	<ul style="list-style-type: none"> - More critical evaluation of operations - Some organisations have already started to report the measurement information for their stakeholders 	<ul style="list-style-type: none"> - No remarkable benefits at the moment, since there is not enough data or it was gathered from too short of a time period - Indirect benefits through learning 	<ul style="list-style-type: none"> - No remarkable benefits, since there is not enough data yet - Indirect benefits through an enhanced understanding of the customer needs and value creation
The main issues on which the PMS is believed to have an impact in the future	<ol style="list-style-type: none"> 1. Action plans and development 2. Reporting 3. Decision-making 4. Monitoring the realisation of targets 5. Enhancing the efficiency of operations 	<ol style="list-style-type: none"> 1. Monitoring the realisation of targets 2. Reporting 3. Action plans and development 4. Decision-making 5. Enhancing the efficiency of operations 	<ol style="list-style-type: none"> 1. Action plans and development 2. Monitoring the realisation of targets 3. Decision-making 4. Rewarding 5. Listening to the customer 6. Enhancing the efficiency of operations

With regard to the future impacts of the performance measurement system, the interviewees listed a number of issues. The perceptions of the interviewees did not vary considerably. Generally, the interviewees perceived that in the long term, the PMS will impact monitoring the realisation of targets, the action plans and development, and the decision-making process. An unexpected result was that in the public and knowledge-intensive organisations, enhancing the efficiency of the operations was listed as fifth in its expected impact, which may indicate that the movement is shifting from efficiency towards the development of operations. Another unexpected result was that listening to the customer was not at the top of the list in the industrial organisations, as might have been expected given the interview data.

5. Conclusions

The study focused on the differences of the implementation and design of a PMS among public sector, knowledge-intensive, and industrial organisations that offer different types of services. The industrial organisations had very clear purposes for the PMS and the responsibilities during the measurement project. They focused on understanding more about the customer needs and value creation process to

find new customers, generate new services, and maintain the quality of services at a high level. The public sector and knowledge-intensive organisations had to some extent a mandatory task to design a PMS, which together with the complex organisational structures may have caused confusion about the purpose of a PMS. Although the effectiveness was sought, the willingness to understand the customer needs and value creation did not exist as much as could have been expected. It can be suggested that especially in the public sector organisations, there is a need to define the intended purpose of use of a PMS and the responsibilities more carefully, and to focus more on understanding the customers when seeking effectiveness.

The study also focused on the differences among the benefits and created value of a PMS. All of the organisations experienced learning throughout the PMS project. The industrial organisations' learning experiences involved understanding customers' needs and value creation, whereas the experiences in other organisations were associated with the performance measurement and operational environment in general. In the long term the PMS was believed to impact monitoring the realisation of targets, the action plans, and the development, as well as the decision-making process in all types of organisations. As an essential insight, the interviewees perceived the PMS as impacting more on the development of the actions surrounding the services, rather than on efficiency of the production component of the service industry.

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MULTI-LEVEL STRATEGIC ALIGNMENT WITHIN A COMPLEX ORGANISATION

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Structured Abstract

This paper presents observations garnered from a multi-year project to introduce strategic alignment across multiple levels and divisions within a major energy conversion organisation.

Purpose: To make information available about a project to build strategic alignment in a large organisation, and to provide insights and understandings concerning practical and methodological issues encountered.

Design/methodology/approach: The paper provides largely qualitative observations of an ongoing programme to improve strategic alignment within a major organisation in the Middle East. Gathered over a five year period, the observations are based on information obtained from interviews with key actors, and the analysis of documentation produced by the observed project.

Research limitations: The project relates to a continuing programme within the client organisation, and so a need to anonymise the identity of the organisation concerned.

Findings: Over five years the project reported upon engaged directly with over 200 units within an organisation to explicitly align the strategic aims of each unit with those of the organisation as a whole. The challenges encountered, the utility of the work done, and consequences for the organisation are reported in the paper. Issues concerning time-lapse effects, misalignment between key management processes, and need for changes in behavioural norms are discussed.

Originality/value: The unusual scale of the project and the use of capacity building as an enabler project success provide unusual, novel information and insights when compared to other case study reports concerning this topic.

Keywords: strategic control, strategic alignment

Article Classification: Case study

Introduction

In 2008 work began in a large multi-divisional organisation in the Middle East to assist its efforts to implement a strategic plan. The focus of the paper is to relate the methods used specifically to build strategic alignment and introduce mechanisms to enable strategic control within the organisation, and to provide some commentary upon the lessons learned from this aspect of the implementation activity. The paper does not, except in the most general terms, discuss the specific aims or content of the strategy itself, nor the success or otherwise of the plan once implemented.

Strategic planning is a familiar concept and widely used, and is by one measure the world's most popular management tool (Rigby and Bilodeau 2013), but the terms have multiple (and sometimes ambiguous) definitions in the literature (Hambrick 1980, Jarzabkowski & Spee 2009, Salih and Doll 2013). For the purposes disambiguation, in this paper we have assumed that Corporate strategy:

- concerns the definition of changes to an organisation's structure, and to its business systems (De Wit & Meyer 2004).
- is linked to, but distinct from an organisation's operational activities (Porter 1996).
- is defined by an organisation's leaders ahead of its implementation (Modell 2012).
- is implemented through a set of non-recurring project type activities that aim to change the tangible and intangible assets of the organisation (Muralidharan 2004).
- requires the introduction of specific methods of interactive control to manage the implementation of a strategy (Goold & Quinn 1990).

In the following sections of the paper, the principles underpinning the design of the programme of work are discussed, followed by a description of the work that was done, in turn followed by a discussion of the outcomes obtained, and the utility of the work and methods used.

Models for strategic alignment and control

Cybernetic controls involve a three step process to control the implementation of a strategy: first, articulation of the strategy itself; second measurement of the organisation's activities to implement the strategy; and, third corrective action based on the difference between planned and actual activity and outcome states (Muralidharan 2004).

Weaknesses in the cybernetic model for strategic control has been noted by many authors (e.g. Ouchi 1977, Hofstede 1978, Snell 1992, Modell 2012): they argue that the unambiguous definition of what is required to implement the strategy, and the timely (and economic) determination of whether the required implementation work has been completed (Schreyogg and Steinmann 1987) are both impractical. These task definition and compliance issues observed are similar to those raised concerning contracting models (Williamson 1975). Williamson noted the common use of a practical work-around for this issue, comprising a simplification of the description of the requirement (i.e. allowing it to be defined in more general terms) and shift to the monitoring of the contracted party against various kinds of behavioural rules rather than strict contract compliance (Williamson 1975). These two changes are, in general terms, the same as the improvements by those observing its weakness (e.g. Ouchi 1977, Hofstede 1978, Snell 1992, Modell 2012). This equivalence of issues between strategic control theory and contract theory is perhaps not surprising, as it is reasonable to view the tasking of an organisation to implement a strategy as a quasi-contracted activity (between the organisation's leaders and its staff).

Use of behavioural compliance rather than explicit outcome monitoring is transformative for the strategic control process - since the definition of the implementation tasks to be pursued and the methods by which they will be locally monitored can no longer be done by the centre. This change can have strongly beneficial effects (Wooldridge et al. 2008), but requires use of an approach to strategic control system design that can accommodate increased ambiguity of definition while retaining overall alignment and coherence (Campbell and Alexander, 1997). In particular, for unit to contribute most effectively to the achievement of corporate strategic goals it may need to adopt goals that appear, on superficial inspection, to be poorly aligned with the corporate requirement (Shulver and Antarkar, 2001). Without such flexibility, such apparent dissonance could reduce organisational effectiveness (Gupta et al. 1999). Under such conditions, relevance can only be determined by the management team concerned, and the challenge is to design a system that provides for this (e.g. Amason 1996, Salih and Doll 2013).

Use of this kind of 'improved' strategy control approach was adopted for this project.

In large organisations an additional requirement is the 'strategic alignment' of the organisation with the corporate level strategy (Shulver et al. 2000, Shulver and Antarkar 2001). This is particularly true where 'improved' strategic control models are to be used, since strategic goals and implementation plans will be determined locally, requiring the local unit managers to have good understanding of how the corporate strategy applies to their unit (Lawrie et al. 2004, Andersen et al. 2005)

The Balanced Scorecard has been widely used as a strategic control and strategic alignment device since its introduction in the early 1990s (Kaplan and Norton 1996). During the 1990s the methods used to design Balanced Scorecards changed, becoming able to support the development of strategic control methods in line with the 'improved' control models discussed earlier (Lawrie and Cobbold 2004, Shulver and Lawrie 2008). One class of design method ("3rd Generation Balanced Scorecard" design) had also been reported as being highly effective for developing strategic alignment in large organisations (e.g. Lawrie et al. 2004, Andersen et al. 2005).

Case Study

Gulf Utilities Company (GUCO) is a large vertically integrated utility operating in the energy sector within one of the member countries of the Gulf Cooperation Council (GCC), employing about 30,000 staff. In 2006 the company's leadership adopted a new strategy. The company's managers knew that the strategy would result in significant changes to the organisation's structure, culture and operations and accordingly would take several years to implement. The managers also realised that implementing these changes successfully and without disruption to daily operations would be difficult and require their active co-ordination and control. Accordingly they commissioned a project to introduce an effective strategic control mechanism that could be used across the whole organisation to establish strong strategic goal alignment within the organisation's 200 discrete management units, and to provide timely feedback on the extent to which the organisation's strategy was being implemented.

This case study describes aspects of the design and execution of this multi-year programme.

A new strategy at Gulf Utilities Company

Meeting rapid growth in demand for electrical energy within the countries that make up the Gulf Cooperation Council (GCC) has for several years presented a challenge that in turn has triggered changes in the regulatory environment and the introduction of new mechanisms intended to encourage investment in the infrastructure developments required to support the growth in demand. GUCO had been formed to take advantage of the commercial opportunities these changes were creating, and was the result of a merger of a collection of smaller energy firms active in various parts of the electricity supply industry within one of the GCC countries.

In 2006 GUCO's leadership decided that to fully exploit future opportunities, it would be better for the company to separate into four linked businesses (initially all owned directly by GUCO, but later to be floated as independent businesses) each addressing one area of the energy supply market: this was partly driven by an anticipation of changes that were yet to be made to the industry regulation within its home country, and partly in recognition of the very different characteristics of the various components of the industry - it was believed that restructuring in this way would provide operating efficiency gains, and also make it easier for each component business to attract new investment and operating partners within the region. The new GUCO strategy that this project was helping to implement concerned implementation of this major organisational redesign.

Approach followed

GUCO decided to use a modified form of the 3rd Generation Balanced Scorecard design method to support the strategic alignment and performance monitoring requirements it had identified. Its choice of this method was in part informed by prior experience: one of GUCO's Directors had used a similar approach successfully before he had joined the GUCO board.

The 3rd Generation Balanced Scorecard design method is described in some detail elsewhere (Lawrie and Cobbold 2004, Shulver and Lawrie 2008) has particular attributes that allow it to support the 'improved' strategic control model discussed earlier. It has also been shown to be effective in large-scale organisations contexts (Shulver and Antarkar 2001, Lawrie et al. 2004, Andersen et al. 2005).

At the heart of the 3rd Generation Balanced Scorecard design method is a representation of the cybernetic strategic control model similar to that described by Muralidharan (Muralidharan 2004) but separated out across four steps. The model - known by its acronym ACME - is illustrated below.

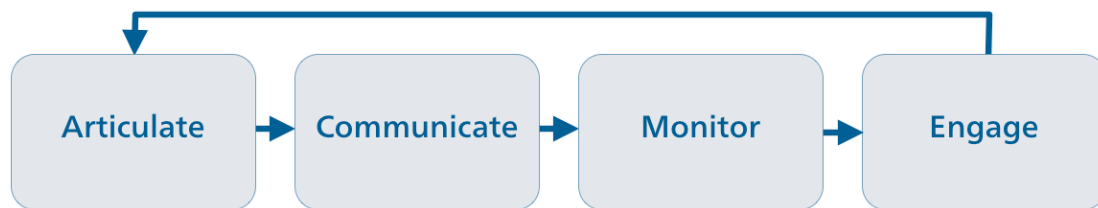


Figure 1 - The ACME Strategic Control Model

The four steps in the ACME strategic control model are:

- Articulate - documentation by an organisation’s management of the strategic outcomes that they are hoping (or needing) to achieve - typically a description of a “to be” state for a specific future date;
- Communicate - a translation of the strategic outcomes into a small set of change programmes and operational goals that the management team will focus on achieving in the near term - combining critical operational outcomes with the most urgently required change initiatives;
- Monitor - a small number of high-level measures with associated targets that will track the implementation activities being undertaken and their consequences (e.g. are the required strategic outcomes being achieved?);
- Engage - an agreed mechanism of intervention to enable the management to efficiently and effectively engage with their organisation to ensure the required actions are being carried out, and where these actions are not working as expected, to be able to change the actions as required (Amason 1996).

The 3rd Generation Balanced Scorecard used by GUCO has design elements that match each of the four ACME steps closely:

- a Destination Statement - a concise description of what the organisation is expected to ‘look like’ at some nominated future date, usually 3-5 years hence. The document has sentences grouped under headings chosen to suit the particular characteristics of the organisation, but broadly similar in purpose to the four ‘perspectives’ that are used as design aids in early versions of the Balanced Scorecard;
- a Strategic Linkage Model (see illustration below) - a simple connected diagram illustrating the short to medium term strategic agenda that needs to be followed in order to achieve the conditions described in the Destination Statement, comprising:
 - activity objectives - describing at a high level the strategic implementation actions to work on over the coming 18 months; and
 - outcome objectives - a high level summary of how managers will track performance of activities;
- a set of detailed descriptions of the measures and targets that the managers proposed to use to keep track of progress against the activity and outcome objectives described in the Strategic Linkage Model; and
- an agreed programme of structured management meetings to formally review the information being reported through the measure defined, coupled to a periodic review of the overall design of the Balanced Scorecard as a whole.

The relationship between these design elements and the ACME model is illustrated below:

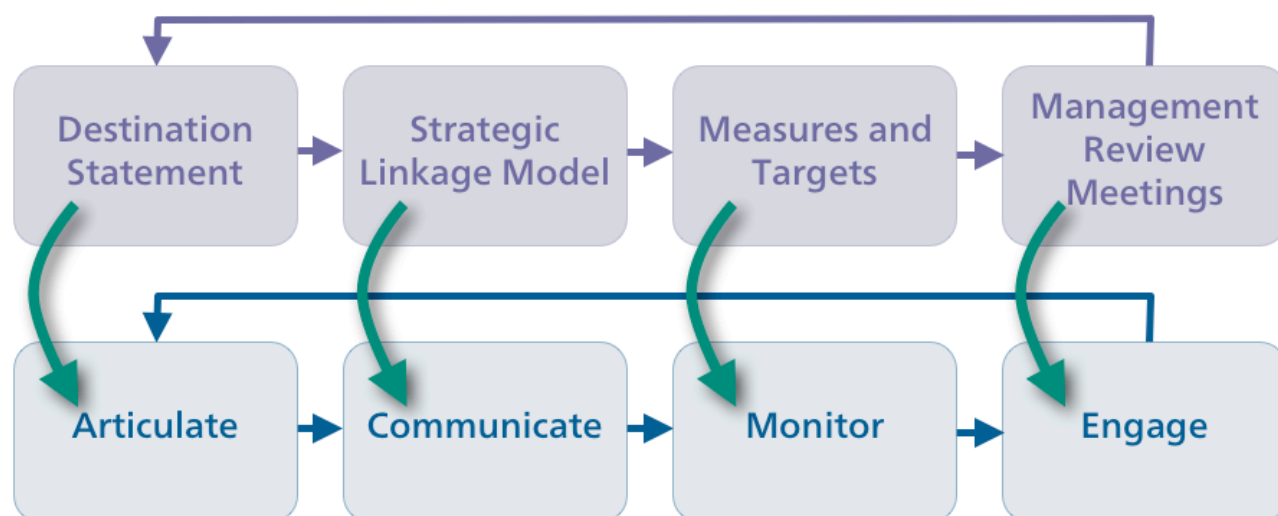


Figure 2 - Linking the ACME Strategic Control Model to the 3rd Generation Balanced Scorecard

An ACME control model and associated 3rd Generation Balanced Scorecard design is relevant only to a single management team, and the organisation they lead. But GUCO was large enough to need an approach that also could align the organisation as a whole behind the corporate strategy.

The approach adopted for this strategic alignment was to create multiple instances of the ACME model - each management unit would construct its own version of the model, basing their design choices on information gathered from other ACME models developed by units above it in the organisation hierarchy. This approach had been tested in other organisations (e.g. Lawrie, Cobbold, and Marshall 2004), and had been found to effectively address both the need for local interpretation of the strategy within each unit and stronger management team consensus about how the strategy was to be applied locally.

Alignment was achieved through a top-down hierarchical cascade based on use of the Destination Statement of a unit's parent as the primary representation of organisational strategy. This approach is unusual, Balanced Scorecard alignment usually being driven by measure or activity definitions (e.g. Kaplan and Norton 2008, Jayashree and Hussain 2011). The use of the Destination statement was advantageous because each unit management team could base their consideration of how best to support the corporate strategy on a concise and 'locally relevant' interpretation of strategy - a more reliable and time-efficient approach than allowing each management team to make their own interpretation of the corporate strategy (Dess 1987). Each unit was expected to develop (and maintain) its own strategic agenda (Amason 1996) based on a premise that these choices would be focused on getting the unit to make its most appropriate contribution to parent unit's strategy and the corporate strategy (within GUCO, these local Destination Statements were known as "Contribution Statements" to emphasise the point). Once a unit had developed its Contribution Statement, it was used as the focal point for work to complete the steps within the ACME model (through the design of a unit Balanced Scorecard).

The work to develop strategic alignment through Destination / Contribution statements requires use of a recursive set of activities, as illustrated overleaf. This recursive pattern was to have useful benefits during the design of the project to implement the ACME based strategic control system.

Cascading with 3rd Generation Balanced Scorecards

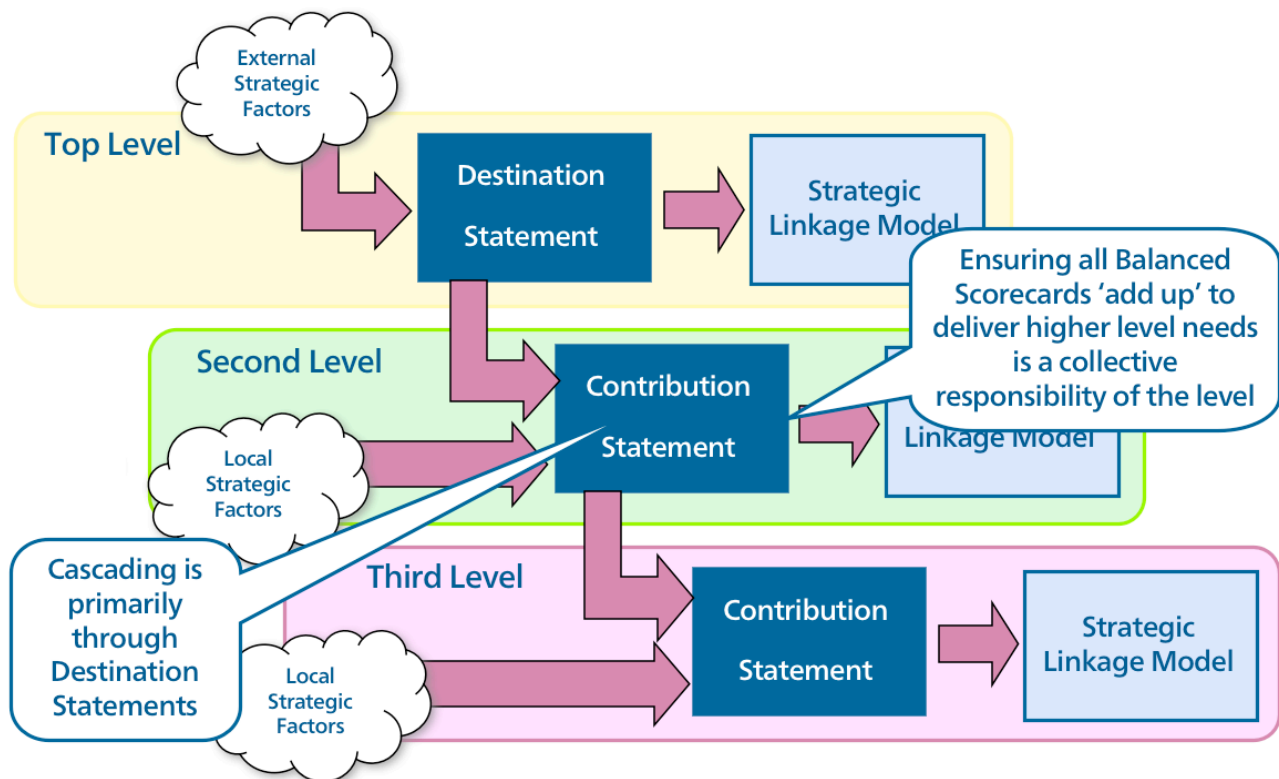


Figure 3 - Hierarchical strategic alignment using the 3rd Generation Balanced

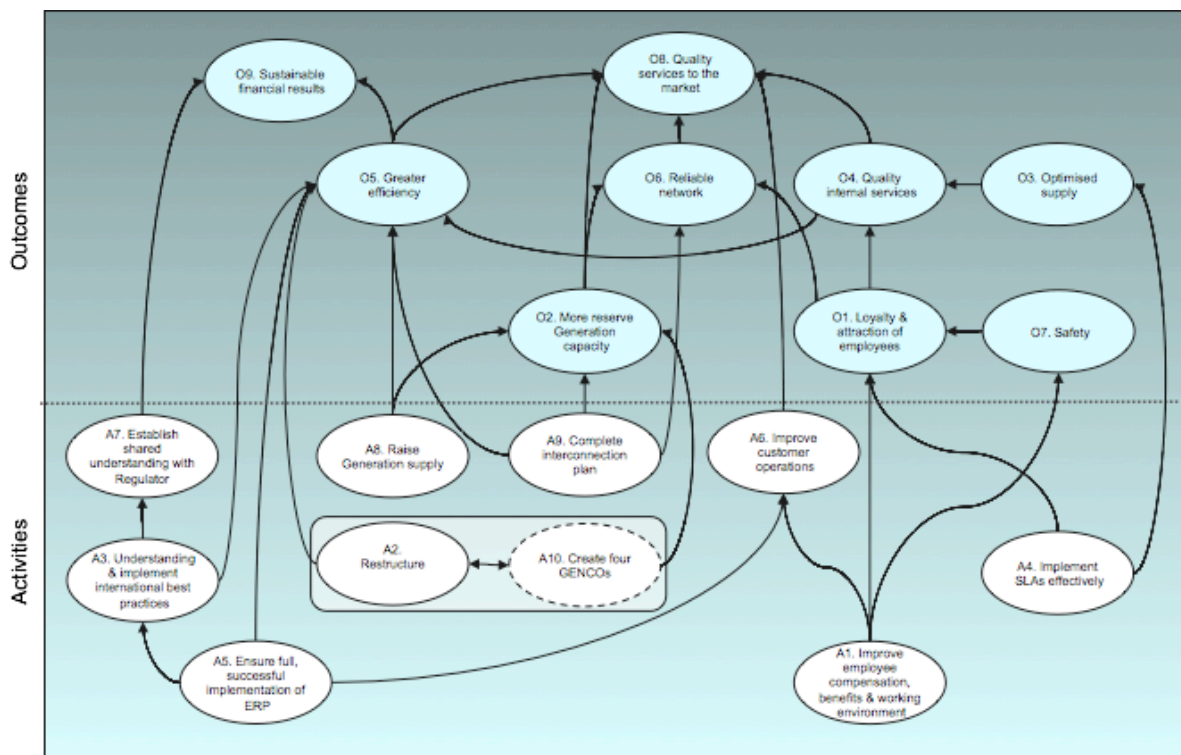
The GUCO project

The GUCO strategic alignment project began in 2008, and from the outset was envisaged as a multi-phase programme. In keeping with the top-down nature of the approach adopted, the early phases were focused on the top units in the organisational hierarchy. Later phases worked down through the hierarchy. This paper will concentrate on the first three phases, which ran from 2008 through to mid of 2010, covering the first 38 of 200+ management units. The work has continued, and as of spring 2014, work is in hand to plan the sixth phase of work. This later work will be covered by a subsequent case study.

Phase 1 - Corporate level work

The first alignment activities of the project were to work with the GUCO Senior Management Team (SMT) to develop a clear articulation of the outcomes sought - in the form of a Destination Statement focused on five years into the future (which at the time was 2013). The SMT then went on to complete the design of their own strategic Balanced Scorecard. The Balanced Scorecard comprised a Destination Statement, a Strategic Linkage model documenting nine strategic priority programmes that the SMT saw as key to overall corporate success that needed to begin execution immediately, and nine interim strategic outcomes they planned to track to ensure that the nine interventions were having the necessary impact on the organisation and its performance. Each of these objectives was described in some detail, and small number of relevant measures and targets agreed by the SMT to track progress and results on a quarterly basis. This work was completed by the summer of 2008, after an elapsed time of four months. The duration was largely driven by scheduling issues - finding dates where all the SMT members could attend the design workshop sessions was difficult, and two or three week gaps between meetings were not uncommon.

The Strategic Linkage Model (illustrated below) gives an overview of the priorities being pursued by the SMT at the



whole-organisation level.

Figure 4 - The GUCO corporate level strategic linkage model in 2008

Phase 2 - Initial Cascading of the GUCO Corporate Balanced Scorecard

In the autumn of 2008 the organisation preparations began to 'cascade' the content of the Corporate Balanced Scorecard to lower levels of the organisation. Initially the cascading activity focused on the seven organisational units that reported directly to the GUCO SMT, which had been defined in line with the overall strategy outlined earlier in this case. The units were split between operational and support roles:

Operational Units

- Generation;
- Transmission;
- Distribution & Customer Services;

Support Units

- Finance;
- Human Resources;
- Planning & Programs;
- General Services.

In each of these units, the same design programme used with the SMT was applied, but with the added requirement that the unit's Contribution Statement was actively aligned with the content of the SMT's Destination Statement. The units then each developed their own strategic linkage model designs, documents that reflected the local management's thoughts about what needed to be done within their division to realise the conditions described in their own Contribution Statement. This local choice of activities echoes the self-scheduling ideas discussed earlier e.g. Amason 1996, Salih and Doll 2013), and allowed each Division to introduce strategic programmes unique to their Division as appropriate, and to simplify / interpret the Corporate Destination statement into terms more relevant to their Division's role within the organisation.

Use of the same design process used at the Corporate level encouraged advocacy of the approach by the Vice President in charge of the Division - as they had been actively involved in the application of the process at Corporate level - this subsequently proved to be a powerful enabler for delivery of the method at lower levels, as the 'top man' was demonstrably on board.

Division level design work began in January 2009 and completed in early July 2009.

Phase 3 - Cascading of the Business Unit level Balanced Scorecards

The third phase aimed to develop Balanced Scorecards within each of the 30 management units that reported directly to the seven divisional level units.

Phase 3 required the creation of five times as many Balanced Scorecard designs as had been completed during Phase 2, but within approximately the same time period (about six months). To achieve this a careful review of the subordinate units within each business unit was carried out and three shorter variants of the standard design process were designed. The variations acknowledged the more limited design choices open to lower level units in the organisation hierarchy. Each variant reused some elements from the parent unit (e.g. the Contribution Statement) to save development time at the lower level units.

The three design variants are summarised below:

- Type 1: Three design workshops (rather than the four used at higher levels), where the first workshop from Phase 2 (Contribution Statement (CS) building) was replaced by an extended interview with the unit General Manager. This interview developed a version of the 'parent' business unit contribution statement that was used at the start of the strategic linkage model workshop (which would then be the first group workshop). The rest of the design sequence was as used in higher levels;
- Type 2: '2.5 workshops'. Similar to the type 1 variant, but instead of a customised CS, the unit simply uses their 'parent' business unit CS. Work started with an SLM design workshop as for Type 1, but the final workshop (which focuses on agreeing how the management team would review the outputs of the monitoring work and then engage with their organisation) was shared with another team from the same BU (e.g. two Transmission districts) – two units therefore need five separate workshops, hence the "2.5 workshop" label...
- Type 3: A '2 workshop / unit' plan. For a handful of small (in headcount) subordinate units, the design approach used the standard 2GC workshop sequence, but with two units working in parallel in each workshop - so two units would need 4 separate workshops, hence the '2 workshop / unit' label.

The application of these variants to the project plan for Phase 3 is illustrated in Figure 5, which shows an excerpt from the programme planning documentation.

Phase 3 began in the Autumn of 2009 and finished in late April 2010.

Ref	Management Unit	Design Type	Training Event	Extended Interview	WS1	WS2	WS3	WS4
1.1 DISTRIBUTION								
1.1.1	Distribution Services	1	Second	Yes		Yes	Yes	Yes
1.1.2	Customer Services	1	Second	Yes		Yes	Yes	Yes
1.1.3	Region - Central	2	First			Yes	Yes	
1.1.4	Region - Eastern	2	First			Yes	Yes	Yes
1.1.5	Region - Western	2	First			Yes	Yes	

Ref	Management Unit	Design Type	Training Event	Extended Interview	WS1	WS2	WS3	WS4
1.1.6	Region - South	2	First			Yes	Yes	Yes
1.2	TRANS MISSIO N							
1.2.1	Commercial Business/Wholesale	1	First	Yes		Yes	Yes	Yes
1.2.2	Assets Planning/Devt	1	First	Yes		Yes	Yes	Yes
1.2.3	Engineering & Projects	1	First	Yes		Yes	Yes	Yes
1.2.4	Consolidated Area	2	First			Yes	Yes	Yes
1.2.5	Developing Area	2	First			Yes	Yes	
1.3	OTHER S							
1.3.1	Public Affairs BU	3	Second		Yes	Yes	Yes	Yes
1.3.2	Legal Affairs BU	3						
1.3.3	Internal Audit BU	1	Second	Yes		Yes	Yes	Yes
1.3.4	Contracting in P&P	1	Second	Yes		Yes	Yes	Yes

Figure 5 - Example of design simplifications applied to the third phase cascade activities

Outcomes Achieved

The cascade programme described in this case study was executed successfully. In summary the work done during between March 2008 and finished in April 2010 comprised:

- Design of 38 Balanced Scorecards developed using 123 separate management team design workshops
 - 1 Corporate
 - 10 Business Units
 - 27 Sectors

Discussion

In broad terms, the project described here achieved all of the aims set for it:

- A new strategy was articulated and communicated through the organisation,
- consensus and support for the strategy was developed within the unit management teams of the organisation, and
- a reporting / control mechanism was developed to enable control of the strategy implementation to be effected.

Within the many learning points, many of which reinforce established insights from the literature, we found two worthy of highlight here:

1) Process Integration

While the intent of the work from the outset was to introduce new strategic management control processes, little consideration was given at the time to how these new processes would be aligned/integrated with existing control processes - in particular those for capital and operational budgeting. While these issues of process alignment are considered in the literature, the consideration is of a theoretical nature - and not of direct practical use. Within GUCO expenditure planning processes and are driven by a simple bottom-up process of bid-gathering activities, supported by aggregate expenditure arbitration - an approach that is difficult to reconcile with the 'top-down' nature of the ACME strategic control process being introduced. Failure to integrate budgeting and strategy alignment processes resulted in delays for managers in getting the resources needed to fully support the strategic implementation actions required of them. Subsequently 2GC has worked with GUCO to better understand how to adjust the strategy and budget processes to reduce the level of conflict between them, but this reconciliation issue is one that clearly would benefit from further consideration.

2) Reporting Systems

While it is practicable to report single Balanced Scorecards manually (for example, using standard Office software to tabulate measure data) GUCO rapidly reached a level of complexity where manual reporting was inefficient - there were simply too many Balanced Scorecards to keep track of. Accordingly at the start of Phase 3 GUCO installed a proprietary Performance Management reporting system with the aim of both capturing documentation about the emerging Balanced Scorecard designs and subsequently automating the reporting of these devices. However getting it to work was much more complex than GUCO (or the software vendor) had anticipated, and enabling this aspect of the software system became a major distraction for the project team for much of Phase 3.

The insight here is that although strategic control is a much-discussed topic, performance management and performance reporting software views the world very differently. As a method of documenting and enabling strategic control activities, current performance management software systems appear to have many shortfalls - primarily in the area of meta data capture.

Conclusions

The case illustrates a large scale strategic alignment / cascading project, and shows that such projects are both possible and practicable provided they are well planned and based on sound methods.

The use of the Destination/Contribution Statement approach is also shown to have advantages in general terms - facilitating the development of ACME compliant strategic alignment within the complex GUCO organisation.

The project was a success - a key measure of such success being occurring in early 2012 when the first of the GUCO operating units was successfully separated from the corporate core to become a free-standing business - in line with initial intent for the strategy as articulated in 2008 Corporate Destination Statement. The remaining operating units within GUCO are also now ready to be separated from the corporate core.

Further, during this period of enormous strategic change the organisation has successfully maintained continuity of supply, and improved the quality of the services it delivers (both of which were explicit goals of the corporate strategy).

In 2012 these outcomes were recognised by the GUCO's SMT, and work began on a redefinition of their Corporate level Balanced Scorecard, and the restart of the alignment process to the organisation's component businesses.

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BEYOND PERFORMANCE MEASUREMENT: CONTRIBUTION MEASUREMENT

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Dr. Farhad Shafti has a BSc and MSc in Industrial Engineering from (respectively) University of Science & Technology and University of Tarbiat Modarres in Iran and a PhD in Management Science from University of Strathclyde. Before joining Strathclyde he was working in the National Iranian Productivity Organisation, providing training and consultancy projects for the Iranian public and private sector industry.

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Keywords: performance, measurement, network, relationship, social, environment, balanced scorecard, contribution

Structured Abstract

Purpose: The aim of the paper is to open a new horizon in the concept of Performance Measurement in business organisations, where the organisation is not looked at as an isolated entity and the impact of its performance on the society in which it performs is also taken into consideration.

Design/Methodology/Approach: To achieve the above purpose the paper presents the idea of Contribution Measurement with the use of an imaginary scenario. The scenario is based on published empirical research and is taking a mobile phone company as an example. The findings of relevant published research are used to establish the cause and effect relationship between a number of social issues and some of the performance objectives that are listed in a balanced scorecard that has been proposed for the mobile phone company.

Findings: Based on the result of cause and effect study, the balanced scorecard is extended to demonstrate its social impact. It is argued that the aim of the extended scorecard is not to maintain any balance, as this is practically difficult, if not impossible. The aim is simply to provide insights into the contribution of a business organisation to the society. The whole process therefore is called Contribution Measurement. However ‘measurement’ here refers to the broader meaning of the word and is not restricted to numerical measurement.

Social Implications: One of the major benefits of ‘contribution measurement’ is to recognise and understand how the performance of an organisation may affect the society.

Originality/Value: This is the first attempt to go farther than what is known as sustainable performance measurement. This is done by removing the restrictions that are normally imposed by the concepts of ‘numerical measurement’ and ‘importance of balanced measures’. The work is an initiative and a first step for a breakthrough research in the area of performance measurement.

Beyond Performance Measurement: Contribution Measurement

By: Farhad Shafti

Introduction

Performance measurement has come a long way from the traditional financial measures to the last generation Balanced Scorecard. Throughout this long journey, one of the most important drivers of progressing towards more advanced performance measurement tools was looking at the bigger picture (Harbour, 2011). Emphasis on aspects of performance that affect customer satisfaction was among the first revisions aiming to make performance measurement more than just a monitoring tool for financial goals (Neely, 1999). Balanced Scorecard is perhaps the best example of looking for the wider picture where the goal is to look at the performance of an organisation from different perspectives (Kaplan and Norton, 2013).

The motivation behind this research paper was the appreciation of the fact that a business organisation, as one of the entities of a much wider network, affects many other entities in this network. To limit the scope of performance measurement in an organisation to its own business goals will result in practically disassociating it from its effects on the social environment in which it operates. This research paper argues that although this limited scope perspective of performance measurement may be beneficial for a business organisation, it does not necessarily benefit the social environment in which the business is operating. Furthermore, in the long term, this can work against the business organisation as well.

This can be illustrated by a very simple but extreme example. An organisation that produces an addictive, harmful, yet legal product may be satisfied by measures of productivity. However, this is only if the measures of increasing rate of fatalities, due to increased productivity, are ignored. In other words, while increasing productivity brings money to the organisation, it takes away lives from the society. As it stands at this era, the main focus of business organisations is on the commercial impacts of their performance. Exceptions can be found mostly where there are legally imposed measures to maintain sustainable use of energy and environmental concerns; however, the scope of measurement does not normally go beyond this.

This paper illustrates how the performance of an organisation can affect the different aspects of the society that surrounds it. It also demonstrates how the organisation may be able to break through its commercial boundaries in order to measure its impact on different aspects of society. An imaginary scenario, based on published research findings, is developed for this purpose. This has led to the development of a framework that is titled 'Contribution Measurement'.

The paper represents a view point that is still under development and invites the attention of the academic and industrial community to engage more with this line of research.

Background

Performance measurement, by nature, is a multi-disciplinary area of research (Marr and Schiuma 2001, Thorpe and Holloway 2008). In fact, this diversity seems to be one of the reasons that the subject of performance measurement has not yet established itself as an academic field (Neely, 2005). The excitement of this field of study, however, is not limited to being a multi-disciplinary one. It also has the capability of absorbing a variety of other themes to its corpus (Taticchi, 2009). The emergence of new additional themes in the field of performance measurement is directing the future of research in this area of study (Taticchi et al, 2010).

Neely (2005) considers ‘measuring performance across supply chains and networks’ to be one of the research questions in the area of performance measurement and management. It is evident from research papers that look at performance measurement across networks that the word ‘networks’ here essentially refers to the networks of organisations that are in a business relationship with each other. Examples include the network of university and industry (Perkmann, et al. 2011), the supply chain network (Morgan 2007, Ramaa, et al. 2009), the enterprise network (Saiz et al 2007), and the after-sales service network (Gaiardelli, et al. 2007).

In a comprehensive literature review, Taticchi et al. (2010) have listed more than ten frameworks that have been developed to bring an integrated perspective to performance measurement. As impressive as these frameworks are, the list suggests that there is little attempt to look beyond business aspirations.

The closest idea to the premises of this research paper is the concept of a sustainability balanced scorecard. The researchers who developed and promoted this concept are raising the same concern that was referred to at the start of this paper; that is, economical goals are not enough for a ‘responsible’ organisation. Butler et al. (2011) mainly look at the inclusion of environmental concerns (green measures) in a Balanced Scorecard. Tsai et al. (2009) develop a Balanced Scorecard for a socially responsible investment. Examples of the measures included in this Scorecard are health and safety, pollution prevention, community participation, and customer supplier relation.

There is a consistent line of research on the subject of sustainability measures and performance measurement by Schaltegger and co-authors. Schaltegger et al. (2006) refer to a triangle of economic, ecological and social effectiveness and efficiency. They argue that while the first two provide a clear set of measurable targets, the targets for social efficiency and effectiveness are rather vague. Nevertheless, the authors define social effectiveness and efficiency by the ratio of value added to the positive and negative impacts on society, originating from a company. In an earlier paper, based on the same premises, Schaltegger and co-authors develop what they refer to as a “Sustainability Balanced Scorecard” (Figge, et al. 2002).

In fact, attempts to bring the concept of sustainability to the area of performance measurement come from the same perspective as this research paper. Although, the movement is praiseworthy and enlightening, there does seem to be some limiting elements. The requirement of measurement seems to have limited the scope of the link between social sustainability and performance measurement. Another limitation of the inclusion of social

aspects in performance measurement systems seems to be the inherited assumption that all measures in a measurement framework should be met and remain balanced with other measures. Furthermore, while the above researches look at social links within a business organisation and its activities, they still seem to be limited to the ‘very close suburbs’ of the business organisation and its goals. The areas of study seem to be mostly limited to environmental concerns and energy consumption, much of which are beginning to become part of the legal requirements anyway. Schaltegger et al. certainly go beyond environmental concerns but still limit the scope of social effectiveness and efficiency to ‘safeguarding the social acceptance of the enterprise and the legitimization of its business activities’ (Schaltegger et al., 2006, p. 9).

In the next section, an imaginary scenario is developed to illustrate how it may be possible to break the above limitations and go beyond what is known as performance measurement.

Developing a scenario

An imaginary scenario is developed for a mobile phone service provider. Although this is an imaginary scenario, it has used findings from published empirical research as input. The objective is to take a typical Balanced Scorecard, project how the measures in the Balanced Scorecard may have different social effects and then link the Balanced Scorecard to these effects.

To begin with, an excerpt from a Balanced Scorecard, developed for the Vodafone Group is used as the starting point. The actual Balanced Scorecard has more measures; however, for the sake of brevity and due to lack of primary data, a partial version of it is reproduced as illustrated in figure 1. Only one objective for each perspective is selected.

Perspective	Organisational Performance
Finance	Maintain investment in new and existing market
Customer	Encourage more customers to come on to the network
Business Process	Increase operational efficiency
Learning and Growth	Create and launch new valued added services

Figure 1: An excerpt from a Balanced Scorecard proposed for the Vodafone Group
(Based on Sekiguchi, 2010)

In the second stage, the performance objectives in the above scorecard are linked with a number of cause and effect social variables. While linking these cause and effect variables to the performance objectives is only for illustration, thus imaginary, the cause and effect variables themselves are derived from already published findings of empirical research. Two main social issues are used for this scenario: the ‘effect of mobile phone on the end users and their relatives’ and the ‘effect of pressure for more efficiency and new value added services on employees’. Each of these two issues is linked with two of the performance objectives in figure 1.

The links to the ‘effect of mobile phone on the end users and their relatives’ is presented by the following causal map (figure 2a) and followed by a brief explanation:

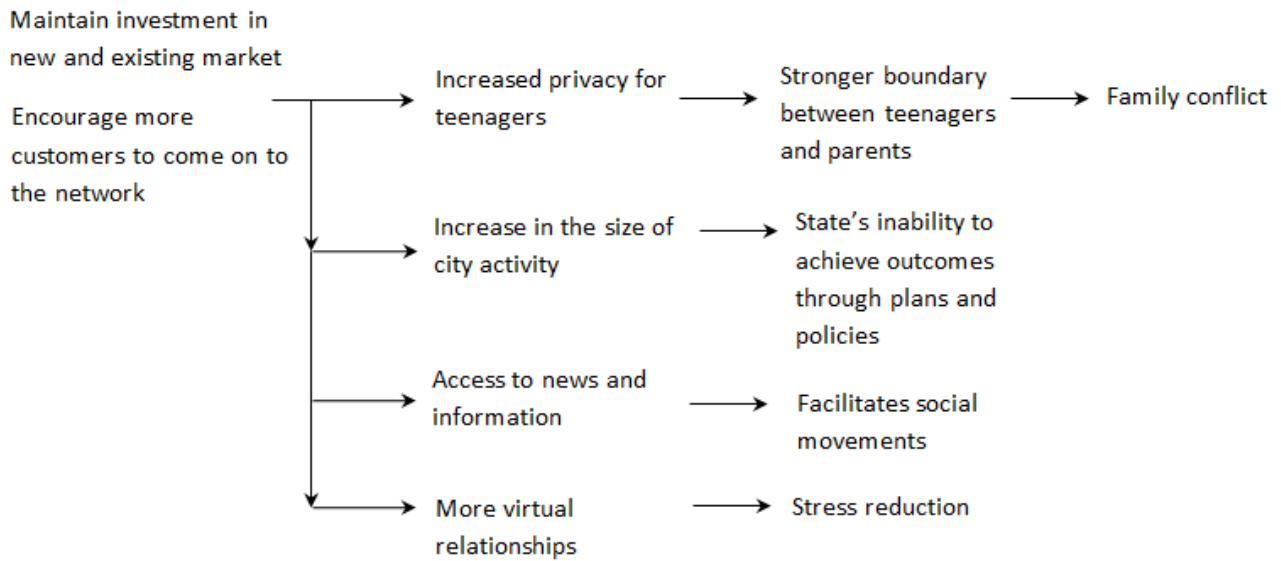


Figure 2a: Some of the effects of using mobile phone on the end users, based on published research

Figure 2a presents a situation where some of the effects of using mobile phone are linked with the objectives of the Vodafone Group to ‘maintain investment in new and existing market’ and ‘encouraging more customers to come on to the network’. According to research carried out by Pertierra (2005), mobile phones bring more privacy to teenagers. This increased privacy in turn strengthens their boundaries with their parents which can be a source of family conflicts (Ling and Yttri, 2001). Townsend (2002) has found that mobile phones increase the size of cities, not physically, but in terms of people’s activities and productivity. Townsend argues that this makes the public more innovative and proactive than before and results in inability of the state in achieving outcomes through plans and policies. Similarly, Pertierra (2005) argues that the increasing access to news and information makes social movements much easier than before. One of the positive effects of being in a culture of mobile phone use, based on the research by Toda et al. (2006), is that it helps with reducing stress and tension, in particular among teenagers.

The link to the ‘effect of pressure for more efficiency and new value added services on employees’ is presented in figure 2b and is followed by a brief explanation:

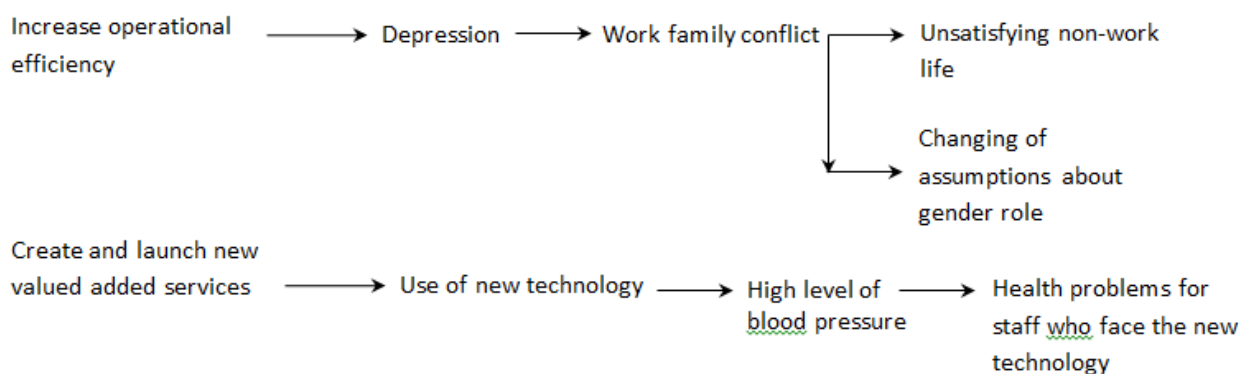


Figure 2b: Some of the effects of pressure for more efficiency and new value added services on employees, based on published research

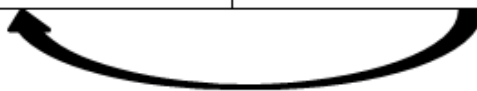
In the above causal map, based on Iacovides et al. (2003), it is assumed that increasing operational efficiency will result in pressure, leading to depression among employees. According to Matsui et al. (1995), this depression results in work family conflict which causes feelings of dissatisfaction with life outside the work place. When female workers are subjected to this family conflict, it leads to a gradual change of assumptions about the different roles husband and wife have within family and society. The lower part of figure 2b is based on the assumption that creating and launching new value added services involves the introduction of new technology. According to research by Kawakami and Haratani (1999), when employees face new technology for the first time, their blood pressure increases. This obviously can result in health problems for these employees.

It is important to note that this research paper is not depending on the validity of the above cause and effect relationships. While verifying the validity of the above relationships and their link to the Vodafone Group is interesting, this is not the concern of this work, as they are only used to develop an imaginary scenario.

Contribution measurement

In the third stage, the above social outcomes are added to the excerpt of the Balanced Scorecard for the Vodafone Group. This is illustrated in figure 3:

Perspective	Organisational Performance	Social Contribution
Finance	Maintain investment in new and existing market	<ul style="list-style-type: none"> - Family conflict - State's inability to achieve outcomes through plans and policies - Facilitates social movements - Stress reduction
Customer	Encourage more customers to come on to the network	
Business Process	Increase operational efficiency	<ul style="list-style-type: none"> - Unsatisfying non-work life - Changing of assumptions about gender role
Learning and Growth	Create and launch new valued added services	<ul style="list-style-type: none"> - Health problems for staff who face the new technology



Possible correcting measures where feasible

Figure 3: Contribution Measurement - Linking the social issues with an excerpt from a proposed Balanced Scorecard for the Vodafone Group (Based on Sekiguchi, 2010)

In figure 3, the outcomes of the social effects are listed in front of their corresponding organisational performance. To understand the thinking behind figure 3 and its practical use, a number of notions are listed as follows:

Notion 1: Performance Measurement is limited to the goals of a defined organisation, therefore it can, and it should be, balanced. However, since Contribution Measurement constitutes the goals of different social groups, it cannot be balanced.

As referred to earlier, one of the imposed limitations of attempts to go beyond business related performance is the presumption that the measures should be balanced. Schaltegger et al. (2006) argue that it is not possible to fulfil all social objectives. Contribution Measurement is developed with the view that the purpose is not fulfilling the objectives in a balanced way. The main purpose of Contribution Measurement is to simply ‘understand and appreciate’ some of the social outcomes of the organisation’s business objectives.

Notion 2: The word ‘measurement’ for ‘contribution’ is used in a very broad sense which implies identifying and understanding.

The problem of ‘measurement’ was another limitation that seemed to slow down and restrict the attempts to go beyond business performance measurement. Contribution Measurement accepts this limitation and surrenders to it. It is obviously difficult to numerically measure some of the above social outcomes, and it seems almost impossible to measure what the share of a business performance objective might be in the formation of these outcomes. Contribution Measurement aims to identify and understand a contribution rather than numerically measure it.

Notion 3: While some of the contributions of a business organisation to its social environment can be easily labelled as positive or negative, many of these contributions can only be labelled as good or bad once the social values are defined.

The unrestricted nature of Contribution Measurement also manifests in the fact that it appreciates the subjectivity of the value of the social outcomes. In figure 3, ‘family conflict’, ‘unsatisfying non-work life’ and ‘health problems’ are certainly negative contributions, while ‘stress reduction’ is a positive contribution. The rest of the outcomes, however, (i.e. state’s inability to accurately plan ahead, facilitated social movements, changing of the assumption about gender roles) cannot be easily labelled as positive or negative contributions. It may be the set values of the society that determine whether these are positive or negative contributions. This itself is very much subjective and can vary based on different stakeholders involved.

Notion 4: Appreciating that Contribution Measurement can prompt and help ‘responsible’ organisations to initiate objectives and measures that see beyond the organisational commercial goals and relate to common social (national) goals.

Although in Notion 1 it was stated that the purpose of Contribution Measurement was to simply understand and appreciate some of the social outcomes, this does not mean that there are no other benefits. Some of the benefits of Contribution Measurement are discussed in the next section; however, for a responsible business organisation, the immediate benefit of understanding and appreciating these social impacts is that it can feed this back to the Balanced Scorecard (as in figure 3). The objective will be to determine whether it is possible to revise or add some measures that could increase and decrease the positive and negative contributions respectively, while also affecting other contributions based on the value sets that the organisation is subscribed to. For example, in the above imaginary scenario, Vodafone

Group may add the performance objective, ‘developing family socialising apps’, to reduce the ‘family conflict’ impact. Likewise, ‘helping with smooth adoption of new technology’ can be an additional performance objective to reduce health problems. However, as stated in Notion 1, not all desired and undesired contributions can be taken care of by the organisational performance. At the end, it has to be appreciated that there are some conflicts of interest between different stakeholders involved that cannot be resolved.

Conclusion and recommendations for follow up research

In the increasing complexity of the society at this era, restricting the understanding of organisational performance only to business goals is similar to the famous story of the elephant in the dark room, in which people who had never seen an elephant developed a false understanding of what the elephant was. It is only after understanding and appreciating the whole picture that true values and effects of an organisation’s business performance can be determined, directed and correctly positioned in the social network that the organisation is performing in.

Performance Measurement has come a long way in widening its scope of interest. This article proposes another step towards improving performance measurement systems but in an ironic way; that is, by breaking the rules related to ‘measurement’ and ‘balance’. An imaginary scenario was developed on the basis of published research to introduce and illustrate the concept of Contribution Measurement. While the campaign of sustainable performance measurement is appreciated, the concept of Contribution Measurement goes a step further by opening the doors of performance measurement frameworks, like Balanced Scorecard, to the variety of social impacts of the performance of organisations.

The above imaginary scenario is of course limited in scope and is also not fully defensible in terms of validity. In terms of scope, only two streams of social impact were looked at: ‘effect on end users’ and ‘effect on employees’. The whole concept of contribution measurement is to ensure that significant impacts of the business organisation’s performance are accounted for. A business organisation’s performance certainly affects its employees and end users. However, it can also affect many other aspects of society, including the state’s policies, educational system, health system, economy, culture, etc. What was produced above is, therefore, only a fraction of what needs to be developed in order to study the wide contribution that a business organisation’s performance may have on the society in which it performs.

In terms of validity, this was only an imaginary scenario. While the social impacts were taken from published research, their link to Vodafone Group performance was only an assumption for illustrating purposes. For reliable work that could examine and materialise the benefits of Contribution Measurement, empirical research will be needed. The advantage of this, beside the fact that it provides more reliable insight, is that it enables the recognition of different degrees of relationship in the cause and effect links. This can determine what causal relationships are worth being included in a contribution measurement framework.

An obvious follow up research to this work is therefore one that studies the impact of a business organisation’s performance on the society from a number of angles, using collected

data as well as experts' views. This will bring both appropriate scope and validity to the concept of contribution measurement. This can be facilitated by adopting Management Science tools like System Dynamics and Multi Criteria Decision Analysis (MCDA) to provide more in-depth analysis and insights. System Dynamics can help with studying the strength of the impact of an organisational performance objective on different aspects of the society. MCDA can facilitate the process of prioritising those impacts that are deemed more desirable. This is in particular important in view of the fact that Contribution Measurement does not promise balanced measures. Such inclusive, validated and analytical research projects can benefit those organisations that, in the words of Schaltegger et al. (2006), are 'responsible' and therefore care about the effect of their performance beyond business boundaries. Contribution Measurement can also be a beneficial exploration tool for policy makers who care about the short and long term effects of economic activities on different aspects of society. Finally, experts in different fields of study, related to the impacts of organisational performance, can not only help with developing a contribution measurement framework for an organisation, but can also use the framework for further studies and expert recommendations.

It is obvious that the above proposal is a multi-disciplinary research project that requires expertise from different disciplines. The author hopes that this viewpoint paper would generate enough interest to facilitate such multi-disciplinary research.

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0049

INTEGRATE AND CONQUER? THE DIGITAL DILEMMA

AMBIDEXTERITY IN THE NEWSPAPER INDUSTRY

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Integrate and conquer? The digital dilemma

Ambidexterity in the newspaper industry

Abstract:

• **Purpose:** The newspaper industry is in crisis. Over the past decade, newspaper firms have walked a tightrope between sustaining their shrinking print business and pursuing new digital revenues. Much has been written about the digital transformation of the newspaper industry, but there has been limited research into how this technological disruption affects newspaper firm performance.

• **Design/methodology/approach:** In this article, we review the current literature on firm performance in the newspaper industry to propose a conceptual model to help guide future studies.

• **Findings:** We identified three promising literature streams: convergence, ambidexterity and business model innovation. Based on these, we developed a conceptual model, recognizing that ambidexterity dilemma is a multi-level, “nested” issue, which transpires at multiple levels in a firm’s ecosystem. This multi-level design allows for the examination of *when* and *how* ambidexterity affects multiple measures, specifically considering four manifestations: online/print resources, online/print markets, online/print revenues and online/print profit margins. The model considers managing conflicting business models.

• **Originality/value:** Ambidexterity recognizes the persistent, profound and irresolvable trade-offs between exploration and exploitation. Our literature review strongly suggests that the divide between online exploration and print exploitation is still a raging conflict in the newspaper industry. We could thusly find no more suitable theoretical framework than ambidexterity to further our understanding of how these tensions can be managed, even if they never will be resolved. We are hopeful that our conceptual model can help guide future studies.

Conceptual paper

Keywords: Ambidexterity; business model innovation; media convergence; newspaper industry; performance management

(Word count 3914)

Introduction

In 2002, Ulrik Haagerup, *Danish Broadcasting Corporation* newschief and an expert on newsroom innovation, made the following statement:

“Media convergence is like teenage sex. Everybody thinks everybody else is doing it. The few who are actually doing it aren’t very good at it.”¹

Sexy or not - over the past decade, news organizations across the world have embraced the concept of media convergence, or more specifically - *the merger of technologies, products, organizations and business models among the previously distinct provinces of print, broadcast and digital media* (Singer, 2004, p. 3). As print readers and advertisers migrate to digital platforms, newspaper firms have been forced to step outside of their comfort zone to keep up - experimenting with digital technologies to reach new audiences online, and expanding their holdings beyond a dwindling legacy print business. But the isolated and accumulated effect of these strategies is still in question as the general decline of the newspaper industry actually accelerates.

More than a decade after Haagerup’s statement, even if everybody now seems to be doing “it,” the question still remains: *is it any good?*

In this article, we review the literature of research into firm performance in the newspaper industry, focusing on ambidexterity, business model innovation and media convergence. We develop a conceptual model grounded in theory. The paper ends with a discussion of how the model could be operationalized of the model, and implications for practice and future research.

¹ Ulrik, Haagerup, “Convergence and the Newsroom Culture,” speech presented at Defining Convergence: 3rd International Ifra Summit on Newsrooms, Columbia, S.C., 14 November 2002.

Literature review

To identify relevant literature on firm performance in the newspaper industry, we used the EBSCO host database to access Academic Search Elite, Business Source AlumnEdition, Business Source Complete, Communication & Mass Media Complete, eBook Collection (EBSCOhost), EconLit, ERIC, PsycARTICLES, PsycCRITIQUES, PsycEXTRA, PsycINFO, Regional Business News and SocINDEX with Full Text. This selection gave a broad range of articles, and to ensure a sufficient quality, the search was limited to peer-reviewed scholarly journals published in English. Further, the search was limited to the period from 1994 to 2013.

Table 1.1 is a summary of the search terms used. These searches yielded a total of 593 articles, including a number of duplicates. Once these were removed, a selection of 358 articles remained. To identify the articles with a newspaper industry perspective, we reviewed the papers manually. In most cases the title was sufficient to assess relevance: we excluded all articles not specifically relating to newspapers, either as the industry or subject of inquiry, or as one of several case studies. At the end of this filtering we had a set of 197 potentially relevant articles which entered a content analysis, where all articles were reviewed, classified concerning type of paper, theory, methodology, empirical basis and relevant findings (where applicable). At the end of this analysis we had a total of 33 relevant articles addressing firm performance in the context of the newspaper industry. We found three promising streams of research into the newspaper industry, namely *media convergence*, *organizational ambidexterity* and *business model innovation*.

Search terms used	# of articles
Newspaper business	235
Newspaper innovation	43
Newspaper organization	134
Newspaper management	84
Newspaper multimedia	23
Newspaper convergence	25
Newspaper organization online	4
Newsroom management	19
Newsroom organization	26
Newsroom convergence	51
Newspaper performance	109
Newspaper explore exploit	0
Newspaper ambidexterity	0

Convergence

One prominent media research stream concerns **convergence**, often referring to the integration of organizational resources responsible for print and online operations, but also “media convergence” in the reference to the integration of technologies, products, and business models among the previously distinct provinces of print,

television and online media. Our literature review shows that in the early 00s, a stream of research theorized how integrated news organizations would provide superior news coverage, capturing lucrative new audiences. For example Quinn (2005), who suggested that convergence in newspaper firms is implemented with a two-fold goal: 1) To help reach an audience as wide as possible and to 2) help newspapers cut costs and improve productivity. Much of the research focus has been on providing a normative, step-wise model to describe how newspaper firms can “become” convergent. See for example Boczkowski, 2004; Deuze, 2004; Fioretti and Russ-Mohl, 2009; Kolodzy, 2006; Lawson-Borders, 2006; Quinn, 2005; Quinn and Filak, 2005; Singer, 2004. More recent research suggests legacy newspaper firms have over the past decade been pursuing strategies that focus on integrating various media platforms, but struggle to find a sustainable business model. Tameling and Broersma, in their 2013 review of the convergence literature, note that the current research on convergence presents a “*fuzzy picture of a confused profession,*” suggesting that convergence should not be conceptualized as a linear process with an end-goal of full integration, but rather as “*an intuitive search for the best way to implement technological opportunities, while in the meantime balancing journalistic aims and profitable business models.*” (p.22.) Their study suggests that the news business still is in a state of constant change and uncertainty, as legacy firms want to embrace the opportunities offered by digital technologies, but have to “*balance the certainties of their present business model with the uncertainties of a digital future*” (p. 20). We found that most convergence studies were founded in the social sciences, relying on qualitative data, offering limited insights into the specifics of newspaper firm performance – in particular across print/online business domains. One notable exception was Graham and Greenhill (2013), who examined the influence of print/online convergence on the rate of print circulation change for 100 regional newspapers in the UK. Their regression analysis suggested that established firms with premium pricing, multiple-platform distribution and free online content, had print circulations that are reducing less. Also, in a study of the relationship between organizational changes and performance in newspaper firms, Van Weezel (2009) found that integration and outsourcing positively affects financial performance. Munificence (resource availability) was positively related to performance.

Ambidexterity

Ambidexterity suggests that the simultaneously pursuing the exploration of new business opportunities and the continuous exploitation of existing business results in superior firm performance (Tushman and O'Reilly, 1996). Juggling new and old business is crucial for firm survival over time, but competition for attention and resources still means that explicit and implicit choices have to be made between the two, as “*exploration of new alternatives reduces the speed with which skills at existing ones are improved*” (March, 1991, p. 72). A review of the current state of literature (O'Reilly and Tushman, 2013) suggests that over the past 15 years, three broad approaches to balancing exploration and exploitation have been extensively investigated: **Sequential** - by firms alternating between periods of exploration and exploitation; **Structural** – by engaging in the two simultaneously by means of structural differentiation into separate organizational units; **Contextual** - the tensions between exploration and exploitation are managed at the individual level. A number of ambidexterity studies have used case studies from the newspaper industry as a context for studying the tensions between exploration and exploitation (Tushman et al, 2002; Gilbert 2002, 2005; Boumgarden 2012; O'Reilly and Tushman 2004, 2013). These studies define ongoing print business as exploitation, and online ventures as exploration, and have focused on structural aspects. In one often-quoted case study, Tushman et al (2002), examined how USA Today, a legacy newspaper firm, established a independent online operation in the mid-1990s to explore new business opportunities. Due to poor performance, online was later integrated back into the parent print organization. This case is used as an example of a successful ambidextrous organizational design, and suggests that USA Today improved their performance as a result. Despite the proliferation of interest in the construct - including hundreds of empirical studies where ambidexterity has been positively linked with for example sales growth, subjective ratings of performance, innovation, and firm survival over time - the empirical evidence is still mixed. Part of the problem is methodological. Ambidexterity researchers are also divided on whether exploitation and exploration involve “unavoidable tradeoffs,” (March 1991) or if the two can be seen as orthogonal to each other, and firms can choose to engage in high levels of both at the same time (Cao et al 2009).

Business model innovation

A third promising stream of research concerns **business model innovation**. See for example Holm et al, 2013; Eppler et al, 2012; Lewis, 2004; Sullivan 2006; Bakker, 2002; Carter 2009; Tang et. al (2011). Holm et al (2013) define business model as a “conceptual device” that helps how value is created through business processes, or more specifically “*describes the value which a company offers to one or several (segments of) customers, the architecture of the internal processes of the firm, and the network of partners it has built up for creating, marketing and delivering this value in order to generate revenue streams and profit* (p.326-327). Disruptive technologies, such as the Internet, have triggered changes in the prevailing business models for newspaper firms. The case studies of two Danish newspaper firms suggested these incumbents “opening” their business models to ideas from outside the company or even the industry. The flipside of this openness is an increased complexity, and involves a number of trade-offs, as increased transparency can help drive innovation and diversify revenue streams, but also makes a firm more dependent on third parties. Although these studies are well done, they do not really address a key issue for legacy newspaper firms in particular - namely that of managing two or more possibly *conflicting* business models simultaneously. Interestingly enough, some recent work suggests that ideas and theoretical constructs from the ambidexterity literature may help guide future research into business model innovation. More specifically, Markides (2013) notes that managing contradictory business models is just one of many paradoxical framings that can be “nested” in the ambidexterity construct. Weak theory and difficulties in operationalizing the business model concepts has led to the business model concept “very” rarely being studied systematically, even as it has been applied to a wide range of disciplines with diverse understandings of the concept (Holm et al 2013; Markides 2013). A review of the empirical basis of the business model literature supports this argument. Harren (2012) surveyed 4500 articles using the term, finding only nine large-scale, quantitative studies. Most of the work to date has been conceptual in its nature rather than empirical and hypothesis testing. One notable exception is Tang, Sridhar, Thorson and Mantrala (2011) examined how investment in the “bricks” (i.e., the newsroom staff and resources that produce news content) helps build “clicks” (i.e., more online visitors and, subsequently, online advertising revenue). The authors conducted an econometric analysis of 12 years of

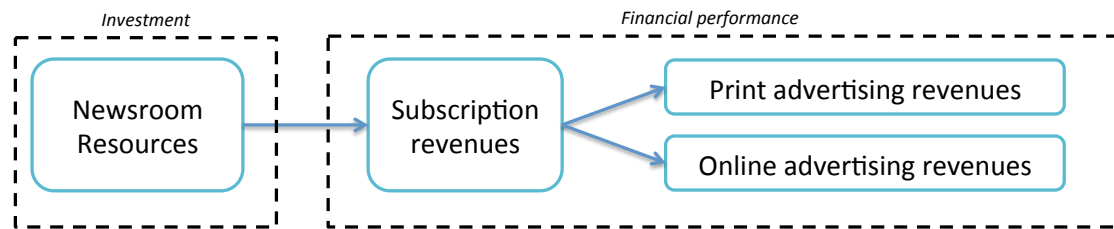
longitudinal data from one multi-channel newspaper. The results show that the basic success of the online business model depends on the investment in the newsroom – i.e. staff resources that can produce the content. Specifically, although newsgathering is a very expensive part of the news business, it is also a creator of value and directly brings in online advertising revenues (OAR) in addition to print advertising revenue. Therefore, as newspapers seek to capture more OAR, they may need to increase, rather than decrease, investment levels in the newsroom.

A conceptual model

In this section, we propose a conceptual model based on the findings from the literature review and the discussion above.

For newspaper companies, revenues have traditionally come from two main sources: sales and advertising. The basic business model has been the same over the past 300 years – printing news on a piece of paper that is distributed to readers who pay for the newspaper. In addition, advertisers pay for advertising space in the newspaper. Newspaper sales are typically either subscription-based (home delivery), or single-copy sales (at newsstands). Newspaper “circulation” is the metric used for the number of newspapers sold. However, several people typically read one newspaper, and the number of total readers typically determines the advertising rates. Conversely, online revenues for newspaper firms have traditionally been based almost solely on advertising. In a most basic sense, the more readers your site attracts, the higher online ad rates you can charge. It should be noted that online performance measures have evolved significantly from 1996 until today, from simple measures of online page impressions (how many times a web page is displayed), to highly complex measures involving the browsing patterns of individual online users on multiple media platforms. Newspaper firms invest in resources to differentiate themselves from the competition, and attract large enough audiences to sustain their business (Lacy 2002). Several empirical studies (Blankenburg, 1989; Cho et. al, 2004; Mantrala et al, 2007; Tang et al, 2011) have shown a positive correlation between newsroom investments and revenues. More resources in the newsroom means more high-quality content, which in turn should help improve competitiveness and yield more revenues. Based on this logic, Tang et al (2011) suggested the following model

of the financial commitment process in the newspaper industry, linking investments in newsroom resources with revenues.



(Figure 1.)

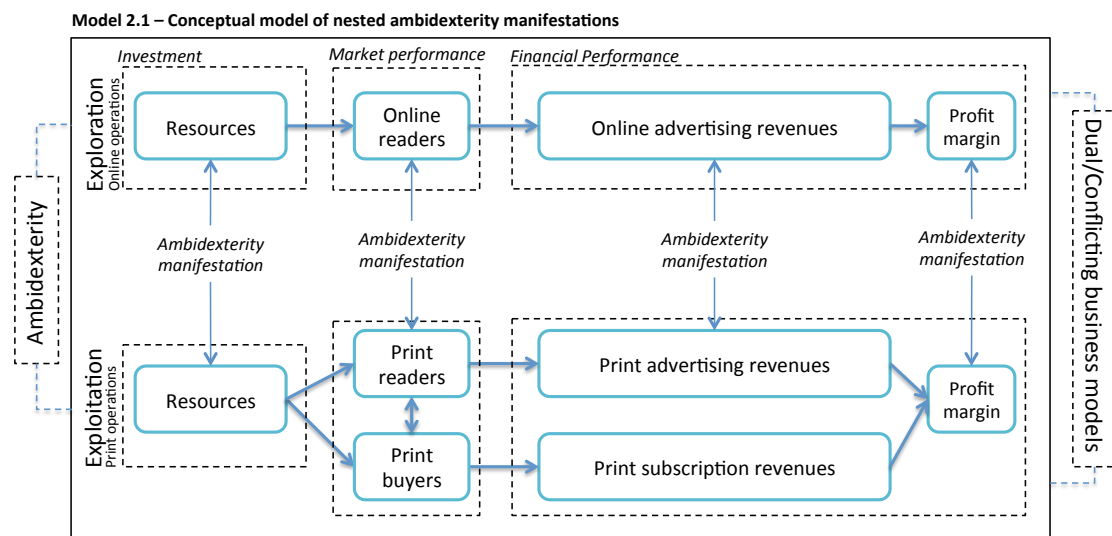
We suggest that this simplified model should be updated to fully take into account the some of the arguments from the literature review.

Firstly, we consider the argument that investments in newsroom resources impacts firm performance both in online and print domains. It seems reasonable that investments in print-specific resources (e.g. a typesetter in print operations) would not necessarily affect online performance. Likewise, it can be argued that hiring a video-journalist to do web-TV online does not necessarily affect print market performance. We thusly suggest that online- and print-specific newsroom investments should be considered separately, unless the newspaper firm has fully integrated their print and online resources – i.e. a convergent newsroom.

Secondly, we consider the financial performance models for print and online, respectively. As noted earlier, online revenues mostly come from advertising, and the ad-rates are based on how many readers an online site attracts. Conversely, for print, ad rates are determined by how many people read the newspaper. In addition, there are subscription revenues. However, online ad sales are increasingly directly tied to print ad sales, as newspaper firm’s sales forces are trained to do more cross-selling. For example, Tang et al (2011) found a positive relation between print newspaper sales and online advertising revenues.

Thirdly, we consider the ambidexterity construct, which suggest optimal performance is found in firms that simultaneously pursue exploration of new business ventures (online) while exploiting existing business (print newspaper). This introduces a series of dilemmas, as managers have to balance contradictory or even conflicting strategies. And as March (1991); O’Reilly and Tushman, (2013); Birkinshaw and Gupta, (2013)

remind us: ambidexterity dilemma is a “nested” issue, which transpires at multiple levels in a firm’s ecosystem, and *maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity* (March, 1991 p. 71). Ambidexterity is to manage (not necessarily resolve) the tensions that exist between incompatible objectives. Markides (2013) summed this up eloquently: No conflict, no ambidexterity (p.320.) Conflicting business models (for example free vs. paid) is thusly seen as another manifestation of the ambidexterity dilemma. Based on the arguments above and the review on the literature on firm performance in the newspaper industry, we can suggest the following conceptual model:



(Figure 2.)

The model takes into the account the argument that the ambidexterity dilemma is a multi-level, “nested” issue (March, 1991; O’Reilly and Tushman, 2013; Birkinshaw and Gupta, 2013; Markides 2013), which transpires at multiple levels in a firm’s ecosystem. And as noted in the theory section, ambidexterity researchers are somewhat divided on whether a combined measure (combined high levels of both exploration and exploitation) or a balanced measure (an optimal relative balance between exploration and exploitation) yields superior performance (Cao et al., 2009). This multi-level design allows for the examination of *when* and *how* ambidexterity affects multiple measures, specifically considering four conflicts involving online/print resources, online/print markets, online/print revenues and online/print

profit margins. The model also takes into consideration managing two conflicting business models, defined as “activity systems” made up of several interdependent activities creating and delivering value to customers in order to generate revenue streams and profit (Markides, 2013; Holm et al 2013). For example, as newspapers merge their online and print staffs, “inevitable conflicts” will arise, and to be successful at ambidexterity, firms must be able to orchestrate the allocation of resources between the old and new business domains (O’Reilly and Tushman 2013, p. 19). Also, we would expect that investment in print-only resources would yield a different result than investment in online-only resources. Hence, firms have to make choices and priorities when investing and allocating newsroom resources. Similarly, one could expect that capturing large online reader shares may come at the cost of existing print readership. It also seems reasonable that higher online ad revenues may come at the cost of decreasing sales of print ads. And finally, since profit is a function of revenues and expenditures, it also seems reasonable that online and print operations may yield different profits, and have a significant interaction effect.

Discussion

The “ambidexterity premise” suggests that firms that balance exploration and exploitation achieve superior performance. In this section, we discuss how our conceptual model could be operationalized in the context of the newspaper industry, applying the ambidexterity framework to characterize how newspaper firms explore online opportunities while simultaneously exploit existing print business. First, we touch upon the issue of how ambidexterity is operationalized. In their review of ambidexterity articles published from 1996 to 2012, Birkinshaw and Gupta (2013) found that ambidexterity has been operationalized in a number of various ways - most notably as an organizations *propensity* to explore and exploit 2) an organizations *intent* to do explore and exploit 3) the *outcomes* of from what the organization actually did and 4) the *capacity* to explore and exploit. When considering firm performance, it seems reasonable that output measures, rather than good intentions, brings results on the bottom line. For the following discussion, we will follow this line of argument.

The first ambidexterity manifestation in our conceptual model is in relation to resources. It seems reasonable that some sorts of resource allocation/investment is necessary to capture online readers, which in turn yields online revenues and profits. The same logic applies to the print domain. Several studies have suggested that environmental munificence (the availability of resources) affects firm performance (Pfeffer & Salancik, 1978; Thompson, 1967; Cao et al 2009; Castrogiovanni, 1991). It also seems likely that munificence becomes more important as newspaper firms have to “open up” their business models to ideas from outside to help fuel their digital transformation (Holm et al 2013).

Next we consider the combined vs. balanced argument for resources. It seems obvious that high+high levels of print and online resources would yield the highest combined outcome measure (i.e. total market performance). It also seems entirely feasible that high+high could also be a balanced measure – i.e. a small relative difference. It also seems likely that there is some threshold as to when the combined and/or balanced measures positively affect firm performance. Cao et al. in their study of high-tech firms found that pursuit of the combined measure (high+high) actually negatively impacts smaller firms (less than 87 employees). Firm size thusly has a moderating effect on the optimal resource allocation. The argument behind this is that high levels of for example online exploration and print exploitation “severely taxes a firms’ resource base,” and smaller firms often do not have the resources to support high levels of both activities (p.22). These effects should be moderated by environmental munificence. An interesting question is what happens when online and print resources are integrated. Multi-skilled employees should (in theory) yield improved market performance in both online and print domains, and thusly improve productivity. However, it seems just as likely that integration is used as a strategy to reduce production costs, while sustaining current levels of market performance. And/or when the environment is scarce in available resources. These argument are in line with (Quinn 2005) as well as the conceptualization of *contextual ambidexterity* (Gibson and Birkinshaw 2004), which suggests that the tensions between exploration and exploitation are managed at the individual level, as employees in an integrated newsroom divide their time and attention between online exploration and print exploitation. It is however, also quite possibly to hypnotize that requiring previously

dedicated print resources to work for multiple platforms could actually have a negative impact on both the quality and output in the print domain. This is likely relative to the degree of “resource slack” (Bourgeois, 1981; Chen & Hambrick, 1995; Lubatkin et al., 2006), which is more likely in large firms with a larger resource base. But integration also brings up another concern, as a *too* tight linking between exploitative and explorative businesses may actually negatively impact overall financial performance. Gary (2005) showed that a high degree of relatedness could result in resource overstretching and lower profitability compared with engaging in more diversified explorative activities. Similarly, Markides (2013) notes that the degree of disruptiveness between conflicting business models should influence the decision to integrate or separate exploration and exploitation. This suggests potential costs of increased relatedness, such as that of increased administration and “conflict management.” The potential benefits from sharing resources are not automatically realized, and synergy initiatives may fall short of expectations (Goold and Campbell, 1998).

The next ambidexterity manifestation is in relation to market performance. Previous studies have shown cross-channel effects for advertisements, as newspaper firms’ sales forces are being trained do more cross-selling (See for example Tang et. al 2011). It is also no secret that the print advertising revenues for newspaper firms are plummeting, while advertisers and readers are flocking to digital platforms. It thusly seems likely that there potentially is a strong interdependency between print and online market performance, which in turn should affect financial performance, the next ambidexterity manifestation in our model. It also seem likely that high levels of online market penetration over time could have a negative relation to print market performance, and thusly negatively affect total revenues. Profits are relative to both revenues and expenses. Online operations often benefit from substantially higher profit margins in general, mostly due to lower overhead and not having distribution costs, printing, etc. As the total revenue mix shifts from print to online, total profit margins should also improve.

Conclusion

Our literature review suggests that although much has been written about the digital transformation of the newspaper industry, there has been limited research into how the digital transformation actually affects newspaper firm performance. Based on theories of convergence, business model innovation and ambidexterity, our model can hopefully help guide future studies.

A final note: Our review suggested an increasing tendency to re-brand existing phenomena as ambidexterity. In presenting our model, there is the danger of doing exactly this. As Birkinshaw and Gupta (2013) note: ambidexterity is an alluring concept, but its flexibility and fuzzy definitions means it can be used to label almost any organizational phenomena (p.291). So what is the real difference between ambidexterity and for example convergence and/or business model innovation? In one word: Conflict.

Ambidexterity recognizes the persistent, profound and irresolvable trade-offs for example newspaper firms face when embarking on the simultaneous pursuit of online exploration and print exploitation. As Markides (2013) notes: Without such conflicts, the concept of ambidexterity loses all meaning. We also agree that this means that many of the articles we reviewed that proposed to study ambidexterity, studied dualities where such conflicts were absent, suggesting that these were studying anything but ambidexterity (p.320). But on the other hand, our literature review also made us certain of one thing: The divide between online exploration and print exploitation is still a raging conflict in the newspaper industry. We could thusly find no more suitable theoretical framework than ambidexterity to further our understanding of how these tensions can be managed, even if they never will be resolved.

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PERFORMANCE MANAGEMENT SYSTEMS IN UNIVERSITIES

DO GOVERNANCE STRUCTURES MATTER?

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Performance management systems in universities: do governance structures matter?

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Abstract

Purpose

The aim of this paper is to better understand if governance structures matter for the success of PMS in universities.

Design/methodology/approach

A comparative study between two innovative and entrepreneurial universities was conducted, using a case study design. Data was collected through documentary analysis and seventy-six semi-structured interviews.

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Findings

The analysis of both case-studies through a new governance framework showed that external pressures to implement PMS are the most influential ones and that internal pressures usually only emerge to help deal with the former.

Moreover, results showed that although governance structures matter, they are not enough for the success of PMS. The establishment of a good level of communication and the involvement of different actors in the development of a PMS are considered central to overcome resistances and build trust, regarded as a fundamental piece for the existence of an integrated PMS and a necessary step to a new mode of governance.

Originality/value

By exploring whether governance structures matter for the success of PMS, this paper contributes to the literature on public management, applied to the context of higher education.

Moreover, it is believed that this governance framework devised could be used for any university, and even for higher education systems, enabling researchers and practitioners to comprehend which are the most influential external and internal coordination mechanisms, thus arguably helping governments to implement policies regarding higher education and university managers to better implement PMS.

Keywords: Performance Management; Performance Management Systems; Governance Structures; Universities; Higher Education

Article classification: Research paper

1. Introduction

Emerging from a period of relatively secluded existence, serving predominantly elite and stable national markets, often supported to a large extent by government funding, universities have been launched into a global market (Parker, 2011), being encouraged to become increasingly responsible for their activities and for finance. Although varying between countries, the reforms that universities across the world are undergoing have in common the adoption of managerial methodologies and approaches once exclusively adopted by the private sector, following a trend to reorganise and restructure universities increasingly as entrepreneurial organisations (Meek, 2000; Etzkowitz, 2003). Within this new model of governance, strategic management has been enforced in universities, and the introduction of performance management systems (PMS) became increasingly important.

Given the recent changes that have happened in the governance and management of many universities, the aim of this paper is to better understand if and how governance structures matter for the success of PMS in universities.

To achieve this aim, a comparative study between Portuguese and British universities was conducted, using a case study design. Two innovative and entrepreneurial institutions were chosen. Data was collected through the use of a qualitative methodology. The methods used were documentary analysis and seventy-six semi-structured interviews to members of the governing bodies of each institution.

The paper is structured in the following way: first, the concept of PMS is introduced; second, an analytical framework incorporating the main actors in the governance structures of universities is displayed and the research questions are outlined; third, the research design and methods are introduced and the case studies presented; fourth, results are analysed and discussed according to the framework developed; and finally, conclusions are drawn.

2. Performance management systems: introducing the concept

For the purpose of this paper, performance management is defined as an integrated system where performance information is closely linked to strategic steering. It consists of three stages: the first is the measurement stage, which involves gathering performance information (Radnor and Barnes, 2007; Askim, 2008); the second is the reporting stage, which entails communicating performance information to decision-makers, so that they can decide what to do; and the third is the management stage, which consists of using the information and acting upon it, aiming at improvements in behaviour, motivation and processes (Bouckaert and van Dooren, 2003; Radnor and Barnes, 2007). If working well, a PMS should provide information on important matters, promote appropriate behaviour, provide mechanisms for accountability and control, and create a mechanism for intervention and learning (Haas and Kleingeld, 1998; Neely, 1998). In other words, performance should be measured, reported and managed, that is, used for improvement purposes.

In previous work, it has been argued that even though some universities claim that they have implemented PMS, there are not fully integrated systems at many of these institutions yet, namely due to the lack of use of performance information in some areas (Melo *et al.*, 2010). Given the recent changes that have happened in the governance and management of many universities, the question that emerges at this point is: do governance structures influence the implementation and functioning of PMS? And, if so, in what way? Before answering these questions, it is essential to understand the way universities are governed. The best way to do that is to look at the existing governance structures.

3. Governance structures in universities: an analytical framework

De Boer (2002: 44) regards governance structures as a 'set of rules concerning authority and power related to the performance of a university's activities directed towards a set of common goals'. In other words, it reflects the way an organisation divides and integrates responsibility and authority.

As Figure 1 illustrates, governance structures can be conceptualized by an 'inner ring' and an 'outer ring'. The 'inner ring' represents the internal coordination mechanisms, and is composed of the members of the university's governing bodies – the 'four Estates'. These are: students, academics, non-academic staff and external representatives.

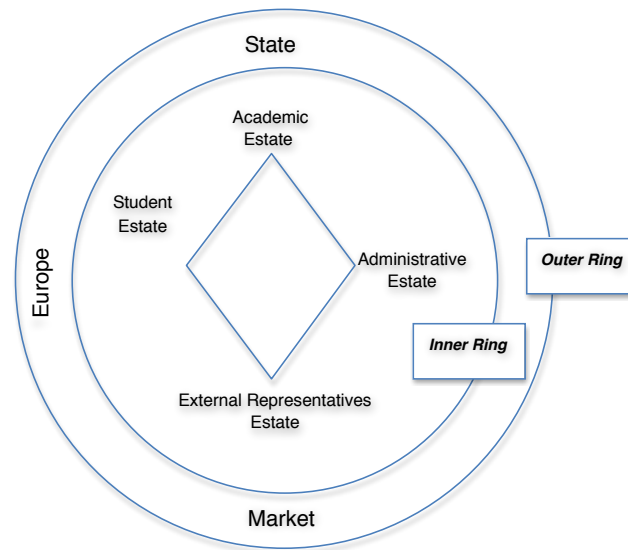


Figure 1 – Governance structures in universities

The 'outer ring' embodies the external coordination mechanisms and is composed of the state, Europe and the market.

This model extends Clark's (1983) 'triangle of coordination' to other internal stakeholders of the university, revisiting the concept of the university's Estates proposed by Neave and Rhoades (1987). According to Neave (2009), the characteristic of an Estate is the central part played by prescribed and formal status. To Neave (2009) there has been a move from what Clark (1983) called 'academic oligarchy' to an extended constituency in which all three Estates – Academic, Student and Administrative – have their formal elected place. To the three Estates, this research adds a new one – the 'External Representatives Estate', since these members have become increasingly important in the governance and management of universities.

Therefore, Figure 1 is proposed as the analytical framework that will help to understand if and how governance structures influence the success of PMS.

4. Research design and methods

To operationalize the research, a comparative study between Portuguese and British universities was conducted, using a case study design. The British higher education system was chosen because it has gone, together with other British public services, through major reforms since the 1980s, putting progressively in place mechanisms of

financial control (Scott, 2004). The Portuguese higher education system was chosen because it has recently gone through major reforms, aimed at implementing control mechanisms.

Inside each system, an innovative and entrepreneurial university was studied in-depth, being both institutions recognised for their good performance. Moreover, the British university is also known for being quite independent from state funding since its genesis, and the Portuguese university was one of the few that decided to become a public foundation subjected to private law, which means that it has to raise at least fifty per cent of its revenue. As such, it would be expected that these institutions would have implemented mechanisms to measure and manage their performance.

The British university (BU) is a chartered one, established in the 1960s. It is divided into four faculties and thirty different departments, and has around 22,000 students. It employs nearly 5,000 members of staff, which comprise approximately 1,000 academics, 700 researchers and 3,300 non-academics.

The Portuguese university (PU) was established in the early 1970s. It is divided into seventeen different departments, and has around 14,600 students. It employs nearly 1,600 members of staff, which comprise, approximately, 1,000 academics, 500 researchers and 100 non-academics.

Mixed methods were used to assemble data. These comprised documentary analysis and interviews. The documents analysed included European higher education policy documents, national legislation, external reports concerning the evaluation of both countries' higher education systems and official statistics related to both systems. In each location, seventy-six in-depth semi-structured interviews were conducted (thirty-seven in BU and thirty-nine in PU) to the four Estates that sit in the governing bodies of a university. The number of interviews conducted to each group was related to their weight inside the existing governance structures.

5. Discussion of results

All the quotes were coded in order to ensure confidentiality. S refers to students, L to external members, NA to non-academic staff and A to academics. British interviewees are identified by a B- before the actual code and Portuguese interviewees by a P-.

5.1. Governance structures and PMS through the lens of a new governance framework

Data analysis showed that internal and external pressures are forcing universities to renew and reshape their governance structures and management practices, often requiring the adoption of methodologies and techniques once only used in the private sector. Among these practices, a special attention was given to the introduction of performance control mechanisms.

From all the pressures felt to introduce control mechanisms, interviewees reported that external pressures were the most influential ones and that internal pressures usually only emerged to help deal with the former.

5.1.1. *External pressures: the 'outer ring'*

In BU, external pressures came mainly from the state and from the market. Actually, the state implemented a lot of policies since the 1980s, destined to promote the efficiency, effectiveness and accountability of the public sector, and from which universities, even though quite autonomous, were still financially dependent. As for the market, the competition between universities became tougher, and these institutions started competing for students, for staff and for funding.

In PU, external pressures came essentially from European policies and from the state. In relation to the former, after the signing of the Bologna Declaration in 1999, a lot of policies were agreed upon by several nation states, with many of them committing towards the establishment of common higher education policies. In relation to the state, indeed, the Portuguese government published a lot of legislation very recently, which fostered the introduction of control mechanisms.

This analysis showed that all the external pressures identified in both universities are included in the 'outer ring' of our governance framework and relate to each other. First, European policies drove national governments to promote quality and assess that quality in order to assure it. The exceptions to this trend were Anglo-Saxon countries, which started to employ control mechanisms before the implementation of these policies, often serving as a benchmark to them. Moreover, European policies seemed to be sometimes used as justification for carrying out certain national policies that would otherwise be more contested. Second, the market also influenced European and national policies, since different stakeholders started to demand more quality from universities (e.g. in BU, several interviewees reported that parents started to worry more with their children's education). As a result, universities started to realise that only by offering quality they would be able to survive. Third, the way governments forced universities to implement control mechanisms, using some of those mechanisms to develop performance indicators (PIs) and to create rankings, enabled comparisons between universities, thus increasing competitiveness between these institutions (e.g. in the UK, university rankings are frequently used by students to select universities).

5.1.2. *Influences of the Estates: the 'inner ring'*

Concerning the Student Estate, and although they were one of the less represented Estates in the governing bodies of both universities, their voices were increasingly heard in these bodies, as keeping them satisfied became a priority. However, when compared to other Estates, they were not very powerful in terms of strategic thinking and decision-making.

In relation to the External Representatives Estate, external members always played an important role in BU, being the majority in the Council, the ultimate decision-making body. Nevertheless, there was a general feeling among the interviewees that they could participate more actively in decision-making. In PU, their presence increased considerably in the General Council, the most important decision-making body of the university, and they chair this body. The opening of universities to new non-governmental stakeholders, such as firms and civil society, and the sharing of decision-making with them, is a good example of the move towards a 'Network Governance' model (Rhodes, 1996; Jones *et al.*, 1997; Goldsmith and Eggers, 2004; Klijn, 2005; Provan and Kenis, 2008) or a 'new public governance' model (Osborne, 2006).

Regarding the Administrative Estate, even if they were never very influential in terms of decision-making in PU, their participation in governing bodies decreased

substantially. In the British case, the opposite happened. Although BU was always known for having a strong administrative core, which was very important in the transformations that took place in the institution, pressures to become more efficient, effective and accountable led to an increased influence of non-academics in decision-making. This change raised concerns among the academic community, with some academics fearing that administrators would endanger the 'collegiality' element and the 'academic freedom' they always had. Nevertheless, data analysis showed that academics were not excluded from decision-making at BU. Au contraire, the Academic Estate and the Administrative Estate shared responsibilities for the governance and management of the institution.

As a matter of fact, it was noted that the Academic Estate still had the most active voice in both universities, especially in strategic decision-making, given that they were the majority in all the governing bodies in PU, and they were strongly represented in the most important governing bodies in BU. The importance of academics in decision-making was even clearer in the Portuguese case, where decision-making was not shared with non-academic staff.

5.1.3. Placement of universities in the governance framework

Having analysed the external coordination mechanisms and the influence of the four Estates in decision-making and in the implementation of PMS, it is possible to place both universities in the governance framework (see Figure 2).

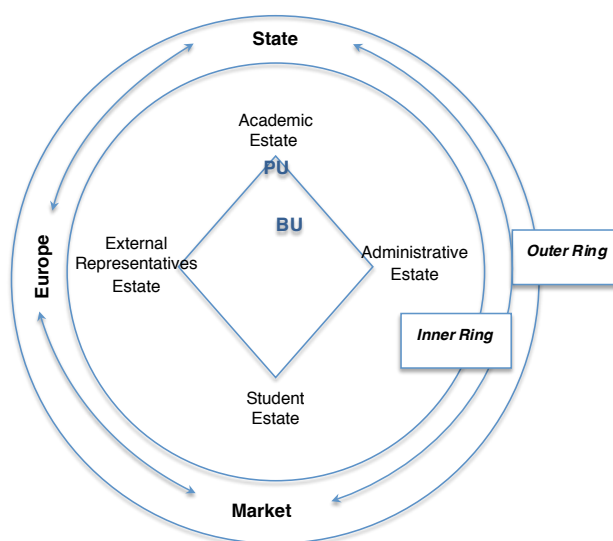


Figure 2 – Governance structures in higher education: BU and PU

The 'outer ring' represents the role of the state, the market and Europe as the main external coordination mechanisms, even though, it should be stressed that the role of European policy in BU was practically inexistent, with no interviewee referring to it, and the role of the market was barely noticeable in the Portuguese case, although some interviewees believed it was slowly increasing.

Concerning the 'inner ring', BU could be placed between the Academic Estate and the Administrative Estate, since decision-making was mainly in the hands of academics and non-academic staff. External members also exerted some influence in institutional governance. The decision-making structure at BU left students with the least decisive role, even though their voices were heard at the university. The

analysis of the data showed that PU could be placed very close to the Academic Estate, which was still clearly the dominant one in institutional decision-making, even though, as explained before, the number of external members in Council rose.

But how have these pressures influenced the introduction and functioning of PMS?

5.2. *Isomorphic patterns towards the introduction and functioning of PMS*

Essentially forced by external pressures to implement PMS, institutions in general tend to conform to prevailing societal beliefs and values and to establish and institutionalise homogeneous structures and processes, in the pursuit of legitimacy. The organisational tendency to conform and homogenise has been described in the literature as 'isomorphism' (Hawley, 1968; Meyer and Rowan, 1977; DiMaggio and Powell, 1983).

A combination of these isomorphic patterns has been spotted in universities. As discussed, the main pressures to introduce PMS were external. This shows the existence of 'coercive isomorphism' (DiMaggio and Powell, 1983) in both cases, since both universities were financially dependent from the state, and thus had to conform to externally dictated processes and structures. This was particularly visible in the Portuguese case, where, for example, universities were forced by law to change their governance structures and had to adopt external instruments to measure, for example, the performance of non-academic staff or support services. With the reduction of governmental financial support to universities, direct government provision and control decreased and some responsibilities started to be devolved to the market. This decrease in governmental support led universities to try to follow 'market leaders', that is the best national and international universities, which were disclosed in the 'league tables'. These practices can be called 'mimetic isomorphism' (DiMaggio and Powell, 1983), where 'market followers' copy 'market leaders', in an attempt to improve. Moreover, the reported proximity between the visions of many British and Portuguese universities, where many set similar goals, is a good example of that type of behaviour. Finally, 'normative isomorphism' (DiMaggio and Powell, 1983) can be found both in universities managed by professional managers, who brought their values from the private sector, thus arguably influencing internal processes, and in the universities managed by academics, where academic values, namely the concept of 'academic freedom', highly influence the existing structures and processes.

With the combination of the different isomorphic behaviour patterns, it would be expected that organisations would become shaped and institutionalised by their environment (DiMaggio and Powell, 1983; Scott and Meyer, 1991; Scott, 1995), but that is not always the case. In fact, in such complex organisations, which, on the one hand, must adapt themselves to the various strains of public authority, and where, by contrast, the norms of academic freedom and autonomy dominate internally, PMS may not always be as successful as expected. This can be analysed from two different interpretative viewpoints: related to the structure and to the actors' expectations.

5.3. Two interpretative viewpoints to explain the functioning of PMS in universities

5.3.1. Rational system perspective

According to the 'rational system perspective', structural arrangements within organisations are designed for the efficient realisation of ends (Scott, 1987). The premise upon which this approach is based is that the formal structure guides and influences decision-making behaviour. This means that the formal structure can have an instrumental value in achieving specific goals and in contributing to the successful implementation of PMS. Nevertheless, our research showed that, even though, for example, in BU, the Council pushed towards the development of PIs, the main governing bodies of both universities were regarded as inefficient, time-consuming, and non-strategic, being defined as 'rubberstamping bodies'.

"Councils are typically very large. (...) That's a kind of classic way of keeping a committee ineffective. Then [they] can fulfil [their] decorative function very well." (B-A17)

Governing bodies are thus deprived from their 'instrumental value', having a 'symbolic value' instead. Larsen and Gornitzka (1995) call it 'window dressing', Meyer and Rowan's (1977) 'decoupling strategies', and Larsen (2001) describes boards 'as rituals'. Having to adapt themselves to the various strains of public authority, with the norms of academic freedom and autonomy dominating internally, universities sometimes opt for 'ceremonial management' (Meyer and Rowan, 1977) or 'ritual' acts, the so-called 'rubberstamping' role of many of the governing bodies, and do not use performance information.

How can then universities function and be successful, as our cases are? It seems that both universities have managed to get around the committee hierarchy, through centralisation, operating on a day-to-day basis through smaller and more agile bodies.

These bodies seem to belong to a 'parallel structure', composed of senior academics and administrators, in BU, and senior academics, in PU, which is more operational and effective, and thus more favourable to the introduction of control mechanisms. This structure co-exists with the 'formal structure', more inclusive (with academics, non-academic staff, students and external members), but also heavier and more time consuming.

In the 'formal structure', decisions take a long time to make and are reviewed over and over by different committees, arguably improving the quality of decision-making, but also promoting delays. In this 'game', the 'parallel structure' seems to manage the university.

Even though the general community acknowledges the existence of the 'parallel structure', most of its members still believe in the importance of the 'formal structure', which occasionally blocks decisions from going further.

But, in reality, more important than to make important decisions, the 'formal structure' seems to have two important roles: to legitimise decision-making to the exterior; and to build trust inside the institution. Indeed, by believing they are actively contributing to decision-making within the university, the wider community will trust the organisation and the decisions made by that organisation and will more easily 'get on board'. Klijn et al. (2010) argues that trust is important for achieving better (perceived) outcomes. The only time the two structures seem to collide is when the type of decisions to be made conflicts with prevailing values. For example, issues

related to academic freedom and loyalty to the discipline may be more difficult to control.

5.3.2. *Actors' expectations*

There is more than one type of organisational reaction to evaluation, since the behaviour of the various actors is differentiated due to their different views (Rebora and Turri, 2011). For example, external members will most likely encourage the introduction of control mechanisms, since they come from the private sector, being thus used to dealing with PMS. Students may also favour PMS, since they are interested in studying at the best university possible:

"(...) they will like to see their professors and non-academic members of staff evaluated." (P-A51)

Academics and non-academic staff were those perceived to 'resist' change more. By being 'employees' of the university they are most likely the ones more directly affected by evaluation practices:

"The accountability is on the academic and the non-academic staff. So, quite naturally, there's an element of feeling concerned about... being measured, about performance management (...) and, inevitably, people feel quite protective of their own particular area." (B-NA35)

Therefore, the biggest challenge for the success of a PMS seems to reside in how to have all the Estates accept PMS as something important and positive for organisational development, therefore avoiding the tendency for the lack of use of performance data (Melo *et al.*, 2010).

Resistance to changes are arguably potentiated by the lack of participation of some actors in the development of PMS. According to Stensaker (2008), a bottom-up approach is needed and, in addition, a new way to view the personnel as active contributors. Actually, the interviewees reported feeling more at ease when they participated in the preparation process.

Thus it could be argued that even though governance structures matter for the successful implementation and functioning of PMS they do not seem to be enough. Although it is acknowledged that the governance reforms that took place in many higher education systems – more institutional autonomy, increased centralisation of decision-making, stronger leadership at the top, increased accountability and wider participation of external members – are enablers for the success of PMS, there are still other variables to take into consideration. It would be desirable, at various moments, to arrange for interaction between academics and managers (De Bruijn, 2007). Moreover, there should be a clear identification of the functions of performance measurement and forums for dealing with performance results. This way, the manager and professional could trust that any deviation from it would demand consultation. As Thomas (2004) argued, an ideal PMS should be embedded in the organisation, stable and widely understood and supported.

6. Conclusions

The analysis of both the external and internal pressures to the introduction and functioning of PMS, allowed the placement of both cases (PU and BU) in the governance framework devised in this paper. In terms of the 'outer ring', the external

pressures were the most influential ones, with internal pressures usually only emerging to help deal with the former. In BU, external pressures came mainly from the state and the market, and in PU from Europe and from the state. These pressures led to some changes in the governance of both universities. In BU this process started many years ago. In PU, the change was more recent. This tendency towards the institutionalisation of homogeneous structures and processes, in the pursuit of legitimacy, was defined in the literature as 'isomorphism' (Hawley, 1968; Meyer and Rowan, 1977), having practices of 'coercive isomorphism', 'mimetic isomorphism' and 'normative isomorphism' (DiMaggio and Powell, 1983) been identified in both cases.

In terms of the 'inner ring', BU could be placed between the Academic Estate and the Administrative Estate, since decision-making was mainly in the hands of academics and non-academic staff. The analysis of the data showed that PU could be placed very close to the Academic Estate, which was still clearly the dominant one in institutional decision-making.

In terms of structure, findings showed that the main governing bodies of both universities were deprived from their 'instrumental value', attributing them a 'symbolic value'. Data analysis also showed the co-existence of two governance structures in both universities, enabling universities to succeed: a 'formal' structure, with a more 'symbolic' role; and a 'parallel' structure, which managed the university on a daily basis.

In terms of actor's expectations, external members and students were the ones that encouraged the introduction of PMS more, being academic staff and non-academic staff the ones that resisted these systems more. Thus, the biggest challenge seems to reside in how the four Estates accept PMS as something important for organisational development, being a bottom-up approach needed.

Therefore, it could be argued that even though governance structures matter for the success of PMS they do not seem to be enough. Even though several steps have been given in the direction of a new public governance, with higher education systems displaying evidence of network development; increased self-steering; and increased participation of new actors in university governance, there is still much to do to reach the ideal type of managing performance.

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0055

FROM BELTS TO BALDRIGE

CHARLES AUBREY

From Belts to Baldrige

Charles Aubrey

Chairman, Asia Pacific Quality Organization
Academician & Board Member, International Academy for Quality
Managing Partner, Aubrey Partners
Former Vice President of Quality, Anderson Packaging

Anderson Packaging has always been committed to quality by meeting and exceeding customer requirements and continuous improvement. Founded in 1967, the Anderson Brothers manufactured packaging machines. They continued to refine and develop the equipment for their customers. They were however, unhappy with how their customers operated the equipment. The quality of the packaging was not up to the standard they thought it should be for the ultimate customer. Therefore in 1968, they began operating the packaging machines themselves in order to get the most effective packaging output for the final customer- the consumers. There has always been this desire to be “the best”. Continuous improvement efforts and programs have always been the direction and way the Anderson leadership team has focused and led the organization. Today the vision of the company is:

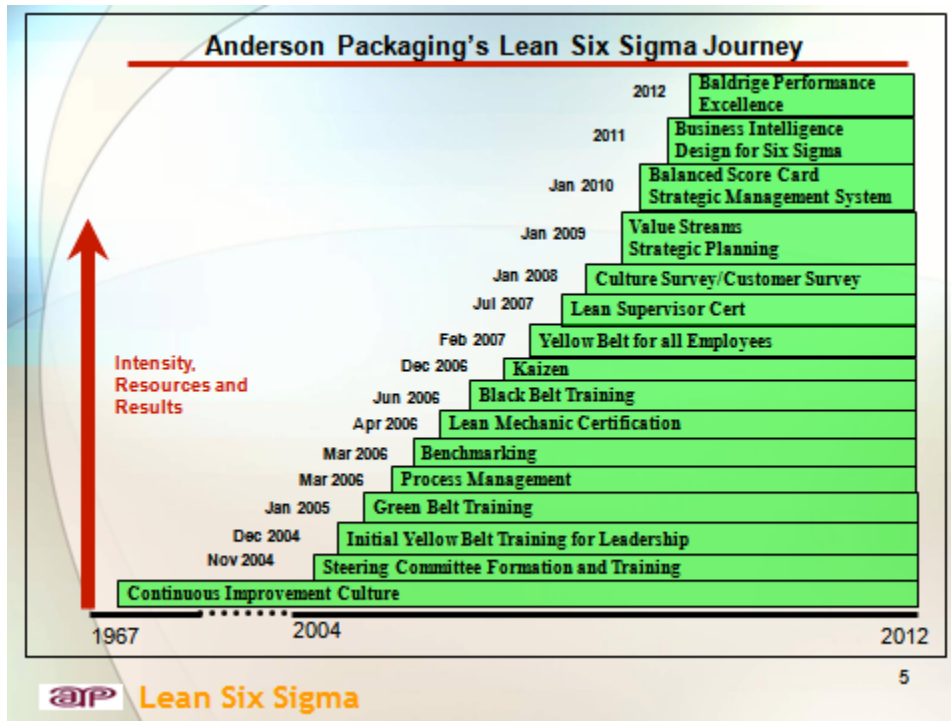
“To be ‘Best in Class’ in Pharmaceutical/ Healthcare contract manufacturing and packing services. Our culture will be customer focused, embracing regulatory compliance, and continuous improvement. By utilizing operational excellence, state of the art technology, innovation, and training, we will ensure strong growth and profitability.”

The vision is driven to realization by our daily mantra and mission:

“To provide:

- **Our customers with an on-going competitive advantage.**
- **Our employees with a challenging and rewarding work experience.**
- **And our shareholders with an attractive Return on Investment.”**

We will accomplish this mission by providing innovative manufacturing and packaging services focused on the pharmaceutical and medical device markets. These services will encompass state of the art manufacturing/ packaging equipment and facilities, highly trained cGMP employees, unrivaled customer service levels, and a constant, driving continuous improvement effort.



The Anderson leadership team “discovered” a new formal approach to continuous improvement in 2004. They began a drive to learn the approach of Lean Six Sigma. In that year they hired a Master Black Belt with extensive experience of implementing this approach in numerous Fortune 500 companies and the pharmaceutical and medical device industries. Senior management started their Lean Six Sigma journey by committing themselves to a formal intensive multi-day training program. They started with Lean Manufacturing and then Six Sigma Improvement. This resulted in integrating the two approaches into Lean Six Sigma (LSS) - attacking both the product and process variation and waste.

The strategic plan was developed integrating LSS into both the long-term and an annual business activities and goals with a serious financial and leadership commitment. Middle management all went through a multi-day Yellow Belt Training. Subsequently the first round of projects and Green Belts were chosen with their five-day training delivered just-in-time as the projects unfolded. Subsequently Process Management (PM) training was developed and a PM teams began documenting, simplifying, and eliminating waste in business processes.


A drive to improve on the part of our Quality Control group led us to initiate Benchmarking, with the desire to have the most efficient and effective quality control processes in the industry. Benchmarking project teams were trained and they are interacting with Best-in-Class Fortune 500 Companies inside and outside our industry.

Our processes are supported with over 100 mechanics and engineers. A significant effort was put in for all of our mechanics and engineers to be Lean Certified. They have multiple days of class room training with tests and demonstration projects to

assure skill acquisition and be certified. They have saved \$500K in improving machine and equipment setups alone. They have also achieved 100's of thousands of dollars with continuous improvement projects to make operations more efficient and effective.

Participation in the API LSS Program by Skill Level

Black Belts	Very complex Improvement Projects	12 (160 hrs training + project)
Green Belts	Complex Improvement Projects	152 (40 hrs training + project)
Certified Lean Mechanics	Set-up/mechanical trouble-shooting, waste removal	34 (24 hrs. training + skill demo)
Kaizen Team Members	Identify and eliminate waste in processes	159 (3 days training + event)
Yellow Belts	Remove waste in daily work	797 (3 hrs. training + skill demo)
Lean Supv. Certification	Shop Floor Lean coaching/mentoring – emphasis in real time	29 (32 hrs. training + skill demo)

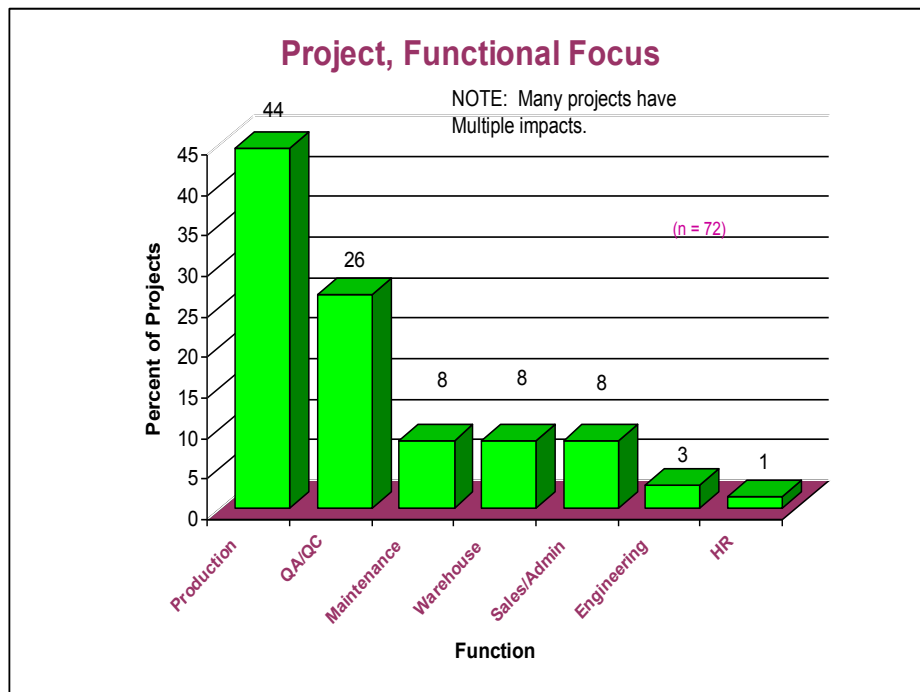
 **Lean Six Sigma**
7

Anderson has developed six Green Belts into Black Belts by having them acquire additional training and skills. They lead projects teams to solve more difficult and sophisticated problems and implementation actions. In addition they assist in coaching Green Belt teams and deliver LSS training. Kaizen Events are led by Lean Certified experts and Black Belts. These waste reduction efforts have saved almost \$500K in less than a year of operation.

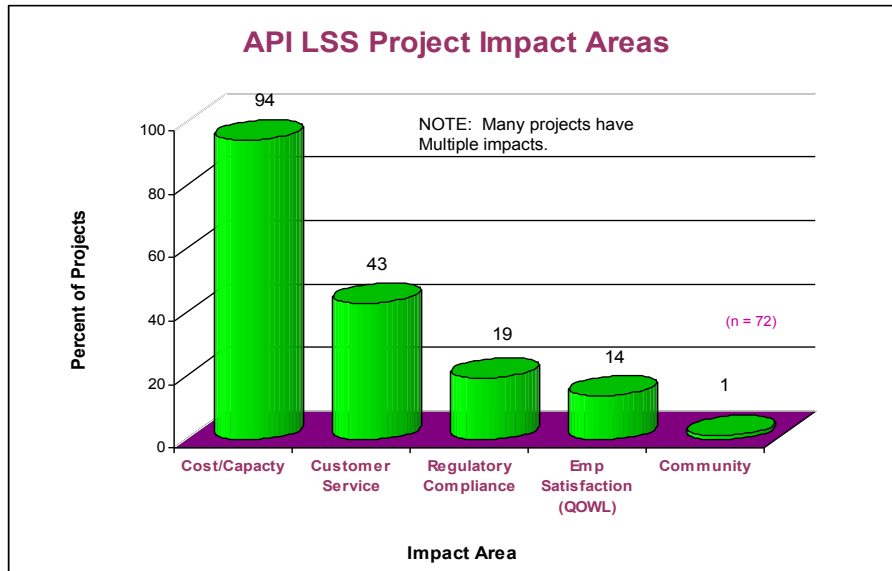
The Steering Committee has committed to every employee who doesn't already have a "Belt" to be Yellow Belt trained and certified. We are well underway to completing this continuous goal. The expectation is that everyone in the organization is

either identifying waste and improvement opportunities or eliminating waste and making improvements or both!

To that end our projects are focused in every area of the company: 44% Production, 26% Quality Control/ Assurance, 8% Maintenance, 8% Warehouse, 8% Sales/ Administrative/ Finance, 3% Engineering, and 1% Human Resources. There are waste and improvement opportunities in every function or the organization:



The resulting areas of impact likewise are numerous: Cost/ Capacity, Customer Service, Regulatory Compliance, Employee Satisfaction, and Community.



Listed below is a sample of the projects which Green Belts and Black Belts pursue.

Anderson Packaging's Lean Six Sigma Projects

Production Projects

- ◆ Scrap Reduction
- ◆ Downtime Reduction
- ◆ Productivity, Cycle Time
- ◆ Changeover Reduction

QA/QC Projects

- ◆ Reduce Inspection Costs
- ◆ Improve Validation Cycle Time
- ◆ Reduce Documentation Errors
- ◆ Reduce Lab Costs

Maintenance Projects

- ◆ SMED
- ◆ Reduce Welding Burns
- ◆ Reduce Nominal OT

Warehouse Projects

- ◆ Improve Material Issue Cycle
- ◆ Reduce Inventory Variance
- ◆ Reduce Receiving Cycle

Sales/Admin/Finance Projects

- ◆ Improve Supply and MRO Ordering Processes
- ◆ Reduce Investigation Cycle Time
- ◆ Reduce Non-Conforming Material
- ◆ Revise Non-Routine Billing

Engineering Projects

- ◆ Reduce Tooling Costs
- ◆ Improve Tooling Cycle Time, Delivered Performance

HR/Community Projects

- ◆ Reduce Turnover
- ◆ Improve the Customer Project Management Process

The financial results of these LSS project efforts benefit both Anderson and our customers. Anderson has had hard savings between \$2MM and \$4MM annually. Soft

savings has also been achieved each year (capacity increase and cost avoidance) of between \$500K to \$4MM annually. Every year we pass a portion of our saving to our customers. This has ranged from \$500K to over \$1.5MM over the years.

Anderson Packaging's LSS Project Results

	Year Three	Year Four	Year Five	Year Six
Hard Savings	\$1.28MM	\$3.83MM	\$3.62MM	\$2.25MM
Capacity/Cost Avoidance	\$1.50MM	\$468K	\$3.48MM	\$566k
Total	\$2.77MM	\$3.86MM	\$7.10MM	\$2.82MM

AP Lean Six Sigma 21

Cost Savings, capacity increases, and cost avoidance help Anderson be more competitive and hold down prices. At the same time this allows us to significantly reduce the risk of defects and assure on time customer deliveries. Customer savings typically is directly transferred to customers. Some examples are reduced bulk scrap or reduction of cost that customers are typically billed for such as obsolete material disposal or reduced tooling costs.

Continuous improvement and waste reduction are added value benefits of trusting Anderson to make and package the product. This is a free service that makes both Anderson, and our customers more competitive with less risk. In addition, over 25% of

our projects improve our regulatory profile and directly contribute to stronger compliance with Continuous Good Manufacturing Practices (cGMP), Drug Enforcement Agency (DEA) the Federal Drug Administration (FDA) regulations and others.

Strategic Planning, including annual self-assessments, linked to company-wide Balanced Score Cards and executed through work teams in every area utilizing six sigma project and lean Kaizen projects has been the key. Adding Value Stream teams, product line teams with responsibility for executing everything for that product line from “the incoming door to outgoing door” midway through our journey propelled us to now performance heights. One of our product lines actually improved profit margins by 50%.

Following the Malcolm Baldrige performance excellence model, dogmatic leadership to our mission vision and plans, engaging, training, empowering and holding everyone in the organization responsible, engaging and meeting our customers and supplier needs and finally rewarding our leadership, our employees, our suppliers and our customers created a “perfect storm” leading to a company worthy of winning the Baldrige.

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EXPLORING LEAN DEPLOYMENT IN NEW ZEALAND APPLE PACK-HOUSES

HANS J.T. DOEVENDANS, NIGEL P. GRIGG, JANE GOODYER

Exploring Lean deployment in New Zealand apple pack-houses

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Nigel Grigg is Associate Professor in Quality Systems at Massey University, and leads Massey's Graduate Diploma, Post Graduate Diploma and Master of Quality Systems programmes. He has undertaken research projects, consultancy, and supervision of Masters and doctoral student projects in quality and Lean related areas within a range of industry and economic sectors. He is a Chartered Quality Professional, a certified six sigma master black belt, and a member of the Chartered Quality Institute, the Institute of Directors and senior member of the American Society for Quality.

Jane Goodyer is an Associate Professor in the School of Engineering and Advanced Technology at Massey University. Her research is in Lean and its ability to sustain productivity improvement with recent studies of the effectiveness of NZTE's Lean Business Programme. Jane is a strong advocate for manufacturers to improve and has created a national web based hub that assists manufacturers build their international competitiveness (www.mkhere.org.nz). She was a practicing manufacturing engineer in the UK's automotive industry and is a chartered engineer.

Keywords: Lean, horticulture, fruit, performance, improvement, action research

Classification: Research paper

Abstract

Purpose: This paper presents findings from a research project that investigated the suitability of Lean in a seasonal horticultural setting, specifically the New Zealand (NZ) apple and pear (pipfruit) industry. The paper focusses on improvements made while deploying Lean elements in several apple pack-houses.

Methodology:

The literature review discusses how common theoretical Lean themes are not industry or contextually bound and may be transferable to other industries.

An industry-wide survey assesses the current state of knowledge and Lean deployment within the industry using a unique 'single-question-per-day' approach. Two case studies and one action research study are used to obtain rich data from organisations that have implemented Lean in recent times.

Reliability and validity were achieved by selecting representative samples, using a case study protocol, a single researcher for consistency, participant verification, multiple sources of evidence within cases and replication logic.

Findings:

The industry survey shows a low level of knowledge and applied Lean within the industry. Data demonstrate that significant progress is made, using different implementation approaches that lead to a measurable increase of Lean, supported by some positive financial indicators.

Research Limitations/implications: This research is restricted to NZ apple pack-houses but indicates that Lean can contribute significantly to general horticultural pack-house performance.

Originality/value:

Literature research shows that little research has been done to study Lean in the horticultural field generally and in the NZ pipfruit industry specifically. This paper contributes to filling that knowledge gap.

Introduction

New Zealand (NZ) currently grows food to sustain nearly ten times its population (Guy 2013). With the United Nations estimating the world population to rise from 7 billion today to 9 billion people in 2050, the New Zealand government has recently set an ambitious goal to double its primary industry exports by 2025 (Barnao 2013). The New Zealand government's business development agency (New Zealand Trade and Enterprise: 'NZTE') is assisting businesses to succeed and has introduced support programmes such as the 'Better by Lean' programme which includes a number of different sectors (Goodyer et al 2011).

In recent times, several companies within the NZ apple and pear (pipfruit) industry have started to consider Lean as a way to improve their performance. However Lean was not developed for horticultural industries, which produce seasonal, fresh and perishable products, and there is little research about implementing Lean in horticultural settings.

This paper is the second in a series of three papers focussing on Lean in the NZ pipfruit industry, respectively investigating 1) Lean implementation in a non-Lean orchard group and non-Lean pack-house; 2) Performance improvement through Lean implementation in pack-houses, and 3) Improving practices within and between supply chain elements.

In seeking to understand the implementation of Lean in a horticultural setting, this section of the wider study sought to investigate:

- To what degree is Lean currently used as an approach within the wider NZ pipfruit industry?
- How applicable is Lean and how well can Lean be implemented and adapted to pack-houses within the NZ pipfruit industry?

Literature review

Lean and the New Zealand pipfruit industry

In their seminal book identifying Lean production, 'The machine that changed the world', the authors' state:

"In this process we've become convinced that the principles of lean production can be applied equally in every industry across the globe and that the conversion to lean production will have a profound effect on human society – it will truly change the world" (Womack et al 2007, p6).

Consequently, common theoretical themes for the Lean philosophy, methods and tools are considered not to be industry- or contextually bound and may be transferable to other industries, such as the pipfruit industry. Although Lean has mostly been applied to the manufacturing area, it has broadened to other disciplines such as economics, human resources, product development, marketing and sales, service and accounting (Stone 2012), health (e.g. Joosten et al 2009), government (e.g. Seddon and Brand 2008), and supply chain (e.g. Holweg and Pil 2001).

Lean involves the diligent implementation of best practices in a fluid paradigm, moving with times and environments (Holweg 2007), while grounded in stabilising fundamentals such as customer value, waste reduction, flow, continuous improvement, respect for people and Just-In-Time principles. This supports that Lean may be applicable and appropriate for use in settings such as horticulture and more specifically pipfruit.

The NZ pipfruit industry shows a traditional focus on technical innovation, such as variety development, yield and quality improvements and solutions to pest and disease problems. Annual reports of the industry's governing body (Pipfruit NZ) show that between 2008 and 2013, the industry R & D expenses averaged approximately 51.8% of the industry body's annual operational expenses (Pipfruit NZ Inc. Annual Reports 2009-2011-2013).

The available pipfruit industry literature shows a distinct lack of process literature. Frater (1999) e.g. observes that only 9.9% of articles in the national horticultural magazine relate to management subjects, 4.3% of which relate to Research and Development and a further 1.8% relate to innovations, patents and IP protection. Doevendans (2010) asserts that in 2009, the on-line Pipfruit NZ library contained over 600 publications addressing mostly technical fruit-growing issues, with not a single paper addressing quality of management or business management issues.

This gap in literature is indicative of the research focus in an industry that has a substantial manual labour component, multiplying the number of employees ten-fold during the three to five monthly season (Doevendans 2010). The industry is a global competitor and potentially vulnerable if the manual component is neglected. Consequently, Lean may offer opportunities to make the industry more resilient for the future.

Methodology

As there was limited published research, an industry-wide stakeholder survey was conducted using a questionnaire to assess current levels of Lean within the industry. A unique survey approach was adopted by the researcher in order to stimulate response rates through perceived diminished participant effort (PDPE). This consisted of the researcher emailing a single question or statement each working day to 150 randomly selected stakeholders from a population of approximately 800. The daily effort required by participants was less than a minute, improving response rates for an otherwise long and challenging survey (Sheehan 2006). The survey was grouped into two sections, using a five point Likert scale to assess the level of understanding and implementation of:

1. Kobayashi keys: Twenty statements, each relating to one of twenty keys (Kobayashi 1995). The Kobayashi criteria were selected as they had been part of earlier research into Lean in NZ (Goodyer et al 2011).
2. Lean principles, methods and tools: Twenty broadly accepted Lean principles methods and tools.

Since there is little literature about Lean in the NZ pipfruit industry or the horticultural environment in general, a green-fields approach was self-evident when considering the components of the research methodology. It was essential to follow the quantitative inquiry with a qualitative inquiry to provide rich data that would enhance understanding of the research questions. Inquiries revealed that very few NZ pipfruit companies were implementing Lean, affecting the methodology; only a few pack-houses volunteered to participate, two of which were starting with Lean implementation and one of which had not started yet. A mixed survey, case study and action research approach was adopted to best provide an understanding of the research problem (Creswell 2003).

The case study approach has consistently been one of the most powerful research methods and case studies can be used for different types of research including exploration, theory-building, theory-testing and theory extension/refinement (Voss et al

2002). Case studies allow the retention of general and meaningful characteristics of real life events such as organisational and managerial processes and the maturation of industries (Yin 2003). As such, the case study approach is an appropriate and alternative method to analyse the applicability of the Lean philosophy, methods and tools for the few pack-house/cool-store organisations within the NZ pipfruit industry that have started implementing Lean. There were two pack-houses in New Zealand's main apple growing region known to have recently started implementing Lean, and these were selected for the case studies.

Action research has a reputation for low rigour and being 'messy' (Cardno 2003) and presenting the double burden of affecting change and research. This potentially causes a conflict between rigour of the research and relevance of the research (Argyris & Schon 1991). However action research is appropriate whenever the research question relates to describing an unfolding series of actions over time in an organisation (Coughlan & Coughlan 2002). The action research approach was therefore proposed involving the volunteering non-Lean pack-house to better understand issues around Lean implementation.

All three research pack-houses were assessed at the start of the Lean implementation period and after approximately 1 ½ years, using an instrument designed by Tapping et al (2002). The pre- and post-period measurement provided an opportunity to measure Lean progress and offered triangulation options with the Kobayashi criteria.

Reliability and validity for the survey approach were achieved using a questionnaire with a 5 point Likert scale, sample selection through industry body collaboration, and questionnaire design allowing convergence and discrimination, cross-referencing of questions and validating consistency.

Reliability for the action research and case study approach was addressed by using a semi-structured protocol (Yin 2003), using a single researcher for consistency, identification of themes and participant verification. Validity was addressed by using multiple sources of evidence, achieving 'recoverability' (Checkland and Holwell 1998), cross-case analysis, focus group review and comparison with known theory and empirical evidence.

Findings

Stakeholder survey:

The response rate to the survey was 25.39%. This response rate is considered excellent given the length of the questionnaire (Sheehan 2006) and the low response rate by industry stakeholders in earlier studies (Doevendans & Wilson 2011).

Kobayashi keys: 2012 Stakeholder survey versus research companies: Respondents to the survey applied little or none of the elements captured by the 20 Kobayashi keys with approximately 75% of all responses not or only sometimes implementing Kobayashi keys, indicating a low level of Leanness.

The research (i.e. the action research and case study) companies' Lean position at the end of 2013 was assessed using the same questionnaire as was used for the industry stakeholders in 2012. The research companies showed a significantly improved position in comparison with the wider industry in 2012 (Figure 1).

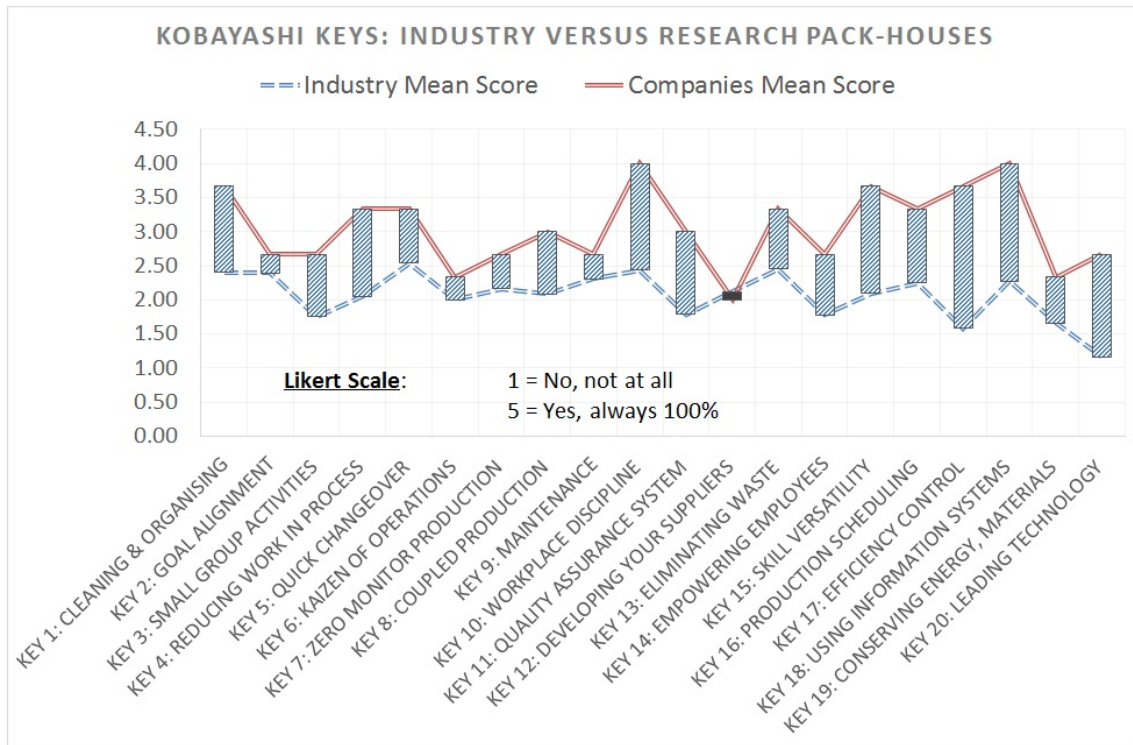


Figure 1: Kobayashi keys level of implementation - Industry versus research pack-houses

Lean principles, methods and tools: 2012 Stakeholder survey versus research pack-houses: There was little knowledge of Lean principles, methods and tools in general; more than half of all responses indicated that respondents did not know the principles, methods and tools presented. Only a small number of organisations indicated use of some of the tools or use with some form of regularity.

The same questionnaire was answered by the research pack-houses after approximately 1½ years of Lean field work in December 2013. Responses showed that the level of knowledge and use of Lean principles, methods and tools differed significantly from the 2012 industry stakeholder survey. Figure 2 shows the positioning of the research pack-houses in relation to the general industry.

Action Research and Case Study Pack-houses

One action research and two case study pack-houses were included in the study. One pack-house (CS-1) was interested in implementing Lean but had no resources available and was therefore selected as action research packhouse. The second pack-house (CS-2) had employed a manager with Lean experience and had sent several key staff to TQM/Lean introductory workshops. The third pack-house (CS-3) had employed a Lean consultant to assist with Lean implementation. These three different approaches offered triangulation opportunities. More than 40 researcher visits to the combined action research and case study pack-houses provided data.

Due to the space restrictions for this paper, the following section offers a summary of description, approach and method for each pack-house, followed by a summary table of successful Lean interventions, combining results of all three pack-houses.

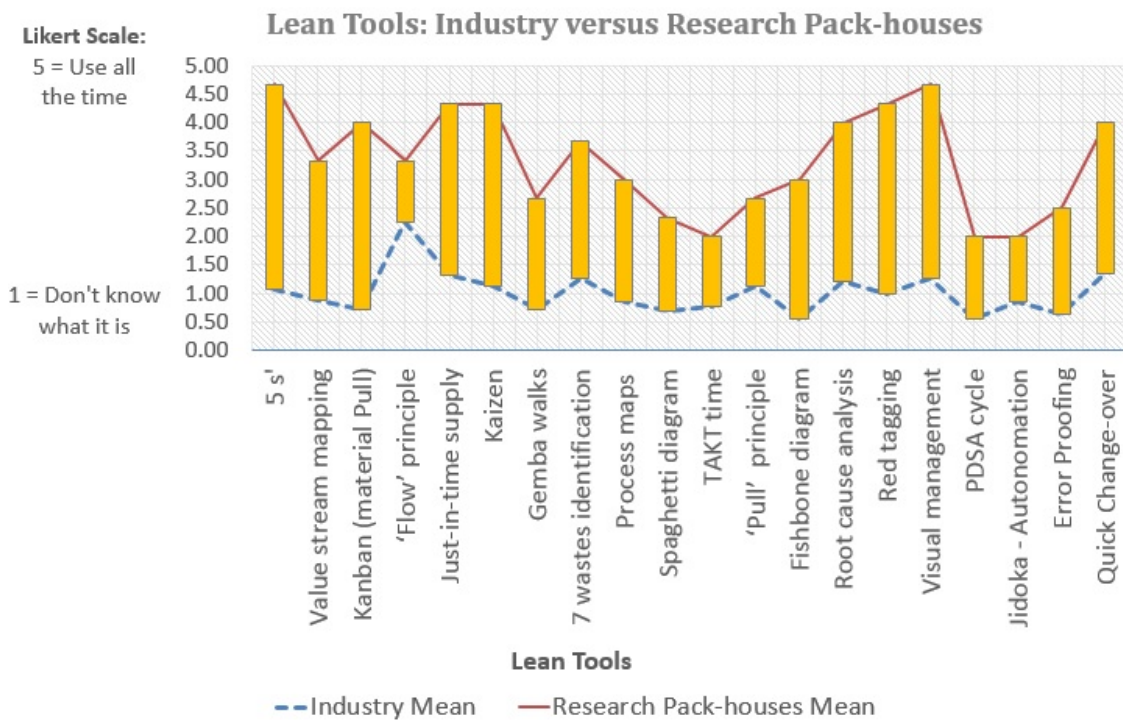
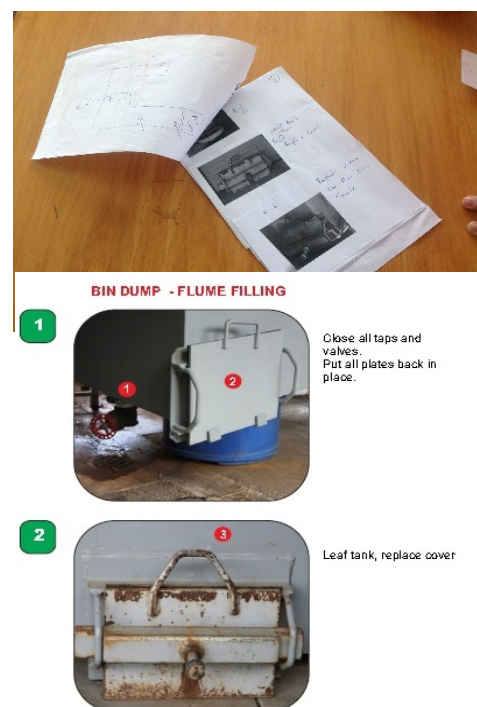


Figure 2: Lean tools knowledge and use: Industry versus research companies

CS-1 - Action research: Pack-house/cool-store (pack-house)

The CS-1 was medium size, with two shifts consisting of approximately 45 people of which most were seasonally employed from February to June. The few permanent employees have the knowledge and experience; they are called upon to resolve multiple issues that arise during the season and are generally absorbed by running the pack-house during the season. During approximately 20 visits to the action research pack-house the researcher attended several planning meetings with the manager and his team and partly educated the team on Lean elements. The team would then agree to implement a change and the findings would be discussed the next week.

On several occasions, the team had been too busy and nothing had been achieved or changed from the week before. As an example, the researcher discussed the usefulness of stand-up meetings, but the team was too busy to introduce these. On that occasion, the researcher arranged a visit for the company's supervisors to a reputedly Lean company to observe the concept of stand-up meetings. Within an hour, the attendants had observed three stand-up meetings and reflected -on returning- that stand-up meetings would be useful and subsequently implemented these without delay. The pack-house did achieve a number of results, mostly in the 5S area and in standardising procedures (figure 3).



**Figure 3: Developing an easy-to-use standard procedure
Top: Draft plan, Bottom: Final laminated procedure**

CS-2 – Case Study: Pack-house with Lean champion

The second pack-house was medium-to-large with two shifts of around 110 seasonal staff and 7 permanent staff. The pack-house manager was specifically employed because of his Lean experience in other industries. Similarly to CS-1, most staff were seasonal and employed from February to July. The manager drew up a dedicated Lean transformation programme, himself being the champion, supported by senior management. A number of basic elements were tabled by the champion with target dates for achievement. These included daily stand-up meetings, 5S split up in sequential target dates, Lean thinking, training, and visual management improvement. The champion reported after a period of approximately a year that staff started to think along the lines of continuous improvement to the point where they would simply effect the improvement and report afterwards.

A distinct culture change took place in the packhouse. A number of interviews showed that key staff were ‘picking up’ on Lean principles and taking pride in their achievements. At the end of 2013, significant changes had been made during the Lean implementation period. These included improvement of the packhouse lay-out, standardised 5S, leadership group meetings, the beginnings of total productive maintenance (figure 4), the formation of a skills matrix, standardising and various others.



Figure 4: Visual TPM planning. Yellow notes signify standard maintenance and purple notes signify improvements. Folded notes signify completed maintenance.

CS-3 - Case study: Pack-house with consultant

The third packhouse was older and operated two packing lines simultaneously. This packhouse too operated a day and night-shift but would immediately following the export season continue to pack for the domestic market with a small team. Consequently the ratio of seasonal staff versus permanent staff was lower than with the other research pack-houses.

The pack-house relied on the programme of the Lean consultant. The consultant visited once each month, each time for several days and combined ‘gemba walks’ with training sessions, education, tasks set to achieve before the next visit, before and after photos (figure 5) and value stream mapping exercises. The consultant provided reports after each visit, highlighting all individual observations, including celebrating the positive outcomes but also subtly expressing areas of concern.

After a period of significant adjustment, the pack-house staff began to understand how Lean worked and started developing improvements in many different areas throughout the operation. During interviews, staff indicated that a difficult but significant culture change was taking place. A typical example is that during an open day, the packhouse manager who traditionally would do presentations to visitors, had the day run by his supervisors, each taking the visitors through their own areas and explaining how they had implemented Lean and what the operational results were. Staff reported that the lead-in to the 2014 season was the least stressful start in many years because they felt far better prepared.



Figure 5: Regular updates on notice board, showing before and after photos

Table 1: Summary sample of Lean interventions in pack-houses

No.	Lean interventions
1.	The development of simple standardised procedures with pictures of each step during the 'off-season' reduced the number of questions and issues arising during the season.
2.	Creation of a pallet flow system with a free transfer lane and a lane for problem pallets ensured that problem pallets were immediately fixed before being stored or holding up the system.
3.	A change of machinery lay-out allowed the pack-house to pack multiple products simultaneously without bottle-necks.
4.	Development of a simple Velcro sealing kit for sealing coolstore doors instead of using disposable tape saved 30 minutes each time.
5.	After applying 5-S to a label store room, a Kanban system was introduced that made re-ordering simple and direct and reduced both issues and stress to a minimum.
6.	The introduction of daily stand-up meetings involving all key staff created direct and indirect spin-offs with everybody knowing the plan for the day.
7.	The creation of a maintenance schedule with operational and maintenance staff led to a very visual and flexible maintenance planning system differentiating between maintenance and improvement projects and ensured the execution of the plan.
8.	The introduction of weekly planning meetings with growers and exporters allowed the packhouse to reduce daily set-up times for individual packing runs by using information provided by growers (fruit size, colour, quality) and exporters (required packaging).

Lean assessment of research pack-houses at the start of Lean and at the end of 2013: Participating pack-houses had shown progress in relation to the wider industry, but a different measurement was required to quantify progress within the organisations with some form of accuracy. To this end, a Tapping et al (2002) Lean assessment was

completed at the start of Lean implementation and was compared with the same assessment at the end of 2013, after approximately 1 ½ year of Lean. The data show progress made in terms of lean criteria. Packhouse scores at the start of Lean and at the end of 2013 are shown in figure 6.

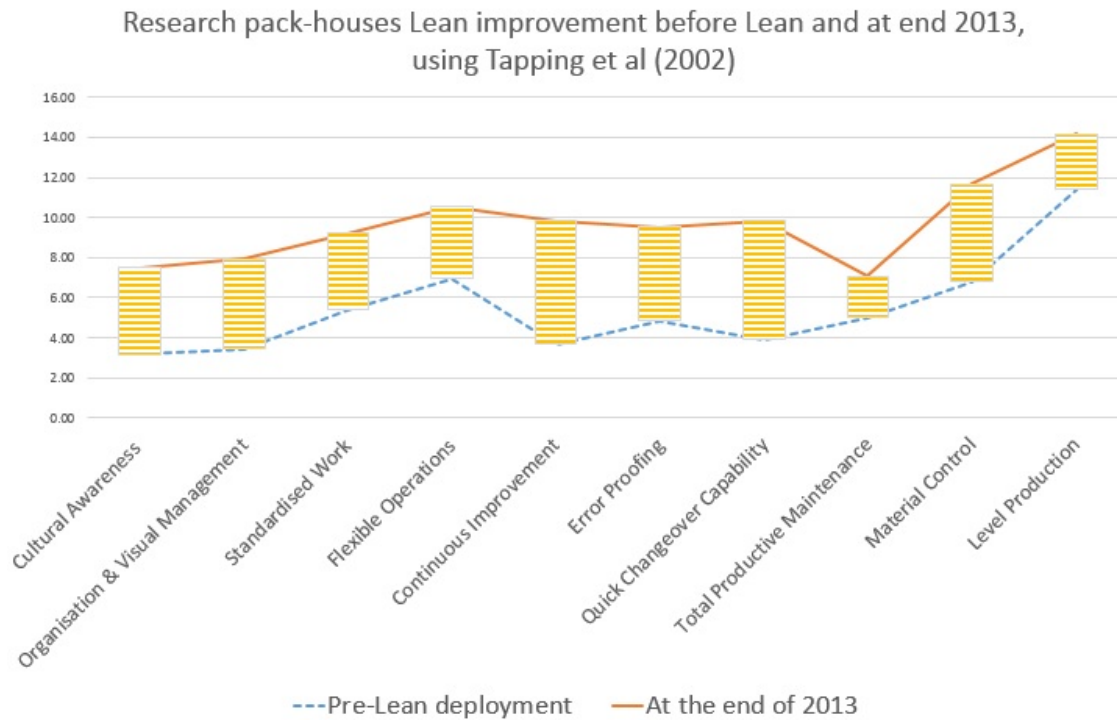


Figure 6: Lean assessment before starting lean and at the end of 2013 (Tapping et al 2002)

Financial indicators:

All three pack-houses provided basic financial data, based on traditional cost accounting, to help assess if progress had been made. Two pack-houses provided industry-typical ‘labour cost per bin packed’, which was determined unreliable by the researcher as the labour cost per bin was substantially dependent on the fruit characteristics in the bin and not on the skills of staff or systems deployed. One packhouse provided ‘labour cost per carton packed’ (figure 7), which was deemed a better indicator although not entirely accurate. All pack-houses were considering other indicators but none were deployed. Indirect financial indicators indicated a 110% reduction of rework costs, a 17% reduction of staff and a 32% increase in packing capacity.

During an open day in 2013, organised by Pipfruit NZ Inc. (the pipfruit industry’s governing body), the manager presented a graph (figure 7) of the labour cost to pack a carton which showed that the company had been reducing its cost in 2013 to levels not experienced since 2007. The general manager explained that he could not empirically attribute the lower cost to Lean but that Lean was the only change they had made; the transformation through Lean appeared to create financial results.

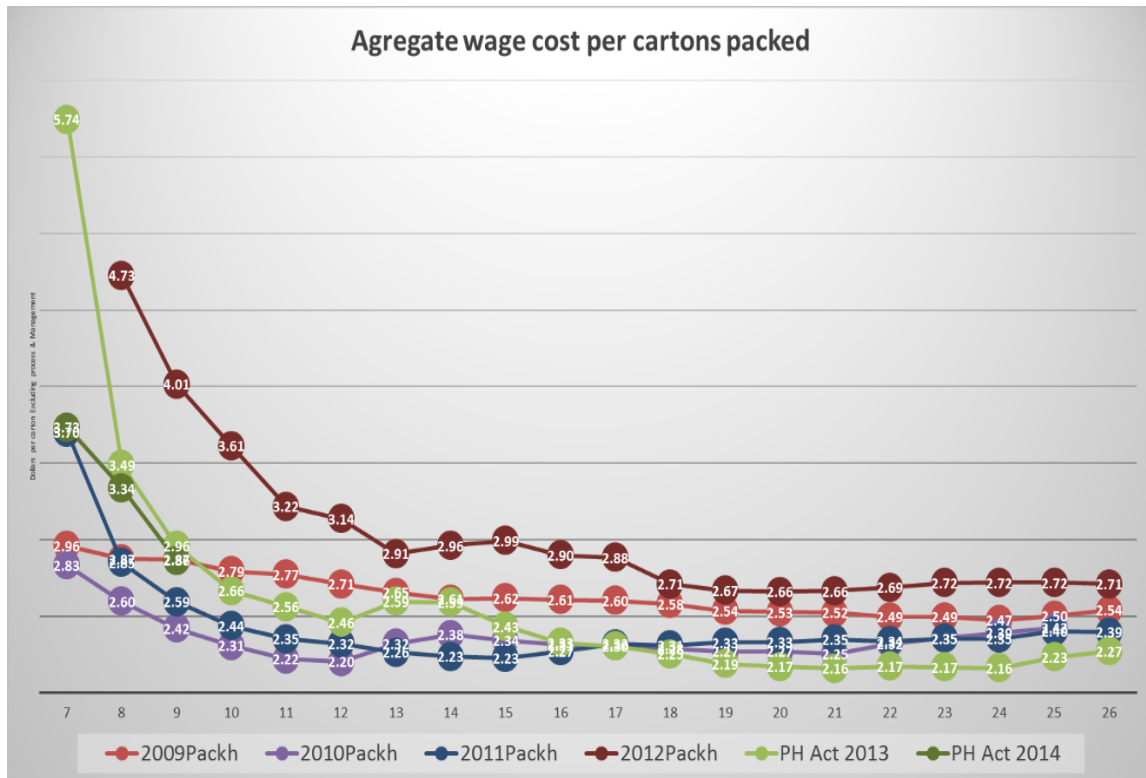


Figure 7: Labour costs per packed carton (Graph reproduced sic - as provided)

Discussion

This inquiry set out to understand the implementation of Lean in a horticultural setting, specifically to what degree Lean elements are applicable to, and currently used as an approach within the wider NZ pipfruit industry, and how well can Lean be implemented and adapted to pack-houses within the NZ pipfruit industry.

The inquiry’s survey was addressed to the wider industry and responses reflected representation of all industry elements which include growing, packing, storing and exporting, pointing to the incontrovertible conclusion that the industry as a whole is only marginally familiar with Lean.

There can be little doubt from the inquiry that the pack-houses that were engaged in Lean have made significant improvements since 2012, measured using Kobayashi (1995) and Tapping et al (2002) instruments. Similarly, measurement of tool knowledge and use and financial indicators indicate meaningful improvement across pack-houses. Common Lean methods and tools are therefore concluded to be applicable to pack-houses which are the element within the NZ pipfruit industry that closest resembles traditional manufacturing. This resemblance will help the transition to Lean. This being the case, it can be inferred that pipfruit pack-houses in general can make similar improvements to their operations. The research pack-houses did however show that a substantial culture adjustment is required before Lean implementation gains momentum and this cannot be underestimated. All three pack-houses had a Lean champion in either the researcher, the specialist manager or the consultant, and these appeared essential to gain momentum (e.g. Womack & Jones 2003).

Non-packing activities such as growing and exporting are not the specific object of this study but cannot entirely be precluded from the pack-house discussion because of

their interaction with the packing process. One intervention during the inquiry e.g. indicates that a dis-connect between growers, pack-houses and exporters is negatively affecting quick change-over. In an industry dominated by manual labour (Doevendans 2010), one could expect that more attention would be placed on the creation of flow and reduction of waste in the value stream. This points towards an opportunity to improve performance by organising stakeholders into a cohesive value chain.

This inquiry is restricted to pack-houses in the NZ pipfruit industry. It appears that there are no obvious reasons for similar results not to be achieved in other horticultural industry pack-houses.

Conclusion

The NZ pipfruit industry is technically innovative and internationally competitive (World Apple Review 2013) but stakeholders have relatively little knowledge of Lean thinking and this brings into question the resilience and robustness of operations within the industry. Lean is found to be applicable for pipfruit pack-houses and those that are engaging in Lean are making significant progress within their organisations, improving performance and validating future implementation of Lean.

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GRAND GLOBAL CHALLENGES IN
RELATION TO SUPERIOR AND SUSTAINED
ENTERPRISE PERFORMANCE & IMPACT

RICK EDGEMAN

Grand Global Challenges in Relation to Superior and Sustained Enterprise Performance & Impact

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ABSTRACT

PURPOSE: We are familiar with the news headlines: “*Humanity faces significant and perhaps unprecedented challenges of grand and global scales*”. Such headlines refer first to the consequences of complex challenges and second to the similarly complex roots from whence such challenges stem. In a cosmic version of the “chicken or the egg” issue, causes and consequences of these grand global challenges are often difficult to distinguish from one another, but such distinction is critical to derivation of solutions. *Sustainable Enterprise Excellence, Resilience & Robustness* (SEER2) is discussed in relation to multiple wicked challenges and their consequences, including ones related to climate change and human security.

APPROACH: Roots of grand global challenges and the present and future reality they portend are discussed in relation to key intersections with enterprise strategy, performance and impact.

FINDINGS: Social-ecological innovation, big & small data analytics and intelligence, and supply chain proficiency are identified as key drivers of enterprise response to grand global challenges. These are embedded in a larger, more holistic model for enterprise sustainability, resilience and robustness that emphasizes performance and impact.

PRACTICAL & SOCIAL IMPLICATIONS: Sound approaches to enterprise sustainability, resilience, and robustness that emphasize performance and impact have the potential to aid progress toward a more sustainable future for the enterprise and humanity alike.

ORIGINALITY: The presented model for leverages key business excellence thinking to advance strategic and tactical approaches not only to enterprise excellence, but also to sustainability, resilience and robustness. As such the model is distinctly performance oriented. Performance alone is not sufficient however, so that impact – especially on society and the natural environment – is also deeply embedded.

KEY WORDS & PHRASES: Biomimetic Design, Impact and Performance Assessment, Resilience, Robustness, Social-Ecological Innovation, Sustainability, Wicked Challenges.

Introduction

We live in the *Anthropocene Age*, one with many grand global challenges, perhaps chief among which are wicked sustainability ones associated with human influences. Wicked challenges (Churchman, 1967) are complex, interrelated, and not easily solved. Wicked challenges: (Batie, 2008; Waddock, 2012):

- Are intractable and difficult to define.
- Are multi-causal and possess complex interdependencies.
- Generate conflicting stakeholder perspectives that may be driven by strong ethical, moral, political and social dimensions.
- Sit astride ecological, society, enterprise, and other boundaries.
- Are associated with chronic policy failure.
- Demand complex judgment in the face of urgent, high-stakes resolution when no clear solutions are available.
- “Solutions” yield unforeseen challenges that are neither right nor wrong, only better, worse, or “good enough”, thus and implemented solution alters the challenge.

Wicked sustainability challenges include climate change in relation to increased atmospheric presence of CO₂ and methane; consequent global warming and increasing intensity and incidence rates of extreme weather events, drought, and desertification; food availability and distribution; water pollution, air pollution, and soil contamination; and the connection of these to disease, violence, and terrorism. Wicked challenges are discussed in relation to enterprise excellence, sustainability, resilience and robustness (SEER2) as is the value of SEER2 and selected of its enablers in solving selected wicked challenges.

Due to complex interactions, causes and consequences of these grand global challenges are often difficult to distinguish from one another, but such distinction is critical to derivation of solutions. Further, the multi-faceted, inter-and-transdisciplinary nature of most wicked challenges creates the solution-related dilemma that solutions derived via discipline-constrained scientific approaches are typically inadequate (Brown et al, 2010) – primarily because those solutions have been filtered through a specific disciplinary paradigms, rather than through an intrinsically more valuable unification of paradigms. As such, policy that is created to address wicked challenges has ordinarily been filtered through singular or perhaps a limited number of disciplinary lenses and is hence subject to chronic, almost inevitable failure (Funtowicz & Ravetz, 1993). An obvious implication of this situation is that inter-and-transdisciplinary cooperation, collaboration, and co-creation are likely to provide more effective means of combating wicked challenges than are approaches limited to a single or small selection of disciplines.

Herein we focus on enterprise contributions to (partial) solutions to wicked sustainability challenges. The motivation behind this focus is the enormous influence of enterprises: of the world’s largest 100 economies, more than half are enterprises – not nations (Smith, 2013). Indeed, through use – and some times abuse – of resources, enterprises have contributed in massive ways to the creation of wicked challenges, but equally, have both the obligations and privilege of contributing to their solution.

Given the importance of enterprises both to the creation of and solution to wicked sustainability challenges it is in our collective best interest to derive and apply approaches that improve enterprise performance and impact that spans the people, planet, and profit triple bottom line sustainability domains (Elkington, 1997). A model and assessment regime referred to as SEER2 (*Sustainable Enterprise Excellence, Resilience and Robustness*) that examines enterprise strategy, actions, performance and impact from a more comprehensive 360° perspective is briefly discussed. SEER2 incorporates strategy, governance, processes, human ecology, supply chain, innovation, and big data analytics & intelligence elements among others as part of this perspective. While SEER2 is intended for use in enterprises of any

size and sort: public and private, manufacturing and service, local or multinational – it has the potential of being especially effective for larger enterprises that are inherently more inter-and-transdisciplinary, yielding almost by default a multiplicative or composite effect.

Sustainable Enterprise Excellence, Resilience and Robustness: SEER2

To a very large degree, sustainable enterprise excellence (Edgeman & Eskildsen, 2014a) or SEE results as a strategic melding of movements. The first of these is the enterprise excellence movement that is ordinarily associated with international quality awards such as America's Baldrige National Quality Award and the European Quality Award (Bou-Llusar et al, 2009). The second movement is associated with sustainability, models of and measures for which include the United Nations Global Compact and Global Reporting Initiative (Lim & Tsutsui, 2012), and environmental and corporate social responsibility standards such as ISO 14001 (King et al, 2005) and ISO 26000 (Helms et al, 2012), respectively.

While SEE is itself highly desirable, SEER2 derives from an extension that acknowledges both the synergies of resilience and robustness with SEE, as well as the reality that they are not wholly congruent since they are not entirely synonymous. Numerous studies documenting affirmative relationships between social, environmental, and financial performance provide the motivation behind melding of sustainability and enterprise excellence, with other studies supporting addition to resilience and robustness to this blend (e.g. Al-Najjar & Anfimiadou, 2012; Boons & Wagner, 2009; Guenster et al, 2011).

Sustainable enterprise excellence, resilience and robustness (Edgeman & Williams, 2014) can be characterized as a comprehensive summarization of desirable organizational goals and objectives, that is, the enterprise is:

- *Sustainable* to the extent that it is able to create and maintain economic, ecological, and social value for itself, its stakeholders, society at large, and hence policy makers.
- *Resilient* to the extent that it possesses capacity to self-renew through innovation by adapting its responses to negative shocks and challenges over time (Contu, 2002; Reinmoeller & Van Baardwijk, 2005).
- *Robust* to the degree that the enterprise is resistant or immune to a critical subset of such shocks and challenges.
- *Excellent* when its governance (Edgeman, 2013a; Elkington, 2006), leadership and strategy, as deployed through people, processes, partnerships and policies deliver superior performance and impact in specified areas (Kaplan & Norton, 1992). Enterprise human ecology (Lozano, 2011), innovation (Nidumolu et al, 2009), financial (Surroca et al, 2010), social-ecological, data analytics and intelligence (Kiron & Shockley, 2011; McAfee & Brynjolfsson, 2012), and supply chain management (Closs et al, 2011) are among interrelated areas commonly considered as performance and impact enablers.

With the exception of enterprise human ecology, these areas are largely familiar so that we here identify human ecology as the set of relationships between and among the enterprise and its human capital with its supply chain and extended social, natural and built environments including competitive, cooperative, collaborative, and co-creative relationship among individuals and entities within and across enterprise boundaries.

Innovation is regarded as the linchpin element in SEER2 – an enabler upon which enterprise ambition regarding SEER2 can rise and fall. SEER2 values innovation in general while placing particular emphasis on social-ecological innovation (SEI) that results from strategic embedding of innovation for sustainability in an enterprise culture of sustainable innovation. A culture in which *sustainable innovation*

thrives is one where innovation is regular, rigorous, systematic, systemic (Edgeman & Eskildsen, 2014b), and central to enterprise strategy in ways that contribute to economic performance (Knott, 2003). *Innovation for sustainability* implies that the enterprise is persistent in its pursuit of innovation aimed at social and environmental good (Olsson & Galaz, 2011). When such innovation has exclusively ecological targets it may be referred to as eco-innovation (Pujari, 2004) and whether eco-innovation or social-ecological innovation, the natural alliance of these with a broader corporate social responsibility (CSR) agenda is clear (Kolk & Pinske, 2004; Kolk & Van Tulder, 2010; Porter & Kramer, 2006). The combination of these provides a medium for translating triple top line strategy emphasizing social equity, ecological responsibility, and economic wisdom (McDonough & Braungart, 2002) into people, planet, and profit triple bottom line performance and impact so that SEI is a form of ecopreneurship (Dixon, 2007). As such, it is readily evident that SEI has the potential to simultaneously contribute to enterprise pursuit of SEER2 and to the fight against wicked sustainability challenges (Geels et al, 2008). Equally, specific SEI strategies, processes, and performance may contribute more to institutional, regional, national, or transnational sustainable development efforts (Hall & Vredenburg, 2012).

Defining SEE or SEER2 is a much needed but insufficient step toward their attainment. Whether generically or contextually, subsequent steps involve development of a relevant model, identification of key performance indicators for all primary model elements, means of assessing maturity of enterprise performance for those indicators, and a reporting mechanism that presents both feedback and foresight in an easily understood and easily communicated format. In all, these are the usual elements of enterprise self-assessment. Self-assessment aims to provide an accurate representation of recent enterprise performance, and in the process to extract intelligence leading to identification and implementation of best and next best practices and sources of competitive advantage. Such approaches have been pursued for both SEE (Edgeman & Eskildsen, 2014a) and SEER2 (Edgeman & Williams, 2014), as well as for social-ecological innovation. In all cases the self-assessment approach taken is one that applies springboard technology that restricts the number of criteria assessed and that yields a combined graphic and narrative report that are assembled in a performance dashboard format (Evans & Lindner, 2012; Spreitzer & Porath, 2012).

Grand Global Challenges or Wicked Challenges?

Challenges: are they grand global challenges or wicked challenges? The answer is that these are largely synonymous with the selected language determined by perspective. Referring to such challenges as “*grand*” focuses on their size and scope, whereas “*wicked*” refers to their complexity and troubling nature. Regardless of the characterization of such challenges, enterprises have in many cases contributed to their creation and, equally, must be also contribute to their solution.

That pursuit of SEER2 will contribute to such solutions requires conscious alignment, or at least congruence of the goals and objectives of SEER2 with sustainability related challenges. Alignment is more easily accomplished if the enablers of SEER2 can be exercised in ways that simultaneously advance SEER2 while slowing, muting, or reversing the relentless march of the consequences of wicked (sustainability) challenges. It is with this perspective that synergies of SEER2 enablers with solution to wicked sustainability challenges are explored. Among those enablers attention will be directed to hard, soft and blended enablers: supply chain proficiency, (big) data analytics and intelligence, general and social-ecological innovation, governance and strategy, and human ecology. Similarly, wicked sustainability challenges are numerous and highly interrelated, so that only a few such challenges are used as exemplars: climate change, water security, food security, and human security.

Understanding human interaction with natural environment can clarify avenues for managing increasingly interconnected global systems. As an example, design and innovation of irrigation systems has been stimulated by drought and water scarcity, but drought and water scarcity have also endangered cultures

(Strauss, 2012) or, more extremely, brought about social collapse (Costanza et al, 2007). As a specific case in point that provides a contemporary illustration of political dimension of wicked challenges in that Israel, a naturally arid nation, has through massive innovation of water desalinization, waste water treatment, and irrigation technology systems quite literally made the desert bloom – and has offered this technology to its water deprived neighbors – Egypt, Jordan and Palestine – only to have their offers rejected as attempts at colonization (Tal, 2013). A dozen wicked environmental challenges we face today that future societies will also face and that have led to the collapse of historical societies (Diamond, 2005) include the following:

- Habitat and ecosystem services losses (Pejchar & Mooney, 2009);
- Biodiversity loss (Sharman & Mlambo, 2012);
- Soil erosion, degradation and contamination (Gnacadjia, 2013);
- Photosynthetic capacity limitations (LePoire, 2014);
- Alien and invasive species introductions (Pejchar & Mooney, 2009);
- Freshwater limits (Bakker, 2012);
- Overfishing (Khan & Neis, 2010);
- Energy limitations (Koomey, 2012);
- Human consumption levels (Moser et al, 2012);
- Toxic chemicals (Allen, 2013);
- Population growth (Head, 2008); and
- Climate change (Koomey, 2012).

These and other wicked sustainability challenges ordinarily fall into one or more of three broad, inter-connected categories: energy supply (Turnpenny et al, 2009), climate change, and global food security (Hammond & Dubé, 2012), with each of these are being combated in diverse ways by myriad companies. Other wicked challenges that have been linked to climate change include deforestation (Gough, 2013), human security, plague (Strauss, 2012), violent conflict (Barnett & Adger, 2007), terrorism (Sheffi, 2001), bio-terrorism (Velusamy et al, 2012), and – less directly via intervening variables – cyber terrorism (Clark and Hakim, 2014). In light of such wicked sustainability challenges it is surprising to many experts that there is a contemporary absence of international armed conflict over water (Dunn, 2013) with such wars thus far waged politically instead.

SEER2-Congruent Responses to Wicked Energy and Related Sustainability Challenges

Selected known enablers of SEER2 also provide useful means of addressing wicked sustainability challenges so that synergistic effects are possible. Extensive discussion of these enablers in relation to SEE and SEER2 can be found in the literature (Edgeman, 2013a; Edgeman, 2013b; Edgeman & Eskildsen, 2014a; Edgeman & Eskildsen, 2014b; Edgeman & Williams, 2014). As such, illustration of the consistency of SEER2 with wicked sustainability challenges will be accomplished by centering discussion around examination of selected SEER2 enablers with varied interconnected wicked sustainability challenges with primary focus on energy supply and distribution limitations. The most obvious enabler – enterprise human ecology – is ignored precisely because its relation to wicked sustainability challenges is so obvious (Jackson et al, 2011; Wagner, 2013).

Social-Ecological and Biomimetic Innovation in Relation to Energy and Other Wicked Challenges

Energy limitations are being addressed by various means, including exploration and cultivation of alternative and renewable energy sources. These include wind power, hydroelectric, and solar energy by companies such as Vestas Wind Power and Siemens. It is of value to note that energy limitation is related to other of the wicked environmental challenges cited by Diamond that include population growth, excess

consumption, and generation of greenhouse gases such as methane and carbon dioxide so that in addressing energy limitations also affects other wicked challenges. Carbon dioxide contributes to climate change that is by the end of this century expected to move the earth to a temperature that is on average 4°C warmer than in pre-industrial times – a temperature increase that is associated with decreased polar and glacial ice cover, rising sea levels that threaten coastline, increasing ocean acidification, increased frequency and intensity of extreme weather events, drought, desertification, water scarcity and security (Bakker, 2012; Beddington, 2013), food insecurity (Parfitt et al, 2010), and other devastating consequences (New et al, 2011) and in response enterprises have developed a wide variety of carbon strategies (Lee, 2012). This complex network of wicked sustainability challenges illustrates the value of pursuing inter-and-transdisciplinary solutions (McGregor, 2013).

Innovation is a critical success factor in many of these efforts and designs that prosper in nature often provide innovative suggestions for such human-created challenges. The process of developing designs adapted from nature is referred to as biomimicry. The material things we design and develop are in some sense prosthetic extensions of the human condition that are inseparable from the natural world from which biomimetic inspiration is drawn. Biomimetic and photosynthetic hydrogen production provides such an example (Allakhverdiev, 2012) in the case of energy creation. Biomimetic buildings provide another example of innovation that is (often) aimed at reducing energy consumption, minimizing CO₂ generation, and minimizing infrastructure demand and urban sprawl. Example biomimetic building strategies include the use of thermo-chromatic tile that functions like an organic skin to regulate temperature, along with use of curved, smart, solar-controlled glass that changes density in response to temperature and weather changes to regulate light transmission (Talasek, 2013). In light of continuing world urbanization, numerous efforts are underway around the globe to create smart and sustainable cities that make use of biomimetic buildings, innovative water use and sanitation, smart energy grids, and other innovation technologies and strategies (Zygiaris, 2013). In further relation to this, global networking of smart and sustainable cities is on the horizon, in order to improve knowledge sharing around common challenges, along with subsequent solution development and implementation (Tranos & Gertner, 2012).

Innovations of these cited sorts provide examples of social-ecological innovations, most of which are technological innovations. “Technology is neither good nor bad; nor is it neutral ... technology’s interaction with the social ecology is such that technical developments frequently have environmental, social, and human consequences that go far beyond the immediate purposes of the technical devices and practices themselves” (Kranzberg, 1986: p. 545).

Of course, such technology may involve high-investment research and development and at least in some cases may not contribute to the financial bottom line to the same extent as a lower cost, less innovative and – also – less efficient technology and in such cases enterprises must determine the degree to which they are willing to sacrifice financial profits in exchange for gain in social and environmental realms (Reinhardt & Stavins, 2010).

A Snapshot of Supply Chains in Relations to Wicked Sustainability Challenges

Extending our biomimetic theme in an “innovation meets the supply chain” manner, protein biosynthesis is a fundamental supply chain present in every organism and recent research has extracted four key supply chain strategies that may be adapted from protein biosynthesis to improve the efficiency and effectiveness of enterprise supply chains to deliver, e.g., reduced transportation demands, reduced energy consumption, reduced carbon dioxide emissions, and hence smaller eco-footprint (Sivakumar et al, 2012). Other intersections of supply chain proficiency with wicked challenges include minimization of waste within food supply chains (Parfitt et al, 2010), limiting greenhouse gas emissions (Chonnikarn & Toffel, 2013), and knowledge-sharing across the supply chain leading to significant innovation.

Similarly derivation of approaches intended to mitigate supply chain vulnerability to international terrorism (Sheffi, 2001) are being hotly pursued, with an impressive example provided by the United States Navy, which has piloted technology capable of converting sea water into liquid hydrocarbon fuel – a game-changing development because it significantly shortens the fuel supply chain – a weak link that makes any military force more vulnerable (Rabechault, 2014). While this social-ecological innovation is critical to a naval force, it holds equal commercial promise and has clear carbon emissions reduction implications, while also hinting at the possibility of future development of sea colonies of long-term habitability.

Ultimately, the effectiveness of such approaches will rely to an extent on mindful consumption by consumers (Sheth et al, 2011), as will market growth and ecosystems complexity (Pogutz et al, 2013). This of course adds to strategies, actions, and achievements at the enterprise, supply chain, institutional, governmental, and inter-governmental levels (Faaij et al, 2013), with enterprise level innovation playing a particularly vital role (Pinske & Kolk, 2010; Rodima-Taylor et al, 2011). Similarly, supply chain impact on climate change is now well-established (Carter & Easton, 2011) so that green supply chain management and optimization has an important part to play both in terms of enterprise progress toward SEER2 and with respect to climate change and related wicked challenges (Darnall et al, 2008).

Big Data Analytics & Intelligence

On one hand, the *age of the anthropocene* refers to human impact on or even creation of daunting societal and environmental challenges such as those previously discussed. On the other hand, the *age of big data*”, addresses the inexorable march of information technology able to store massive quantities of information of increasing variety and complexity derived from various sources and to process that information at increasing velocity. Motivation for doing so includes revelation and extraction of actionable, high value, high impact intelligence and to operationalize that intelligence with more precise timing. That big data analytics and intelligence can advance enterprise progress toward SEER2 is undeniable (Edgeman, 2013b), but sophisticated data analytic capabilities can also enable progress toward solving wicked sustainability and human security challenges and is doing so. Examples include direct application of fish retrovirus discovery with human health implications (Marx, 2013), enhancing environmental sustainability (Malhotra et al, 2013; Melville, 2010), crowd-sourcing of ecological big data in an effort to confront climate change and better predict extreme weather events (Hampton et al, 2013), predicting deadly infections and more timely intervention (Mayer-Schonberger & Cukier, 2013), transitioning from disease prevention strategies to well-being strategies (Chen et al, 2012), advancement of United Nations Sustainable Development Goals including water security (Griggs et al, 2013), agro-terrorism detection (Rohn & Erez, 2013), improving the psychological strength of military personnel in ways that may aid peace-keeping efforts (Vie et al, 2013), counter-terrorism (Wijaya, 2011), and smart city development (Van der Zee & Scholten, 2014).

Summary and Conclusions

Wicked challenges are upon us and, indeed, rather than arising naturally many of them are of our own making. Wicked challenges are typically of high complexity; span social, environmental, and economic boundaries; are driven by conflicting moral, ethical, social and political dimensions; and are subject to chronic policy failure. Enterprises contribute to such challenges and it is reasonable to demand they should also contribute to their solutions.

Synergies between the goals of sustainable enterprise excellence, resilience and robustness (SEER2) and solutions to wicked sustainability and related challenges are many so that enablers of SEER2 also provide means of attacking such challenges. In particular general, social-ecological, and biomimetic innovation; supply chain proficiency; and (big) data analytics and intelligence are simultaneously able to advance

enterprise progress toward SEER2 and enterprise contribution to solution of wicked sustainability challenges. While not discussed in detail, other enablers of SEER2 having similar potential include enterprise governance and human ecology. Energy supply and distribution and related challenges were used to illustrate these principles.

The clear implication of this work, then, is that enterprises pursuing SEER2 do so not only to their own benefit, but to the benefit of society and the natural environment and as a consequence also combat wicked challenges. Organizations collectively consume and generate enormous resources and a critical mass of organizations working together toward the common aim of solving wicked sustainability challenges have the potential to transform the world.

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0060

WEB-BASED STRATEGY FOR TECHNOLOGY ASSESSMENT

ELAN SASSON, GILAD RAVID, IRAD BEN-GAL

Title:

Web-based Strategy for Technology Assessment

Keywords:

Technology Assessment, Information Extraction, Co-word Analysis, Temporal Trend Detection, Web mining.

Abstract:**Purpose (mandatory):**

Companies heavily dependent on technological innovation must constantly engage in technology assessment processes (TAS) upon considering investments in new emerging technologies or evaluating the impact of existing technologies on the business landscape. The ability of decision makers to foresee technological advances and to assess new and current technologies is essential for anticipating future developments, understanding market position vis-a-vis the competition, identifying upcoming innovations, as well as applying these insights to strategic business planning. Considering the increasing complexity of the decision making process and the speed of technological change and its economic impact, the need for information support, whether the information is from formal and informal sources or from sources internal and external to the organization, is becoming a critical success factor in the competitive global market. With the advent of the web as an immense information space with diverse and often unstructured and non-standardized content formats, every decision maker turns to search engines when he or she is engaged in TAS process of a domain under exploration. However, relying on web search engines as a conceivable and major method in search of information needed to accomplish a TAS mission raises three concerns. First, without either information skills or a roadmap of what to look for, most people don't know how to ask for what they are seeking. Second search result pages returned by search engines for a specific query include vast of information to sort out, read and integrate, so professionals are inundated with too much information, and very few tools to help them handle the flood. Third, there is really no metric we can use to compare the value of a 'good' search to a 'bad' one given that relevance measurement is crucial to web search and to information retrieval (IR) in general. Against this background emerges the following research question: how does one extract knowledge essential to technology assessment from a diverse corpus of textual data on the web?

Design/methodology/approach (mandatory):

This study aims to address the TAS challenge by developing a knowledge-mapping research model and an automated research instrument for demonstrating and validating the technology assessment knowledge (TASK) mapping research model. The TAS approach in this work begins by amassing a corpus of unstructured textual data about a specific technology from diverse sources using the Google Alert (GA) content change detection and notification service. Then, to uncover hidden patterns in the corpus and generate a conventional concept map (co-occurrence network), information extraction (IE) is applied to the corpus using a text mining (TM) technique based on natural language processing (NLP), followed by co-word analysis. However, the generated concept map provides almost no validated knowledge regarding concept relatedness. To overcome this deficiency, the initial map is then further processed in this work into a *knowledge map* and improved by two novel consecutive phases: relatedness proximity measurement and pair-wise temporal analysis, respectively depicting the extent to which concept pairs on the map are *contextually* related and *temporally* linked. The first phase of adding knowledge to concept maps draws upon webometrics, meaning the use of web-based bibliometric indicators (e.g., search queries and publication counts) to measure relatedness proximity and discover to which degree the concepts on the map are contextually related. This step is particularly useful for amplifying silent information (e.g., tacit data) and reducing noisy information (e.g., outlier data). The second phase of adding knowledge to the concept map draws upon emerging trend detection, meaning the use of objective quantitative temporal operators to conduct pair-wise-temporal analysis and discover how temporally linked are the concepts on the map. These temporal operators are used to determine concept categorization based on the time dimension, differentiating

between *co-occurring hot concepts* on the one hand and *co-occurring emerging concepts* on the other hand.

The transformative process of combining relatedness proximity measurement and pair-wise temporal analysis yields a knowledge map which is more understandable, accurate and augmented compared to the conventional concept map.

Findings (mandatory):

Given the importance of Information Technology (IT) assessment in a wide range of relevant fields, the proposed research model demonstration and validation in this work are correlated to several fundamental IT domains, such as Cloud Computing, Business Process Management (BPM), Service-Oriented Architectures (SOA), and Semantic Web. The datasets used for building the time-tagged corpus were created using Google Alerts (GA) collected throughout 190 days. The validation instrument used to validate relatedness proximity and the pair-wise temporal analyses was implemented as a targeted web-survey which was globally distributed among IT professionals, consultants and scholars. The computed relatedness proximity measurement was found to be highly correlated with expert subjective ratings ($n = 136$): $r = 0.91$ to 0.98 . Also, high inter-rater reliability scores were found based on Intraclass Correlation Coefficient (ICC) = 0.92 to 0.94 . In addition, the Fleiss Kappa reliability of agreement value was above 0.698 for each of the ITs applied in comparing the pair-wise temporal analysis detection of co-occurring hot concepts to expert ratings, indicating significant agreement, while the average predictive validity value was above 85% . The research instrument used to implement the knowledge-mapping research model was found valuable in assisting decision makers in assessing emerging and existing ITs, and the promising results indicate that it is also applicable to other domains.

Research limitations/implications (if applicable):

Write here...

Practical implications (if applicable):

Write here...

Social implications (if applicable):

Write here...

Originality/value (mandatory):

This study makes novel theoretical and practical contributions. From the theoretical perspective, it presents the development of an innovative algorithmic model for upgrading conventional concept maps of specific technologies to *knowledge maps*. From the practical perspective, this study presents an automated research instrument capable of supporting decision makers engaged in TAS, and in helping gain a clear picture of the knowledge about specific technologies and identifying future technological trends when evaluating technology alternatives. The model contribution is emphasized by the current growing attention to the big data phenomenon.

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DEVELOPING A NEUROPSYCHOLOGICAL MEASUREMENT TO CAPTURE WORKPLACE LEARNING

YVONNE LAGROSEN, FRED TRAVIS

Developing a neuropsychological measurement to capture workplace learning

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Associate Professor Yvonne Lagrosen holds a Ph.D. in quality management from Chalmers University of Technology. Her main research interests are organizational learning and quality management with relations to health and fitness, performance, values/core values, and brain functioning. She has a wide range of publications in those areas.

Professor Fred Travis received his Masters and PhD in Psychology. He had a two-year post-doctoral position at UC. Davis and the VA Medical Center in Martinez, CA with Dr. Irwin Feinberg exploring brain changes during sleep. He has authored 52 papers that investigate the relation between brain patterns, performance, conscious processes, states of consciousness and meditation practice.

Abstract

Purpose

The purpose of the paper is to develop a measurement instrument which measures workplace learning and reflects the connections between quality, learning and brain functioning.

Design/ Approach/ Methodology

A literature review is conducted, investigating measures of workplace learning as well as the connections between brain functioning and management. Further studies will use the Brain Integration Scale, whether the brain functions in isolated units or as an integrated whole, calculated from brain waves measured during two reaction-time tasks, to compare levels of brain integration with measures of quality and learning.

Findings

The dimensions “empathy”, “integrity”, “presence and communication”, “influence”, “development”, “being informed”, “work-integrated learning” and “flow” were found to be relevant from the literature review to be tested for inclusion in the measurement instrument. Other measures which has shown to be correlated with high brain integration could be included as well.

Practical implication

High organisational change requires continuous flexibility of leaders and co-workers, which can lead to poor health. The proposed measurement instrument can be used by managers to gain insight into underlying mechanisms in the organisational culture that influence employees' learning and potential for development. It could be used as a first step for improvements "to break the ice".

Originality/value

Traditional ways of measuring working environment are rarely connected to brain functioning of the employees. Only requiring small resources, this approach adds to an understanding of underlying mechanisms

Keywords: Measurement instrument, Workplace learning, Work-environment, Quality Management, Core values, Brain functioning, Brain Integration Scale

Literature Review

Introduction and purpose

Quality Management can be viewed as consisting of different levels of profundity (Lagrosen and Lagrosen (2003). A large body of research has identified quality management values, keystones or principles that determine the usefulness and success of the models and tools of quality management (Oakland, 2001, Lagrosen and Lagrosen, 2005). Thus, these values are often seen as the basis of quality management.

However, quality management values are themselves based on core values such as trust, justice and honesty that have been described in other social science disciplines. In addition, it has been argued that core values determine to a large extent the authenticity of quality management values.

A recent paper argues that core values are based on the quality of brain functioning (Lagrosen et al., 2012b). Our ongoing experiences enhance or reduce connections between brain cells/the synapses. Thus, the organisation-experience is shaping the brain circuits and in turn the core values of its members through the work environment. An instrument based on all levels of quality management—quality values, core values, and brain functioning—could help to assess the quality of the work environment and guide constant improvement of any organisation. This is relevant since many instruments have problems such as inability to capture what is really going on in the organisation (Elg, 2007). Typical situations in which performance measurement is used are:

- (1) To Continuous follow up in managerial work or serve as an attention-getter (Elg, 2007)
- (2) In development/improvement work for e.g. problem solving (Fundin and Elg, 2006)

In today's rapid changing society work-related learning by employees is increasing in importance for retaining a productive workforce and for the employees themselves in retaining their employability (Gijbels et al., 2012). When organisations change, employees are challenged to learn continuously through both formal and informal means (Marsick and Volpe, 1999). Therefore, more knowledge about how to enhance such learning is needed (ibid.).

The overall purpose of this research is to develop a validated questionnaire (our measurement instrument) that measures workplace learning and reflects the contributions of

quality values, core values, and brain functioning. The first step in this endeavour is a literature review. Workplace learning is intended to be measured through the employees' perceptions of their work- environment.

The paper is structured as follows. First, the importance of an integrated brain functioning for quality of perception and performance is discussed. Then, relevant theories and literature in the field of work-environment and workplace learning are presented. After this, organisational learning and its connection with quality management is discussed. The literature review is used to connect workplace learning with brain functioning and how to measure workplace learning. In the discussion section relevant dimensions to include to test for validity in our measurement instrument are presented.

Brain functioning and performance

Brain functioning underlies our thinking, speech, and action. We see the world; we evaluate our experience; we respond to the world through brain functioning. The quality of our brain connections determines the quality of perception.

Different parts of the brain carry out different tasks. Research suggests that the integrated functioning of the entire brain is the key to success in all areas of life. Successful performance rests on integrated brain functioning. If your brain is functioning in a fragmented way then you only see differences. If your brain is functioning in an integrated way the information from any one brain area is available to all brain areas. Then you will see the bigger picture that connects the parts.

The level of brain integration has been operationalized by a Brain Integration Scale created from three EEG measures calculated during complex reaction-time tasks. Scores on this scale correlate positively with higher emotional stability, greater moral reasoning, more openness to experience, and lower anxiety in a group of long term meditating subjects. Higher scores on the Brain Integration Scale are also reported in top performing athletes, managers and musicians (Travis et al., 2011, Harung et al.,2011, Harung et al., 2009). A recent study reported significant correlation between higher scores on the Brain Integration Scale, faster speed of processing in an event-related potential task, faster conflict-resolution during the Stroop task, higher moral reasoning, higher manageability in Antonovsky's Sense of Coherence instrument and flexibility and originality in figural and verbal creativity tests (Travis and Lagrosen, 2014).

Learning environment

The potential for learning in work depend much on whether the workplace is designed for learning. Two types of learning environments have been identified, enabling or constraining, depending on how conditions and practices are manifested (Ellström et al., 2007). In practice most learning environments are of a mixed type (ibid.). Also, the learning environment are built on both structural and subjective aspects (ibid.). The subjective aspects refer to how the structural aspects are experienced, understood and evaluated including motivation. Individual learning readiness (Ellström, 2001) can be viewed as a complementary to organisational readiness for learning (Ellström et al., 2007). From theoretical and empirical research six indicators have been suggested that enable or constrain the learning environment; task orientation, perceived work content, planning and organisation of work, leadership and managerial work, and organisational and individual readiness for work (Ellström, 2001; Ellström et al., 2007)

Work environment has been related to creativity and implementation of new ideas (Foss et al., 2013). In addition, good communication plays an important role for employees' perception of work environment, see e.g. Kleasen and Foster (2002)

The field of positive psychology has its roots in the experience of flow that was revealed by Csíkszentmihályi (1990) to be a state of complete immersion in an activity in a most highly effective way while at the same time highly enjoyable. Features of this state include to have control of the situation as well as balance between ability level and challenge. It also include absorption in activities to the extent that time and space are forgotten but with a maintained clear focus. This state resembles the personal characteristic self-directedness which contributes to learning and can predict work-learning behaviour (MacKeracher, 2004).

Extensive research (Edvardsson and Gustavsson, 2003) found the following work environment requirements connected to high quality service and employee satisfaction:

- the ability to influence and control the work situation
- to experience security and meaning
- maintaining good health and avoid negative stress,
- a safe physical work environment,
- the ability to develop social relationships through the work
- the opportunity to keep a social distance to the job.

Organisational or management support appears to play a key role in shaping the climate of the organisation. A strengthening in job design such as more autonomy and less job stress is associated in increasing job security and learning opportunities. (Wilson et al., 2004).

A work situation offers more learning potential if the dimensions of job demand and job control are in balance (Karasek, 1979). When employees have sufficient opportunities to adjust successfully to the challenges arising from the work situation, the learning of new skills and behaviours as well as the effective solution of problems, work commitment and motivation increases (Taris and Kompier, 2005).

Workplace learning

Only lately the workplace as learning-conducive setting has been more systematically explored (Russ-Eft, 2002). Theoretically, workplace learning can be traced back to e.g. Dewey (1938) and Lewin (1947), who highlighted learning from and through experience as essential for human learning. Workplace learning related concepts such as informal learning, task-related learning, work-based learning and development activities all presume that learning is situated in the work context (Wielenga-Meijer et al., 2010).

An overview of different learning conditions that stimulate learning at work include in a majority interactional factors such as cooperation, supervision, feedback, communication and interaction and coaching (Kyndt et al., 2009). They all reflect employees learning from their immediate social environment such as colleagues and supervisors. Workplace learning has been identified to have two core components, the above mentioned interactional component and a task-based one. The task-based include cognitive features such as learning through listening or observing as well as behavioural features such as “learning through experience” or “doing the job” (Nikolova et al., 2013)

Learning through reflection and learning through experimentation can be viewed as two inter-related cognitive-behavioral processes from the task-related aspect of work-based learning (Nikolova et al., 2013). As postulated by Kolb (1984), learning occurs in four consequent stages and these allow the individual to perceive and process. Reflective observation and active experimentation are active essential elements of the learning cycle. According to Kolb (1984), certain experiences can activate individuals’ reflective observation leading to stimulation of one’s abstract conceptualization and experimentation.

Another partitioning of workplace learning have been identified in form of formal, informal and incidental learning (Watkins and Marshick, 1992). They are interconnected. Learning as opposed to training, is more appropriate to business environment in which jobs are constantly changing (Marsick and Volpe, 1999). Workplace learning occurs as a means of achieving organisational and individual goals such as development (Leslie et al., 1998).

In addition, most forms of learning are dependent on the learning potential inherent to the particular workplace (Gustavsson, 1992; Coetzer, 2007). Employees not provided with the time and “space” to reflect on and experiment with work tasks will probably not be able to benefit from the learning associated with these behaviours (Ellström et al., 2007; Ellström, 2001).

Organisations that have made learning and development a priority have experience greater profitability and increased employee satisfaction. (Schein, 1992; Rowden and Clyde, 2002; Leslie et al., 1998)

Organisational learning and quality management

Most authors in the quality management literature emphasise the importance of training (see e.g. Dahlgaard et al., 1998; Deming, 2000; Ishikawa, 1985; Juran, 1989). In order to be effective, the training should take the form of work integrated learning which considers the employees’ actual tasks, personal competency and work domain to be relevant (Ley et al., 2008). According to Choy (2009) successful work integrated learning should be organisation-centred. Therefore, it should be beneficial to base work integrated learning on the field of organisational learning in which profound aspects of learning, double loop learning is studied (Argyris, 1999, Senge, 2006). Organisational learning could help to build a bridge between learning in the workplace and the performance of organisations (Fuller and Unwin, 2011). This makes it particularly valuable for quality management purposes.

Research has shown that work integrated learning can have a vital role for the performance of small enterprises (Panagiotakopoulos, 2011). In this case, work integrated learning should be related to a wider view of workplace learning in, through and for the workplace which goes beyond mere training for the actual work at hand and thus involves many stakeholders and in particular the employees themselves (Evans et al., 2006). Work integrated learning can take many forms. Work integrated learning often refers to informal processes of learning in organisations rather than formal education. Regarding learning in organisations, one group of scholars argue that such learning can only take place when the

individuals are learning while others emphasise the social, relational and interactional aspects of learning (Dahlgaard-Park, 2006).

Connecting workplace learning and brain functioning

Access to unchanging core values allows flexibility and adjustment in a changing environment (Shefy and Sadler-Smith, 2006). Managers who are exposed to a more holistic learning experience may be able to act from this centered state and thereby recognize, develop and use their full range of capacities coping better with challenges in turbulent times and act with greater integrity and authenticity (ibid.). This is in line with the concept of perceived self-leadership which Dolbier and Steinhart (2001) have shown empirically is correlated with psychological functioning and work outcomes. Similarly, Marsick and Volpe (1999) emphasize the need for employees to heighten their awareness around learning and develop skills of reflection while taking action.

Double loop learning include that whole brain is involved in learning (Tesone, 2004). From a systems thinking perspective, learning may be considered to be the enactment of permanent change within the individual (Lueddeke, 1999). This transformational process include a higher level of self-awareness which results in personal evolution through development (Tesone, 2004).

Measuring workplace learning

A lot of advances have been made during the last decade to conceptualize learning as informal, contextual and situated (Skule, 2004). However, these theories do not easily translate into indicators for measuring and comparing the quality of the learning environment (ibid).

Measurement instruments have been developed for capturing specific concepts in the working environment such as self-concept of nurses (Arthur, 1995) or focusing on different segments such as women (Stokes et al., 1995). A multi-dimensional scale measuring the learning potential of the workplace tested to be applicable across various occupational settings have recently been developed (Nikolova et al, 2014).

In a preparatory study, an index of work integrated learning has been developed based on Theliander et al. (2004). Recently, this index has been shown to significantly correlate with employees perception of flow and underlying dimensions of quality management values related to employees health (Lagrosen and Lagrosen, 2014). Especially the quality

management values “leadership commitment” and “participation of everybody” have been found to be related to health of the employees (Lagrosen et al., 2007) as well as good work environment (Bäckström, 2009). Lagrosen et al.(2010) have studied the underlying dimensions for those two values and found them to be:

- For leadership commitment: empathy, integrity, presence and communication and continuity
- For participation of everybody: influence, development and being informed.

The dimensions contains three items each. All items were measured on seven level interval scales ranging from 1 to 7 with the extremities “disagree completely” and “agree completely” (Lagrosen et al., 2012a).

Discussion

Further study will use the Brain Integration Scale calculated from brain waves measured during two reaction-time tasks, to compare levels of brain integration with measures of quality and learning. A neuropsychological validated questionnaire will measure the readiness for workplace learning. The measurement scale with items to include are discussed below:

From the literature review the following items are relevant to include for validation in the questionnaire; empathy, integrity, presence and communication, continuity, influence, development and continuity (Lagrosen et al., 2010).

These dimensions resembles core values such as respect, responsibility, openness, trust, co-operation as well as empathy described in literature as important for continuous improvement and learning (Jabnoun, 2001; Edgeman et al., 1999; Grönroos, 2000; Edgeman and Dahlgard, 1998). For instance, influence has to do with employees’ scope for exerting influence and resembles Nikolova et al. (2013) dimensions *learning through reflection* and *learning through experimentation*. The importance of influence in one’s work is also highlighted by e.g. Wilson, Detoy et al. (2004); Karasek (1979) and Taris and Kompier (2005). Regarding presence and communication, the importance of well-functioning communication for stimulating learning at work is emphasized by many authors (See e.g. Kyndt et al., 2009; Kleasen and Foster, 2002). The dimension also include the item “Employees are not afraid to express their opinion” and an emotional safe environment is considered crucial for learning as well (Lagrosen and Lagrosen, 2012a; Edvardsson and Gustavsson, 2003; Marsick and Volpe, 1999). Continuity include items such as “Managers stay in their positions long enough to build up a high level of manager-employee confidence”

and “The things we talk about and agree upon at my development appraisal are followed up”. The importance of feedback and cooperation has also been emphasized by for instance Kyndt et al. (2009). Development concerns the employees’ opportunity for personal development and development of skills. Achievement of personal goals include the need for personal development and are considered important for workplace learning (Leslie et al., 1998).

In addition, these dimensions have shown to be significantly correlated with employees’ perceived health which the literature review found are important for the working environment (Edvardsson and Gustavsson, 2003). Also, they have been validated and shown useful in several studies (Lagrosen and Lagrosen, 2012b; Lagrosen and Lagrosen, 2014; Lagrosen et al., 2012a; Bäckström et al., 2012). Moreover, these dimensions were also found to be related to leadership behaviours, values and practices in successful organisations that have achieved good workplace health, such as; excellence in leadership, good work environment, co-worker health and co-workership, along with improved profitability (Bäckström, 2009).

Also the work integrated learning index (Lagrosen and Lagrosen, 2014) is considered to be relevant to include. It include three items such as “We have competence development which leads to increased understanding of the work situation” and “The management actively promotes learning”.

Last, the flow dimension is considered to be included with three items. It was included in a recent study shown to be correlated with work integrated learning and employee health (Lagrosen and Lagrosen, 2014). Dewey’s view of experience is very similar to people in “flow” described by Csíkszentmihályi (Park Dahlgaard, 2001). In addition, peak experiences which resembles flow have been shown to correlate positively with brain integration (Travis et al., 2011; Harung et al., 2009).

Conclusion

Performance measurement can create possibilities for managers to gain knowledge about the state of organisation (Elg, 2007). The importance of using performance measurement reflectively is emphasized by Elg (2007). However, this kind of instrument should be more objectively since it aims to be neuropsychological verified.

The literature research drew from the domains of work-place learning, organisational learning, human resource management, psychology, quality management. The factors that will be developed for the questionnaire should then reflect and measure what it is intended to measure, thus addressing construct validity.

The dimensions “empathy”, “integrity”, “presence and communication”, “continuity”, “influence”, “development”, “being informed”, “work-integrated learning” and “flow” were found to be relevant from the literature review to be tested for inclusion in the measurement instrument.

The creation of our instrument can in itself be viewed as a knowledge creation process since knowledge about factors correlating with brain functioning are explored. Then it will be the managers’ interest to explore the strategies and methods which develops the individuals towards more holistic learning.

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WHAT ABOUT MUNICIPAL STRATEGIC MANAGEMENT

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What about municipal strategic management and performance measurement

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Abstract

[Purpose] The purpose with this paper is to study how environmental uncertainty affects strategic priorities and to what extent the strategic priorities could be monitored through performance measures, within a Swedish municipal context. *[Design/approach]* The study was conducted with the help of a web-based survey, sent to all municipal CFO's in Sweden. The survey was centered on key strategic themes. Using structured questions and claims the CFOs were asked to answer on a 7 grade Likert-scale. *[Findings]* The findings show that in some areas such as a budget in balance and cost control, there are traditional priorities and performance measures, where as in other areas such as monitoring day-to-day improvements and growth and expansion, there is less support from performance measurement systems. *[Research implications]* Through this study understanding will be add to the growing knowledge about performance measurement and strategic management, especially when it comes to strategically important areas and priorities among municipal CFOs. *[Originality/value]* Since the western society, as we know it is depending on its public management, a management that is undergoing a constant change, this study can help in ways of understanding how to follow and evaluate strategically critical areas to society.

Keywords:

Strategic areas, municipal CFOs, performance measurement

Article classification:

Research paper

1 Introduction

It is from time to time stated that the single most important task for management is strategy (Macintosh, 1994). In a classical manner this then comes down to two different tasks, formulating a strategy and implementing a strategy (Andrews, 1971). The later task usually is integrated with management control ideas where historically important authors like Anthony (Anthony, 1965) places management control in the area in between strategy and operations in an organizational hierarchy. Still today, even though the first thoughts in the line of the above reasoning, is dated around the second world war and was first fostered at Harvard Business School (Merchant, 1989), there is an interest in what circumstances that contributes to the strategic thinking in organizations and to what extent that impacts strategic actions. In this context modern performance measurement and management ideas have come to grow and it has had a natural impact on how systems and models have been developed.

Even though performance measurement and management ideas in its contemporary form could be traced back 50 years in time, there has been two developments that have triggered the interest in the research community. First there has been an increased technological development especially around the ability to store and present data and information in a never-ending capability. This has made it even more important to really understand what information is needed since there is more or less an infinite supply of data in larger organizations. Secondly there has been an increased interest in not only financial reporting and information, a trend that could be described as a consequence of the relevance lost debate in general and the balanced scorecard models been developed in particular. New information needs have been named and the information market has become even more demand oriented. Much of the development that is happening today comes from the industry and very little of new ideas comes from public administration in general and municipal organizations in particular.

Over some time now there has been a transfer of management ideas from the industry to public sector, which has come to be summarized in the concept New Public Management. Since the public administration in many ways is an even more complex operation to manage, due to several different stakeholders and due to huge volumes handled, there is a possibility to use resources in a more effective way, if effective management tools are used. In this study effectivity is about measuring to what extent an operation is reaching its goals. So performance measurement then comes down to being able to follow how well a strategy is implemented, and if the goals are reached. This also, in a way, defines the purpose behind developing extensive measurement systems, and that is to be able to measure how well the organization is fulfilling its strategic intent and purpose.

This paper is focused on strategic management in a municipal context. Since two basic tasks are formulating and implementing a strategy this also is of interest in this paper. This interest could be formulated into three questions; [1] in what areas does municipal CFO's consider uncertainty, [2] in what areas are there strategic focuses and [3] in what ways is it possible to follow performance. In this way strategic management is understood as being conscious of uncertainties, making strategic priorities and then measuring performance. Even though much of the development in the area of strategic management and performance measurement today comes from industry there should be a clear interest within public administration to be able to translate and transform ideas and models from industry to public sector. Especially since the public sector is so

diversified and deals with so many different operations and since computer technology and modern information systems makes it possible to follow and monitor complex operations.

2 Theoretical framework

One important task for strategic management is to handle strategic uncertainty. Usually this is done through an ongoing alignment with the changes and uncertainties in the environment (Andrews, 1971; Anthony, 1965). For a municipal organization uncertainties can come from political and regulatory stakeholders (Ebrahimi, 2000). In order for the organization to be able to act in a strategic way it therefore needs to scan its environment for potential uncertainties and threats which can be done by the top managers or special units or part of an organization (Porter, 1980). Because of the problem with scanning the entire environment research have argued that it needs to be decomposed into segments (Bourgeois, 1980; Fahey & Narayanan, 1986). One segment consists of remote environmental sectors, such as political, economic, social, cultural and technological ones (Asheghian & Ebrahimi, 1990; Sawyerr, 1993). From another point of view the task environment consists of issues dealing with goal setting and goal achievement (Bourgeois, 1980; Duncan, 1972). Altogether strategic management is then a form of continued alignment of the internal ambitions with the ongoing changes in the environment.

When making strategic priorities it becomes important to understand both the internal and external environment in order to handle strategic uncertainty, as discussed above. There are several important differences between how private business are operating compared to public sector management, especially shown in the environment (Rainey, Backoff, & Levine, 1976; Ward & Mitchell, 2004). One of them is that the public sector is dependent on formal regulations and procedures more then the private sector, which also affects how strategic management is done. The customer is the citizen or constituents which does not pay for the service direct but indirect through taxes, in most cases. It then becomes important to understand in what areas that the critical success factors can be identified (Rockart, 1979), something that from a public management perspective gives vital input to the strategic management in general and strategic priorities in particular.

After deciding what the strategic priorities are it then becomes important to decide in what ways performance within the strategic areas should be measured (Poister & Streib, 1999). There are several different areas that need to be understood and dealt with in order for the performance measurement to be effective. Measures should for example be derived from goals and objectives, different forms of standards or targets needs to be established and instead of focusing on what data that is available there should be a focus on what is important to measure. It is also important measure over time to be able to identify changes in performance and also to measure and define metrics in a similar fashion over several operations in order to be able to benchmark and compare performance. The timing in measuring a performance is also crucial in order to be able to take action when performance is not satisfactory.

3 Methodology

This paper is based on a survey conducted during March 2014. There are 290 Swedish municipalities and they were contacted by e-mail and the CFO or the person with an

equivalent job description was asked to answer a web-based survey with mainly 18 proposals and three background questions. The proposals, which are translated from Swedish, are presented in the appendix. The respondent was asked to give a response on the proposal based on a seven grade Likert-scale (Norman, 2010). If the respondent answered 1 that equals with that the respondent didn't agree to the proposal at all and if the answer was 7 the respondent fully agreed to the proposal. The survey was open for the respondents for about a month and during that period 91 answers were given. Out of them 85 answers were complete and were used as the empirical material for this study. The method was in many ways suitable for the purpose of the paper and even though a higher response rate always is better, the collected material showed enough of variance to be interesting.

Since this paper is of a descriptive kind, with three rather open questions, this method gives a broader view and a more general picture of what the CFO's opinions are within this field. There is a problem with a general picture such as the one presented in this paper, much due to the fact that a municipal operation is complex and multifaceted. The picture presented is therefore of an aggregated kind and mainly based on one respondents opinion and view. This could also be biased based on how the CFO wishes things to be instead of how they actually are. Nevertheless it gives a quick glimpse of how they look on strategic management and performance measurement, which for example gives insights into additional studies and more focused methods. In the next section findings will be presented and this is done with an ambition to give a broader picture. Likert-scale studies are not suitable for advanced mathematical calculations, due to the type of scale used, and because of that the only actual calculation done was three means. In addition seven combinations between two questions are presented in frequency tables.

4 Findings

From a more general perspective the findings could be categories or clustered into three groups. The first group consists of proposal 4 to 8 and deals with how uncertainty is perceived. The second group of questions is proposal 9 to 15 and this group answers to questions about strategic priorities. In the final group, proposal 16 to 20 the respondent's answers describe how performance measures and reports are dealt with in the organization. In order to get the general view or picture, a mean of the answers to each proposal or question in the groups have been calculated and the answer is presented in a radar-diagram in the coming paragraphs.

In the first group of answers to proposal 4 to 8 the findings show that the respondents agrees on that uncertainty is produced from external factors like the general economy, proposal 4, and legislative and regulating authorities, proposal 5, to a greater extent. It also shows that they agree that there are many factors that influence the municipal outcome and economy, but it isn't an uncertainty factor in the same way, nor is the business community's success or failure. The least source of uncertainty is the political leadership and how they are working. The diagram, see figure 1 below, and means show a slight tendency to acknowledge uncertainty as something coming from the outside, the general economy and authorities, and not from the inside, e.g. the political leadership.

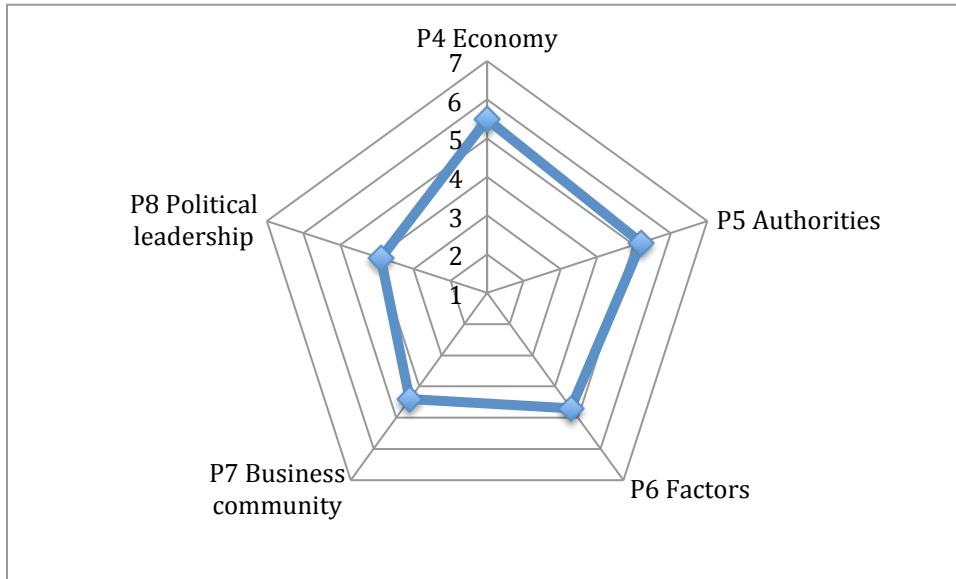


Figure 1 Means from proposal 4 to 8, grouped into how uncertainty is perceived

When it comes to answers about strategic priorities the means shown in a radar-diagram can be found in Figure 2 below. In this group of findings it is one thing that stands out and that is the answer to proposal 9, a budget in balance, which have a mean of 6,7. It is a clear statement from the CFO's but maybe not a surprising one. One might think that to a CFO it is of highest importance in a strategic perspective to have a budget in balance and a good economy in general. The answers also show a strategic interest in growth and expansion, proposal 10, cost control, proposal 11 and in adapting service levels, and improving operations in general, proposal 12 and 13. However when it comes to two additionally interesting areas, employees conditions and marketing, there is a slight decline, but still quite high since the mean is above 5.

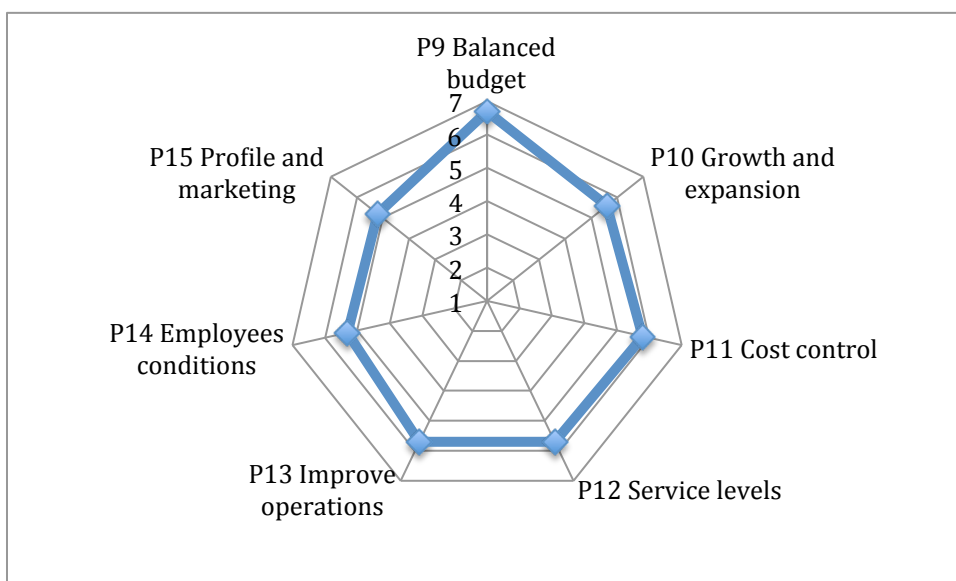


Figure 2 Means from proposal 9 to 15, grouped into strategic priorities

The final group of answers show two different perceptions. In a more general way the respondents on average is pleased with the report systems, the mean on proposal 16 is 5,3, and they also think that it is fairly easy to follow costs, the mean is 5,7 on proposal 18. However on a more specific level it is harder to follow growth and expansion, with a mean of 4,0, and both day-to-day performance and work results are hard to trace in the reports. The respondents gives those two proposals a mean of 3,5 for proposal 19 and 3,6 for proposal 20. So the performance reporting systems seems to be working on a general level but when it comes to more specific areas the respondents are not that pleased.

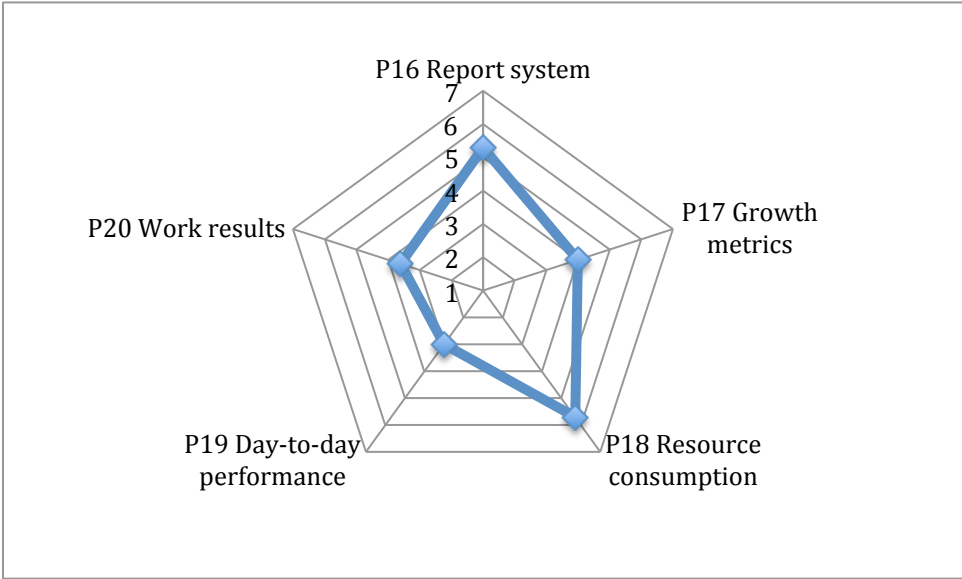


Figure 3 Means from proposal 16 to 20, grouped into performance measurement and reports

In addition to the more general picture painted above this paper continues with cross-tabulating different proposals with each other. With this kind of cross-referencing the idea is to see if statements and proposals from one perspective is back with support from other proposals and perspectives. Each of the seven presentation or cross-tabulations are show in summary in a table. Since working with strategic management issues in many cases comes down to understanding how to deal with uncertainties the first table shows how different type of municipalities see uncertainty in the general economy, which is shown in table 1 below. There is a slight tendency towards showing that municipalities closer to big cities sees the general economy as a larger uncertainty factor then the average municipality. Other then that the uncertainty concerning general economy is fairly evenly distributed.

Type of municipality	P4 Impact from general economy						
	1	2	3	4	5	6	7
Metropolitan				1		1	
Suburbs of metropolitan					1	4	7
Town				1	2	8	
Suburbs of town					1	1	
Commuting municipality			1	6	2	6	4
Tourism and hospitality municipality			2	1	2		1
Goods-producing municipality				1	6	6	2
Sparsely populated municipality				2	2	1	
Municipality in densely populated region					2	4	1
Municipality in sparsely populated region					2	2	

Table 1 Type of municipality and general economy uncertainty

One of the strongest indications in the survey was that finding a budget in balance was of strategic importance. This more general statement is interesting in itself but it is also interesting to see if the respondents that thought the issue of getting a budget in balance also think that there are many factors to deal with which would cause uncertainty. This combination is shown below in table 2. 66 of the respondents answers that a budget in balance is of highest strategic importance but when it comes to different factors affecting the outcome of the local economy the answers is more evenly distributed, with a focus around 5. This might be interpreted as if an uncertainty is recognized but its impact is not that crucial.

P9 Balanced budget	P6 Uncertainty from many factors						
	1	2	3	4	5	6	7
1							
2							
3							
4							
5				3			
6			2	4	5	2	2
7		4	9	13	18	16	6

Table 2 Cross-tabulation from proposal 9 and 6

In a similar combination it would be interesting to who have a strategic focus on a budget in balance think its easy to do the financial follow up through the report systems. The answers are shown in Table 3 below. The majority of the respondents have answered that it is easy but also here there is somewhat a more even distribution with several outliners. Two respondents have answered 2 and 3 on proposal 16 which could be interpreted that even though there is a strategic focus on a budget in balance it is not easy to follow in the existing reporting system.

P9 Balanced budget	P16 Easy to use the report system						
	1	2	3	4	5	6	7
1							
2							
3							
4							
5					2	1	
6			1	3	6	5	1
7		1	1	8	19	31	6

Table 3 Cross-tabulation from proposal 9 and 16

In the survey there are some questions/proposals that asking about the same thing but from two different perspectives. In the following section four of them are presented. One important part of leading an organization strategically is to decide whether it should grow and expand. This is in many cases a strategic decision, which is important to decide. But if that decision is made then it also becomes important to follow to what extent there actually is a growth. Among almost half of the answers that state that growth and expansion is of strategic interest a majority is not stating that they have clear metrcis and reports showing this. The answers to this combination is presented in Table 4. It seems like there is a tendency to think that growth and expansion is important but the CFO does not have measures to follow if this is accomplished.

P10 Growth and expansion	P17 Metrics and reports that show growth						
	1	2	3	4	5	6	7
1							
2			1				
3		1	1	1	1		
4		2		4		1	
5		3	4	10	5		
6		1	4	9	11	1	
7	1	1	4	6	5	6	1

Table 4 Cross-tabulation from proposal 10 and 17

Traditionally financial information systems have been focused on costs and consumption of resources. In the next combination of proposals, shown in Table 5, there should then be dominance towards showing costs, especially if cost control is of strategic importance. That is to a certain extent also true since there is an even distribution around the answer 6 on proposal 18, if the report systems show costs. But it is also interesting to see that as much as a quarter of the answers are a 5 on the proposal if costs are of strategic importance. But overall the findings are more or less as expected.

P11 Cost control	P18 Reporting systems show costs						
	1	2	3	4	5	6	7
1							
2						1	
3							
4			1	1	2	2	1
5				2	4	16	
6			2	2	6	11	4
7			1		6	10	11

Table 5 Cross-tabulation from proposal 11 and 18

For sometime there has been a focus on improving day-to-day operations within industry, something that also is a part of New Public Management. Two of the proposals were centered around this, proposal 13 and proposal 19 as shown in Table 6 below. This seems however to be an area where there has been little or not sufficient development. When it comes to being able to measure day-to-day performance there is a great variance among the answers, with a center around 3 and 4. These answers are in this context fairly low. In the same time a majority says that improving daily operations are of strategic importance.

P13 Improve operations	P19 Measure day-to-day operations						
	1	2	3	4	5	6	7
1							
2						1	
3							
4			1	1	2	2	1
5				2	4	16	
6			2	2	6	11	4
7			1		6	10	11

Table 6 Cross-tabulation from proposal 13 and 19

Being able to measure daily performance is also something that involves the ability for an employee to follow their work, which was one of the strategic proposals. Combining proposal 14 with 19 then shows to what extent respondent’s look at employee’s conditions as a strategic issue and if there is a possibility to measure what is done, what the performance is. This combination is shown in Table 7. As presented earlier in this chapter there is a somewhat weaker tendency towards focusing on employee conditions as a part of strategic issues, which also is shown in Table 7. But there is a slight linear pattern showing that the two proposals follow each other to some extent.

P14 Employee conditions	P19 Measure day-to-day operations						
	1	2	3	4	5	6	7
1							
2							
3		1		2	1		
4	3	3	5	3		1	
5		4	6	7	6		
6	2	3	5	6	5	2	
7		3	4	3	5	2	

Table 7 Cross-tabulation from proposal 14 and 19

Altogether the findings show that some of the answers are close to what could be expected while others show a greater variance. In the following section the paper continues with a short discussion of the findings.

5 Discussion

Overall answers show what might be expected. CFOs think that it is of strategic importance to have a budget in balance and they also feel that they can use their reporting systems to follow this. They also see it as important to follow costs and consequently they find that information to a large extent in the reporting systems. When it comes to handling uncertainty as a part of the strategic management process there seems to be a emphasis on things they can not control, such as the general economy and legislative and regulatory authorities. The least problem and a cause of uncertainty seem one of the most important stakeholders contribute with, the political leadership. On a more general perspective it seems like the respondents have a higher profile among the answers when it comes to strategic intent and a slightly lower response distribution when it comes to performance measures and reporting. In a way this might be interpreted as intention and reality, what the CFO wish for and what they live by.

In some areas there seems to be answers that might not be expected. One of those areas are that if there is a specific strategic intent its not always easy to follow performance. One such example is the ambition to grow and expand, which seems not be that easy to follow in reports. In the same way there is an intention to improve on a day-to-day bases but at the same time this is an area that is hard to measure and report on. This is an interesting result since at the same time the respondents say that they are

interested in controlling costs, and that is something that can be monitored in the systems. But for some reason that is not connected to day-to-day operations. Being able to follow and monitor daily operations is also something that on average shows lower distributions among the answers. When the relevance lost debate turned into a balanced scorecard solution, many public administration managers were quick to embrace the non-financial reporting thought. As a last question in this survey the respondents were asked to name non-financial measures and reports they used on a regular basis. Only one fourth of the respondent did this, which might signal that they don't work with that kind of reporting to the extent that it sometimes have been presented.

6 Conclusions

In this paper three different areas have been connected to strategic management that is dealing with strategic uncertainty, making strategic priorities and working with performance measurement. In a way the findings show that these three areas could be understood together, as parts of strategic management. In order to be able to work with strategic management one must understand the uncertainties, make priorities and follow performance. Theories within this field have a heavy focus on business operations, which in several ways are different from working in the public sector. In many cases the stakeholders are harder to grasp, compared to a business environment, where for example the customer is equal to a citizen and boards are made of different political opinions. Nevertheless the findings show that municipal CFOs are heavily focused on thinking strategically.

When it comes to the three areas, which in this paper makes up strategic management in a municipal context, the proposal that got the highest average was how the general economy impacted operations. This is truly something that nor the CFO or the politicians can do something about. In the same way it seems like the CFOs does not think that the political leadership is creating uncertainties, which might point at executive management function that is working. Among strategic priorities the proposal saying that it is of strategic importance to work with a budget in balance got the highest average. In general all of the proposals in this grouping got high averages. This might be explained by a general interest among CFOs in strategic question. On average the third group of proposals answers were much lower. This could be due to the fact that the respondents have high intent, strategically, but it might be harder to follow that intent in reports and measures. Even though saying that the highest average among answers in this categories was on the proposal that it is easy to follow planning and outcome in the report systems.

Since the municipal environment is so much more complex in many aspects it becomes interesting just to study traditional business logic, when it comes to contemporary management control theories. In some cases that logic is easy to transfer and translate, such as a budget in balance, but in other areas, such as growth and expansion, it becomes harder to compare ways of working with the theories. In the long run benchmarks between different branches and environments could enrich the other areas and maybe in the future businesses will look at how public sector have chosen to solve issues with strategic management and performance measurement

Appendix

The following proposals were used in the survey.

- P4 The general economy in Sweden largely impacts municipal operations.
- P5 Legislative and regulatory authorities often alters our business conditions.
- P6 There are so many factors that affect the outcome of the local economy, and the economy is then perceived as uncertain.
- P7 There is a strong link between if the business community in the municipality succeeds and if the municipality succeeds.
- P8 The way the political leadership is working, is creating uncertainty for municipal operations.
- P9 A functioning economy, such as a balanced budget, is strategically important.
- P10 Growth and expansion are key strategic areas that we work with.
- P11 In our business, it is a strategic priority that we control our costs.
- P12 It is strategically important for the municipality to adapt the municipal service levels.
- P13 We work long term to improve the daily operations.
- P14 It's a strategic priority that employees at all levels in the municipality have the best conditions possible to do their jobs.
- P15 In our municipality, it is strategically important for us to continually enhance our profile and we market ourselves in the best way.
- P16 It's easy to follow the municipality's financial planning and outcome in our report system.
- P17 We have clear metrics and reports that show growth and development.
- P18 Our reporting system shows where we consume resources in the municipality, ie where the costs were incurred.
- P19 The performances in the day-to-day operations are easy to present using reports.
- P20 Employees at various levels in the municipality are able to get access to reports that show the results of their work, what they have done.

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0065

EVIDENCE FOR THE PERFORMANCE PRISM IN HIGHER EDUCATION

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Evidence for the Performance Prism in Higher Education

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Structured Abstract

Purpose: This case study examines the potential for the Performance Prism (Neely, Adams & Crowe, 2001) to influence the perceived outcome of a planned organizational change. General Systems Theory (Ruben, 1979; Thayer, 1968; vonBertalanffy, 1950) is used to understand the differences in stakeholder perception throughout the institution.

Design/methodology: Thirty-two participants from four educational support services departments and the senior leadership group of a university were interviewed. A grounded theory, constant comparative method (Glazer & Strauss, 1967) was used to generate themes and codes from transcripts.

Findings: Findings suggest that implementers failed to adequately assess all employees' satisfaction and contributions prior to implementation. Using the Performance Prism could have been key to perceptions of success about the change effort.

Research limitations/implications: Research comparing the Performance Prism to implemented planned change efforts not using the Performance Prism is limited, especially in higher education. Also limited is research using the Performance Prism and General Systems Theory.

Practical Implications: Understanding stakeholder satisfaction and contributions throughout the organizational system are vital to planned change efforts, especially in loosely coupled

organizations (Gallivan, 2001; Neely, Adams & Crowe, 2001; Ruben, 1979). Using the Performance Prism is valuable to further this understanding.

Originality/value: The study advances the literature about the use of the Performance Prism in higher education by providing an understanding of the implications of neglecting to consider all stakeholders at all levels of the system in planned change efforts.

Keywords: Performance Prism, performance measurement, organizational change, higher education, case study

Article classification: Case Study

Evidence for the Performance Prism in Higher Education

Introduction

The need for planned organizational change has grown to accommodate the ever-changing business landscape and competitive environment. Along with change come decisions about introducing, implementing and evaluating the effort. Change agents and implementers are turning to the vast selection of performance measurement systems (PMS) to help them implement and determine if the effort has met expectations.

PMS are designed to promote and/or document planned organizational change efforts (Smulowitz, 2014). While PMS are in abundance (Bitici, Turner, & Bergemann, 2000; Neely, 1999) most focus on continuous improvement through consistently measured and monitored benchmarks and goals (Eckerson, 2011).

Whereas PMS are used and accepted in organizations across the globe, institutions of higher education are just beginning to embrace the need for such assessment (Worthen & Sanders, 1991). In some instances members of institutions of higher education are being pressured to assess performance and outcomes as well as to document and report on their effectiveness to a variety of stakeholders, and in other instances members view such assessment as essential (Worthen & Sanders, 1991).

The purpose of this case study is to identify whether or not factors from the Performance Prism (Neely, Adams & Crowe, 2001) could influence the perceived outcomes of the failure of a planned organizational change in a large, research university in the Northeastern United States as perceived by most participants. First the literature on PMS and higher education are discussed, followed by an examination of the case using the Performance Prism (Neely, Adams & Crowe, 2001). General Systems Theory provides a theoretical framework (Ruben, 1979; Thayer, 1968;

vonBertalanffy, 1975). The loosely coupled nature of institutions of higher education is examined (Weick, 1976). Implications, limitations and future research opportunities are considered.

Focus on Higher Education

Increasingly, institutions of higher education have been examined closely and even held with contempt by some for their slow moving capacity to be more accountable to their stakeholders (Gumport, 2000; Ruben, 2007). These calls for accountability are rising while at the same time funding is declining (Boyce, 2003; Gioia & Thomas, 1996). While some internal shifts in structure have forced changes (Gersick, 1991), external forces such as accreditation are increasingly the impetus for change (Ruben, et al. 2008). Institutions of higher education need to be able to meet the demands of their stakeholders. In doing so, more and more institutions of higher education are considering or have adopted a PMS.

The literature on PMS in industry is twice as robust as the PMS-focused literature specific to higher education. A broad query of the ProQuest Central database for “performance measurement systems” yielded 694,074 results while “performance measurement systems AND higher education” yielded 201,840 results. An even smaller amount of results (31) was found with a query of “Performance Prism AND higher education.” With further review only four of the 31 papers in this review pertained to higher education. Those articles that discuss Performance Prism do so only to list the framework as an alternative to a listing of various other PMS. There are no articles that discuss the use of the Performance Prism in institutions of higher education.

The importance of a review of the Performance Prism in higher education is that such institutions have a distinction from traditional organizations considered tightly coupled systems.

This distinction provides a basis for reviewing the literature on organizational change implementation as a comparison between higher education institutions and traditional organizations in industry.

Loosely coupled organizations have many similarities including: (a) physical separateness, (b) independence from the central area of authority, (c) isolation from others in the organization that are failing or succeeding, (d) unique identity from others in the organization, (e) the ability to use many methods leading to the same conclusion, (f) and great emphasis on social construction of reality (Weick, 1976).

Institutions of higher education make a good example of a loosely coupled system because: (a) Many academic areas are located in separate buildings. (b) Most academic areas are managed by a Chairperson and Dean, their own central area of authority. (c) Over time universities find the need to eliminate one department or add another to meet demand. (d) Each academic area has a specialty in knowledge (Clark, 1983) which enables each department its own unique identity. (e) Each faculty member has the autonomy to teach and conduct research in their own way. (f) Each academic department socially constructs the reality of their department which becomes more cohesive to that group than ties to the overall institution.

In addition institutions of higher education are considered distinctive and have little or weak shared values – both reflected in loosely coupled organizations (Glassman, 1973; Orton & Weick, 1990). Further, departments within institutions of higher education are more likely and capable of successful change within their department while preserving their autonomy from the overall institution and making institution-wide change difficult (Boyce, 2003; Glassman, 1973; Orton & Weick, 1990; Weick, 1976).

Comparatively organization-wide change, while always challenging, is not viewed as problematic in most organizations in traditional industry which are considered tightly coupled (Smulowitz, 2014). Of course this assumes that the hierarchy in traditional organizations supports interdependence among departments to follow the lead of a central area or person of authority (Smulowitz, 2014). Alternatively, it is difficult to get departments within an institution of higher education to work together toward a common goal (Orton & Weick, 1990) because of their “inherent autonomous and independent leadership, decision-making, budget and culture” (ASHE, 2001, p. 66). Departments within institutions of higher education will often compete against each other for scarce resources (Weick, 1976).

Theoretical Framework

Using General Systems Theory as a theoretical framework is beneficial to conceptualize planned organizational change (Ruben, 1979; Thayer, 1968; vonBertalanffy, 1975). Within systems theory open systems is a fundamental concept that defines living systems as those that “exist only through continual exchanges with the environment” (vonBertalanffy, 1975, p. 32). Living or open systems create their individual system through the process of disruption and restoration made through these exchanges of matter-energy and information with the environment (Miller, 1965; Ruben, 1979; Thayer, 19768 vonBertalanffy, 1975). Further, these systems seek harmony, or homeostasis (Miller, 1965; vonBertalanffy, 1975), with the environment.

A planned change effort is seen from the systems perspective as a disruption to the harmony and, thus, the dynamics of the system (Smulowitz, 2014). Organizations considered from the open systems perspective consist of sub systems, such as departments, which have individual functions and boundaries (Smulowitz, 2014). In addition, organizations of all kinds

consist of various levels of units from which they can be considered including across the organization, group and individual levels (Mohrman, Mohrman & Ledford, 1989). Working together members of the organization from these levels can achieve considerably more than members from a single level can independently.

When planning a change effort, implementers need to consider that a change to one part of the system will affect the other parts (Smulowitz, 2104). Consideration of the systems perspective when planning an organizational change using a PMS can help avert negative unintended consequences throughout the organization.

Performance Measurement Systems

PMS are abundant (Bitici, Turner, & Begemann, 2000; Neely, 1999). The industry surrounding PMS is also wealthy in number of publications, conferences and consultants (Kennerley & Neely, 2002). Over the last few decades there have been a number of popular PMS including: Balanced Scorecard, Dashboard, ISO, Kaizan, Lean, Malcolm Baldrige National Quality Award Program, TQM, Six Sigma, and specialized frameworks such as the Excellence in Higher Education and Compstat in law enforcement (Smulowitz, 2014).

A close review shows that most PMS have benchmarking and consistently measured and monitored goals in common, but differ in process (Eckerson, 2011; Smulowitz, 2014).

Regardless, the goal of most PMS is to promote or document change programs and provide change agents with a way to monitor gaps in performance, analyze performance results and consistently improve processes through management (Eckerson, 2011; Smulowitz, 2014).

Because of the wide range of options, one of the largest problems facing change agents is choosing the most appropriate PMS.

Kennerley and Neely (2002) provide a comprehensive review of PMS and as such this paper does not intend to provide an in-depth analysis of PMS, nor to compare and contrast or even discuss the pros and cons of all existing PMS. The scope of this paper is to call to attention the dashboard and the Performance Prism as they relate to the case study of an institution of higher education that experienced a planned organizational change effort.

Dashboards

The dashboard provides a quick view of indicators about key organizational goals which can vary drastically depending on strategic organizational goals (Smulowitz, 2014). For example a dashboard indicator for one organization might be profit margin and another might focus on number of customers served. Similarly, departments within an organization may have different indicators because of their focus within the organization (Eckerson, 2012; Smulowitz, 2014). While the focus of the dashboard is broad which allows for vast customization (Smulowitz, 2014), there is a misperception that it solves “something for everyone” (Lunger, 2006, p. 9).

Performance Prism

The Performance Prism (Neely, Adams & Crowe, 2001) touts increased delivery over the Balanced Scorecard (Kaplan & Norton, 1996) because of its flexibility in focus on stakeholders. According to Adams and Neely (2000) stakeholder focus of the Balanced Scorecard is limited only to shareholders and customers. Additional stakeholders, such as employees, are examined with the Performance Prism (Neely, Adams & Crowe, 2001), an advantage to this framework.

The Performance Prism encompasses five major areas (Neely, Adams & Crowe, 2001):
(a) Stakeholder Satisfaction: “Who are the stakeholders and what do they want and need” (Neely, Adams & Crowe, 2001, p. 6)? (b) Strategies: “What are the strategies we require to ensure the wants and needs of our stakeholders are satisfied” (Neely, Adams & Crowe, 2001, p.

7)? (c) Processes: “What are the processes we have to put in place in order to allow our strategies to be delivered” (Neely, Adams & Crowe, 2001, p. 7)? Processes include developing new products and services and specific measures that relate with each process should be identified (Neely, Adams & Crowe, 2001).

(d) Capabilities: “What are the capabilities required to operate our processes” (Neely, Adams & Crowe, 2001, p. 7). Neely, Adams and Crowe (2001) define capabilities as “the combination of people, practices, technology and infrastructure that together enable execution of the organization’s business process (both now and in the future)” (p. 7). (e) Stakeholder Contribution: “What contributions does the organization need from its stakeholders to maintain and develop these capabilities” (Neely, Adams & Crowe, 2001, p. 7)? No other PMS frameworks recognize this back-and-forth rapport between the organization and the employee (Neely, Adams & Crowe, 2001).

While the Performance Prism has been discussed widely in literature about traditional organizations, it has a paucity of research in the higher education literature. Therefore, this paper explores the Performance Prism as an option for an institution of higher education that experienced a planned change as compared to the chosen PMS, the dashboard.

Methodology

There is much in the literature that details PMS as a part of a planned change effort in industry. The current study examines the dashboard PMS, a planned organizational change strategy, as compared to the use of the Performance Prism in an institution of higher education. To study these issues this paper uses the results of a case study from 32 in-depth interviews of several levels of organizational employees within a university including four Educational Support Services Departments (ESSDs) and the senior leadership group.

Using participant claims from the case study allowed the researcher “insight, discovery and interpretation” opportunities for this study (Merriam, 2009, p. 42). The transformation of the undergraduate experience (the setting) is seen as significant because ESSDs were physically moved and now reported to a new Vice President in a newly formed division which left them with no distinct mission or common history.

Each ESSD met with a member of the Center for Organizational Development (COD) to clarify their mission, set goals, choose key performance indicators (KPIs), collect data and integrate the results into a web-based dashboard. The COD helped to determine interview participants: (a) all of the senior leadership group was involved with the effort; (b) all of the directors and their direct assistants were involved with the effort and (c) staff members were included by proportional stratified sample of 20% and systematic sample and then the researcher added one participant to ESSDs three and four to supplement the one person yield in those departments. Thirty-two employees from three organizational levels were interviewed including 15 staff members, 10 directors and seven senior leaders.

Interview guides were developed for each of the three levels studied within the institution including senior leaders, directors and department staff members. A grounded theory, constant comparative method, coding data into categories, was used to analyze the interviews (Glaser & Strauss, 1967). Next the researcher analyzed the categories to generate themes across the ESSDs (Merriam, 2009; Stake, 2009). The use of “member checking” verified the accuracy of the researcher’s interpretation of the data. This paper is part of a larger research study.

Results

A greater understanding of the introduction and implementation of the dashboard as the planned change process comes from the examination of the effort through perceptions of several

levels and systems of members of the institution of higher education (Gallivan, 2001; Ruben, 1979; Thayer, 1968; vonBertalanffy, 1975). The major shortcoming from this planned organizational change was leadership and their facilitation of the effort which led to some drastic differences in perceptions between levels of members of the university.

The first major difference between the senior leaders, directors and staff members was the goal of the change effort. Senior leaders expected the dashboard to serve as support of the contributions of their division to external constituents and to increase awareness of the directors and staff members about assessment. Conversely, directors and staff members expected the dashboard to help them analyze, identify and continuously improve departmental programs and operations. A director revealed, “They don’t want to uncover dirt...they want to paint a pretty picture” (Participant 1, 2011).

The next major difference in perception was between senior leaders, directors and staff members. This time the difference concerned resources to collect and analyze KPI data. Directors and staff members discussed these resources one-and-a-half times more than senior leaders, showing a heightened concern about resources for directors and staff members.

The third and greatest disparity between any of the levels of the members of this institution of higher education came from the perceived lack of involvement and awareness about the dashboard effort by members of the department. While this was barely mentioned by senior leaders, directors were seven times more likely and staff members were eleven times more likely to comment about this notion. A staff member exclaimed, “Everyone needs to know what’s going on. I have no clue...That’s almost like locking me in a closet” (Participant 8, 2011).

Feedback to staff members versus department directors and senior leaders provided another discrepancy especially for those staff members who were directly involved with data collection for the dashboard. Those staff members wanted to know that the time they spent collecting data was not wasted. A director commented, “At this point it’s stalled and just another exercise” (Participant 12, 2011).

Finally, senior leaders and directors were more concerned with priority than staff members. Most senior leaders and directors perceived that the Vice President did not keep the dashboard effort a priority in the division.

A closer look at the disparities reveals opportunities for the Performance Prism (Neely, Adams & Crowe, 2001) to be applied to this institution of higher education’s planned change effort. The first area of focus for the Performance Prism is Stakeholder Satisfaction: “who are the stakeholders and what do they want and need” (Neely, Adams & Crowe, 2001, p. 6). Had the change agent in this case study considered this question, the directors and staff members would have emerged as stakeholders and their “wants and needs” would have been examined. As such, the change agent would have learned about department head and staff members “wants and needs” for continuous improvement, feedback and involvement with the change effort. The process used to create the dashboard ignored these stakeholder “wants and needs” and led to a major disparity in understanding the goal of the effort.

The second area of focus for the Performance Prism is Strategies: “what are the strategies required to ensure the wants and needs of the stakeholders are satisfied” (Neely, Adams & Crowe, 2001, p. 7)? Using this framework, the change agent could have addressed the “wants and needs” of all the stakeholders including directors and staff members. This could have meant

the preparation of the dashboard KPIs to enable these stakeholders to be able to monitor, analyze and manage department operations and programs (Eckerson, 2011).

“What are the processes we have to put in place in order to allow our strategies to be delivered” is the third area of focus of the Performance Prism (Neely, Adams & Crowe, 2001, p. 7). Again, this would require the change agent to focus on each stakeholder including the directors and staff members.

The fourth area of focus for the Performance Prism is Capabilities: “What are the capabilities required to operate our processes” (Neely, Adams & Crowe, 2001, p. 7)? Perhaps an examination of this area of focus by the change agent would have alleviated the concerns by directors and staff members about resources. This evaluation may also have contributed to amend the perception that the Vice President did not portray the dashboard effort as a priority.

Stakeholder Contribution is the fifth area of focus for the Performance Prism: “What contributions does the organization need from its stakeholders to maintain and develop these capabilities (Neely, Adams & Crowe, 2001, p. 7)? An investigation into these contributions by the change agent could have set expectations for the senior leaders, directors and staff members that they were also responsible to keep the dashboard effort a priority, among other factors.

Discussion & Conclusion

This paper draws upon the literature from performance measurement, organizational change and higher education as a means to identify evidence for the use of the Performance Prism as a useful PMS in higher education. From this exploration it is clear that using the Performance Prism in higher education is valuable because it allows for evaluation of all stakeholder “wants and needs” that might otherwise go overlooked. This is especially important in institutions of higher education which exhibit characteristics of loosely coupled systems such

as, independence from a central area of authority, isolation and unique identity from others in the institution. As was the instance in this case study, the overlooked stakeholder “wants and needs” could be keys to the success or failure of the planned organizational change effort as perceived by stakeholders. This is especially important for practitioners choosing between the vast assortment of PMS.

With many asserting that 60-80 percent of all planned organizational change efforts fail (Kee & Newcomer, 2008; Ruben, 2009; Wheatley & Kellner-Rogers, 1998), it makes sense to consider as many facets of the organization as possible. Using the General System Theory viewpoint helps the change agent to investigate all levels of the organization as they are likely to have different perspectives about the same issue which further supports the use of the Performance Prism (Neely, Adams & Crowe, 2001). In addition, reviewing alternative PMS provides the change agent with advantages and disadvantages for each as evaluated to their specific planned change requirements.

Research comparing the Performance Prism (Neely, Adams & Crowe, 2001) to implemented planned organizational change efforts that did not use the Performance Prism is limited. Additional research analyzing change efforts using the Performance Prism and General Systems Theory should be considered. Also limited is the study of the use of the Performance Prism in institutions of higher education. Particular to this paper, more than one institution of higher education should be studied. Additional institutions of higher education should be compared with this case study and others. Future studies should make a point to examine further what role the loosely coupled nature of institutions of higher education plays in planned change efforts.

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DESIGNING THE APPROACH FOR
ASSESSMENT THE IMPLEMENTED
PERFORMANCE MANAGEMENT SYSTEMS

TARMO KADAK

Designing the approach for assessment the implemented Performance Management Systems

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Structured abstract

Purpose

In remarkable amount have been published survey results, articles and other literature about performance of business. The subject has not remained only at the level of theory but attempts have been made to implement the performance related methods also in practice.

On the other hand, there are many references in literature that indicate that in practice there have been difficulties in the implementation of PMS. In addition, insufficient implementation of Performance Management Systems (PMS) may lead to low achievement rates of organisational performance. There are few studies which focus on identifying which characteristics within PMS are crucial for supporting achievement of high organisational performance. This particular study contributes to filling in this gap. Some prior analyses about implementation difficulties indicated that the key issue related with implementation of PMS is lack of communication.

The **objective of this paper** to create a model for increasing the successful implementation of PMS by using the chain principle in the design, implementation and functioning of PMS for ensuring communication to support achievement of high organisational performance.

Design/methodology/approach

The author tests this approach **by case study**, tracking the chain principle in the PMS of one listed business company, gone through one full strategy cycle.

Findings

The main finding was that continuity of chain between all PMS parts and all components of parts of the case organisation revealed and on the same time the organisation attained high achievement rates of strategic objectives.

Research limitations/implications

As a theoretical contribution, this paper shows some characteristics inside PMS which positively affects organisational performance.

The chain principle that was used, contributes to the design of implementation models of PMS.

In addition, the author's approach complements the implementation models of PMS.

Practical implications

The approach makes it possible to assess the efficiency of an implemented PMS and where malfunctioning is detected, to focus on the weaknesses in the respective parts of the system. After the shortcomings are removed, the efficiency of the PMS will be restored.

The same model can be applied in addition to strategic objectives for achievement the other objectives lying under term of organisational performance.

In addition, the same approach can be used in the creation of PMS and also to study the implementation of a PMS in the public sector organisations.

Originality/value

Originality of this paper consists in the approach which helps the design, use and test of PMS. Novel is the view presenting the contribution of structure of PMS to the strategic objectives of PMS.

Keywords: Design and implementation of Performance Management Systems, communication in PMS

1.Motivation and methodology of research

Analysing the definitions of Performance Management Systems (PMS) about how relations between these systems and organisational performance are reflected, three types of definitions can be identified.

In the first group of definitions, these relations are not treated. In these definitions an approach is used to determine what the PMS does and to indicate what it consists of. For example, the PMS: ... is a management process... (Tools and..., 1998) and ...process that links people... (Performance Management Guide..., 1991).

In the second group are definitions which indicate that these relations exist, but are indirect. In these definitions that show relationship between PMS and organisational performance verbs are used like: ...PMS helps... (Verweire and Berge, 2004) and ... steering of the organization... (Waal, 2001).

Chenhall (2003) analysed how the definition of Management Control Systems (MCS) has evolved over the years. He divided MCSs into three categories, according to how these systems are perceived.

(1) Conventionally, MCS are perceived as passive tools providing information to assist managers.

(2) Sociological orientation see MCS as more active, furnishing individuals with power to achieve their own ends.

(3) Contingency-based research perceives MCS as a passive tool designed to assist manager's decision making.

All these see PMS also as indirect influencer of organisational performance and may also classify into second group.

The third group are definitions in which relations between PMS and organisational performance are direct. In these cases phrases are used like: ... to improving organisational performance to achieve corporate strategic aims... (Edis, 1995), ... the improvement of an organisation's performance ... (Armstrong, 2006), ... for managing the execution of an organization's strategy... (Cokins, 2006) and ... the outcome variables (author: of MCS) should be some dimension of desired organizational or managerial performance (Otley and Wilkinson, 1988).

Definitions of the third group perceive PMS as a direct influence on organisational performance.

Malmi and Brown (2008) classified definitions of MCS (Management Control Systems) into four groups. Some definitions in the first group contain overlaps and some definitions are quite different from each other.

In the second group very broad concept of MCS are presented by definitions of Chenhall (2003) and Merchant and Otley (2007). In these definitions MCS consists of different components of Management Accounting.

The third group presents narrower definitions about MCS by Merchant and Van der Stede (2007) and Abernethy and Chua (1996). In these definitions MCS directs employees' behaviour.

In the fourth group, the definition of Flamholtz et al. (1985) sees MCS as the means to achieve goal congruence, ... lead to the attainment of organisational goals.

The final group also perceives MCS as a direct influence on organisational performance.

Further in this paper PMS also has considered as a direct influencer of organisational performance. Organisations behave rationally, they implement systems only then if they see that raising benefits from the system exceed implementation costs. The ultimate purpose to

implement PMSs is to get organisational strategic objectives achieved. Therefore the broad term, organisational performance of organisation, is defined in this paper with achievement of the strategic objectives.

Many references in the literature indicate that there have been difficulties in the implementation of PMS which have not allowed to obtain the full benefits from the system (e.g. Business Intelligence, 2000; Bourne, 2005).

There are certainly many success stories, but there is also growing literature that addresses the difficulties of implementation. Some scholars now claim that 70 per cent of performance measurement initiatives fail (McCunn, 1998).

The same rate (70%) marks failures of BSC implementation (Neely and Bourne, 2000).

Waal (2002) says that 56% of performance management projects fail.

Research studies have shown that PMS implementation in industry still lags far behind expectations (Olsen etc., 2007).

If PMS is direct influencer of organisational performance, then insufficient implementation of PMS leads to low achievement rates of the organisational performance. High rates of implementation failures are call to investigate this phenomena, to get closer to the factors causing this with purpose to eliminate these shortcomings systematically on the implementation and functioning phase of PMS and thereby ensure high achievement rates of strategic objectives of organisations. Lucianetti (2009) claims also: however few of researches are related to the BSC implementation in terms of appropriateness or, to be clearer, on how the BSC should be adopted to make this methodology really useful to the organisations.

Although there are studies listing benefits arising from PMSs, then consisting achievement rate of strategic objectives among of them is rare. Lucianetti (2009) drew together benefits from Balanced Scorecards (BSC):

Translating strategy into operational goals

Improving employee's knowledge on how they are evaluated

Making more clear the linkages among short and long period objectives

Linking performance measures to corporate strategy

Adopting new performance measures

Improving internal communication among people

Aligning the organization with strategy

Explicating cause-effect relationships

Increasing the participation of top management to the formalisation of the strategy

Building a consensus around the organization's vision and strategy

Motivating people (on comprehension about their role in the firm)

Enhancing time and efforts on strategic related issue

Making strategy everyone's day job

These all are relevant influencers of high achievement rate of strategic objectives, but not objectives themselves. There are lack of studies in the literature investigating PMS's impact to the achievement rate of strategic objectives of organisations. There is high need for such a research allowing to stress on factors which play significant role on the achievement of strategic objectives of organisation. These factors have to be find. Remissive factors need to be eliminated and strengthening factors need to be fixed on the implementation and functioning theories and practices of PMSs.

Kadak (2008) analysed the viewpoints of several authors (9) found in the literature about the causes of the difficulties in the implementation of PMS. He grouped these into six group encountered in strategy execution:

More specific difficulties are encountered in strategy execution as a process:

1. Communication difficulties: strategy has neither been deployed nor aligned with managers, units and employees; strategy is not clearly understood.
2. Measures are poor and there are too many of them, which all is a consequence of poor selection process of measures. This implies a lack of an efficient method.
3. Insufficient resources for strategy execution, resources are allocated without consulting strategic priorities but on some other basis.
4. Feedback related: adjusting activities are not based on actual results or these are not performed at all; bonuses are determined not based on strategy execution.
5. Problems are encountered in PMS implementation, insufficient initiative, insufficient allocation of time and money for execution.
6. Problems caused by PMS: lack of an advanced information system.

These difficulties were in turn divided into two:

1. Difficulties with communication: both deployment of objectives and feedback. Also measures can be regarded as means of communication tools 1, 2, 4.
2. Difficulties arising from insufficient leadership and resources in PMS implementation 3, 5, 6.

Difficulties with communication affect creation of PMS structure and its functioning more directly. Insufficient leadership and resources influence the quality of the structure and functioning somewhat more indirectly.

Difficulties with communication have been pointed out by many other authors too. Merchant (1989) argues that communication failure is an important cause of poor organizational performance. Verweire and Berghe (2004) claim that communication has a significant role in the performance management process.

Weak communication is mentioned also by Malmi (2001) in his research:

“Most interviewees stated that they have derived their measures from strategy, based on cause-and-effect reasoning. When asked to give an example of such cause-and-effect chains, the claimed link between strategy and measures appeared weak in most companies. Comments suggest that the initial idea of linking measures is not well understood”.

Debusk and Crabtree (2006) claim, that: Breakdowns in communication and difficulty in translating the strategy into action are common reasons for failure. It is often difficult for employees to know what to do to improve performance.

Organisations obtain to have high organisational performance and when PMS is seen as direct influencer of it, then is relevant to decrease influence of this main shortcoming – lack of communication inside PMS.

Taking into account these findings and the necessity of organisations to have an efficient supportive PMSs, this research is focused on the factor which most prevents the achieving of strategic objective. Objective of this paper is to construct the conceptual model which minimizes exposed impact of factor of communication in PMS and thereby increases probability of the successful implementation of PMS.

The research methodology consists of first constructing of a conceptual model based on the chain approach. Then validity of the created model is tested through one case study. Case investigates the PMS of the business company, gone through full strategy cycle with patent strategic results.

This paper is structured as follows. In chapter 2 the conceptual model is contrived. In chapter 3 results of a case study are presented in way which opens more constructed model and

contribution of its components for ensuring the chain existence. In chapter 4 the conclusions of research are presented.

2. Constructing the model

What constitutes state-of-art in literature about design of PMS?

Otley and Kaplan and Norton cover material closely related to this topic. Otley (1999) posed five questions that need to be answered by any organisation in relation to the design and nature of its PMS¹. Ferreira and Otley (2005, 2009) extended such study to include 12 questions of which eight (1-8) relate to PMS design and four (9-12) are more „contextual“ variables that guide the nature of any PMS. Answers to these questions mould the PMS. The questions developed in these studies are about components such as vision, mission, key factors, organization structure, strategy, plans, performance measures, targets, evaluation, rewards, information flow, use and change the system and strength and coherence of PMS.

Kaplan and Norton (2006) use the terms „alignment“ and „cascading“. These are targeted to the same results as Otley's questions: through alignment and cascading to achieve situation in which strategic objectives are translated into activities for executing units. The components that need alignment and cascading are the same in the Ferreira and Otley study. The author of the present paper also uses these components in the conceptual model. Novel is tying the components with each other and through this linkage, constituting the chain (as a key dimension of the PMS).

Analysing the questions of the Ferreira and Otley study and the content of alignment in a hierarchically structured format (which express the assumptions for ensuring efficient communication) of PMS, author of this paper found that questions and content of alignment do not reflect this aspect strongly enough to minimise the risk of drift. Even the 12th question (how strong and coherent are the links between the components of PMSs and the ways in which they are used?) indicates the need to have strong and coherent links between the components of PMS, then authors do not (yet) provide a tool/approach for ensuring this.

Designing PMS by answering questions of Ferreira and Otley needs additional support to assure the genesis of the chain relations in PMS. This is because just having answers to these questions may not be sufficient and may not assure the continuous interrelations between components of PMS, through which undistorted and uninterrupted information (and applications of information) can flow to the next component.

The conceptual model constructed in this paper for designing and using an effective PMS (for eliminating the communication failure in PMS) is based on observing the chain principle. The author perceives PMS as a chain. The chain fulfils its function when it is continuous. If the chain has been broken or some link in the chain does not fulfil its function, then the information does not spread along the chain and the chain as a whole does not fulfil its function (to enhance communication).

In similar fashion, it is possible to assess how the PMS has been designed and is functioning. The structural components of the PMS must be firmly interlinked, because each component depends on others, thus making up the whole. The same applies to the functioning of system where consecutive activities must occur. If this is the case, the author can claim that chain is continuous, which assures the flow of information (ensuring communication) and that its

¹ Ferreira and Otley are using a term Management Control System (MCS) as well.

applications in the PMS and most probably the PMS itself is effective and will support high achievement rates of organisational objectives.

Classical components of PMS

In this section, a rationale for the necessity and genesis of specific components constituting the chain and their interrelations are presented. Communication can be ensured by existence of consecutive components. Next these components, linked with each other are described.

Strategy is a broadly defined concept employed by a number of authors. The author examines strategy as defining the objectives and activities, and a description of the definitions and based on it the implementation of a strategy to bring the issue previously determined by the achievement of strategic objectives will begin.

The *strategic objectives* are derived from the strategy and make it concrete, in order to allow for a later the distribution of time and action.

Critical Success Factors (CSF) are the most urgent, critical (described qualitatively) areas where the in the implementation of strategy the greatest obstacles exist and an organization should overcome them in order to achieve a specific strategic objective. Overcoming these obstacles should lead to the achievement of the objectives, if not, the CSF are derived in a wrong way.

To ensure overcoming CSF and for the measurement of the achievement of objectives there is a need for *Key Performance Indicators (KPI)* together with the *target value (TV)*.

The *key process* is a derivative from the effort KPI and the latter in turn a derivative from the effort CSF. Surmounting is characterised with the help of effort KPI (or activity already), which are divided into those characterising inputs, process and outputs. *Inputs* must be sufficient for *activities*, which have *outputs* ensuring that success factor of effort is surmounted, and which guarantees that sufficient effort KPI target value is achieved.

The chaining of these components

The chained structure for performance management exists when executing units of the organisation are given the strategy based targets with KPIs and target values and also activities with KPIs and time limits have been fixed (or available) for executors (Figure 1). On the basis of that structure can gather information and communicate it to managers, and on the basis of which adjusting activities are carried out, where necessary. All this chain is necessary so as processes/activities could be derived from the organisation's objective with the deadline many years away, which the units need to perform in the short term as well as in the following years. Since functional division of labour is dominating in organisation, units have to make efforts to the best of ability, which they do, or they are which through short-term activities generate long-term success(es).

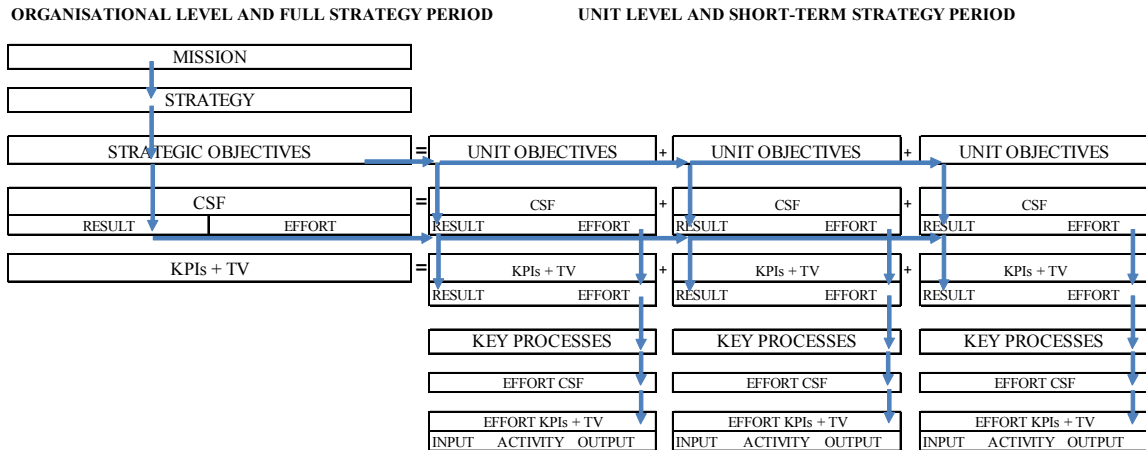


Figure 1 Chain in the PMS structure of a business sector organisation (compiled by the author)

Hence, so as the right things are done well today it is necessary to derive an unbroken chain from strategy/future into the present day. In this way organisation can prevent “wrong activities“ from being “mistaken for the right ones“ in structural units’ development activities. The author divides the above structural components of PMS into two: recommended and obligatory.

Recommended are the components which support deriving, so as the right KPI target values could form. They do not let deviate from deriving the right KPIs for strategic objectives. A deviation would cause the situation where units achieve KPIs with target values, but their achievement will not involve achievement of the KPI target values of the organisation’s strategic objectives. The recommended components of PMS are: mission, strategy, action plan, various CSFs at organisational and as well as unit level. As there is a chance that organisation can reach directly to the right obligatory components in the PMS structure then this is a reason classifying these as a recommended components.

Obligatory components fix precisely where the organisation needs to get and enable it to track its pathway in the short term. The obligatory components (13) of PMS are: the organisation’s and units’ objectives and KPIs of these objectives with target values; KPI key process for every process with input, activity and output KPIs and target values for every key process (activity) (Table 1). Obligatory components constitute the chain in PMS structure.

Table 1 Obligatory and recommended components of structure of PMS in the business sector

OBLIGATORY AT ORGANISATIONAL LEVEL	OBLIGATORY AT UNIT LEVEL	RECOMMENDED
(1) Strategic objective	(4) Strategic objective	Result CSF
		Effort CSF
(2) Key performance indicators (KPI) + (3) Target value (TV)	(5) KPI + (6) TV	
	(7) Key processes	Effort CSF
	(8) Output KPI + (9) TV	
	(10) Activity KPI + (11) TV	
	(12) Input KPI + (13) TV	

At the beginning of the strategy execution, the **structure of PMS** must be in a situation where all units have been forwarded the objectives with the measures (and all other obligatory components) derived directly from the strategy. After that the **functioning phase** of PMS starts where the chain consists of ranked activities. Functioning – keep the system running – starts around the date when the strategy execution begins and new tasks enter into force.

Running activities related with functioning and constituting the chain:

- data collection,
- analysis,
- reporting,
- communication,
- interpretation,
- managers and senior executives familiarising themselves with the report and their reaction,
- feedback together with the assessment of “carrot and stick”,
- planning adjusting action (new KPIs with targets),
- execution of adjusting actions.

Classically, using of PMS begins when the **implementation phase** is finished and execution starts following the “new rules“. Reporting monitors milestone set in the PMS structure, their achievement and communication of outcome. On the one hand, functioning finishes the entire chain, but on the other hand, it gives input into the PMS structure after milestone reporting. As a result units' CSFs, KPIs and target values will be adjusted for the next period. Actually, adjustment closes the functioning chain of PMS.

To summarize: the author can point out relationships between its three parts of PMS and between the components of the parts. The model first shows these three parts of the PMS occurring in a chain (Figure 2), and then shows components of these parts appearing in a chain (Figure 3).

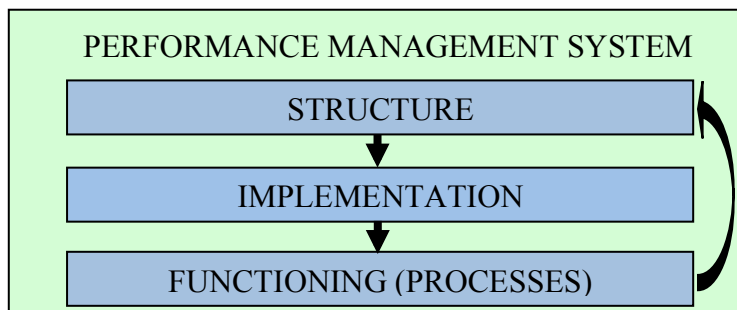


Figure 2 PMS parts occurring in the chain (compiled by the author)

Figure 2 depicts the three of the PMS appearing in a chain: structure – implementation – functioning – structure. During the implementation the obligatory components in the PMS structure are set/established for executing units. In addition, the functioning phase concentrates on them, collecting and communicating the results and deriving adjusting activities. In addition to the three parts of the PMS, components of the PMS parts (components of structural and functional chain) are also shown in a chain in Figure 3.

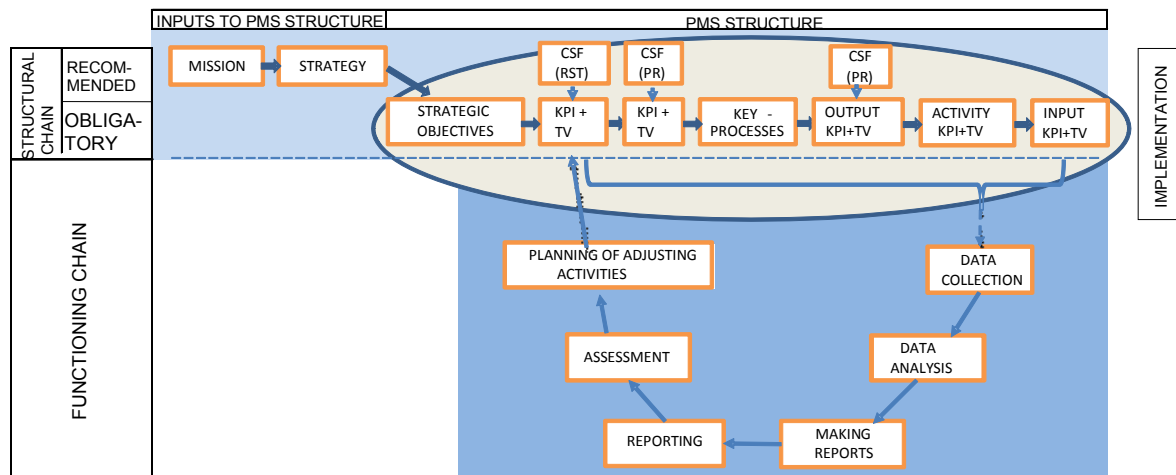


Figure 3 Relationships between parts and components of PMS in the chain (compiled by the author)

The PMS, existing in this fashion, assures the flow of information (communication) between the components and their parts and thus supports the achievement of high organisational performance. The content of information consciously changes as the information moves along the different components.

In brief, the obligatory components constituting the chain in PMS in the created conceptual model, are presented in the academic literature earlier, but to this point, an effective way to aggregate these components and apply them in a continuously linked fashion for assuring communication in the PMS has not yet been developed and exploring influence of PMS to achieved strategic objectives of organisation either. The author through the present study contributes to fill these gaps.

Next the validity of the created conceptual model is tested through the case study.

3. Case study

3.1 Introduction

The case study investigates the presence and interrelationships of all parts of the PMS and their components. When particular definitions of the PMS stress direct relations between PMS and organisational performance, this was considered in the selection of the case organisation. Observing PMS and organisational performance in conjunction with each other, the case organisation must go through one full strategy cycle and has to have a measureable achievement rate of organisational performance (in this case strategic objectives). In that way is possible to assess impact of PMS to the achievement rate of organisational strategic objectives.

When strategic objectives can be communicated to executors by moving along the chain in the PMS structure and when activities occur currently in the chain during the system functioning phase (starting from data collection through the monitoring of the execution of adjusting activities), then it is more likely that the strategic objectives are achieved (as compared to the instances when the chain was interrupted).

If strategic objectives of the case organisation are achieved and a case study confirms that the chain is not interrupted, then the chain approach can be considered appropriate. By contrast, when objectives are not achieved and an interruption occurs in the chain at the places that can be identified, then the chain approach can also be considered appropriate. For data collection purposes the author conducted interviews and performed an internal analysis of the content of the document(s), more specifically a qualitative observation of the document. The author was

not given permission to record interviews. The author conducted the content analysis based on the following steps: defined the documents to be studied, specified the objective, ascertained that the sample of documents to be representative, conducted the analysis and interpreted the results. In order to develop plausible (reliable) interpretations he used internal and external coherence. He observed that the latter was in conformity with what was described in the literature and used these studies to describe the research.

The case company – Baltika AS (later Baltika) – is listed on the Tallinn Stock Exchange. Until this strategy period Baltika was a clothing company. At the end of 2002 the group was comprised of ten companies and employed 1725 people. In 2001 the consolidated sales revenue of the group was 26.5 million euros and its net profit was 1.1 million euros. Baltika operated the several retail concept and retail sales area in seven countries: Estonia, Latvia, Lithuania, Poland, Ukraine, Russia and Sweden.

This paper analyses the strategy period 2002–2005². The previous strategy period (2000–2001) had seen a very important change for Baltika – a turnaround from a production company into a retailer began during this period. This turnaround continued during the next strategy period.

Next the results by parts of PMS of Baltika are presented mixed with descriptions about theoretical contribution of components of PMS` part. The purpose of descriptions is to open more detail the created model.

3.2 Results about PMS structure

The analysis starts from strategic objectives. Baltika had a stated *mission* statement and a 5-page *strategy* document (2002), written for the years 2002–2004. Both of them are not obligatory components of PMS and they have an indicative role in the development of strategic objectives, which are themselves obligatory structural components of PMS. Three objectives were stated as *strategic objectives* for the period 2002–2005:

1. double sales revenue by 2005,
2. triple profit in the period,
3. ROE at least 15%.

Analysing these objectives the author concluded that the first two are leading objectives and the third a lagging objective (under the assumption that equity volume will not be changed).

There were no other strategic objectives; however, early in each year of the period sub-objectives were set for that year (Appendix 1).

Analysing the sub-objectives it can be seen that these like the strategic objectives, are focused on financial interest. Considering that the strategic objectives of Baltika are on a quite general level, the sub-objectives focus on what should be achieve in a given year to fulfil the overall strategic objectives. Based on the strategic objectives of Baltika, every sub-objective must contribute in a more direct or indirect way either to increasing sales revenue, decreasing expenses (or keeping expenses under control), or on both tasks. The sub-objectives are clearly stated, but some of them still needed deployment (further elaboration), because they were difficult to relate to specific executors for implementation (because specific executors may need more detailed information for the tasks of implementation). For example, many different functions may contribute to the achievement of the sub-objectives of promoting “sales efficiency growth“ and to “improve retail system operating expenses to total revenue ratio“. From the chain aspect, it is important to note that sub-objectives were aligned to executive units and that in the PMS functioning phase reporting against them would occur.

² In 2002, the strategy period was expected to be 2002–2004. The year 2005 was added at the end of 2004 when it turned out that some of the strategy related activities cannot be carried out in that calendar year.

These sub-objectives can be regarded as *effort objectives* the achievement of which must lead to the achievement of *result objectives* (strategic objectives) by the end of 2005.

Although the author regards CSFs as recommended structural components of PMS, they should exist on the focusing purposes considering the specific nature of the strategic objectives of Baltika. Namely, the objectives of sales revenue increase and keeping expenses under control in an important growth phase depend on numerous factors and contributions of units/functions, and these objectives also influence many qualitative indicators of Baltika and *vice versa*, therefore there must be a more specific focus.

The strategy document did not contain structural components of PMS as author was labelled them. The author analysed the strategy document contents, since regardless of whether these components are explicitly named, they may be present and/or other parts of the document may fulfil the role of success factors.

Can the six items contained in the strategy part of the strategy document regarded as *CSFs*? These stated that the objective posed for Baltika can be achieved:

1. with the help of fashion offers targeted at different consumer groups, which will be achieved by *developing effective* and *active retail solutions*;
2. by rapidly and creatively combining consumer information and global fashion trends *in product development*;
3. with the help of a vertically integrated business model, which permits the application of *contemporary logistics solutions* to provide consumers with a new fashion after every two weeks and high level availability of goods;
4. by investing in Baltika owned production companies, ensuring flexible production with *short production times* to satisfy consumer needs;
5. with *strong retail organisations* in Baltika's designated markets, which ensure fast and effective implementation of Baltika's strategies and tactical solutions;
6. with a work environment oriented to versatile professional development *of employees*.

The task of CSFs is to concretise the strategy. The obstacles in these critical areas must be overcome as a result of purposeful activities. The criteria of critical success factors are:

1. in the limits of the existing activity areas of the organisation;
2. they have a clear connection to the strategic objective;
3. expressed in qualitative terms, not expressed in quantitative terms;
4. clear, short, not contradictory, unambiguous.

Do the six items previously listed meet the critical criteria of success factors?

- They all meet the first criterion.
- Based on the second criterion, they are not directly related to any of the strategic objectives. It may be said, however, that either directly or indirectly they influence earning income and keeping expenses under control. In what way are these success factors related to the sub-objectives? It must be admitted again that they can be linked to any of the sub-objectives specifically. They do, however, exert a co-effect on different sub-objectives. For example, all the so-called success factors can be regarded as CSFs of the sub-objective "sales efficiency growth".
- They are all expressed qualitatively; a quantitative expression is missing.
- From the aspect of clarity and the avoidance of several, possibly contradictory interpretations, they do not meet the requirements. First, an interview with the business processes manager revealed that for example, the term "strong retail

organisation” caused confusion in the company, since it was not clearly defined. Secondly, they are too general (and need to be specified).

In short, it may be concluded that although CSFs specifying the areas of activity more precisely than strategic objectives of Baltika, they were still too general because they did not conform to the final criterion; hence they could not completely fulfil the role of CSFs.

The lack of detail in the so-called six items is compensated by the sub-objectives. Although these have a different role than success factors, looking at the sub-objectives their effect is ambiguous: either an increase in income or keeping expenses under control. Despite this limitation, considering the specific nature of Baltika’s strategic objectives, it may be concluded that sub-objectives draw attention to something more detailed, and therefore it might be concluded that these sub-objectives help fulfil the role of success factors. Yet in must be asked; do they meet the criteria of success factors in other respects?

- They are within the limits of the organisation’s areas of activity.
- They lack direct connection to strategic objectives, but have an indirect linkage, because every objective exerts influence on the income and/or expenses of Baltika.
- They cannot be presented qualitatively, but only quantitatively.
- They are clear, short and not contradictory.

In short, it can be conclude that the consideration of the six items and sub-objectives together fulfils the role of success factors. A common shortcoming of both was that they were not directly connected to strategic objectives. Yet some connections were discernible. To sum up, they helped to channel strategic objectives.

KPIs are by considered by the author to be obligatory structural components of PMS. Every strategic objective of Baltika had *KPI* (e.g. sales objective – monitoring of sales revenue), as well as target values (e.g. sales revenue objective – double growth). In addition every sub-objective had *KPIs* and *target values*. Thus far the author can discern the presence of continuous chain in the PMS structure (Figure 4).

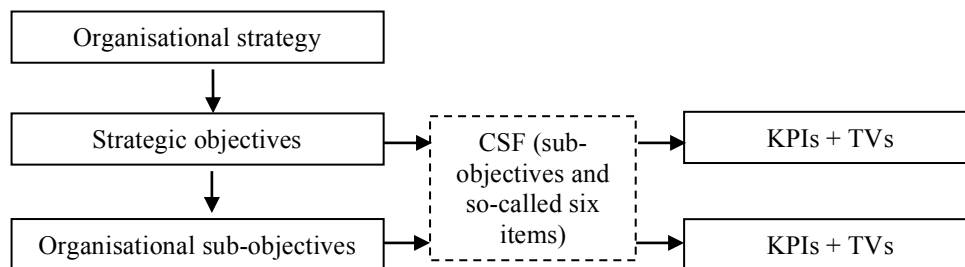


Figure 4 PMS structure to strategic objectives’ CSF, KPI and target values (including sub-objectives)

In brief, it may be argued that although CSFs did not exist directly and their role was borne by other parts of the strategy document, their objective was achieved, even though this occurred between the different parts of the strategy document. The objectives of the *KPIs* with target values were directly and fully present.

Description of the Success Model

The strategy of Baltika was tied to Success Model (named in this way by author of this paper). The Success Model was a central part of Baltika’s PMS. In the Success Model structure (created by Baltika) were the factors that ultimately led to the achievement of

strategic objectives. These factors were influenced by units during the strategy period, which set for themselves respective objectives via sub-objectives. The Success Model was based on Goldratt's Theory of Constraints.

A central part of the Success Model was sales revenue growth by increasing retail space. When the implementation of strategy for the underlying period began Baltika had X shops with the total area of Y m², which produced in total Z euros of retail sales revenue. Here can speak of average sales per square metre or Z/Y (€/m²). Subtracting the production or purchase costs of goods from the sales revenue, the result was the 1st additional value that can be expressed also through the sales revenue to cost of goods ratio. If to the subtract expenses of shops (which can be expressed also per m²) from the 1st additional value, the result is the 2nd additional value.

To achieve the strategic sales revenue objective by the end of 2005 at the same per m² sales, the square metres had to be increased by Y+ m². Such a calculation was done in 2002 when they knew how many square metres more they needed at average indices to achieve the intended sales revenue by the end of 2005. The missing m² difference had to be covered by investments during the strategy period.

The second part of the Success Model was more explicit. Based on its strategy and business model, Baltika relied most on retail sales. This was more profitable than wholesale and subcontracting production.

Retail sales revenue was created in several different ways and depended on the interaction of several factors, for example:

- average sales price x quantity sold, or
- average sales per store x number of stores, or
- average sales per area sq.m x sales area (sq.m), or
- average purchase (€/transaction) x transactions per visitor x visitors, or
- sales in first price net - discount amount, or
- sales in first price net x average discount, or
- sales per loyal client database x number of loyal clients, or
- sales per option x number of different options.

These equations were mathematically correct and ensure sales revenue, but based on their character, they were not sufficient for setting an objective for one unit only (too general) since an unit is not directly able to influence them. For that purpose they needed to be deployed and this deployment should be expressed in documents, first of all, based on the organisation strategy, in unit objectives. The Success Model contained 12 measures (Appendix 2).

Strategic objectives, sub-objectives and the Success Model were interrelated in a way that the Success Model identified the factors sales revenue and profit depended on, and the strategic objectives gave them target values that had to be achieved in the strategy period (Figure 5).

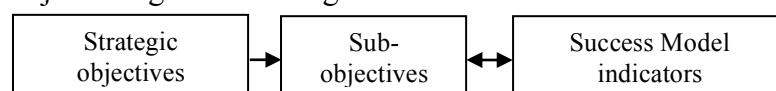


Figure 5 Relationships between objectives and the Success Model of Baltika

Sub-objectives specified where to focus more attention in the current year. The relationship between sub-objectives and the Success Model was mutual. Sub-objectives being also relatively monetary based, were presented in the "Success Model language". Both objectives established/enforced the Success Model content to the executors.

Moving in chain within the PMS structure from the organisational level to the unit level the next structural components are *unit objectives*. The movement from the organisation's strategic objectives to unit objectives can be discussed as a vertical movement along the

chain. For the chain continuity these must be derived from the organisation's strategic objectives.

The objectives of Baltika must be analysed in two parts: first, revenue and expense objectives to units, based on strategic objectives and then determining how the integrated level sub-objectives reach units. All units of Baltika should have objectives the achievement of which will ensure the fulfilment of sales revenue and profit objectives, which is the basis for achieving strategic objectives.

Did all units receive their objectives from the strategic objectives at organisational level? Baltika had a consolidated income statement for the strategy period 2002–2005, which revealed doubling of sales revenue and tripling of profit. When the strategy was prepared (in 2001), it existed only at the organisational level and before every new financial year turned into an aggregated budget, being formed of revenue and expenditure budgets of all units of Baltika. It may be argued, therefore, that when the units of Baltika had their own budgets and their implementation was set as an objective, then all units had received their own (financial) objectives that were derived from the organisational level, or to claim it in another way; there was alignment between strategic and unit objectives.

Since Baltika had also more explicit sub-objectives, then in addition to unit revenue and expense objectives these sub-objectives had to be communicated. It was important for the units to have the sub-objectives, since units start acting for the achievement during the strategy period. Key activities are derived from them. Baltika's revenue and expense objectives are too general for the derivation of specific activities.

Deployment between executive units is needed also for those sub-objectives that are to be met by mutual contributions of several units. For example, one of the sub-objectives in 2004 was a "rise in sales efficiency". This concerned the product development unit, which should offer clothes desired by customers, production/purchase in product quality, retail sales in sales activity.

For the chain continuity it is important that the (biggest) units affecting the group revenues and expenses had sub-objectives documented:

- Retail division influencing revenues, by countries and brands;
- On the expenditure side, production, retail sales, purchase division, logistics, brands, support functions.

Whether and what were established to units in documents from other objectives, were these derived from the organisational level sub-objectives?

The document analysis showed that every unit currently received objectives for the next year. A planned activity, who orders the activity (in the company), a deadline, the potential impact of the activity on the company (either preconditions for earning revenue and/or reducing risks and/or efficiency growth and/or expenses and saving money) were fixed for every objective.

In terms of processes, the integrated level objectives reached units as activities through which the general director and unit manager cooperated to derived tasks for the unit and determine how the unit can contribute to the achievement of the organisational level sub-objectives.

Analysis of the documents indicated that different approaches were used in different years, in some years connections were sometimes made directly; at other times more indirectly.

To this point, the author concludes that there was a functioning chain where sub-objectives at the organisational level reached the executive units.

The units' sub-objectives can be regarded as effort objectives, the achievement of which will lead to the achievement of units' result objectives: achievement of the revenue and expense objectives.

The presence of an *action plan* is significant in the case of Baltika, because financial objectives are relatively general and their achievement (especially revenues) presumes a series of activities. For example, how many shops will be opened in shopping centres in a new year – this will increase sales revenue, gross profit and thereafter also net profit. Action plans must combine sub-objectives, activities and inputs available at the level of Baltika.

An analysis of interviews and documents revealed that there was no document by the name, "action plan". At the same time, it was identified that a previous written action plan was replaced by certain regular activities. This is associated with the informal approach that was then dominant in the company. Baltika had centrally established standardized forms on the basis of which half-year plans had to be made and submitted. These were submitted twice a year.

These plans and reports did not meet the criteria of a classical documented action plan; but occurring as sets of activities with a six-month step within subsequent period's activities they could, in the author's opinion, be sufficient for the purpose of focusing attention on goals and activities and thus fulfil the role of an action plan.

CSF, KPI and target values of unit objectives

The unit success factors cannot be regarded as obligatory structural components of PMS. Their role is to focus on specific issues for the achievement of an objective. When revenue and/or expense objectives were set for units, they also needed success factors; because there are many ways to increase sales revenues and CSF helps to focus on that objective. It was noted above that success factors were not directly present throughout the various level of the enterprise but they existed indirectly (labelled with other names) enabling connection to units. In general, unit success factors should be derived from unit objectives rather than depending too much on organisational level success factors. Did the so-called success factors at the level of Baltika reach the units or were the unit success factors derived from unit objectives? This was clarified by analysing the unit objectives and the success factors with each other.

Here the author have to separately discuss success factors, measures and target values of objectives derived from revenues and expenses objectives and sub-objectives.

When units have their own budgets, their total revenue and expenses can be regarded as KPIs of sales revenue and profit objectives with target values. These objectives had no success factors.

Sub-objectives were present at the whole Baltika level, which helped the strategic objectives to focus on something more specific. Sub-objectives were also present at the unit level. Did they have success factors?

An analysis of interviews and documents revealed that components labelled as success factor were not used in the documents or in practice. Have some other components, for example, unit sub-objectives, analogously with the organisational level, fulfilled the role of success factors? The author tried to answer this question below. For this discussion, the unit level critical success factors must meet certain criteria, presented on the page 11.

Based on the analysis of unit sub-objectives, it can be said that all sub-objectives met the first criterion. The connection to the second criterion varied by year – in some year it was more direct, in other years more indirect. Sub-objectives were expressed quantitatively because of they include measures and target values. They were clear and unambiguous.

As they met most of the four criteria (3/4), it may be concluded with some reservation that unit level sub-objectives also partly fulfilled the role of CSFs. The answer to the previous question whether they derived more from (either the Baltika level success factors or the unit level objectives) favours the latter because the same objectives were the substitute for success factors.

The following statement from the interview with business process manager was taken into consideration when reaching the unit level at Baltika: “Our attitude has been that: if to define from higher objectives more detailed sub-objectives to units, they often reach local measures which may contradict the overall result. For example, the cost of a standard minute in production was an important indicator of production effectiveness – as a result, continuous production was set for an objective – even when there was no need to produce anything. *I.e.*, goods that few wanted were stockpiled and sold later at discount prices or written off – the result was negative effect on total net gain. Hence we preferred to explain to units how they influence total result rather than specifying for them their own measures. When a local measure was given to units, a more general measure was always more important, which this unit had an effect on but which was not for them to influence 100%”.

Taking into account the unit objectives that were derived from the Success Model, which, typical of the success factors, draw attention to something important, led to the conclusion that even though CSFs were not directly present, this role was fulfilled by several other parts of the strategy. Unit objectives included measures and target values.

Thus far the author concludes there an uninterrupted chain where objectives derived from the organisation’s strategic objectives with measures and target values have reached units (Figure 6).

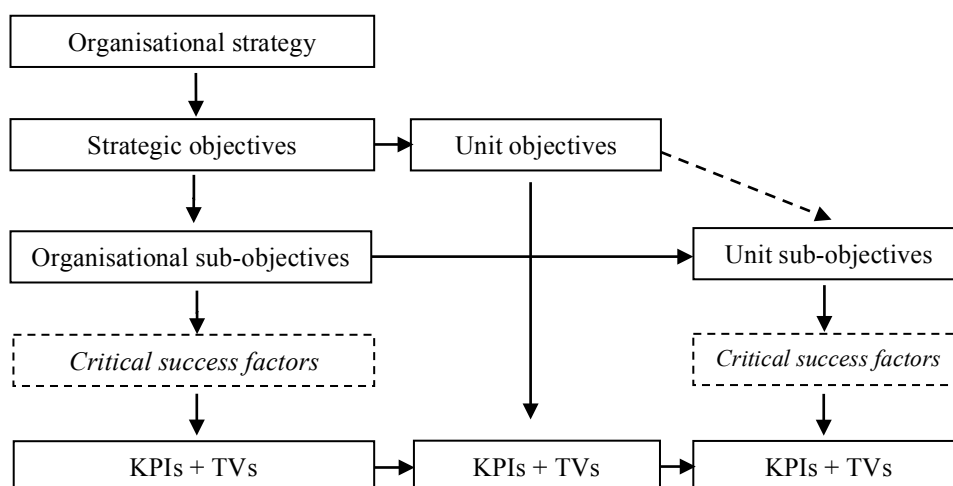


Figure 6 PMS structure after unit CSF, KPI and target values

Key processes and output, activity and input KPI

Key processes must be aligned from measures of unit objectives. Because the strategic revenue and expense objectives of Baltika were too general, the key processes must be derived from the measures of unit sub-objectives.

For example, sub-objectives in 2004 were linked to the opening of new shops, updating of logistic solutions, and the more efficient management of inventory. In this context, the key process of a regional sales division should contain activities that help to increase sales revenue. The product development division should have a key process which includes activities to produce more clothes to the liking of the target group. The development division should choose new regions in which to increase shops area. The market division should increase popularity in new regions. Key processes in divisions classified as cost centres should contribute to producing more outputs in their area at the same input expenses.

In practice, it was the responsibility of every unit manager to define the key processes. The author did not meet such documents where this expectation should have been formulated. However, some unit managers themselves created suitable instruments for the management and a presented better overview of their unit (e.g. flow diagrams, schedules) with more detailed descriptions of activities.

Surpassing of the key process success factors is characterised with the help of process (or already specific activity) key performance indicators/measures, which are divided into those characterising inputs, activities and outputs. Inputs must be sufficient for activities the outputs of which ensure surpassing of the effort success factors, which in turn ensure that measure target value of the (effort) objective is achieved. Inputs determine the resource necessary for the achievement of objective, or a connection between PMS and budgetary funds for strategy execution are established. But input need not be a resource measured only in financial terms.

Did Baltika establish three kinds of measures for every key process: output – activity – input? The author did meet few documents on this topic, but there was a document at the unit level which revealed that Baltika assigned unit tasks on the basis of task description, task outputs and resources.

Interviews implied that in real life the objective and activity needed for the achievement of this objective were defined automatically, because most of the unit managers had been working at the company for years; in this case the conformity of resources needed for activities was easy to provide. There were cases, by contrast, where inputs had to be increased currently to achieve the result – then such allotments were made in order to achieve this objective. It can be concluded in this instance that the objective and resources needed for the achievement of this objective were related.

Despite the small number of documents, it can be briefly stated about key processes that key activities for the achievement of unit sub-objectives were essentially defined based on the resources needed for the implementation of these activities.

For the *assessment of PMS structure* of Baltika, the author relies on the created model. The table below evaluates the obligatory PMS components with regard to: whether or not they are present; when they are present, whether they meet the requirements for the respective component essentially; and the component's impact on the chain (Table 2).

Table 2 Conformity of Baltika's PMS structure to the created model

LEVELS and COMPONENTS	PRESENCE	CONTENT CONFORMITY	EFFECT ON CHAIN
ORGANISATIONAL			
(O) Strategic objective	YES	Conform	Chain is continuous
(R) Result CSF	YES, not defined which	Conform indirectly as so-called 6-items and sub-objectives	No effect on chain
(R) Effort CSF			
(O) Key performance indicators (KPI) +	YES	Conform	Chain is continuous
(O) Target value (TV)	YES	Conform	Chain is continuous
UNIT			
(O) Strategic objective	YES	Conform	Chain is continuous
(R) Result CSF	YES, not defined which	Conform indirectly as so-called 6-items and sub-objectives	No effect on chain
(R) Effort CSF			
(O) Key performance indicators (KPI) +	YES	Conform	Chain is continuous
(O) TV	YES	Conform	Chain is continuous
(O) Key process	YES	Conform indirectly	Chain is continuous
(R) Effort CSF	Did not search	-	No effect on chain
(O) Output KPI +	YES	Conform	Chain is continuous
(O) TV	YES	Conform	Chain is continuous

(O) Activity KPI +	YES	Conform	Chain is continuous
(O) TV	YES	Conform	Chain is continuous
(O) Input KPI +	YES	Conform	Chain is continuous
(O) TV	YES	Conform	Chain is continuous

O - Obligatory; R - Recommended

It can be concluded that the PMS structure of Baltika was uninterrupted and therefore the PMS, based on the organisational strategy, enabled Baltika to derive activities the units need to execute during the strategy period 2002-2005 (Figure 7).

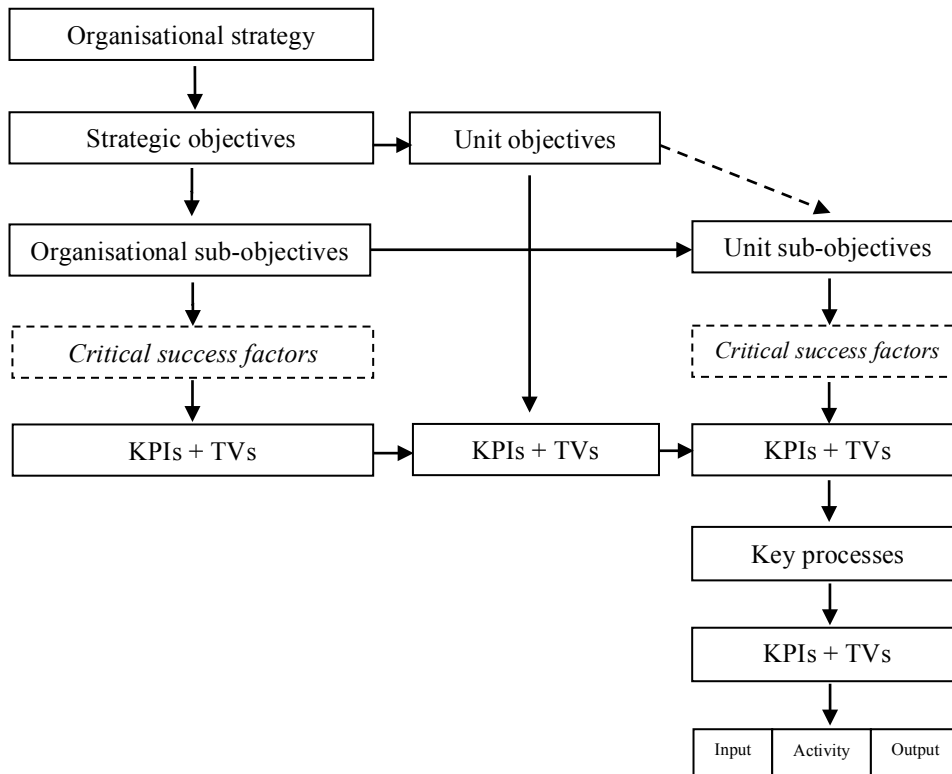


Figure 7 Total structure of PMS (after key processes)

To sum up: all obligatory structural components of PMS were represented in the structure. Many components occurred in the form of periodical activities instead of a classical version. Success factors were not directly present, either at the whole or at the unit level; but they were replaced by other parts of strategy at the organisational and unit level. Success factors are recommended in the PMS structure, but their direct absence did not cause interruption of the chain because eventually all organisational level strategic and sub-objectives reached executive units. Action plans were replaced by regular meetings with their materials. Decisions on key processes were left to the head of each unit. Activities that were necessary to perform had measures and target values to make it possible in the PMS functioning phase to monitor results of activities and, where necessary, react preventively. The contents of the PMS structure were established for the executors in the PMS implementation phase.

3.3 Results about PMS implementation

Most of the presentations and implementation of the new approach (Theory of Constraints and Success Model) were completed in the previous strategy period (2000–2001), which was the first period after the new approach had been introduced. The content of new performance indicators and the effects of various activities on indicators were explained to key persons of Baltika and the affiliated companies of the group. The need to develop and execute changes in

four areas of activity from among the existing policies was described for the strategy implementation: in product development and marketing, logistics, production, sales. Strategy work groups of key personnel were formed for these activities. New functioning rules were developed in the above areas, and these new rules were partly applied. The introduction of “the new” expectations for unit employees was not organised centrally; the manager of each unit was given free reign about how to do this task, and even could decide not to do it.

The incentive system was rearranged in the implementation phase. All employees of Baltika were to be motivated by the operating profit of Baltika – their annual profit bonus depended on that indicator. The bonus rate was based on average wages. The management of Baltika was additionally motivated by the net profit of the group. From the interview: “unit managers were notified of the incentive system according to what revenue and profit centres were motivated by their sales indicators and profit. Although both Baltika and affiliated companies also monitored the fulfilment of expense budgets, the bonus system was not linked to those results”.

In greater detail, for example, the units of sale system (selling subsidiaries, shops) and sales managers (director of trade division, director of retail operations, etc.) were to be responsible for sales revenue. Sale units in markets were responsible also for achieving shop space efficiency indicators.

Materials on the strategy implementation were few. There were some documents used in strategy workshops with managers held twice a year. Their objective was to equalise knowledge and generate ideas.

Notwithstanding the scarcity of materials, a conclusion can be drawn that during the implementation unit objectives and sub-objectives in the PMS structure were set as objectives to units through the incentive system. In this way, the indicators in the PMS structure that had to be achieved were communicated to executive units in the implementation phase.

3.4 Results about PMS functioning

For the chain continuity, PMS functioning must contain data collection and communication of information on the same indicators as were established in the PMS structure. Otherwise the chain is interrupted.

In the functioning phase of Baltika, it should be taken into account that since the central part of PMS was the Success Model, much of the information were collected based on the needs of the Success Model. But since the strategy, strategic objectives, sub-objectives and Success Model were interlinked much of the information collected for the Success Model could also be directly used for monitoring the indicators in the PMS structure.

Since it was the first strategy period in the new conditions, IT system was constantly developed and collecting many indicators was not possible during that period, but this could be done in later periods.

Indicators covered in the Success Model (12) and their monitoring frequency is contained in the tabel (Appendix 2). Those were covered in internal reports but mostly without comments.

An interview with the business process manager revealed how collection and communication of units’ key process indicators was organised. She as a very good information systems expert together with unit managers first, based on unit objectives, set measures for key processes which they should achieve after a certain period of time. In the functioning phase she herself monitored the results from the information system and communicated them to the unit manager. Being a listed company, Baltika took the achievement of strategic and other disclosed objectives very seriously and therefore adjusting activities were made whenever some objective was not fulfilled as revealed by mid-term results.

The revenue and expense objectives derived from the strategic objectives of the company were currently monitored in all units and in the company as a whole monthly – monitoring both their growth compared to the previous period and deviation from the budget.

The achievement of strategic objectives related to sub-objectives was monitored with different frequencies, with the steps of a maximum of one year.

To sum up the functioning; the Success Model related indicators were monitored most frequently. Revenue and expense objectives derived to units from strategic objectives were monitored regularly, with one month interval. The achievement of sub-objectives was monitored and covered regularly in reports. There was alignment between the objectives in the PMS structure and the indicators monitored. Adjusting activities were undertaken, whenever necessary. The analysis detected no interruption of the PMS functioning chain.

3.5 Achievement of strategic objectives

The Success Model of Baltika was based on increasing sales revenue through a growth in the sales area. The sales area increased in the strategy period, which created preconditions for the achievement of a strategic objective – growth in sales revenue (Table 3).

Table 3 Sales revenue and growth in the sales area in 2001-2005 (Annual reports of Baltika 2001-2005)

Year	Sales area, m ²	Growth,%	Sales revenue, thousand EUR	Growth,%
2001	8 649		26 487	
2002	8 870	+2.5	31 025	+17.1
2003	10 109	+14.0	31 767	+2.3
2004	11 668	+15.4	37 189	+17.1
2005	12 736	+9.2	43 518	+17.0

Three objectives were fixed as strategic financial objectives for the period 2002–2005, and their results follow:

1. Objective 1: double sales revenue by 2005 (in 2001 26.5 mln EUR; in 2005 at least 53.0 mln EUR); actual sales revenue 43.5 mln EUR or the achievement of the objective 82%. 2005 report: Sales revenue increased 3.6-fold in 2002–2005.
2. Objective 2: triple profit in the same period (in 2001: appr. 0.96 mln EUR; in 2005 at least 2.88 mln EUR); actual profit 4.26 mln EUR or the achievement of the objective 148%. 2005 report: net profit increased 4.6-fold in 2002–2005.
3. Objective 3: ROE at least 15%. 2005 report: ROE increased from 4.4% in 2001 to 44.1% in 2005, or the achievement of the objective 294% (44.1%/15%).

Baltika itself had ranked its objectives based on Goldratt’s Theory of Constraints and did not set any weights for the objectives. To assess the achievement of strategic objectives unambiguously, the author has attached equal weights to each objective (Table 4).

Table 4 Achievement of strategic objectives of Baltika, 2002–2005

Strategic objective	Result	Weight	Weighted result
1. Sales revenue	82%	33.3%	27.3%
2. Profit	148%	33.3%	49.3%
3. ROE	294%	33.3%	97.9%
TOTAL			174.5%

Hence, it can be argued that Baltika achieved its strategic objectives approximately 175 percent.

4. Conclusions

The purpose of this paper was to create the model for ensuring high achievement rate of strategic objectives. The conceptual model was created to decrease the negative influence of the main shortcoming of unsuccessful PMS implementations – lack of communication inside PMS. The model that was based on chain principle. In the model the author divided PMS into three:

- PMS structure design,
- implementation of PMS, and
- functioning of PMS.

PMS as a chain can be seen existence of these three parts and interrelations between them. The author categorized components of PMS structure into recommended or obligatory. The obligatory structural components (occurring in a chain) of the PMS of business sector organisations at the organisational level are:

- strategic objective,
- key performance indicators (KPI) and target values (TV).

The obligatory components at the unit level are:

- strategic objective, key performance indicators + TV,
- key process,
- key output indicator KPI + TV,
- key activity indicator KPI + TV and
- key input indicator KPI + TV.

In the PMS implementation phase, new temporal objectives formulated in the PMS structure are communicated and established for units or executors. It is a transitional stage where the above created PMS structure is put into operation. This provides new knowledge to executors as a result of which these things will be done in a slightly different manner than before in the next periods. Implementation can be summarised as a process where new rules/principles are clarified and established for units.

The PMS functioning phase comprises collecting and communicating of information on the indicators formulated in the designed PMS structure, and where necessary, conducting adjusting activities.

This phase starts when the strategy execution begins. In this phase running activities constitute the chain starting from data collection till execution of adjusting activities and system maintenance.

Then author conducted a case study with the purpose of focusing on tracking the created model in PMS of a particular company. The case study revealed that PMS chain continuity was identified in the PMS structure where the chain was continuous, and in the PMS functioning phase where the functioning chain was also continuous. In the PMS implementation phase, objectives were set for the executive units to achieve. In the functioning phase, the indicators that occurred in the PMS structure were reported.

According to the created model, the chain was continuous between the parts of PMS. Baltika achieved its strategic objectives by the end of 2005.

Taking into consideration the conformity of the PMS of Baltika to the chain principle and the fact that it achieved the strategic objectives, it may be concluded that the chain principle is appropriate for raising the achievement rate of organisational performance.

Even in the literature are definitions which see PMS as a direct influence of organisational performance, still have to take into consideration that the achievement of a company's objective may be affected in addition to the effectiveness of PMS by other factors. Therefore have to admit as a limit of created model that the conformity of Baltika's PMS to the chain principle is in one factor that ensured the achievement of strategic objectives, but probably this not the only one. Still would be worthwhile to explore how to increase the contribution of PMSs to strategic objectives of organisation and broader to organisational performance. As a theoretical contribution, this paper illustrates some characteristics inside PMS which positively affects achievement rate of strategic objectives. The same approach is suitable for enhancing the implementation models of PMS. Novel is approach which opens insight about functioning content of PMS. Also view presenting the contribution of structure of PMS to the strategic objectives of PMS.

The practical contribution of this paper is, that the approach allows an assessment of the effectiveness of implemented PMS and where mal-functioning is detected, draws attention to the weaknesses in the respective parts of the system so that the shortcomings can be addressed and corrected and the efficiency restored. In addition, the same approach can be used on PMS creation and also in the public sector organisations. The same model can be applied in addition to strategic objectives for achievement the other objectives lying under term of organisational performance.

Relations of this model with external environment have to consider as a limit of presented model. If strategic objectives are too low and their achievement takes place anyway, then it may indicate that PMS itself is effective. On this case this model needs adjustment to respond on this situation.

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Appendixes

Appendix 1 Sub-objectives of Baltika

In 2002 sub-objectives of Baltika were (Annual Report...2002):

1. to accelerate the growth of sales in comparison with the year 2001 by 22% and to increase the share of retail sales to 50% of the total sales;
2. to launch a new international fashion brand;
3. to prepare and launch a new retail concept (portfolio of retail brands) to segment the markets.

The sub-objectives were set for 2003 (Annual Report...2003):

1. to improve the efficiency of operation of retail sales space;
2. to reduce the percentage of old (older than one season) inventories in the system;
3. to increase sales revenue (particularly in the retail system);
4. to ensure and strengthen positive cash flow.

The sub-objectives for 2004 were (Annual Report...2004):

1. increase sales efficiency (sales growth per m2) 8%;
2. open new retail space and close less profitable ones;
3. improve the retail system operating expenses to total revenue ratio;
4. improve the 1st price marginal (compared to 2003/1) 2004/1-5%, 2004/2-7%;
5. improve the discount rate (compared to 2003) by 1.2% from 17.9 to 16.6;
6. loss in Poland maximum 5 million kroons (author: 1EUR=15,6 kroons);
7. growth in production costs 1.6% (1.8 mln kroons);
8. growth in general management costs 0 (compared to 2003);
9. stronger based to finance the growth of group;
10. system of measures to support conduct of profit centres in the interest of BG future results;
11. better inventory management:
 - a. inventory turnover rate 3.5;
 - b. the amount of old inventory not more than 10%;
 - c. channels for realising inventories;
12. keep up wholesale level (2003);
13. profitable realisation excess production capacity;
14. growth in advertising costs not more than 2%.

The sub-objectives for 2005 were (Annual Report...2005):

1. increase in retail sales at least 20%;
2. increase in retail sales efficiency;
3. increase in gross margin;
4. well managed operating expenses.

Appendix 2 Performance indicator system of the Success Model of Baltika

Place of monitoring	Performance indicators and/or incentive	Frequency	Notes
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Production	7. Penalty for delay (Throughput Money-days)	Not measured, IT support missing	Was planned to monitor in the following units: production, purchase of goods, purchase of production services, intermediate depots, logistics.
	Penalty for delay of goods returned	Not measured, IT support missing	Measure of quality unit.
	Lead time (duration of the cycle)	Measured if needed, IT support missing	
	10. Age-specific inventory, (Money-days)	Weekly	Helped to assess the work of logistics and purchase unit managers. Shops, materials warehouse, production (intermediate products), finished goods warehouse, intermediate depot.
	11. Result of production unit	Monthly	Was calculated both for the whole division and for sub-structures of the division.
Product development	4. Value added rate	Weekly	Product saleability and variable costs depend most on their work.
Sales	1. Sales outside the group or final sales in chain	Weekly	Was monitored by markets, retail cooperation forms, trademarks, shops.
	12. Sales units' "profits" calculated without intermediate prices	Monthly	Was calculated both for the whole division and for sub-structures of the division (e.g. shop, sales, result of product development).
	4. Value added rate	Weekly	Product saleability depends most on their work.
	7. Penalty for delay	Not measured, IT support missing	Was planned to monitor in the following units: production, purchase of goods, purchase of production services, intermediate depots, logistics.
	2. Sales area (m ²)	Weekly	Was monitored by markets, retail cooperation forms, trademarks, shops.
	3. Sales per sales area	Weekly	Was monitored by markets, retail cooperation forms, trademarks, shops.
	5. Additional value	Weekly	Used for assessment of the activity of top executives in Baltika sales structure.
	6. Additional value per sales area	Weekly	Used for assessment of the activity of top executives in Baltika sales structure.
	8.9.10. Inventory indicators: money tied up in chain, age-specific inventory	Weekly	Shops, materials warehouse, production (intermediate products), finished goods warehouse, intermediate depot.
	Residues at the end of season	Not measured, IT support missing	For merchandisers.
Whole company	Net profit of the group	Monthly	

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PERFORMANCE MEASUREMENT COMMUNICATION SUPPORTING LEAN PRODUCTION IN SMES

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Performance measurement communication supporting lean production in SMEs

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Abstract:**Purpose**

The aim of this paper is to provide an overview of the current status of performance measurement communication to support lean production in SMEs.

Design/methodology/approach

The paper is based on theoretical and empirical studies. A literature review of existing research in performance measurement communication, focusing on lean production in SMEs, was carried out. The empirical part is based on interviews with both managers and operators in SMEs in the south of Sweden working with lean production. Twenty-four interviews in eight companies / plants were carried out.

Findings

The paper provides a structured overview of current research in performance measurement communication. Performance measurement communication was categorised into three parts, which taken together could support lean production implementation in SMEs. It can be concluded that, although all existing research in performance measurement and communication, there is no operational guideline of how to communicate performance measurement. From the interviews it can be seen that the companies have improved their performance measurement communication during the lean production implementation, but that there is no common way of communicating performance measurements in SMEs.

Originality / value

The originality of this study is that it focuses on operational level communication and measurement in SMEs, and includes both the managerial and the operator views.

Keywords

Lean production, performance measurement, communication, SME, implementation

Article classification

Research paper

Introduction

There are over 20 million small and medium-sized enterprises (SMEs) in Europe which represent 99% of business and are a key driver for economic growth (European Commission, 2013). The headcount criterion for an SME is according to the European Commission (2005) a company with less than 250 employees. A popular way for SMEs to meet the tough competition on the global market is to implement lean production, but despite the well-known theory only a few SMEs succeed in their lean production implementation (Bhasin, 2012, Nordin et al., 2012, Tiwari et al., 2007).

Matt and Rauch (2013) mean that there is a need to do research in lean production specifically for SMEs, since these have other prerequisites than bigger companies. The likelihood for lean production implementation is strongly affected by the plant size, where smaller plants are less likely to implement lean production (Shah and Ward, 2003). The authors also conclude that implementation of lean production practices contribute substantially to the operating performance of plants, and that not implementing lean production is likely to put plants at a performance disadvantage.

There are several different factors that have shown to be important for a successful lean production implementation, where two of them are performance evaluation and communication (Bakås et al., 2011, Hilton and Sohal, 2012, Kumar et al., 2009). Performance measurement is a well-researched area, and several performance measurement system (PMS) frameworks are proposed (Anand and Kodali, 2010, Cocca and Alberti, 2010, Jayaraman et al., 2012). Communication is identified as important for lean production implementation both in general and as communication of specific topics (Alaskari et al., 2013, Bakås et al., 2011, Jayaraman et al., 2012, Laureani and Antony, 2012). The combination of performance measurement and communication, i.e. performance measurement communication, is an area where increased knowledge could support lean production in SMEs.

The research in performance measurement communication on operational level is rare concerning SMEs (Ukko et al., 2006), and SMEs need to develop their internal communication process (Ates et al., 2013). This article tries to increase the knowledge in performance measurement communication for SMEs, focusing on current status of performance measurement communication in SMEs, in research as well as in companies. This paper tries to answer the question: *What is the current status of performance measurement communication in SMEs?* An answer to that question will support lean production in SMEs, and strengthen SMEs on the global market.

Method

The theoretical part of this paper consists of a traditional literature review (Jesson et al., 2011), covering performance measurement communication with a focus on SMEs. The review consists of peer-reviewed articles from four different databases: Google Scholar, WorldCat Beta, Scopus and Inspec. The search terms chosen from the beginning were performance measurement and communication. Since these are well-researched areas, they gave a huge amount of search hits. Therefore they were complemented by either one or both of the terms lean production and implementation. For even more specific hits the term SME was added, which gave few but very relevant hits. All terms were also used in different forms, and complemented with synonyms. The result was then categorised based on content. The papers were summarised and papers and themes were compared and contrasted.

The empirical study was made in the research project PEXiSME, production excellence in SMEs. To reach companies that are or have been implementing lean production the empirical study was done in collaboration with Industrial Development Centre West Sweden (IDC), and Produktionslyftet. These organisations support manufacturing companies with their lean production implementation. The study was carried out in eight different SMEs that are or have been working with lean production, and consist of interviews with twenty-four employees in the companies, both managers and operators. The persons that were interviewed were asked open questions about leadership in the company, the improvement work and the employee participation in that, and were also asked questions about performance measurement and its communication in the company. Since the information was collected by interviews, the results from the empirical study are based on what answers the interviewees gave when they were asked. Therefore, it cannot be certain that the information is totally complete.

Results from the literature review

Categories of performance measurement communication

When existing literature was mapped out, the content could be categorised into three different categories. The first category involves the containment of the information that is communicated: what performance measures to use, and specification of how the measures should be designed. This category of performance measurement communication covers the information that is communicated, and is named *performance measurement content*. The next category identified was related to the way the communication is done. This includes both if the communication is written or oral, by whom it is communicated, and the frequency of the communication of the performance measurement. This category is named *performance measurement communication process*. The last category concerns different best practice for performance measurement communication. It includes presumptions for performance measurement communication, guidelines for communication between different parts or levels in the company, and some general communication guidelines. The category is named *performance measurement communication guidelines*.

Since PMS is a huge research area, and not the focus of this paper, the performance measurement content was not explored in-depth, but a draft overview was made of the first category. The performance measurement communication process and the performance measurement communication guidelines were more thoroughly reviewed.

Performance measurement content

Concerning the performance measurement content, Neely et al. (1997) have made a thorough literature review. It is a summary of recommendations of performance measures, and concludes them into ten elements that seek to specify what a good performance measure constitutes. That is: 1) a clear title of the measure, 2) the rationale underlying the measure, 3) the business objectives to which the measures relates, 4) an appropriate target for each measure, 5) formula – the way to measure the performance, 6) the frequency with which performance should be recorded and reported, 7) the person to measure, 8) the source of the raw data, 9) the person who should act on the data, and finally 10) the management process that will be followed depending on if performance appear to be either acceptable or unacceptable. In addition to this review, several authors see the disadvantages with financial indicators. The reasons are that they are inadequate (Nudurupati et al., 2011), they give misleading signals (Kaplan and

Norton, 1992) or that they are insufficient to gauge business performance (Kaplan and Norton, 1996). Van der Stede et al. (2006) even conclude that organisations with extensive performance measurement systems that included both subjective and objective non-financial measures achieve higher performance than others. Also Kennerley and Neely (2002) mean that having both financial and non-financial performance indicators is important for the PMS. Maskell (1991) summarizes the characteristics of key performance measures for world class manufacturing companies. He means that there should be different measures for different areas of the company. Bilalis et al. (2002) mean that the information should provide: a clear vision of the job, target method and restrictions, a measure, results (absolute and against target) and managerial support. Ukko et al. (2006) mean that the quality of the information is important, and has a strong influence on the success of the target communication. Later Ukko et al. (2007) specify that it is the exactness, reliability, intelligibility and usefulness of the measures that is important. Some authors discuss the management information system (MIS). Garengo et al. (2007) mean that performance measurement require a MIS to support collection, processing and delivery of performance data. Bourne et al. (2002) mean that the difficulty of implementing the performance measures is caused by inappropriate information from the MIS.

The linkage between different measures is another important part of the performance measurement content. According to Amaratunga and Baldry (2002) compensation, reward and recognition should be linked to performance measures. Ukko et al. (2009) state that two of the most important factors to succeed with operative level performance measurement are the linkage of performance measurement to reward, and the understanding of the linkage between the individual's target and the organisations' targets.

Performance measurement communication process

The second category of performance measurement communication is the performance measurement communication process. Ukko et al. (2007) make references to an article in Finnish by Åberg (1997), where the internal communication is divided into three groups. These groups are: face-to face communication, written communication and electronic communication. According to Ukko et al. (2006) the best success in target communication is achieved if information is communicated face-to-face. This communication can be supported by some system communication, but the authors mean that for SMEs electronic communication is just a waste of resources. They continue by saying that for SMEs face-to-face communication can be supported by hand-outs and noticeboards. Later Ukko et al. (2009) state that the interactive communication is one of the most important factors that influence the operative level performance measurement.

Gama and Cavenaghi (2009) point on the importance of visual management. They propose a communication model of the vision and strategic objectives of the organisation, facilitated by the visual management and provided by an A3 report. Parry and Turner (2006) look into the mode of communicating, and mean that visual management systems act as an extension to metrics, and must be kept simple. They also state that only information which adds value to the management of the process should be displayed, and teams using the board must not be tempted to display information just because it is to hand. A colourful physical visual control system should be developed where possible, and tidying up and moving the system to an electronic version should be avoided. Further, Parry and Turner (2006) mean that the core visual tool is value stream

mapping, but also mention 5S, andon boards and standard work charts as visual tools. These should according to the authors be displayed with key measures, since visualisation is central to communication. Finally, concerning the mode of communication, Bilalis et al. (2002) make some guidelines for the visual management. They mean that the best visual aids include graphical presentation, pictures, posters, schematics, symbols, transparencies and colour coding, the last which can be enhanced with audio signals.

Performance measurement communication guidelines

Several authors express the need of good communication in general terms, such as clear communication (Nordin et al., 2012), effective communication (Sprague and McNurlin, 1993, Ukko et al., 2006), more information (Robson and Tourish, 2005), consistent information (Karlsson and Ahlstrom, 1996) or understandable and accessible information (Ukko et al., 2006). Sometimes the reason for the specification is pointed out. For effective communication Ukko et al. (2006) means that the purpose is to increase the understanding and knowledge of the employees. Other authors focus on the communication between different parts or levels in the company. Robson and Tourish (2005) see the need of a better information flow from the bottom to the top of the organisational structure, and mean that the managers need time to communicate effectively with those further down in the organisation. Worley and Doolen (2006) mean that clear communication is required between shifts and along all value streams, while Amaratunga and Baldry (2002) conclude that the communication should be effective and open between employees and stakeholders. Concerning lean production implementation communication Puvanasvaran et al. (2009) mean that the communication process should be effective at all levels, to make everyone be aware of and understand the lean production concept and the process of implementation. Scherrer-Rathje et al. (2009) mean that lean production wins need to be communicated from the outset, and that communicating early lean production success throughout the entire organisation is important.

There are also some performance measurement communication guidelines concerning managers. Nudurupati et al. (2011) mean that managers need up-to-date performance figures to proactively act on controlling processes, to achieve performance targets. They also mean that it is necessary that senior management support the management information system during design, implementation and use. Finally, the authors mean that information must be communicated throughout the organisation to make it transparent to everyone.

Results of the empirical study

Performance measurement content

In research, performance measures are divided into financial measures, such as sales, productivity and efficiency, and non-financial measures, such as quality, customer satisfaction and cycle-time (Nudurupati et al., 2011). All participating companies in the empirical study have financial measures, and all but one communicate them. All companies but two also have non-financial measures, although some of the companies have had some of the measures even before the lean production implementation. The non-financial measures had in some companies been extended by typical lean production measures, like 5S, lead time and number of improvement proposals. Most of the companies have an uncertainty of what measures they should communicate, or work

Production boards in the production area	√	√	√	√		√		√
Other written information	√			√				√
Daily production meetings	√	√	√		√			√
Weekly/every other week production meetings	√	√	√	√		√		
Monthly information meetings	√	√				√		√

Table 2. Performance measurement communication process in participating companies

Performance measurement communication guidelines

The theoretical part of performance measurement communication guidelines consist of presumptions for communication, and some guidelines. The empirical part, seen in table three, consists of the companies' experience of the change in performance measurement communication. After implementing lean production, all companies mean that they improved their way of communicating performance measurement, and in all companies but one the improvements still maintain. Three of the companies mean that they now have improved the structure of the performance measurements, such as standardised the measures or have been more conscious of what measures they choose. Three other companies mean that they have improved their way of communicating, such as having structured or standardised their meetings. The structure of the follow-up has been improved in three of the companies. Two companies mean that the results now are followed-up with analysis and actions, while another company mean that the follow-up have been more simplified and understandable.

Company	A	B	C	D	E	F	G	H
Maintained change in performance measurement communication	√	√	√	√	√	√		√
Improved performance measurement structure			√		√	√		
Improved communication structure		√		√				√
Improved follow-up structure	√				√	√		

Table 3. Performance measurement communication guidelines in participating companies

Discussion and conclusion

Performance measurement communication for SMEs was categorised into three parts: performance measurement content, performance measurement communication process and performance measurement communication guidelines. This is comparable to a categorisation of a management information system, done by Nudurupati et al. (2011). They divide the system into three parts: to decide the indicators, to implement the measures and to exploit the information by the people. Also PMS can according to Neely et al. (2000) be divided into different parts: to design, to implement, to use and finally to maintain the PMS. Looking into product development, Frishammar and Ylinenpää (2007) mean that the capability of managing information consist of three components: acquiring, sharing and using information. The empirical part in this paper is categorised in the same way as the theory, showing improvements in different categories of performance measurement communication. This categorisation could help SMEs improve performance measurement communication, by getting concrete guidelines in each category, which also fits together as an entity.

The review also shows that there are some frameworks, guidelines and conclusions on specific topics in each area, but there is a lack of knowledge in the three parts of performance measurement communication together. The interviews indicate that almost all of the companies have improved different parts of their performance measurement communication. The way performance measurement communication has improved differs, but the measures, or the way of communicating performance measurement and results, has been more structured. Most of the companies have an uncertainty of how many or what measures to use, and there is no common way of choosing measures.

In one company the improvement worked stopped, and the improvement deteriorated. This company hasn't maintained any improvement in their performance measurement communication, despite taking part of an improvement program. In this case the management didn't prioritise the improvement work, but got stuck in the day-to-day business. This gives an indication that no matter what improvement program, the management have to be engaged in the improvement work to make and maintain improvements in performance measurement communication.

It can be concluded, that although all existing research in performance measurement and communication, there is no operational guideline of how to communicate performance measurement, and there is no common way of communicating performance measurement in SMEs. A performance measurement communication guideline might therefore be useful supporting lean production in SMEs, why it is an area for further research.

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USING GUEST FEEDBACK FOR MANAGING THE PERFORMANCE IN A HOTEL

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Using guest feedback for managing the performance in a hotel

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Purpose

In the service business generally and in hotels specifically regularly conducted guest satisfaction surveys and collecting written guest comments is widely common. In addition, travel and booking websites such as booking.com or TripAdvisor.com provide many guest comments and ratings that are also influencing choosing hotels.

Although plenty of guest-related information is available, it is not clear whether, to which extent and how operational managers use the information provided by guest comments to improve the performance of their departments and teams.

The purpose of this paper is to get a better understanding of whether (or not), to which extent and how information is used by operational managers to improve performance. Specific attention is given to identify factors that explain why the guest feedback is not or only used to a limited extent.

Design/methodology/approach

A single case field study is done in a more than 800-bedroom, four-star hotel in a major European city. First, the status quo of available guest feedback, to which extent and how it is used by operational managers is analysed. The focus is on the Front-of House/Reception Department. Data sources are: interview data, archival records, and direct observations. We interviewed the General Manager, the Hotel Manager, The Head of the Front-of-the-House/Reception Department, five non-managerial staff of Front-of-The-House-/Reception Department, the Guest Relations

Manager, and the Guest Loyalty Coordinator. Archival data include all reports used by the managers. Direct observations encompass the the Reception Department meeting, the Morning Meetings and the Thursday Operational Meeting.

Findings

A result of the case study is that operational managers do not have the understanding of the performance measures and cause-effect-relationships between guest feedback and performance. Partially this is due to a lack of support as they do not have/take the time and capacity to analyse guest comments. Support staff can take on the task and help them better understanding it. In addition, in management meetings these cause-effect relationships have to be addressed regularly.

Originality

How guest feedback from multiple sources is used in hotels is not widely researched, specifically how guest comments provided by websites such as TripAdvisor are used. Therefore, this paper contributes to better understand how guest feedback can be used to improve performance generally and in hotels specifically.

Key words

Guest feedback, TripAdvisor, Performance measurement, Cause-effect-relationships, Hotel industry

Article classification

Case study

Motivation

In the service business generally and in hotels specifically regularly conducted guest satisfaction surveys and collecting written guest comments is widely common. In addition, travel and booking websites such as tripAdvisor.com or booking.com provide many guest comments and ratings that also affect the decision of choosing a hotel.

Although plenty of guest-related information is available, it is not clear whether, to which extent and how operational managers use the information provided by guest comments to improve the performance of their departments and teams.

The purpose of this paper is to get a better understanding of whether (or not), to which extent and how information is used by operational managers to manage and improve performance. Specific attention is given to identify factors that explain why the guest feedback is not or only used to a limited extent.

In this paper, the reception department of a large hotel is focused on as receptionists have contact to all guests when they check them in and out.

Thus, the paper also addresses the larger issue of getting insights in management accounting practices in a significant worldwide industry ("Despite the fact that the hospitality industry is one of the world's largest, there is very little research on its management accounting issues and practices", Dittman et al., 2009)

Guest feedback for managing and improving performance

Guest feedback is important for managing and improving the performance in general, and specifically in the service industry such as the hotel industry. The customer perspective within the Balanced Scorecard as one of four (or more) perspectives underscores the importance (for instance Kaplan and Norton, 2004). As a leading perspective with respective performance measures they indicate with cause-effect-relationships what are drivers of the financial performance (Ittner and Larcker, 2003). Hereby, specific cause-effect relationships between customer satisfaction and customer loyalty have been addressed in research and practice as the latter is considered to be the main driver for growth and profitability.

In addition, word-of-mouth is important for repeat business and referrals (see for instance Chevalier and Mayzlin, 2006). Furthermore, online reviews and ratings on travel and booking websites provide guest feedback and influence consumer behavior. The most popular is tripadvisor.com, another one is booking.com. Therefore, hotel managers take these online reviews seriously, respond directly to some guest comments online and use it internally to manage and improve the (service) performance of their operations.

In order to avoid complex guest feedback data and performance measurement systems, Reichheld (2003) suggested to focus on the net promoter score (NPS). The NPS is asking customers one question, "How likely is it that you would recommend company X to a friend or colleague?" (on a scale of 10 "extremely likely" to 0 "not likely at all"). "Promoters" are those customers who gave ratings of 9 or 10. So called "passively satisfied" logged a 7 or an 8, "detractors" from 0 to 6. The NPS is the percentage of promoters in a customer survey minus the percentage of detractors. Thus, companies can keep customer surveys simple.

The question is how and to which extent the multiple forms of guest feedback is used to manage and improve performance in a hotel.

The case hotel and the reception department

The hotel

The hotel is a four star deluxe hotel in a major European city with more than 800 bedrooms in different categories. It is part of a hotel group that operates more hotels under different brands. The hotel offers conference facilities and dining options.

Since the opening a few years ago the hotel operates very successfully with high occupancy and average rates and contributes significantly to the success of the hotel group. Due to its size it has both a general manager and a hotel manager. Next to these managers there are ten managers for the operations teams: Meetings and Events, Front-of-House, Back-of-House, Housekeeping, Food-and-Beverage, Executive Chef, Head Chef, Spa, Security, Chief Engineer. Front-of-House and Food-and-Beverage is further differentiated in departments and teams. In addition, there is Revenue department directly reporting to the general manager, the HR manager and the Finance director.

The management team meets weekly on Thursdays for the Operations Meeting to discuss managerial issues and items. In the morning meeting the hotel manager and the ten operations team managers (or their assistants) discuss all relevant issues for the day. In addition, there is a quarterly meeting of the executive team, i.e. the general manager, the hotel manager, the HR manager, the Finance Director.

The reception department

In general, the reception department has contact to all guests with its primary tasks of checking them in and out. Furthermore, the reception is a first contact when guests have issues.

In the case hotel, the reception department is part of the Front-of-House area. Other departments or teams within this area are Guest Relations Team, the Concierge team, the Guest Service team and the Operations Team. The task of the Guest

Relations team is to deal with guest issues when directly approached or when guests approach the reception and the receptionists cannot settle the issue themselves.

As guest satisfaction and guest feedback is very important for hotels, the position of a guest loyalty manager was created in 2012. A major task of the Guest Loyalty Coordinator is to analyse the guest feedbacks provided by the survey and other forms, to present the findings in the Operations meeting monthly (every first Operations meeting in a month) and initiate actions. Furthermore, he/she is to support the Guest Relations team with handling guest issues. In addition, the Guest Loyalty Coordinator takes care about the hotel group's loyalty program and its members who come to the case hotel as well as initiating actions to meet the enrolment targets for the program set by the group.

Within the reception department there is the reception manager, reception supervisors and receptionists. In total, there are 25 people working for reception.

Every afternoon when shifts change, the the leavin and the beginning shift members of the reception take part in the hand-over meeting to discuss issues of the department. The reception manager facilitates the meeting, the Guest Relations manager also takes part in the meeting.

Receptionists ask guests when checking-out whether there had been any problems. If the guests had problems, receptionists fill out a feedback form that will be passed to the reception manager.

Given the total number of rooms of the hotel and high occupancy rates, the receptionists have to check-in and check-out hundreds of guest daily, often more than 1,000 guests considering more than one guest staying in a room. That is the reason why the focus of this paper is on the reception department.

Receptionists have specific monthly targets for getting guests to enrol in the group's loyalty program.

Research method

This paper draws on an exploratory case study of a hotel, specifically the reception department, to better understand how guest feedback is used. Thus, practical implications can be made and potential directions for future research indicated.

Data sources

Three types of data were collected: interview data, archival records, and direct observations. The data collection took place in the first quarter of 2014.

First, to get a better understanding a first telephone interview was carried out with the Guest Loyalty Coordinator to understand which guest feedback was available at the hotel and which reports were generated. After establishing a general

understanding, twelve semi-structured interviews were carried out to understand which guest feedback was known, considered important and used. The interviews lasted between 45 and 75 minutes. The following semi-structured interviews were carried out:

- General Manager
- Hotel Manager
- HR Manager
- Guest Relations Manager
- Guest Loyalty Coordinator
- Front-of-House Manager
- Reception Manager
- Reception Supervisor 1
- Reception Supervisor 2
- Receptionist 1
- Receptionist 2
- Receptionist 3

Second, available sources and reports containing guest feedback were looked at.

Third, management meetings were attended to see which guest feedback was used in communication and which formal reports and performance measures were referred to and discussed. The following meetings were attended:

- Morning meeting – a daily meeting (participants: Hotel Manager and 10 (Assistant) Heads of Departments)
- Operations Meeting Reception – a weekly meeting (participants: see above)
- Reception hand over meeting – a daily meeting (Front-of-House manager, Reception manager, Guest Relations Manager, 14 employees of reception department)

Using guest feedback in the hotel

Guest feedback available

First, the available guest feedback within the hotel will be described.

The hotel group hired the marketing research company Medallia. It conducts online guest surveys and provides guest feedback reports – within the case hotel called

“Medallia report” or just “Medallia”. There are between 80 and 100 question items depending on which services the guest used. In addition, the guest can provide comments. Negative comments are called “alerts” that lead to further investigation by the Guest Loyalty Coordinator and potential. Within the monthly Medallia reports the following performance measures are calculated derived from groups of items:

- GSI – Overall guest satisfaction index
- SPI – Service Performance Index
- PPI – Product Performance Index
- LPI – Loyalty Performance Index
- NPS – Net Promoter Score

Next to the scores, a list of problems guests mentioned and their frequencies are part of the report.

Furthermore, six items referring to the aspects “Feeling welcome”, “Surprise”, and “Passion” are especially communicated as they are considered to be important for guest loyalty. A training program has been started to provide the skills to employees to show how to provide these aspects. The six performance measures were referred to as “Inspirational Service Measures” (ISM – due to confidentiality the name of the measures were changed).

All guests that left an e-mail address with the hotel are contacted for a guest survey. On average 1,500 guests per month send a survey to Medallia which in return prepares the monthly report for the case hotel.

Tripadvisor ratings and comments are formally reviewed by the Personal Assistant to the General Manager at least once a week and distributed to the managers. The tripadvisor position is also reported. As tripadvisor is available to everybody, many managers and employees check it by themselves regularly. In the office of the reception department directly behind the reception desk the reception manager places printouts of positive comments from tripadvisor and Medallia.

In addition the case hotel receives by ReviewPro, an external service provider consolidating online reviews. The majority of the reviews are from tripadvisor.com and booking.review, but also includes reviews on other travel and review websites.

The hotel group’s loyalty manager at the headquarter also provides comments they received by members of the loyalty program and sends them to the Guest Loyalty Coordinator of the case hotel.

Additional sources of guest feedback are direct responses by hotel guests and e-mails after the stay.

In conclusion, there is plenty of guest feedback available, especially the formal, standardized guest-feedback by Medallia surveys. Main performance measures are those from the Medallia report: GSI, SPI, PPI, LPI, and NPS. Further measures are the six ISM scores addressing the loyalty aspects, the loyalty program enrolments and the tripadvisor rating (as the position of all hotels rated in tripadvisor).

Use of guest feedback - findings

The hotel group collects systematically and at a relatively large scale guest feedback via online surveys and claims to “manage and act on guest feedback”. All interviewees rated whether the reception department is managing and acting on guest feedback with at least 4 (1 - do not agree at all, 5 highly agree. Only two rated with a three. These interviewees were from higher managerial positions.

When asking the interviewees how they come to their rating, the operational ones did refer to the feedback forms which are qualitative information. One mentioned the qualitative comments in the Medallia reports. However, no one of the interviewees of the reception department referred to any of the performance measures available.

Another question asked was “How do you assess how well the reception department increases guest satisfaction?”. Again, the employees of the reception team did not refer to any of the performance measures provided. One did, but at a later question could not recall any value of the performance measures such as GSI of the months. The following comments were made, “This is a good question.”, “We make observations.”, “This is quite difficult.” The senior managers referred to the performance measures available though not all knew the values for the last month. The reception team mainly focused on the qualitative comments from the feedback forms, Medallia reports and tripadvisor.

For answering the questions and to actually “manage on guest feedback” plenty of information and performance measures are available, but at the operational level it is almost not used. Mainly qualitative comments are referred to. The SPI directly indicates how the employees act in the view of the guests surveyed. But none of the measures were referred to. This is even more surprising when looking at the answers to the question “How important is formal/informal guest feedback for you?” (two questions differentiating formal and informal guest feedback). All employees rated the importance of both formal and informal (personal) feedback either “very high” or “high”, with the informal guest feedback considered slightly higher important. Again it has to be noted that the employees did not refer to the formal ones when asked how they assess the guest service performance.

When asking “How do you assess how well the reception department increases guest loyalty?” with one exception all referred to the enrolments in the loyalty program. This indicates that performance measures that are understood and with

monthly target values are actually paid attention to by the employees. However, no one mentioned the LPI or the NPS as indicators for guest loyalty.

With regard to the rating of the importance of the different guest feedback the following table shows the average importance (5 very important, 1 not important at all, and 0 do not know), and the range of the answers (excluding the senior managers' answers).

	Average	Range
Guest feedback reports		
Medallia report	4,9	4-5
Tripadvisor	4,4	1-5
booking.com	2,5	1-5
Review Pro	1,1	0-5
Feedback forms	4,3	1-5
Guest feedback performance measures		
GSI	3,0	0-5
SPI	2,9	0-5
PPI	2,4	0-5
LPI	2,4	0-5
NPS	1,8	0-5
Tripadvisor ranking	4,4	2-5
ISM	1,3	0-5
Enrolments in loyalty program	4,1	0-5

Table 1 Importance of different guest feedback reports and performance measures

The figures show differences concerning the assigned importance. Medallia reports, tripadvisor and the feedback forms are considered important. However, from the Medallia reports none of the performance measures provided – GSI, SPI, PPI, LPI or NPS – was on average rated important or very important. The most important ones are the tripadvisor ranking and the enrolments in the loyalty program. The reasons for the high importance of the enrolment figures were already mentioned: There are clear targets set, the measure is understood and is clearly communicated. For the tripadvisor ranking, it is easily available though no one really understands what affects moving up or down in the ranking.

The guest feedback performance measures are closely monitored by the senior managers. However, at the operational level, they are not considered important. The NPS was not even known by the reception team (except for two members, yet, they could not tell values or a range of the values for the last figures).

In conclusion, mainly qualitative guest feedback is used in the reception department. Although plenty of performance measures are available, only the enrolment in the loyalty program and tripadvisor ranking are considered to be important.

Discussion

The case shows that there is not a shortage of guest feedback reports and performance measures. On the contrary, the hotel collects on average 1,500 online guest surveys monthly and calculates measures such as GSI, SPI and even the NPS. However, at the operational level this information is barely used and partially not even known.

Performance measures can play a crucial role to guide employees' behavior. The score "enrolments in the loyalty program" is clearly communicated to the employees with targets, actuals and variances. This shows the potential in the hotel for using the other performance measures as well. Yet, they are to be explained and used in management meetings. Senior managers discuss the performance measures from Medallia reports. At the operational level qualitative guest feedback information is used. The newly created position of a Guest Loyalty Coordinator prepares reports to senior managers and meetings. However, the position has not triggered using the guest feedback and the performance measures at the reception department.

Thus, a huge potential to learn from the established performance measures is not used. People at the reception could better understand how the service performance develops and could discuss possible causes to learn from that. The group claims to "manage and act on guest feedback". The case study shows that this is not the case for the reception department of the case hotel.

Potential ways to overcome the dilemma is leveraging the position of the Guest Loyalty Coordinator as a data analyst and educator of the data. In addition, operational managers have to be educated about the performance measures available and how they can be used for directing employees' behavior. Positive cases exist (i.e. number of enrolments in the loyalty program).

Conclusion

Managing and acting on guest feedback is used as a slogan within the hotel group. Guest feedback is systematically collected and reported. However, in the case hotel and the reception department specifically, only little of the available data was used. What was used most was less quantitative data, but qualitative tripadvisor comments. The case shows the bottleneck in managing and acting upon guest feedback is a lack of operational managers' understanding of performance measures and how they can be used.

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INFLUENCE OF CULTURE AND MANAGEMENT SYSTEMS ON PMS

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Abstract Title: Influence of culture and management systems on PMS.

Purpose: The aim of this study is to find and explore the relationships between organizational culture, management Systems and the implementation and Operationalisation aspects of Performance Measurement Systems (PMS).

Design/methodology/approach: The relevant literature on organizational culture, Organizational behavior, Strategic management and management accounting, in the context

of performance measurement systems, will be examined. A structured questionnaire will be used to survey the views of the top management teams of a suitable sample of organizations. The survey implementation process will follow four steps: pre-notification, initial mailing, first follow up and, second follow up.

Findings: As this is a developmental paper, it is not possible to provide definite findings at this point. However, it is anticipated to find out relationship between Culture, Management systems and PMS.

Practical implications: The findings of this study will provide managers with better understanding of the relationship between organizational culture, management systems and PMS. This will in turn help them to provide a successful PMS.

Originality/value: No research has been done to find out the relationship between organizational culture, management systems and two aspects of PMS, namely implementation and operationalisation aspects, using a large-scale sample approach. The findings of this research therefore will provide useful insights and methods for future researchers in this area.

Keywords: Performance measurement system (PMS), Culture, Management System.

Paper Type: Conceptual Paper (Developmental paper)

Introduction

Today's business environment is changing rapidly. In order to survive, organisations need to be able to evaluate the status of their operation. Organisations need to have clear goals and also operate with increasing levels of efficiency and effectiveness. Performance Measurement Systems (PMSs) are key to achieving these aspirations.

Several authors suggest that the performance of businesses increases if they are managed using formalised, balanced and integrated performance measures (Hoque and James, 2000; Davis and Albright, 2004). Others (Neely et al, 2004; Ittner et al, 2003) argue for the converse case; the performance of a business does not change because of the use of PMS. On the other hand, Braam and Nijssen (2004), argue that the impact of performance measurement is contingent upon the way it is used. Bititci et al (2006) state that organisational culture and management styles influence the way that PMS are implemented and applied.

Little research has been done on the influence of organizational culture and management system on the effectiveness of PMS. Bititci et al, (2006) undertook action research in five organisations in order to establish the dynamic relationships between organisational culture, management style and PMS. They found that a dynamic and bi-directional relationship exists between culture, management styles and PMS. Bititci et al, (2006) suggested additional research on a broader scale was required to develop a robust understanding between these three attributes of an organisation, but since then no research in this regard has been undertaken. The research described here aims to fill this gap by surveying a large number of organisations. It aims to identify the relationship between organisational culture, management systems and two aspects of PMS; implementation and operationalisation. It will build on previous research on PMS by examining how it is influenced by organisational culture and management systems.

Literature review

Lifecycle of PMS

Bourne et al (2000) presented a three-stage model for the lifecycle of PMS. These three stages are; design, implementation and use and update. These stages are discussed below.

Designing PMS

According to Bourne et al (2000), this stage includes identifying the key objectives to be measured and designing the measures themselves. This stage is concerned with two questions – 'what to measure?' and 'how to structure the PMS?'

Many frameworks have been developed in order to design PMS. Some of the popular models and frameworks are - Balanced Scorecard (BSC) (Kaplan & Norton, 1992; Kaplan & Norton, 1996 and Kaplan & Norton, 2001), EFQM Business Excellence Model (EFQM, 1999), Performance Prism (PP) (Neely & Adams, 2001) etc.

Implementing PMS

Bourne et al (2000) argue that in the implementation phase systems and procedures are put in place in order to gather and process the data that enable the measurements to be made regularly. He states that this phase may involve computer programming to capture existing data in an organisation, collating it into a more meaningful form.

According to Schneiderman (1999), many companies' performance measures are poorly defined, thus creating misunderstanding between different staff members. To avoid such misunderstandings, Bourne and Wilcox (1998) and Neely et al (1996) advised that for each indicator a performance measure record sheet should be used to document its definition. After capturing the information about each measure, four tasks are required; data creation, data collection, data analysis and information distribution (Kennerley and Neely, 2003; Marr and Neely, 2002; Nudurupati and Bititci, 2005).

Using and updating PMS

This is the operationalisation stage. This stage has two purposes (Bourne et al, 2000). The first is to evaluate the success of the implementation of the strategy as the measures are derived from strategy (Kaplan and Norton, 1996; Vitale and Mavrinac, 1995). The second is to use the information and feedback from the measures to challenge the assumptions and test the validity of the strategy (Eccles and Pyburn, 1992; Kaplan and Norton, 1996; Feurer and Chaharbaghi, 1995).

Success depends on how people behave in using this performance information (Davenport, 1997; Eccles, 1991; Hill, Koelling, & Kurstedt, 1993; Prahalad & Krishnan, 2002). People's behaviour in interpreting information is the main reason some PMS are short-lived (Bititci et.al, 2002 and Marchand et.al, 2000).

Culture and Performance measurement systems

In the performance measurement literature, several authors have argued that organisational culture and management styles influence the success or failure of PMS implementations. Nudurupati (2003) explained that performance measurement can impact the way management behaves. According to Bourne et al, (2002) for example, a "paternalistic culture" can lead to a successful PMS implementation. Franco and Bourne (2003) argue having an appropriate organisational culture is a prerequisite for success.

Several researchers recognise that culture guides and shapes the behaviour and attitude of all employees (Burnes et al, 2003; Handy, 1985; Hofstede, 1980; O'Reilly and Chatman, 1996; Schein, 1985). Many studies have been undertaken in order to identify the effect of organisational culture on business performance (Denison, 1990; and Gordon and DiTomaso, 1992), but recent studies suggest that this relationship is not yet fully understood (e.g., Wang and Ahmed, 2003).

Since Bititci et al., (1997) classify PMS as an MIS as well as a Management Control System (MCS), it is possible to relate the literature of MIS and MCS in order to understand the relationship between organisational culture and performance measurement.

Organisational culture is an influential factor in the acquisition and development of MIS (Allard, 1998; Brown and Starkey, 1994; Gordon and Gordon, 1992; Katz and Townsend, 2000; Thompson and Wildavsky, 1986; Tolsby, 1998). Other researchers studied how MIS influences organisational culture (Boland et al., 1994; Hibbard, 1998; Newman and Chaharbaghi, 1998; Robey and Azevedo, 1994). All of these studies indicate there is a relationship between MIS and organisational culture. Avison and Myers, (1995) and Claver et al (2001) focused their research on this relationship. They identified that organisational culture needs to be understood and should be manipulated to support the implementation of MIS through cultural change programmes.

In the MCS literature, there is greater focus on national rather than organisational culture when attempting to understand the links between MCS and culture. Harrison and McKinnon (1999) examined a large variety of MCS and organisational characteristics, but were unable to find enough confirmatory work to draw definitive conclusions. According to Chenhall (2003), there is only one general proposition on the relationship between culture and MCS, "national culture is associated with the design of management control systems". Hence, there is a need for research to understand the relationship between MCS and organisational culture.

Management Systems and Performance Measurement Systems:

Performance measurement implementation fails in many companies because of lack of Information Technology (IT) support (Bierbusse and Siesfeld 1998; Bititci et al. 2000; Bourne et al. 2000; and Neely 1999). Hence, IT is a critical success factor for PMS implementation. Nudurupati and Bititci (2005) provide evidence that appropriately designed PMS, with the support of appropriate IT platforms, appropriately implemented and used with senior management commitment, will allow the identification of weaknesses of businesses, enable proactive decision-making and continuous improvement, improve transparency and visibility and engender the positive behaviour of people. They emphasise the importance of integration and automation of data collection and analysis. They also emphasise the importance of data accuracy. Meekings (1995) argues that the successful implementation of

performance measurement depends less on selecting the right measures and more on the way the measures are implemented and used by the people. The real key to success lies in how people use this performance information (Prahalad and Krishnan 2002, Davenport 1997, Eccles 1991). Many researchers believe that the main reason many PMS are short-lived is because of people's use of the information (Bititci et al. 2002, Marchand et al. 2000). According to Marchand & Raymond (2008), with the evolution of information technologies (including the web) PMS can be enriched with new functionalities which provide enhanced support for organisational decision making.

MIS and change management are influential throughout the PMS lifecycle. Nudurupati et al, (2010) state that the MIS have only a very limited influence on the design of PMS. According to Lewin (1947), however, resistance to change due to PMS does exist in the design stage. Senior management commitment is required in mitigating and overcoming this resistance. According to Bititci et al (2002), senior managers should communicate the potential benefits of PMS in order to elicit support.

Nudurupati et al, (2010) state that MIS and change management is significant in implementation stage of PMS. Implementation of PMS involves data creation, collection, analysis and distribution activities. In order to implement the measures successfully, significant effort and commitment are required at every level of the process; capturing, collecting, analysing and reporting performance measurement information. Bititci et al, (2002) state that people whose interests would be compromised by the existence of effective PMS naturally resist its implementation. According to Meekings (1995), in most companies there are people who believe they are threatened and this will always create some resistance to performance measurement. Bititci et al, (2006) and Dunphy and Stace (1990) recommend that this situation should be handled by senior management. They also argue that depending on their organisational culture, managers should utilise different management styles to influence people's behaviour in order to mitigate such resistance.

The need for MIS support is limited in the use stage of PMS. In order to review and update the measures, however, MIS support can be required. For this reason, Nudurupati et al (2010) state that in the use and update stage of PMS, a moderate level of MIS support is required. However, they believe that the change management influences people significantly in applying and updating PMS. According to Nudurupati et al (2010), resistance continues to build in people during the stage of using performance measures. Lewin (1947, 1951) argues that the extent of this build-up of resistance will depend on how well the senior management tackled it at previous stages. Bititci et al, (2006) state that most companies gradually overcome the initial resistance through senior management taking the initiative in the project. In addition, they also state that using an open and non-threatening management style helps companies to overcome the initial resistance.

Several studies have been undertaken to establish whether top management support impacts on PMS effectiveness (Bourne, 2005; Bourne et al, 2002; Chan, 2004; Kennerley and Neely, 2002). Bourne et al (2002) found that top management support plays an important role in the successful implementation and on-going usage of a new PMS. They also indicate that constant participation by top management is very important to resolve problems when crises and conflicts arise. According to Chan (2004) and Emerson (2002), top management commitment and leadership are key success factors for PMS.

Kennerley and Neely (2002) also state that top-level management support is critical for PMS implementation success. Nudurupati and Bititci (2005) state that drive and commitment from senior managers are important factors in improving business performance.

The importance of training in relation to the development and implementation of a successful PMS is highlighted in a number of studies. Nudurupati and Bititci (2005) and Chan (2004) both argue state that training people is necessary for the successful implementation of PMS. Cavaluzzo and Ittner (2004, p. 249), identified that properly trained managers can positively influence performance measurement development and outcomes. All performance measures should have a clearly communicated purpose. These clearly communicated, relevant and reliable measures provide managers with useful information for decision making. It is possible that untrained managers will not understand the importance of the PMS measures and overlook these measures when making decisions. Likewise, Emerson (2002) identified training as the key for useful and effective PMS. He states that training allows users to understand performance measurement concepts and principles. Training enables both employees and managers to operate the system. Therefore, the better those users understand the purpose of the system and how to operationalise it, the more likely they will be to commit to it, thereby increasing the likelihood of a positive outcome.

Many studies have been undertaken to identify the importance and benefits of employee empowerment (Chiles and Zorn, 1995; Koberg et al, 1999; Morrell and Wilkinson, 2002; Nudurupati and Bititci 2005) and employee involvement and participation (Cox et al., 2007, 2006; Pun et al., 2001; Wimalasiri and Kouzmin, 2000) for a successful PMS. Several studies suggest that high levels of employee participation have a positive influence on the effectiveness of PMS (Chan, 2004 and Kaplan and Norton, 2001). According to Kleingeld et al. (2004) employees with high levels of participation perform significantly better than those who participate less.

From the literature it is understood that managing IT is very important for the implementation of PMS. Not enough research has been done to find out the impact of IT management on operationalisation of PMS. This research will investigate the impact of IT management on both implementation and operationalisation stages of PMS.

No research has been undertaken that includes culture, management systems and the implementation and operation aspects of PMS. The research planned by the authors' aims to fill this gap. In addition, most of the previous studies have applied a case study or action research approach and thus were exploratory in nature. Thus there is a need for empirical evidence derived from a large scale data collection programme.

Methodology:

Data Collection and analysis:

A survey method will be adopted. In particular, an online survey questionnaire will be used. This approach will allow a large, geographically dispersed sample to be accessed. The online survey will be administered using Qualtrics.

Questionnaire construction:

Unlike other data collection methods, questionnaires provide the researcher with only one opportunity to gather the data. It is difficult and time consuming to return to the respondents to collect additional information once they have completed and returned the questionnaire. Thus, to ensure that the relevant questions are asked, significant time and effort will be devoted to the construction and pre-testing of the questionnaire.

Responses of the survey will be coded and analysed through SPSS software.

Findings:

As this is a developmental paper, it is not possible to provide definite findings at this point. However, it is anticipated that this project will contribute to our understanding of the nature and extent of the influence of culture and management style on PMS.

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ACCELERATING SUSTAINABILITY PERFORMANCE

BY LEVERAGING SAFETY, HEALTH &
ENVIRONMENTAL CULTURE

CATHY A. HANSELL

Accelerating Sustainability Performance

By Leveraging Safety, Health & Environmental Culture

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Brief Professional Biography

For over 34 years, Cathy has held several senior leadership positions in Safety, health, environment, product and manufacturing quality areas, at several corporations, including AlliedSignal and American Standard. Most recently as the Corporate VP, Safety & Occupational Health at American Standard, she led a strategy throughout 500+ manufacturing, sales and service operations globally, to create a global safety culture and drive for risk prevention for 62,000 employees. Results included 90%+ reduction in incident rates, prevention of 22,000 injuries and cost avoidance of \$152 MM direct costs in 7 years and global pandemic preparedness and wellness focuses.

Cathy received a JD in Law, a MS in Environmental Toxicology (NYU Institute of Environmental Medicine) & a BS in Environmental Science & Engineering. Cathy holds eight certifications in Safety, Six Sigma, Quality and CSR. She was awarded the 2010-2011 NAPW's Woman of the Year Award in Safety & Wellness, and One of the Top 100 Women in Safety from the American Society of Safety Engineers.

As the **President of Breakthrough Results** for the last seven years, her firm specializes in leading companies to achieve superior, sustainable safety cultures. A book, *10 Easy Steps to Create a Successful Safety Culture*, will be released in August 2014. Cathy's firm strategically targets improvements in leadership drive, associate engagement, S&H integration within the business, S&H talent as business partners and risk prevention processes. Easy to use tools and a strategic roadmap, education and safety programs guide the cultural transformation, which also links with sustainability goals. Clients include organizations in manufacturing, chemicals, polymers, pharmaceuticals, retail, energy generation/distribution, US military, construction, US military, government (CDC, NIOSH) and industry trade associations.

Cathy is also the host and executive producer of **Safety Breakthrough Talk Radio**, a unique talk radio show that airs on I-Tunes News & Talk Radio. Cathy interviews international experts and government officials on safety, CSR, sustainability and wellness topics, including Ed Foulke, the former US OSHA Administrator.

Cathy's CSR projects include publishing a ground-breaking guide book, *Accelerating Corporate Social Responsibility Results: Link and Leverage Your SHE Culture* in 2009. She has led many industry and government panels and working groups in SHE and sustainability linkages. Cathy also co-sponsored and co-organized the 2nd Annual Symposium on Corporate Responsibility and Sustainability in Guangzhou, China in 2013. She spoke at a Sustainability Symposium in Rome in January, 2014 and will co-lead an international sustainability symposium in Toronto in April 2015.

Structured Abstract

Purpose

This paper describes an effective partnership between SHE culture, sustainability and CSR, which helps to achieve the goals of all areas. The significant role and impact of SHE culture within CSR initiatives and sustainability goals is outlined. By leveraging the strategic approach of a SHE culture, sustainability results are improved and accelerated. Case studies illustrate the “how to” steps, successful performance and results in SHE and sustainability, and potential traps to avoid.

Design

The method and results are compiled from actual industry case studies, best practices, subject matters global experts in both SHE and sustainability.

Findings

By leveraging SHE culture to sustainability, enhanced sustainability results are achieved. Business productivity, revenues, employee morale, SHE compliance and risk prevention, transparency and sustainability performance all increase. SHE culture and sustainability become mutually reinforcing.

Practical Implications

This paper presents a ground-breaking, practical approach and roadmap, now used across global corporations and industry-groups.

Social Implications

72% of CSR and sustainability requirements and expectations are met through a robust SHE culture, including regulatory compliance, safe and healthy working conditions, sound operations and pro-active, transparent and preventative processes. Business leaders, employees, stakeholders and communities are actively engaged in both SHE and sustainability, creating lasting results.

Originality/Value

A unique, ground-breaking approach to link and leverage SHE culture and CSR programs (sustainability goals) is presented. It has been successfully implemented across many businesses. It creates positive results in organizations, in both SHE excellence and sustainability.

Keywords

Safety-health-environment, culture, sustainability, corporate responsibility, business alignment, leadership

Article Classification

Case Study

Accelerating Sustainability Performance

By Leveraging Safety, Health & Environmental Culture

Sustainability and Corporate Social Responsibility (CSR) have great visibility, importance and influence in society and business. Employees, community and financial investors are just a few of the many stakeholders that are examining and questioning the social, ethical and operational practices of corporations. For corporations, CSR offers a specific path forward to guide a company's actions to achieve "win-win-win" results: good for society, for the company and for the environment.

Safety, health and environment (SHE) has a significant role within CSR and Sustainable Development (SD). Up to eight-five (85%) of sustainability requirements and expectations are addressed by a robust SHE culture, when analyzing the common sustainability frameworks and reporting guidelines. (Hansell, 2012). At the most basic level, the safety and health of the employees are paramount in responsible companies. A safe, environmentally-sound and compliant company is a reliable, responsible and sustainable company. The ultimate SHE goals are to design all business processes and decisions to enable the organization to do the right things all the time and to meet business goals. These accomplishments and approach are embodied in a strong safety or SHE culture. They are also the same expected goals, approach and performance of CSR or sustainability activities. By leveraging the approach and results of strong safety (or SHE) culture, rapid and significant progress can also be made in all three major aspects of CSR. SHE becomes a partner and an enabler to a successful CSR initiative and ultimately to meeting SD goals, and become mutually reinforcing.

This paper describes an effective partnership approach between SHE and CSR, which will help to accomplish the goals of CSR and SD, and reinforce the goals of SHE culture. Potential traps and challenges are also identified, and the actions and skills needed to overcome them are outlined.

Defining CSR, SD and the Relationship with Safety, Health and Environment (SHE)

The 1987 United Nations World Commission on Environment and Development (Our Common Future Report) and the ISO 26000:2010 (November 2010) define SD as "development that meets the needs of the present, without compromising the ability of the future generations to meet their own needs."(Hansell, 2009); (World Commission on Environment and Development, 1987); (International Organization for Standardization (ISO), 2010).

Commentary adds that "SD is about integrating the goals of a high quality of life, health and prosperity with social justice and maintaining the earth's capacity to support life in all its diversity. These social, economic and environmental goals are interdependent and mutually reinforcing. SD can be treated as a way of expressing the broader expectations of society as a whole."

The ISO 26000:2010 defines Social Responsibility (SR) as the "responsibility of an organization for the impacts of its decisions and activities on society and the environment, through transparent and ethical behaviour that:

- contributes to **sustainable development**, including the health and welfare of society;
- takes into account the expectations of stakeholders;
- is in compliance with applicable laws and consistent with international norms of behaviour;

is integrated throughout the organization and practiced in its relationships (and activities within its sphere of influence).” (ISO 26,000: 2010, 2010).

Relationship of SD and CSR

CSR and SD are closely linked, but are different concepts. SD is a widely accepted concept about the economic, social and environmental goals common to all people. As such, it can be used as a way of summing up broader expectations of society that need to be taken into account by organizations’ seeking to act responsibly. The guidance, principles and framework of the ISO 26,000 standard for Social Responsibility (SR) can form the basis for an organization’s practical implementation of CSR and its contribution to SD. The decisions and actions of a socially responsible organization can make a meaningful contribution to SD. Simply put, SD is “What to achieve” and CSR is “How to do it”.

Relationship of CSR and SHE Culture

The goals of CSR and SHE Culture are virtually the same. Mutually shared goals are for all members of the organization to understand and accept their roles to do the right things, regarding CSR and SHE, for both short- and long term business planning and actions. The ultimate SHE culture goal is to achieve safe, healthy and environmentally-sound operations, workforce, business impact in the community, products and services, customers and supply chains. With CSR, the ultimate goal is broader and encompasses the goals of a SHE culture. CSR considerations also include social and economic justice and rights.

To accomplish SHE culture goals, leaders set the tone and expectations of results and behaviors for the organization. They provide the needed education, tools, processes for the organization to fulfill the expectations. Business’s processes are built to facilitate, encourage, motivate and support the CSR and SHE considerations early and thoroughly, so it is easier to the right actions and decisions, all of which result in a strong safety, health and environmental culture. Employees are directly engaged to participate in meaningful improvement activities, moving the culture forward. Opportunities are sought beyond the direct operations to the organization’s supply chain, customers and community, all to improve the overall SHE performance and positive impact of the organization. Fundamental principles of ethics, transparency, governance and respect add the dimensions of responsibility and accountability to the conduct of an organization’s actions and form its culture. (Hansell, 2007); (Hansell, 2009).

All of the above also directly applies to the achievement of the SD goals and CSR objectives. This approach is actually described in detail in the ISO 26,000: 2010 framework to achieve the CSR goals. (ISO 26,000:2010, 2010). Therefore, both CSR and SHE culture share the same goals and use the same approach to accomplish the goals. If the goals and approach of both CSR and SHE culture are the same, then it is logical that these initiatives are mutually supportive in methods and results. SHE culture can both help to improve the CSR effectiveness and the SHE culture approach can be used to accelerate CSR results.

Defining the Specific Linkages of CSR and SHE Culture

If CSR and SHE culture share such similar goals and approaches, then where are the direct linkages? There are two logical sources to use to clarify the SHE culture linkages with CSR:

1. The Three Pillars of CSR and the Seven Core Subjects, both implicitly and explicitly (ISO26,000)
2. Common Sustainability Metrics and Reporting Guidelines, both implicitly and explicitly (GRI)

Three Pillars of CSR and the Seven Core Subjects

The diagram below outlines the three pillars of CSR: environmental, social and economic. Within each pillar, there are specific requirements and actions to achieve responsible and sustainable results. The areas where two of the pillars intersect are also highlighted, because there are unique actions to be taken in those three intersection areas as well. At the intersection point of the six areas, CSR, Sustainable Development (SD) and SHE Culture are all achieved.

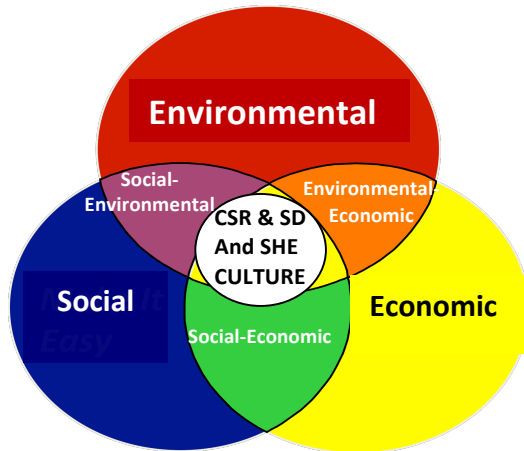


Exhibit 1. The Three Pillars of CSR, and the intersecting areas.

Examining the CSR Pillars: Step 1-Identify Specific SHE-Related Activities Within Each CSR Pillar

In order to identify the specific linkage and alignment points of SHE culture and CSR, the detailed activities within each pillar and the intersecting areas need to be carefully examined. Critical issues or “core subjects”, as defined by ISO 26,000, are Human Rights, Labour Practices, Consumer Issues, Community Involvement/Society Development, Environment, Fair Operating Practices and the overall Organizational Governance. These seven core subjects provide topic areas, from which the most appropriate CSR activities can be identified. These topic areas are also broad and frequently span across the three pillars. Examples of the many SHE-related issues and activities, which are included within those subject areas in all three pillars are outlined in Exhibit 2.

As the CSR pillars and core subjects are reviewed, they should be considered broadly, in both the letter and the spirit of meaning and intent. Given that there are 22 business processes at work, and that they all have some elements of Safety and Health, then the linkages of safety or SHE culture with CSR become quite evident (Exhibit 3). This is also confirmed from a careful examination of CSR background documents, and the ISO 26,000:2010 framework (ISO 26,000: 2010, 2010). It is a logical conclusion when if the ultimate goals and successful approaches to SHE culture and CSR are so similar, that they would be entwined and mutually supportive.

Examining the CSR Pillars: Step 2-Select Specific SHE Programs and Culture Actions to Accomplish the SHE-Related Activities

Once the SHE-related issues and activities are identified which support and help accomplish the objectives of the CSR pillar, then the specific SHE programs and culture aspects can be selected. The usual pro-active SHE-related programs and SHE culture actions meet the expectations of several CSR issues and activities within each pillar, and even cross into different pillars. This is the case for such SHE programs as risk minimization, incident prevention, compliance programs, audit and governance and SHE integration with operations, legal and engineering. The success of these programs is enhanced when they

are implemented within a SHE culture, rather than just a functional program or procedure. A SHE culture approach reaches into many functions of the organization, including human resources, engineering, research and development, operations, procurement, risk management, communications and legal. SHE has a role to play in each of the 22 businesses processes. SHE becomes a business partner with these functional groups. So, a strong SHE culture promotes and supports SHE integration into the business processes, to provide mutual benefits to SHE, business and functional goals. This approach can be applied to CSR implementation. What is the result? Improved, accelerated and lasting performance in CSR.

CSR Pillar	Core Subjects (ISO 26,000:2010)	Additional Details and Sample SHE-Related Issues and Activities
Social	<ul style="list-style-type: none"> Human Rights Labor Practices Community Involvement/ Social Development (CI/SD) Fair Operating Practices 	<ul style="list-style-type: none"> Workplace Safety and Health Programs Workplace Conditions Worker Training & Skills Development Contractor Management Accident Prevention Product and Job Design (PtD principles) S&H Education for Community Risk Minimization and Management
Environmental	<ul style="list-style-type: none"> Environment Human Rights Fair Operating Practices CI/SD 	<ul style="list-style-type: none"> Pollution Prevention (air, water , land, waste) Natural Resource Conservation Prevention of Global Warming Sustainable Consumption of Land Use Prevention Through Design (PtD)
Economic	<ul style="list-style-type: none"> Labor Practices Fair Operating Practices 	<ul style="list-style-type: none"> Profits Cost Savings and Productivity Gains R&D, New Products & Services Pro-active SHE risk resolution
Intersection Areas		
Social-Environmental	<ul style="list-style-type: none"> Social & Environ. Fair Operating Practices CI/SD 	<ul style="list-style-type: none"> Environmental Justice and Stewardship Preservation and Restoration of Natural Habitats Sustainable Consumption Customer & Employee Ethics Hotline Life cycle Analysis
Social-Economic	<ul style="list-style-type: none"> Social Fair Operating Practices Consumer Issues CI/SD 	<ul style="list-style-type: none"> Safety and Health Culture Fair Trade and Business Ethics Product Stewardship Product Literature, Warnings, MSDS Prevention Through Design (PtD) Product Recall Process Customer & Employees Ethics Hotline Process
Environmental-Economic	<ul style="list-style-type: none"> Environment 	<ul style="list-style-type: none"> Energy Efficiency Subsidies and Incentives for Pollution Prevention and Natural Resource Usage Reductions Emissions Cap and Trade
OVERALL AREA	<ul style="list-style-type: none"> Organizational governance 	<ul style="list-style-type: none"> SHE Culture Global SHE Requirements Principles of Social Responsibility: Transparency, Accountability, Ethical Behavior, Respect for stakeholder interests, for laws, for international norms/ behaviors, and for human rights

Exhibit 2. Core Subjects and Sample SHE-Related Issues and Activities within each of the CSR Pillars.

Human Resources Processes

1. New employee hiring
2. New/transferred employee orientation (at all levels)
3. Third party employee selection, retention and management
4. Discipline
5. Recognition and reward
6. Leadership skill development (business, plants, sites, team leaders/supervisors) and employees
7. Leadership personal performance reviews
8. Labor management, negotiation and agreements
9. Organizational design
10. Health benefits and wellness
11. Communications

Other Business Processes

12. Critical raw material and supplier selection and retention
13. Operations
14. New product development and changes
15. New processes and changes
16. Six sigma/lean/quality processes, projects and training
17. Sales and Marketing
18. Facilities/work environment management
19. Contractor selection, retention and management
20. Business Development and Mergers/Acquisitions
21. Risk Management
22. Security

Exhibit 3. Twenty-two Business Processes, Which are Appropriate for Pro-Active SHE Alignment and Integration

Global Reporting Initiative (GRI) Sustainability Reporting Guideline

The second source to identify where SHE culture has an impact is by examining a widely-accepted performance indicator—the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines. (The Global Reporting Initiatives, 2009, 2011, 2013). GRI versions 3.0 and 3.1 provide six categories of topics areas, very similar to the seven core subjects of ISO 26,000:2010. Within each category, specific actions or “aspects” are identified which are assessed for an overall judgment of the effectiveness of the company’s sustainability program. GRI Version 4.0’s criteria contains the same basic categories and aspects, but significant differences in the focus on materiality, strategic role of sustainability, increased disclosures within the aspects, required deeper analysis of impacts and general standard disclosures of company profiles, and sector requirements.

GRI 3.0/3.1 Category	Pertinent GRI Aspect for SHE-Related Issues
Profile-Strategy and Analysis	Sustainability vision, strategy and priorities
	Sustainability Key impacts, risks and opportunities
	Performance Targets
	Governance mechanisms
Profile-Report Parameters	Report scope
Profile-Governance, Commitments and Engagement	Governance, Commitments to External initiatives, Stakeholder Engagement
Environment	Materials, Water, Biodiversity, Emissions, Effluent, Waste
Human rights	Investment and Procurement, Freedom of Assoc and Collective Bargaining, Security Practices
Labor Practices & Decent Work	Employment, Labor-Mgmt Relations, Occupational Health and Safety, Training and Education
Society	Community, Corruption, Public policy, Compliance
Product Responsibility	Customer Health and Safety, Product and Service Labeling, Marketing Communications, Compliance
Economic	Economic Performance, Market Presence

Exhibit 4 . GRI Categories and Aspects Having SHE-Related Issues

Similar to the CSR requirements and its SHE-related issues and activities, the GRI offers abundant opportunity for highlighting the role of SHE, if the GRI is examined from a broad view of SHE culture. The GRI identifies categories (i.e. Issues), both explicitly and implicitly, then aspects (of those categories) and then indicators, all of which have SHE-related issues (Exhibit 4) associated with them. Approximately 85% of the aspects and indicators have a related SHE issue, such as SHE processes of risk assessments, reductions and management; compliance with international regulations and voluntary standards, stakeholder engagement, employee engagement, safety committees, supplier screening, life cycle analysis, incident tracking and root cause analysis, training, performance compensation, community involvement, metrics-leading, lagging and injury rates, fines and penalties. By thinking beyond mere SHE functions to a SHE culture, many opportunities exist to meaningfully contribute to the company CSR activities and results through SHE activities.

Capitalize on the SHE culture and CSR linkages

Current State Assessment and Gap Analysis

The first action is to identify the broad array of CSR activities that are material and important to the organization, and which functional organizations have primary responsibilities for those activities. Then, identify the possible alignment and linkage points of SHE with those activities. Use the information presented earlier, in Exhibits 2-4, to think broadly and to identify CSR and SHE linkages, as well as referring to the ISO 26,000:2010 framework and GRI reporting guidelines for additional ideas.

Once the possible SHE culture linkage and alignment points with CSR are understood, an organizational assessment of the current state of the SHE programs and culture is needed, as it relates to SHE and CSR. The key question is how well are SHE programs and overall SHE culture having a role in the company CSR initiative and activities?

The best assessments are done by a team of SHE professionals, working with the other employees of such functions as human resources, operations, engineering, legal, procurement, risk management, communications and the CSR/sustainability departments, if such a specific group or leader is in place. Employees must be a part of the assessment process, as they have a significant role in the successful SHE culture and CSR program. If the CSR program is already well established, input can also be sought from key external stakeholders, critical suppliers, customers and contractors. Their views as to the role that SHE has in the company operational and CSR programs and practices will provide unique insights and information.

Gap Analysis

A gap analysis can compare the possible role of SHE programs and culture in a company's CSR program, compared to the current state. Gaps need to be assessed for relevance, significance and within an organization's sphere of influence. The priorities can be set, based on meeting the organization's goal of CSR, the status of SHE culture maturity and involvement with the CSR process.

Closing the Gaps

Is the Organization Ready?

With a clear view of what "can be" and the current "as is" state, the differences or gaps in business processes, organizational mindset, maturity and role of SHE culture with the CSR processes can be identified. The gaps have been prioritized to align with the material aspects, company goals of CSR process and results.

Does the organization understand the real value of SHE culture, as it is entwined and incorporated into the actions to drive CSR? If the SHE culture is strong, business and functional leaders already understand their role, and see how SHE partners with the business to support the business. If the SHE culture is not strong, business and functional leaders must be educated to see the value of SHE, as a pro-active partner.

An additional path is to leverage the SHE culture process for change, to accelerate CSR programs and results. A hallmark of a strong SHE culture is the integration of SHE considerations into the business processes. SHE becomes seamless and woven into the business processes. A successful SHE culture is accomplished by clearly defining roles and responsibilities of all employees, leaders actively engaged themselves, pro-active incorporation of SHE issues into the business processes, tools and decisions; employees actively engaged and data-based decisions. This is precisely the path to create a CSR culture. It is logical to leverage a successful SHE culture approach when the ultimate goals and base approach of SHE and CSR are the same.

Are the SHE professionals ready?

The SHE function must be considered as a strategic business issue. It needs a clear business strategy and role within CSR, partnering with the business, and developing strategic multi-year plans, annual operating plans, business and personal goals, metrics, budgets, and tools to help the organization be accountable and successful.

Today, the most effective role of a safety professional is one of a motivating leader, change agent and business partner. Compliance and incident prevention is accomplished through developing a SHE culture of prevention, employee engagement and integration with business processes. In this case, to progressively help the business make the most significant strides in CSR, SHE issues need to be incorporated with the business and CSR activities, teams, training and performance requirements.

To support these integration targets, pertinent base business processes may need to be modified to incorporate the new expectations to drive SHE culture as it relates to the CSR target areas. It is unfair and unrealistic to demand new actions, decisions and behaviors of the organization, if the base processes do not support, and may in fact conflict, with the new expectations. To successfully integrate and align SHE with these supporting processes, partnerships must be formed with SHE professionals and the functional owners of these processes.

Traps and Challenges

It all sounds very straight-forward, and it is. But plans can go awry. Below are two potential traps or challenges and recommended actions to address them.

1. The environmental linkage of SHE and CSR is reasonably clear, due to the environmental CSR pillar, and a long and popular history of environmental “green” issues. The linkages of S&H and CSR may not be clearly understood or evident. The SHE professionals and/or the businesses do not see the full potential of S&H with CSR. S&H may be viewed narrowly, by only looking for obvious or explicit S&H references or requirements. This may also indicate the existence of a weaker safety culture in the company.

Recommendation: SHE needs to be considered and discussed in its broadest terms..as of SHE culture. When considered as SHE culture, it embraces the S&H aspects of 22 business processes. Select the most material business issues. Educate the leaders of those areas, in the role of SHE and impact of CSR. Some potential issues where SHE culture can greatly improve the CSR results are: selection, retention and management of key contractors and suppliers based on S&H programs and performance; wellness programs for employees, their families and local communities; S&H considerations incorporated into final decisions on work process changes, product changes and equipment selection; and global S&H requirement globally, even more stringent than local requirements. SHE culture approach can provide value to the business of terms of increased employee productivity, teamwork and morale; cost reductions, positive customer feedback, positive community response and results; mitigation of potential harm to employees, customers and communities.

2. The company is not ready to embrace CSR in its fullest sense. Easy, short-term actions are being taken, simply for the appearance of being sustainable or for meeting the less onerous CSR reporting requirements.

Recommendation: This is more of a company ethical and business issue for CSR, than a SHE culture issue. However, if there is a strong SHE culture, the foundation would already be established for more meaningful CSR actions. The organization would be more attuned and ready to thinking broadly and doing the rights things for the right reasons.

Many significant SHE issues processes, like GHG reductions, pollution prevention, safety culture, ergonomics and material substitutions in products and processes all started as voluntary initiatives. They became more onerous and demanding, some staying as voluntary initiatives, and some evolving into regulations. CSR is quickly evolving to be a requirement from consumers, customers, employees, NGO’s , governments and the public. Begin to build your SHE culture role and alignment with CSR now.

Conclusions

The SHE function has an important role in advancing the CSR initiatives in organizations. By examining the three CSR pillars and existing guidance, such as the ISO 26,000: 2010 framework, and existing reporting guidelines, such as the GRI, important opportunities are evident for the SHE function to support and advance CSR results. Linkages points exist for safety, health and environmental functional areas, both explicitly and implicitly.

Those linkage opportunities increases significantly if SHE is considered as a business partner and the functional SHE view is expanded to a cultural SHE view. This partnership requires integration and alignment of SHE considerations with business processes, goals and decisions. In order for this partnership to be successful, three things are needed:

1. An organization which understands and embraces its role to help drive both SHE and CSR culturally, by incorporating SHE considerations into the business functions and operations.
2. SHE professionals that view themselves as partners and seek “win-win” solutions to help drive both SHE and business CSR results.
3. A sense of urgency is to act now. CSR can benefit from a strong SHE culture. By leveraging the successful approach used to build a sustainable SHE culture, the CSR initiatives can evolve much quicker and experience accelerated results.

The goal of both SHE and CSR cultures is to promote and support people to make the right choices all the time. These goals are entwined and mutually positive and supportive. This is good for people—the planet—and profit.

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MEASUREMENT BEYOND FINANCIAL PERFORMANCE

SECURITY AND PRIVACY

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Performance Management 2014 Conference: Designing the High-Performing Organization

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Title: (No more than eight words in length)

Measurement Beyond Financial Performance: Security and Privacy

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Security, privacy, key performance indicators, Balanced scorecard

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

The concept of measuring business performance as a precondition for successful management has been widely accepted in research and practice. Approaches to measure business performance are various, reaching from single performance indicators over complex performance indicator systems to holistic approaches such as the balanced scorecard (BSC). Some studies already demonstrated that measures beyond financial performance show important influence on the success of companies. In addition, poor performance of non-financial performance indicators may serve as an important "warning sign" for imminent financial performance problems. In fact, many of the approaches omit measuring beyond financial performance and exclude issues such as technological (e.g. security), social (e.g. privacy, work-life-balance) or environmental (e.g. carbon footprint) aspects. Hence, we argue that measuring non-financial performance indicators has high importance and we further investigate, how well they are covered by research. We focus especially on security and privacy performance indicators and compare the scientific approaches to performance indicators that are actually used in practice in order to identify

differences and gain knowledge concerning the “research-practice” gap.
Design/methodology/approach (mandatory):
In this literature review we analyze performance indicators and Balanced Scorecard (BSC) approaches for measuring security and privacy performance of companies. We rely on a rigorous literature research considering publications from scientific sources, published in between 2003 – 2014 using different scientific databases (such as ProQuest and EBSCO). The search terms for this review have been developed from a pre-study using Google scholar. To narrow down the review, we apply the search query on abstracts and key words only, using Boolean operators. Our approach envisages running through multiple iterations until saturation is reached. Afterwards we compare the given results with sources from practice (e.g. KPILibrary - http://kpilibrary.com/).
Findings (mandatory):
Information security and privacy measurements – either in form of single performance indicators or integrated into BSC approaches – are rarely addressed in academic research. On one hand, literature supports the idea that measurement is necessary and represents an important issue. On the other hand, the “how-to” has not been discussed in a rigorous way. Concerning security, there are some well-established approaches, but often security and safety are either mixed up or seen as the same thing. Furthermore, security performance indicators are mainly based on technology, e.g. performance of firewalls. Compared to security indicators, privacy performance indicators are even less prominent. Although privacy has been addressed by many industries and disciplines, (e.g. health care, psychology, statistics, marketing) privacy performance is not an issue. This may either be due to the lack of appropriate measurement methods or reflects the fact that the importance of privacy in research has been bound so far to the user or customer concerns towards privacy and the business point of view has been ignored. We conclude that information privacy has not been perceived as an indicator which influences overall business performance.
Research limitations/implications (if applicable):
The research is limited by the method applied, since the literature review only includes a selected set of databases and limits the time frame of publications to 2003 until 2014.
Practical implications (if applicable):
Write here...
Social implications (if applicable):
Write here...
Originality/value (mandatory):
The results are valuable in different ways. First, offering a comprehensive overview on privacy and security performance indicators in research. Second, demonstrating how non-financial performance is addressed in research and finally, comparing scientific literature with sources from practice in order to illustrate the research-practice gap. Hence, the literature review serves as a solid basis for further research on security and privacy performance indicators and measurements.

Introduction

Research and practice in general agree upon the need to measure business processes, resource usage and many other business-related factors (Venkatraman and Ramanujam, 1986). Measuring business performance has been identified as success driver for management (Neely, 2002). Approaches to measure business performance include single performance indicators, complex performance indicator systems and holistic approaches e.g. the Balanced Scorecard (Kaplan and Norton, 1996). Overall, financial performance indicators (PIs) are commonly used, but nonfinancial metrics seem to be more appropriate for measuring impacts beyond financial performance (Eccles, 1990). All indicators require operationalization to enable measurement, which can either be realized in terms of counting (absolute) or relating numbers to each other (relative). Nevertheless, measuring requires operationalization in terms of defining what and how to measure.

In this research we focus on security and privacy performance indicators (PIs), comparing scientific discussion to PIs actually used in practice. Thereby we are able to gain knowledge concerning the “research-practice” gap. In terms of security we realized that some research has been done on security, but PIs in this area have been widely ignored although security PIs are predominating practice. Concerning privacy performance indicators (PIs), we evidenced little discussion in research and practice, mainly connected to product responsibility or integrated into CSR reporting.

State of the Field

Performance measurement has been identified as one main method for planning, steering and reaching organizational goals since years (Barnard, 1968, Horrigan, 1968). Due to the fact that businesses main focus is on profitability, financial performance measurement received some importance (Neely, 2002). This may be a result of the existence of well-established methods for measuring financial performance by accounting systems and ignorance of nonfinancial performance measurement (Gleich et al., 2011, Frank et al., 2008). Nevertheless, it has been stated that a “shift from treating financial figures as the foundation for performance measurement to treating them as one among a broader set of measures” is necessary to sustain success of companies (Eccles, 1990).

As a consequence holistic approaches and frameworks integrating financial and nonfinancial measures, such as the Balanced Scorecard (Kaplan and Norton, 1996), the performance pyramid (Lynch and Cross, 1992) or the performance prism (Neely et al., 2002) were widely adopted by business. Lately, the relationship between financial and social performance of companies have been investigated extensively (Husted and Salazar, 2006, McWilliams and Siegel, 2000, Wartick and Cochran, 1985, Orlitzky et al., 2003), showing that nonfinancial performance influences companies’ success (Davis and Albright, 2004, Orlitzky et al., 2003, Ittner and Larcker, 2003). In addition, poor performance of non-financial performance indicators may serve as an important “warning sign” for imminent financial performance problems (Ittner and Larcker, 2003, Ittner and Larcker, 1998, Said et al., 2003). Widely-used non-financial performance indicators are customer satisfaction (Ittner and Larcker, 1998), quality (Eccles, 1990) or market shares (Chaudhuri and Holbrook, 2001). In addition, social (e.g. privacy, work-life-balance), technological (e.g. security), or environmental (e.g. carbon footprint) issues (Huang et al., 2006, Beauregard and Henry, 2009, Loveman, 1998, Konar and Cohen, 2001, Laurent et al., 2010) are important indicators allowing insights into companies’ performance. Special emphasis has been put on key performance indicators (KPIs), which are “focusing on those aspects of organizational performance that are the most critical for the current and future success of the organization” (Parmenter, 2010, p. 4).

But still, “what” and “how” to measure are open questions requiring further investigation (Neely, 1999). Besides holistic approaches, performance indicator systems (e.g. the DuPont system, Diebold) gained some importance in practice (Gleich et al., 2011, Frank et al., 2008). All approaches depend on performance indicators, which are the underlying operationalized measurement instrument (Parmenter, 2010). PIs can be categorized as being absolute (countable numbers) or relative (ratio or relationship of reference values). In addition they may be plain (a single value) or composite (combining different performance dimensions into one indicator, e.g. Carbon Footprint), showing different advantages and disadvantages

(Venkatraman and Ramanujam, 1986). Despite the importance of nonfinancial PIs, approaches to monetize them can be observed (Parmenter, 2010).

Security and Privacy Performance Indicators

The importance of information systems for companies lead to new challenges, among them security and privacy. They have been evidenced to influence the financial performance of companies, e.g. privacy and security breaches negatively influence companies' success (Acquisti et al., 2006, Campbell et al., 2003, Kannan et al., 2007, Ko et al., 2009). Thus, measuring security level of systems, e.g. resistance to attacks or ability to restrict system damages (Reznik, 2003) is required. On the other hand information on privacy practices may impact customers' trust in companies (Flavián and Guinalú, 2006).

Doubts on the importance of security and privacy PIs have been expressed. Cashell et al. argued that organizations refuse to measure their information security because they fear negative impacts (e.g. on financial markets, attracting hackers) when bad results of security PIs are disclosed (Cashell et al., 2004) leading to unpopularity of security PIs (Hagen et al., 2008). Despite the evidenced perceived importance of security and privacy performance measurement systems (Abu-Musa, 2007), adequate implementation of procedures and application for evaluation has been questions (Abu-Musa, 2010).

Due to this unclear picture and the assumed "research-practice" gap, we compare scientific results to PIs actually used in practice to close the gap. In essence, this research tries to answer the question, which PIs are noticed as being of relevance in research and practice.

Methodological Approach

In this literature review we analyze PIs for measuring privacy and security performance of companies. To investigate how they have been addressed in research, we applied a rigorous systematic literature review. In a pre-study, applied in September 2013, we used Google scholar to identify appropriate search terms, which resulted in five queries on security and three queries on security including different combinations of privacy/security, measurement, metrics, performance, as well as balanced scorecard applying Boolean operators (AND, OR, NOT). We applied the search in two scientific databases, namely EBSCO and ProQuest in January 2014. Our approach envisages running through multiple iterations until saturation has been reached. As a first step, we applied the search queries narrowed the search down - based on the results of the pre-study - to abstracts, key words and full text to avoid flooding by non-relevant information (e.g. mentioning search terms in referenced work). Due to the fact that privacy and security research gained a lot of attention in the last years, we selected exclusively scientific papers published between 2003 and January 2014 listed in the databases resulting in 442 (privacy) resp. 410 (security) unique publications. We excluded all publications investigating healthcare or e-government (2nd step). Afterwards (3rd step), we excluded publications addressing privacy and security from other perspectives, such as social security, bodily privacy, providing technological solutions (e.g. security algorithms for programming). Finally we excluded publications not investigating actual performance indicators and selected 40 (privacy) resp. 22 (security) for further screening. Further screening was done manually by the co-authors and revealed that only 4 (privacy) resp. 46 (security) unique PIs were de facto discussed in research.

Results

The examination of the literature showed that using, or rather communicating single PIs is unpopular, but governance or security frameworks are discussed as a basis for performance measurement. The studies address business strategy, information security governance, service level agreements (SLAs) and organizational security measures, thus no topic is predomination. Concerning categorization, absolute and relative PIs are discussed approximately to the same extent and monetization is an issue. 35 KPIs have been proposed within a Balanced Scorecard approach, therefore are aggregated into four balanced composite PIs. In the context of Information security governance, eight PIs were named, which are basically counts of desired and undesired states of security, and in the assessment of Service Level agreement, two PIs were mentioned. As a SLA defines the target output, these PIs are calculated relative to a given, desired value.

Author	Objective of the study	Research Methodology	PI Group (Framework)	PI (absolute or relative)
(Huang, 2006)	Business strategy and PIs for information security projects	Survey information managers in manufacturing companies	Adapted BSC - 12 strategy maps 35 KPIs	Financial perspective Losses and Recovery costs (3) (monetized) Information security (3) (absolute) Time related: Training, Breakdown time, Integration, awareness and recognition of information security
(Abu-Musa, 2010)	Information security governance implementation	Empirical survey	ITGI, Guidance for Boards of Directors and Executive Management	Number of incidents damaging reputation (absolute) Systems missing security requirements (absolute) Access Control Account management and Identification (5) (absolute) Malicious code prevented (absolute)
(Potter and Hsiung, 2008)	SLAs – Performance and expectations alignment	Survey		Availability of critical and non-critical subsystems (relative) Time to respond to possible VOIP security incidents (relative)
(Hagen et al., 2008)	Implementation and effectiveness of organizational security measures	Qualitative Research		Security routines, policies, non-disclosure agreements, guidelines, training, awareness campaigns (absolute) Response plans, audits, reporting systems (absolute)

Table 1: Security PIs

Huang used the balanced scorecard framework and adapted it to the security context (Huang, 2006). Abu-Musa investigated the ITGI framework, presenting mainly absolute KPIS (Abu-Musa, 2010). The framework features twelve so called strategy maps, encompassing 35 KPIs, condensed 80 PIs collected from literature and purged

any item, which performance was found not to be essential (Huang, 2006). The work of Potter and Hsiung provide one KPI concerning security in the context of Service Level Agreement, namely the time to respond to possible VoIP security incidents, which is quantified in different grades for the impact and time values given (Potter and Hsiung, 2008). Hagen et al. provide results from a survey and state that the existence of guidelines and policies is high within companies, but KPIs for assessing security were rarely mentioned (Hagen et al., 2008).

Concerning privacy PIs, we found four unique PIs being discussed in the literature (Privacy as part of CSR reporting resp. GRI has been found in 10 other studies). Three of them are connected to sustainability (resp. CSR) whereas one is a conceptual paper on developing a real time privacy dashboard. Three out of four identified privacy PIs use absolute measures, the fourth describes a PI system including absolute and relative measures. Measured items are complaints (2 times) and customer satisfaction (Table 2). In the majority of cases, privacy is only of marginal importance in the articles, because the authors often focuses on more general aspects (e.g. CSR reporting or compliance). Overall, qualitative research methods were used in seven articles to extend the previous body of knowledge. In opposite, only two quantitative studies have been conducted.

Author	Objective of the study	Research Methodology	PI Group (Framework)	PI (absolute or relative)
(Lin et al., 2014)	Perceptions of sustainability reporting	Quantitative survey	Social Performance Indicators product responsibility (Global Reporting Initiatives (GRI))	Customer Privacy measured by ‘number of complaints’ (absolute, not monetized)
(Matev and Assenova, 2012)	CSR issues in Bulgarian hotel industry	Qualitative research – content analysis of in-plant assessment and monitoring	Consumer issues (ISO 26000)	‘Consumer data protection and privacy’ measured by ‘average customer satisfaction’ (absolute, not monetized)
(Delai and Takahashi, 2011)	Critical analysis of sustainability measurement initiatives	Literature review on sustainability measurement initiatives	Product responsibility	Respect for privacy measured by ‘number of customer complaints regarding breaches of privacy and loss of data’ (absolute, not monetized)
(Pearson and Allison, 2009)	Model-driven automated privacy process analysis and privacy configuration checking system, resulting in a real-time dashboard	Conceptual paper	System of 14 checks to control privacy (mainly technical measures)	‘Presence of privacy seals for the back end system’ (measurement was not mentioned in detail, not monetized)

Table 2: Privacy PIs

Research-Practice Gap

To identify the research-practice gap we selected two different sources supporting practitioners the application of PIs: KPILibrary (<http://kpilibrary>) and the “Complete Guide to Security and Privacy Metrics” (hereinafter referred to as “CG2SPM”) (Herrmann, 2007). The KPILibrary is a free-of-charge online platform which encourages registered users to submit PIs to the platform. The PIs listed are described in terms of formula, unit (number, money, score, percentage, time ...), direction

(minimize, maximize, keep stable), time range (per month, per year ...) and additional information as well as categories, they are listed in. The CG2SPM is a collection of security and privacy PIs as used in standards, frameworks, regulations (e.g. the Sarbanes-Oxley Act) and companies. It categorizes the PIs by what they measure (compliance with security and privacy regulation standards, resilience of physical, personal, IT and operational security controls, Return on Investment (ROI) in physical, personnel, IT, and operational security controls) (Herrmann, 2007, pp. 13 - 16) and further by sub-categories such as physical security, personnel security or IT security. For the comparison we focus on PIs listed in the chapter on IT security including privacy PIs.

In the two sources we found 244 (KPILibrary: 27, CG2SPM: 217) security and 14 (KPILibrary: 2, CG2SPM: 12) privacy PIs, relative PIs are used mainly for security PIs, whereas privacy PIs are mainly absolute. The CG2SPM often combines different categories (e.g. “number and percentage”) for the same item, hence these PIs add up in both categories. Composite PIs (4) and monetized (in terms of costs) PIs (4) are rare.

Two main points emerge from the data on security and privacy (Table 3). First, more security than privacy related PIs are mentioned. However, 46 security only four privacy PIs have been found in the scientific literature. The second point is the absence of relative measures in the academic articles. As it is sometimes not distinctly possible to assess whether a PI is composite or not, only two PIs could be identified as being assessed relatively. As the goal of a BSC approach is to provide a composite value for the mapped categories, there were five composite KPIs identifiable, although these encompass three monetized KPIs, namely “Losses of -policy breaking, -malicious attacks and -IS suspension).

Table 3 lists the figures.

Source	Issue	PIs	Absolute	Relative	Composite	Monetized
KPILibrary	Security	27	10	16	1	2
	Privacy	2	1	1	0	0
CG2SPM	Security	217	70	182	3	2
	Privacy	12	8	4	0	0
Literature	Security	46	20	2	5	3
	Privacy	4	4	0	0	0

Table 3: Comparison of PIs by Categories

Discussion

Our research revealed that security and privacy PIs are rarely addressed by academia. Although literature supports the importance of measurement, the “how-to” has not been discussed in a rigorous way. Concerning security, there are some well-established approaches, but the operationalization in terms of PIs is missing. Furthermore security PIs are often technology related (e.g. performance of firewalls) and hence not related to business performance measurement. Moreover, privacy PIs are even less prominent. Although privacy has been addressed by many industries and disciplines, (e.g. health care, psychology, statistics, marketing) privacy performance seems not to be an issue. In practice the huge variety of security PIs is apparent, whereas is privacy even in practice does not found a lot of attention.

We were able to identify some security PIs mainly address the governance of a holistic IT strategy, which mostly encompass security KPIs as well. Due to the fact

that companies neglect to communicate their KPIs for security issues, it is still unclear, whether they are effectively used and evaluated. On the other hand, it can be seen as best practice to incorporate a given security framework, therefore there is no need to assess certain aspects with single KPIs. As already mentioned (Abu-Musa, 2010, Abu-Musa, 2007, Hagen et al., 2008), companies do not want others to know details about their security PIs and independent of their ascertainment, their actual consideration in practice is also unclear. Although it has been stated that organizations should understand privacy as an important issue to success in many areas (Flavián and Guinalíu, 2006) which should be managed through PIs (Stone et al., 2010), PIs are hardly found in research and practice. We assume that non-existence of appropriate measurement methods as well as underestimating the importance, or being afraid of privacy measurement are reasons for this picture. Our results on privacy PIs revealed that privacy is often investigated in connection with sustainability as part of product responsibility. This is a consequence of GRI as a commonly used CSR reporting platform which includes privacy in terms of customer complaints as part of the reports. Our results show that the consumer is in the focus of privacy PIs (customer complaints, satisfaction), leading to the assumption that companies feel responsible only for their customers' data, but not to the same extent for data from partners or employees.

Considering our results, they are valuable in different ways. First, offering a comprehensive overview on privacy and security PIs in research. Second, demonstrating how non-financial performance is addressed in research and finally, comparing scientific literature with sources from practice in order to illustrate the research-practice gap.

Conclusions

In the field of performance measurement based on performance indicators many open issues can be identified. One of them is the missing discussion in research on non-financial PIs, especially concerning security and privacy. In addition the stated importance of performance measurement has not been covered by investigating PIs in this area. Even holistic approaches widely accepted in practice, such as the BSC which integrates different PIs, have not generated research on nonfinancial performance measurement. Future research should focus on both, security and privacy PIs, and their application in practice to create understanding on how and what to measure. Security PIs require attention from business, due to the importance of information systems for business success. Privacy as a chance to build deep relationships with customers should use measures to control customers' satisfaction by sophisticated PIs (Herrmann, 2007). Our literature review serves as a solid basis for further research on privacy and security performance indicators. Future research should focus on one hand on the business value of security and the importance of security PIs to manage the value. On the other hand, customer privacy could be measured through more sophisticated approaches. Hence, the development of holistic privacy PIs can be a good starting point.

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UTILIZATION OF BALANCED SCORECARD
AND CUSTOMER RELATIONSHIP
MANAGEMENT AND THE EFFECT OF THEIR
JOINT USE ON THE FINANCIAL
PERFORMANCE OF COMPANIES IN THE
CZECH REPUBLIC

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Article Classification: research paper

Title:

Utilization of Balanced Scorecard and Customer Relationship Management and the Effect of Their Joint Use on the Financial Performance of Companies in the Czech Republic

Keywords:

Balanced Scorecard (BSC), Customer Relationship Management (CRM), financial performance, synergetic effects

Abstract:

Purpose (mandatory):

The article aims to evaluate the synergetic effect of the joint use of selected performance concepts BSC and CRM and especially their synergetic effects on achieving higher financial performance of companies.

Design/methodology/approach (mandatory):

An extensive questionnaire survey (a total of 167 enterprises in the Czech Republic) was used for identification of the use of selected performance concepts – BSC and CRM. It was tested whether the joint use of performance concepts BSC and CRM in corporate practice improves the financial performance of companies. Financial performance was measured by Return on Equity (ROE) and Return on Assets (ROA).

Findings (mandatory):

An extensive questionnaire survey revealed that the BSC is currently used by 21 % of enterprises and CRM by 33 % of enterprises. Furthermore, it was also analyzed whether and to what extent companies in the Czech Republic use several selected performance concepts contemporarily, 11 % of companies in the sample use the BSC concept in combination with the CRM concept.

It was also tested whether the joint use of performance concepts in corporate practice improves the financial performance of companies. As financial performance indicators were selected Return on Equity (ROE) and Return on Assets (ROA). Based on the questionnaire survey conducted in 167 companies in the Czech Republic, it was found that the use of BSC and CRM tools in the Czech Republic is still relatively low. It can also be stated that a synergetic effect of the joint use of BSC and CRM, which would improve higher financial performance of companies, was not confirmed.

Research limitations/implications (if applicable):

As all articles, even this one was associated with certain constraints: 1/ Quality of accounting data used to calculate the profitability indicators of return on equity and return on assets. For reasons of tax optimization, companies often report earnings lower than they actually are. 2/ Questionnaire survey. To compile the study an extensive questionnaire survey was used, which is always linked with a certain degree of subjectivity in data provision. 3/ Time frame. Companies in the Czech Republic began to implement the concepts of BSC and CRM later than in the USA and developed European countries, hence the contribution of these tools might not yet emerged to the full extent. 4/ Sectorial specialization.

Originality/value (mandatory):

The benefits of the article consist in the analysis and subsequent synthesis of synergetic effects that are provided by the joint implementation of the selected performance concepts – BSC and CRM. It can also be stated that a synergetic effect of the joint use of BSC and CRM, which would improve higher financial performance of companies, was not confirmed.

Utilization of Balanced Scorecard and Customer Relationship Management and the Effect of Their Joint Use on the Financial Performance of Companies in the Czech Republic

Adriana Knápková, Lubor Homolka, Drahomíra Pavelková

Introduction

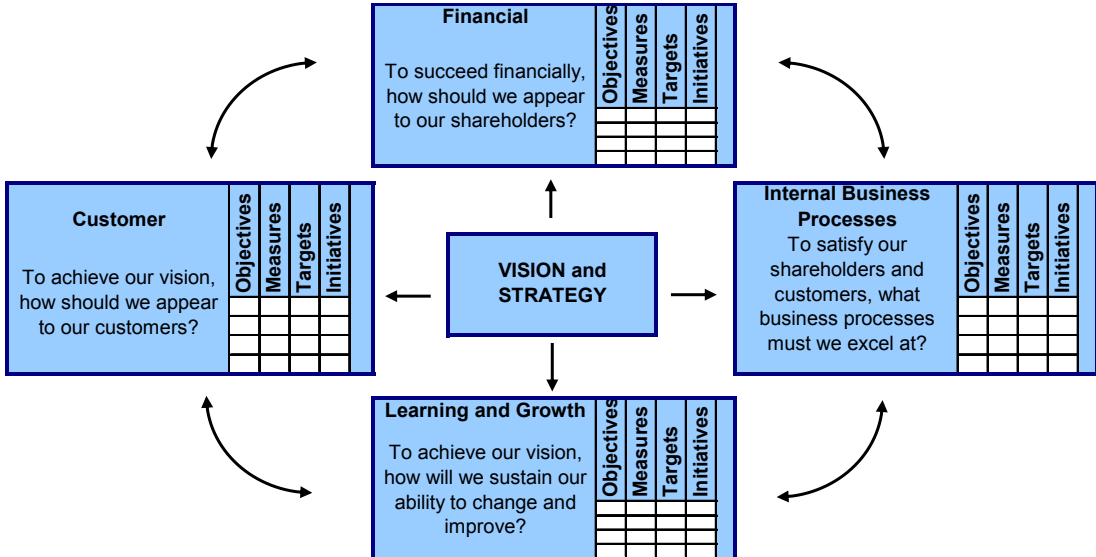
Nowadays companies use a wide variety of tools supporting corporate performance measurement and management. However, there is still a lack of quality studies on the effect of these concepts on the financial performance itself. Even to a lesser extent authors pursue synergetic effects arising from the joint use of performance tools. Hence the aim of this article is to find out whether the joint use of selected performance tools will increase financial performance of companies. Other parts of the article deal with a critical literature review and further develop scientific questions posed. The third part presents the methodology used in the article. In the fourth part the main results are discussed, and the last section consisting of conclusion also includes the evaluation of the article and its constraints.

1. Balanced Scorecard (BSC) a Customer Relationship Management (CRM) – theoretical backgrounds

1.1. Balanced Scorecard (BSC)

A complex and lucid view onto the company performance and generators of this performance provides the concept of Kaplan and Norton referred to as Balanced Scorecard (BSC). This concept of managing the performance adds new measures of the driving forces of the future performance to the financial measures of the past performance. The goals and measures are based on the vision of a strategy of the company and monitor its performance from the four following perspectives: financial, customer-related, internal processes, learning and growth – see figure 1. Financial and non-financial criteria are then a part of the information system available to the managers on all levels of the company. Measuring properties of BSC can be used for the clarification of the vision and strategies of the company and their conversion into concrete goals, for planning and communication, and for the refinement of the feedback and of the learning process. The utilization of BSC can be amplified by the emphasis on the value-based approach to the management of performance.

Fig. 1. Balanced Scorecard (BSC)



Source: Kaplan and Norton (1992)

1.2. Customer Relationship Management (CRM)

Customer Relationship Management (CRM) can be defined variously as:

- data driven marketing (Kutner and Cripps, 1997),
- the management approach that enables organizations to identify, attract and increase retention of profitable customers by managing relationships with them (Hobby, 1999),
- the development and maintenance of long-term mutually beneficial relationships with strategically significant customers (Buttle, 2001).

Rigby and Bilodeau (2013) proved that CRM is the most widely used management tool in the world and the research showed (total 1208 respondents) that CRM was used in 43% of companies

1.3. The influence of BSC and CRM on financial performance

Nowadays companies use a wide variety of tools supporting corporate performance measurement and management (Rigby and Bilodeau, 2013). However, there is still a lack of quality studies on the effect of these concepts on the financial performance itself. The use of any tool do not imply automatically increase performance.

Studies showed a positive relationship between the use of BSC and corporate performance (Braam and Nijssen, 2004; Crabtree and DeBusk, 2008; Davis and Albright (2004); DeGeuser et al., 2009; Hoque and James, 2000). Only studies Ittner et al. (2003) and Griffith and Neely (2009) did not show a positive effect of the use of BSC on corporate performance. Some scientists have provided evidence of a positive relationship between the use of CRM and financial performance (Coltman et al., 2010; Reinartz et al., 2004; Shang and Lu, 2012; Keramati et al., 2010). Hendricks et al. (2006) show negative impact of CRM implementation on financial performance. As a result of these different results is the contribution of the use of BSC and CRM implementation on financial performance still debatable. There are no studies that investigated the influence of synergetic effects BSC and CRM on financial performance.

2. Determining research questions and suggested research model

The aim of the article is to evaluate the use of BSC and CRM in the Czech Republic, to analyse the synergetic effects of these tools and to evaluate whether the joint implementation of BSC and CRM will improve financial performance of companies.

Based on the critical literature review, the following research questions (RQ) were specified:

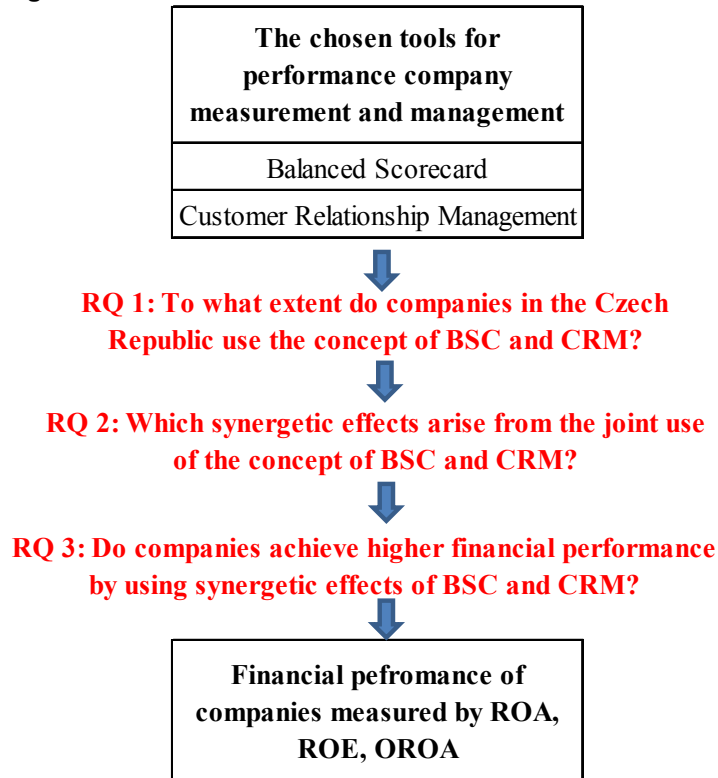
RQ 1: To what extent do companies in the Czech Republic use the concept of BSC and CRM?

RQ 2: Which synergetic effects arise from the joint use of the concept of BSC and CRM?

RQ 3: Do companies achieve higher financial performance by using synergetic effects of BSC and CRM?

The linkage between the individual objectives and determined research questions investigated in relation to these objectives is clearly shown in Fig. 2.

Fig. 2: Research Model



Source: own

3. Data collection techniques and applied research methods

This section describes data collection, the process of designing and implementing a questionnaire survey, identifying individual variables. Furthermore, it specifies the scientific methods used to answer the research questions set out in the previous part of the article.

3.1. Data collection techniques and the process of designing and implementing a questionnaire survey

In pursuance of the research two basic data collection techniques were used - questionnaire survey and historical data from the Albertina database containing data of individual companies in the Czech Republic in the form of financial statements. The questionnaire survey was primarily used to collect data that are not available from other public sources. This questionnaire was designed to determine the extent of use of individual performance concepts in enterprises in the Czech Republic.

3.2. Identifying individual variables

To assess financial performance of companies, three basic indicators were selected:

1. Return on Equity (ROE = Net Profit / Equity)
2. Return on Assets, which was measured in two different forms (ROA = Earnings Before Interests and Taxes / Assets and PROA = Operating Earnings Before Interests and Taxes / Assets)

To identify companies having the largest influence on distorting data set (considered as outliers) we propose in two-stage procedure. Financial data interpretability suffers from their nature. Financial statements should not only depict company's performance but also to assess a tax and other obligation to state administration. This ambiguity of purposes leads in bending of reported statements. It was chosen distance-based method using as underlying metrics robust Mahalanobis distance. Each company was described as a vector of the length j , when j indicates numbers of financial indicators

$$D_i = \sqrt{(x_i - T)^T C^{-1} (x_i - T)} \quad (1)$$

where T is the measure of central location of overall data set. C is a robust estimate of covariance matrix of rank j describing the variance between investigated performance indicators is distance if the

i-th company to the T. If D value exceeds threshold identified by distribution the company is labelled as an outlier. Identified outliers protrude homogenous structure so that if company has only one outlier within one performance indicator it can be omitted in the outlier list. This is the rationale for the second stage which follows more subjective outlier identification. Within each performance indicator the boundaries were estimated. We adopted the technique more frequent in the context of Bayesian statistics – (empirical) highest posterior density estimator.

Tab. 1: Limits for variables

	ROE	ROA	PROA
Minimum 2008	-0.238	-0.037	-0.059
Minimum 2009	-0.161	-0.044	-0.045
Minimum 2010	-0.070	-0.042	-0.030
Maximum 2008	0.385	0.239	0.243
Maximum 2009	0.322	0.190	0.230
Maximum 2010	0.357	0.179	0.203

Source: own

4. Results

4.1. Synergetic effects stemming from the joint use of BSC and CRM

One of the four basic perspectives of the concept of BSC is a customer perspective, which can be aptly supported by implementing the concept of CRM. Virtually all companies view a relationship with customers as one of the most important processes therefore the implementation of the concept of CRM can aptly support the concept of BSC.

Combining BSC and CRM brings the greatest benefit in the following forms:

1/ Applying the concept of CRM can more accurately define objectives for a customer perspective of BSC, which affects all other BSC perspectives.

The objectives of the customer perspective may concern in particular:

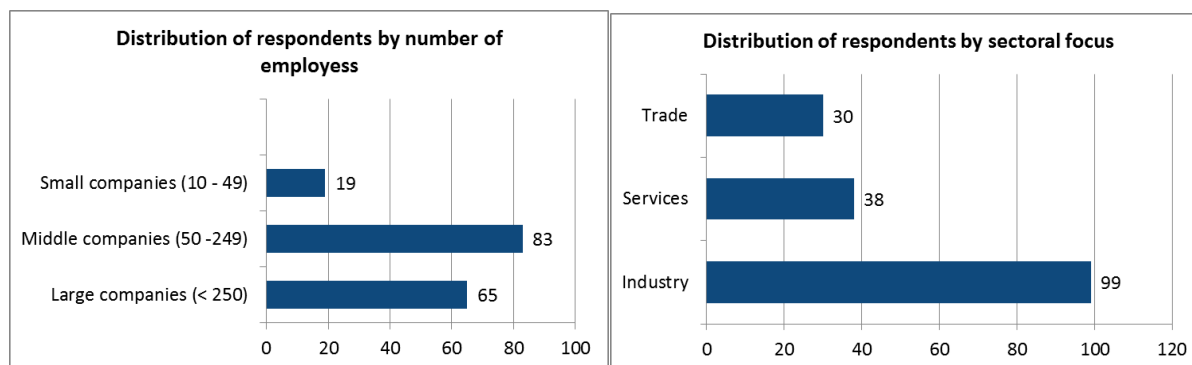
- shareholder value (higher shareholder value is associated with higher customer loyalty),
- customer satisfaction (higher satisfaction leads to higher sales and profitability),
- communication with customers (offering effective communication channels in customer relationship leads to higher customer loyalty),
- customer knowledge (understanding customers and their needs will enable companies to better innovate their products/services and better satisfy customers' demands in general).

2/ Conversely, it is possible to use the concept of BSC as an excellent tool to evaluate the effectiveness of CRM, because it can assess the elements of financial and non-financial performance and it is focused on objectives and actions.

4.2. Research sample identification

The research sample consists of a total of 167 companies in the Czech Republic. The basic characteristic of a data set is displayed in Fig. 3. Even this data set clearly shows that the representation of SMEs and product-oriented companies predominate. In terms of legal form of business, the sample mainly encompasses limited liability companies (56 %), joint-stock companies (43 %), and cooperatives and state-owned enterprises (1 %). 45 % of companies from the modified data set indicate the presence of foreign capital.

Fig. 3: A sample of companies researched by a team at FaME TBU in Zlín in 2009 - 2010 (data set = 167 companies)



Source: own

4.3. The joint use of BSC and CRM in the Czech Republic

Companies were categorized into four main groups as follows (see Table 2):

- Group 1 - Companies use neither BSC nor CRM
- Group 2 - Companies use BSC but not CRM
- Group 3 - Companies use BSC jointly with CRM
- Group 4 - Companies use CRM but not BSC

Tab. 2: Distribution of companies

	Number of companies	% of companies
1 st Group	97	58%
2 nd Group	16	10%
3 rd Group	18	11%
4 th Group	36	22%

Source: own

The questionnaire survey carried out at FaME TBU in Zlín revealed that, out of a total sample of 167 companies, the concept of Balanced Scorecard (without joint use of CRM) is used by 10 % of companies only (see Tab. 2) and 22 % of companies use the concept of CRM (without joint use of BSC). A total of 11 % of the companies in the sample use both tools jointly - BSC and CRM. Most companies in the sample, however, use neither of the analysed tools. As companies using BSC or CRM were considered only those which had been actively using the concepts for at least two years. The lack of use of BSC and CRM in the Czech Republic is caused mainly by managers' insufficient knowledge of this method or the improper use of this concept in practice. Incorrect implementation is usually due to the concept being rejected by all employees or due to adopting mainly the "software form" of implementation. Nevertheless, it is essential to realize that the implementation of BSC and CRM does not only mean to "fill" software with various financial and non-financial performance metrics, it above all involves close cooperation between company management and employees.

4.4. The effect of joint use of BSC and CRM on financial performance of companies

This part of the article is aimed at testing the effect of joint use of BSC and CRM (the use of the chosen tool for at least 2 years) and the impact of its use on financial performance of companies measured by financial indicators of profitability - ROA, ROE and PROA in the years 2008 - 2010. It was found that there are no significant differences between the groups of companies, as illustrated in Tab. 3.

Tab. 3: Average values for ROA, PROA, ROE

Year	Group	ROA	PROA	ROE
2008	1 st Group	6,0%	7,4%	9,1%
	2 nd Group	7,5%	12,0%	11,0%
	3 rd Group	5,1%	6,2%	4,9%
	4 th Group	7,8%	10,0%	11,7%
2009	1 st Group	4,8%	6,8%	8,2%
	2 nd Group	7,9%	9,0%	10,3%
	3 rd Group	5,3%	7,1%	7,0%
	4 th Group	5,6%	6,4%	8,8%
2010	1 st Group	5,7%	6,9%	10,1%
	2 nd Group	9,1%	11,2%	13,1%
	3 rd Group	3,2%	4,3%	6,8%
	4 th Group	5,9%	7,3%	11,4%

Source: own

The results (see Tab. 3) did not confirm that the joint use of BSC and CRM contributes to higher financial performance. It may be due to the fact that companies in the Czech Republic had less time to use concepts BSC and CRM and their use may not be fully reflected in higher financial performance. Also incorrect implementation and non-acceptance of the concept by company's employees may be the cause of the results gained. Another reason may lie in the inappropriate implementation of selected performance tools. Further explanation may be an attempt of Czech companies to influence their economic result, which was used as the basis for calculating profitability ratios whose values may not reflect the true state of performance of companies.

Conclusion, contribution and constraints of the article

The article contributed to determining the extent of using concepts BSC and CRM in the Czech Republic. Based on the questionnaire survey conducted in 167 companies in the Czech Republic, it was found that the use of BSC and CRM tools in the Czech Republic is still relatively low. It can also be stated that a synergetic effect of the joint use of BSC and CRM, which would improve higher financial performance of companies, was not confirmed.

As all articles, even this one was associated with certain constraints:

1/ Quality of accounting data used to calculate the profitability indicators of return on equity and return on assets. For reasons of tax optimization, companies often report earnings lower than they actually are.

2/ Questionnaire survey. To compile the study an extensive questionnaire survey was used, which is always linked with a certain degree of subjectivity in data provision.

3/ Time frame. Companies in the Czech Republic began to implement the concepts of BSC and CRM later than in the USA and developed European countries, hence the contribution of these tools might not yet emerged to the full extent.

4/ Sectorial specialization. Another important limiting factor is unknown affiliation of individual companies by sectorial or branch (NACE) affiliation. There are companies that benefit from the current boom in their industry, while many enterprises are affected by a deep crisis. The inclusion of this factor would make the results of the conducted analyses more precise.

5 / Conclusions drawn on the research study. Although the relationship between the joint use of BSC and CRM and higher financial performance was not confirmed, it is not possible to claim that the joint use of BSC and CRM tools generally does not improve financial performance of companies. No evidence was found (using our selected methods) of the positive impact of the joint use of BSC and CRM (using our selected indicators) on financial performance. The fact that we did not reject a null

hypothesis (BSC does not improve financial performance) does not mean its confirmation, we only have “more confidence” in its validity.

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FUTURE OF PERFORMANCE MEASUREMENT AND MANAGEMENT

AN EMPIRICAL EVIDENCE (PMM)

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Future of Performance Measurement and Management: An Empirical Evidence (PMM)

1. Introduction

As we are moving into the 21st century, there is an increasing belief that rate of change in the world is set to increase further both in scope and magnitude coming from unexpected directions (e.g. Weick, 1995; Hammer, 2001; Kotter & Cohen, 2002). While the change is fuelled by rapidly developing technologies (such as ICT platforms), increasing globalization and dismantling of trade barriers, issues such as global warming, environmental considerations and the sustainability of our planet are becoming key concerns for everyone. Based on these emerging trends, Bititci et al. (2012) conducted a review identifying ten grand challenges for the future of performance measurement. However, from a practitioner point of view it is not clear how these trends impact on their PMM practices.

Hence, the overall aim of this paper is to empirically explore how the PMM practices of organisations responding these trends are being impacted. While our study was inspired by the challenges identified by Bititci et al (2012), the our purpose is to conduct an exploratory investigation from the context of emerging business trends. In this paper, we first review the emerging business trends from a performance measurement and management perspective and identify five significant trends for further exploration. These trends are: (1) collaboration and networks; (2) multicultural aspects; (3) servitization; (4) sustainability & CSR and (5) innovation and knowledge based workforce. We then outline our empirical method based on inductive case studies with four different organisation.

2. Literature Review

2.1 Business Trends

The effects of globalisation, technology and the growing need for environmental responsibility and sustainability is forcing organisations and individuals to take corporate social responsibility (CSR) initiatives to make changes in the way they live, work and act (Slack et al 2010). As sustainability of the natural environment becomes a much stronger issue, products, services and the processes need to be designed, delivered and operated with sensitivity to all these considerations. In short, sustainable growth must include responsibility towards all aspects of life (Forrester, 1971; Bateson, 1980; Boulding, 1985; Meadows, Randers & Meadows, 2005). Any major unethical actions or violations by organisations are exposed faster than ever before (i.e. through social media, forums, etc.) thus threatening their survival and existence. Several researchers has explored the current business trends in the global economy (Harrington et al 2011; Bititci et al 2012; Bourne et al 2012), which organisations should respond to retain competitive advantage. Organisations of all shapes and sizes, industrial, service or public have to consider end-to-end processes

that include development, supply-chain and end-of-life management. Some of these trends are summarised in Table 1.

•	The advent of information revolution and ease of trade barriers are increasing global customers and global competition (Harrington et al 2011; Bititci et al 2012)
•	The technological developments increasing information dissemination (i.e. through websites, social media such as face-book, linked-in, twitter and online forums) creating markets with higher customer expectations and peculiar customer behaviour (Harrison and van Hoek, 2011)
•	The recent technological developments are enhancing the connectivity of people and organisations (collaboration) creating new structures for extended enterprise, virtual enterprises and modern supply chains (Gunasekaran et al 2001; Bititci et al 2012; Bourne et al 2012)
•	With the increase of technological developments in organisations, the nature of work is transforming from manual work to knowledge work (i.e. traditional face to face individual interactions are now moving towards on-line services, cash machines, answering machines, self-service, etc.) (Snowden and Boon 2007; Hilton 2008)
•	New level of volatility created through unstable economic and political circumstances creating new government interventions (Prahalad 1998; Konzelmann et al., 2010)
•	New methods and approaches are emerging to focus on different (often conflicting) outcomes simultaneously (i.e. cost, responsiveness, security, resilience, innovation and sustainability) (Melnyk et al 2010)
•	To stay ahead in the modern global marketplace, organisations must constantly look for innovative strategies to improve their competitiveness. There is a considerable growth in studies on innovation since late 1990s (Ettlie et al., 1984; Griffin and Page 1996; von Hippel et al., 1999; Tether and Howell, 2007; Chesbrough and Garman 2009)
•	New and innovative business models (such as outcome and performance based contracts) are emerging in delivering value propositions (i.e. servitization, product service systems, etc.), co-creating value with customers thus exploiting value throughout life-cycle (Vargo and Lusch 2008; Ng and Nudurupati 2010)
•	The awareness on environmental issues and impact is increasing eco-sensitivity across the consumers. Hence businesses are now emerging to take socially responsible actions and ethical practices not only to survive and retain competitive advantage but also to reduce costs as well as to increase revenues and to fuel innovation (Slack et al 2010; Lubin and Esty 2010)

Table 1 – The main social and economic trends.

It seems that the social and economic trends outlined above when combined are creating new dynamics within the operating environment of most contemporary businesses that each business needs to respond to. These the business impact of these trends can be summarised as follows:

- The advances in technologies and the developments of ICT (enabling information revolution) are enabling organisations to *collaborate* faster and create modern supply chains and *networks* to quickly respond to the customer needs, i.e. collaborative networks (Baldwin et al. 2004).
- As a result we are seeing rapid changes to the way in which organizations are managed in the global economy, often operating under *multicultural environment* (Pisano and Verganti 2008).

Embracing the rapid developments in ICT alone is enabling organisations in bringing breakthrough changes for offering products and services (Burca et al. 2006). Burgelman et al. (2004) argue that managing knowledge and keeping abreast with the technological developments and competitor strategies is key for *innovation*. In fact, the advances in technology are transforming the manual workforce into *knowledge workforce* (Hilton 2008).

- Increasing pressure from unstable economic climate as well as reducing the impact of product on environment (Manzini and Vezzoli 2003; Mont 2002) is putting organisations under pressure to add service to their portfolio of products to meet customer requirements and generate more revenue (Ng and Nudurupati 2010). Thus, there is an increasing emphasis on innovatively integrating services with their products to deliver value-adding customer benefits to enhance competitive advantage (Wise and Baumgartner 1999), which was originally termed as *servitization* by Vandermerwe and Rada (1988).
- As the global economy is increasingly dependent and driven by technological developments, which is often having greater impact on the environment (Borouh et al 1980). Recognition of this fact in public domain and the government interventions are making organisations to put more emphasis on their activities/initiatives in delivering *sustainable* products and services.

2.2 Implications of business trends on PMM practices

While the business trends discussed above influence the businesses to steer their strategy (Kennerly and Neely, 2002), their impact on PMM practices is under-researched (Bititci et al 2012). Bourne et al (2012) argue that the emerging nature of business trends makes it difficult to (re)deploy the strategic changes frequently into measures and metrics. Hence it will be useful to explore the five business trends at a greater depth and understand their implications on PMM practices. The five business trends are summarized in the Figure 1.

<i>Collaboration and Networking</i>	With globalization, the opportunities to collaborate with other organizations have enormously increased (Chesbrough and Garman 2009; Hansen and Birkinshaw 2007). With traditional organisational boundaries becoming less significant, collaboration is often leading to the development of networks that overlap with organizational boundaries shifting from inter-organizational to trans-organizational networks (cf. Davenport and Prusak 2003; Handy 2002a,b; Senge et al. 1999; Söderqvist 2002; Wenger 1999; Wenger and Snyder 2000). Bititci et al. (2012) recognises this dynamic nature and argues that performance measurement should be evolving from rational control towards cultural control (Child 1972, 1973; Tannenbaum 1968) and that performance measurement as we know it today has to be replaced by performance evaluation within the network, and that the performance of an organization or individual will be judged by the network they belong to, according to their contribution, where factors such as trust, relationship and ingenuity will become important dimensions of performance evaluation
<i>Multicultural environment</i>	Although there is evidence that performance measurement and management yields better organizational performance (Franco-Santos et al., 2007; Bititci et al. 2007; Kennerley and Neely 2003), there is also contrary evidence that in certain circumstances it could also be counter-productive (Bititci et al. 2012; Johnson and Broms 2000; Seddon 2008; Sobotka and Platts 2010). The culture and the nature of the work being carried out in the organization have an impact on how performance is measured and managed. As the globalization intensifies, organizations and individuals need to be networking across multiple and diverse national and organizational cultures. This gets even more complicated when an organization is operating in a network of several organizations involving different cultures.
<i>Servitization</i>	On one hand, many product based manufacturing organizations are now competing by repackaging their products with a service offering (Lovelock and Gummesson 2004; Neely 2007; Vargo and Lusch 2004; White et al. 1999). Hence, the value perspective has changed from the notion of “value-in-exchange” to “value-in-use” making the organizations to co-create value with their customers to understand the use/consumption of product/service throughout its life cycle (Ng and Nudurupati 2010; Woodruff 1997). On the other hand creativity in organizations, particularly open innovation in the network of organization, is paramount to competitive advantage (Adams et al. 2006; Berry 2004; Raymond 2001; Ullhøi 2004). Just as product innovation is important to organizations, the way the product gets re-packaged with the service is vital to organizations for gaining competitive advantage. Increasing emphasis on servitization will not only generate additional revenues but also support green and sustainability agenda to create and retain competitive advantage (which is further discussed in next section). Understanding and developing PMM practices for value-in-use perspective as well as different types of innovation (particularly knowledge and intellectual property in a product-service systems context) requires attention from academics, practitioners and policy makers.
<i>Sustainability and corporate social responsibility (CSR)</i>	The need for sustainable development is well recognized by many organizations and as a result, there are many green production and service systems. Increasing focus on sustainability could be a competitive advantage to many organisations as it drives down costs and hence increase revenues (Hopkins 2009; Lubin and Esty 2010; Nidumolu et al. 2009). According to Perrini et al. (2006) there is a growing interest on CSR from business communities, academic researchers as well as policy makers. This interest is mainly due to globalization, changes to environmental policies and practices as well as governments’ initiatives to promote sustainable and responsible business practices. There is also a growing consumer demand for transparency in sustainable and responsible business practices. In fact, Piercy and Lane (2009) argue that consumers are discriminating brands and companies on ethical, sustainability and responsibility standards. Hence, it is in an organisation’s interest to develop good quality indicators or measures (and hence PMM practices) for these standards in strengthening their brand positioning.
<i>Innovation and knowledge work</i>	While innovation is broadly classified as technical (product) and non-technical (product related or service), for the purpose of this research we focus more on non-technical or architectural innovation (the way in which organisations re-structure their resources in re-packaging their products and services). While Kandampully (2002) identified technology and knowledge work are the essential factors that contribute to non-technical innovation, Chesbrough and Spohrer (2006) emphasised that exploitation of ICT and transparency to create combination of knowledge that feeds into useful systems and promote innovation. The nature of work is taking new shape requiring the knowledge workers with a greater complexity of skills (Hilton, 2008). Moreover, there is also a growing consensus that the performance of a knowledge worker cannot be effectively managed (Bititci et al. 2007; Johnson and Broms 2000; Seddon 2008; Sobotka and Platts 2010). Hence, the organisations need to develop PMM practices to monitor and manage their innovation and knowledge work.

Fig. 1 – The five business trends.

In summary, with the rapid growth of ICT developments, the globalisation intensified and resulted in the business trends described above. Bourne et al. (2012) conducted a Delphi study where a group of practitioners concluded that in the light of business trends, organisations need help and guidance in developing and deploying their PMM practices. Hence, the overall aim of this paper is to explore how organisations operating in this turbulent environment are responding to the trends outlined above and particularly how their PMM practices are being influenced as a result of these responses. The following section will describe the methods used in pursuit of this aim.

3. Methodology

A qualitative research involving multiple case study approach forms the methodological basis of the research presented in this paper. While the unit of analysis (UoA) is each case company, to obtain a generalized view, the case companies were carefully selected from both SMEs as well as large enterprises as well as from the sectors that are operating under slow incremental change and breakthrough step change improvements as demonstrated in Figure 2. Within this framework of thought the cases were selected out of convenience of the researchers, where they already have established links to access data (Yin 1999).

	Slow incremental changes in the sector	Rapid breakthrough changes in the sector
Large Companies	<p>Company KS, a distribution company operating in food sector</p>	<p>Company CB, a bank operating in financial sector</p>
Medium Companies	<p>Company LS, a furniture company operating in manufacturing sector</p>	<p>Company LP, a music company operating in manufacturing sector</p>

Figure 2 – Matrix of the four case organisations selected for research.

The literature review presented a framework of challenges for performance measurement, influenced by an existing stream of literature (Bititci et al., 2012). The empirical data collected from four case studies was used to explore and build a framework/phenomenon for addressing the challenges presented. The case study approach was chosen for three main reasons (Eisenhardt, 1989; Meredith, 1993). Firstly, this research was exploratory since, as mentioned earlier, the research was carried out to find insights of companies addressing the current challenges of 21st century and there is a lack of research on the topic studied (Bititci et al 2012). Secondly, case studies are considered to be very useful for discovering possible factors and their effects as well as finding empirically grounded explanations for them (Gioia and Pitre, 1990). Finally, case study approach generates

richness and a depth of understanding which we use as a basis for understanding the performance measurement and management challenges. In this research, we adopted a multiple data collection approach, i.e. in-depth interviews, participant observations and collecting the relevant documentation to triangulate the findings. Grounded theory approach was used to analyse the data collected to validate the existing challenges as well as explore any new ones (Strauss and Corbin 1990).

4. Discussion and management implications

The empirical investigation, summarized in Appendix 1, highlighted the relevance of all the five emerging changes and trends identified by literature (Bititci et al., 2012). *Collaboration and networking* with other organisations to develop right kind of competencies is essential in delivering products and services to the customer. It was clearly demonstrated in the case of LP and LS (as shown in Figure 3). LP has increased the levels of collaboration with a network of artists, by creating their own record label that made their music available in a number of formats. This enabled them to create the world's first multi-media streaming product that can play any music format. This would not have been possible without engaging their own work force, customers, suppliers, artists and distributors into an extended network.

In the case of LS, they not only maintained and further developed the collaboration with customers, suppliers and designers but also created a network to complement and prosper their creativity by attracting external talent. As part of this network, they created a studio and a blog to bring together young university graduates and designers from all over the world where they study and explore different ways of improving customer's life experiences through using various furnishings at their home. In the case of CB and KS, while they integrated with suppliers and customers to gain some of the supply chain benefits, but did not explore the benefits of disrupting the market by creating a collaborative network of stakeholders.

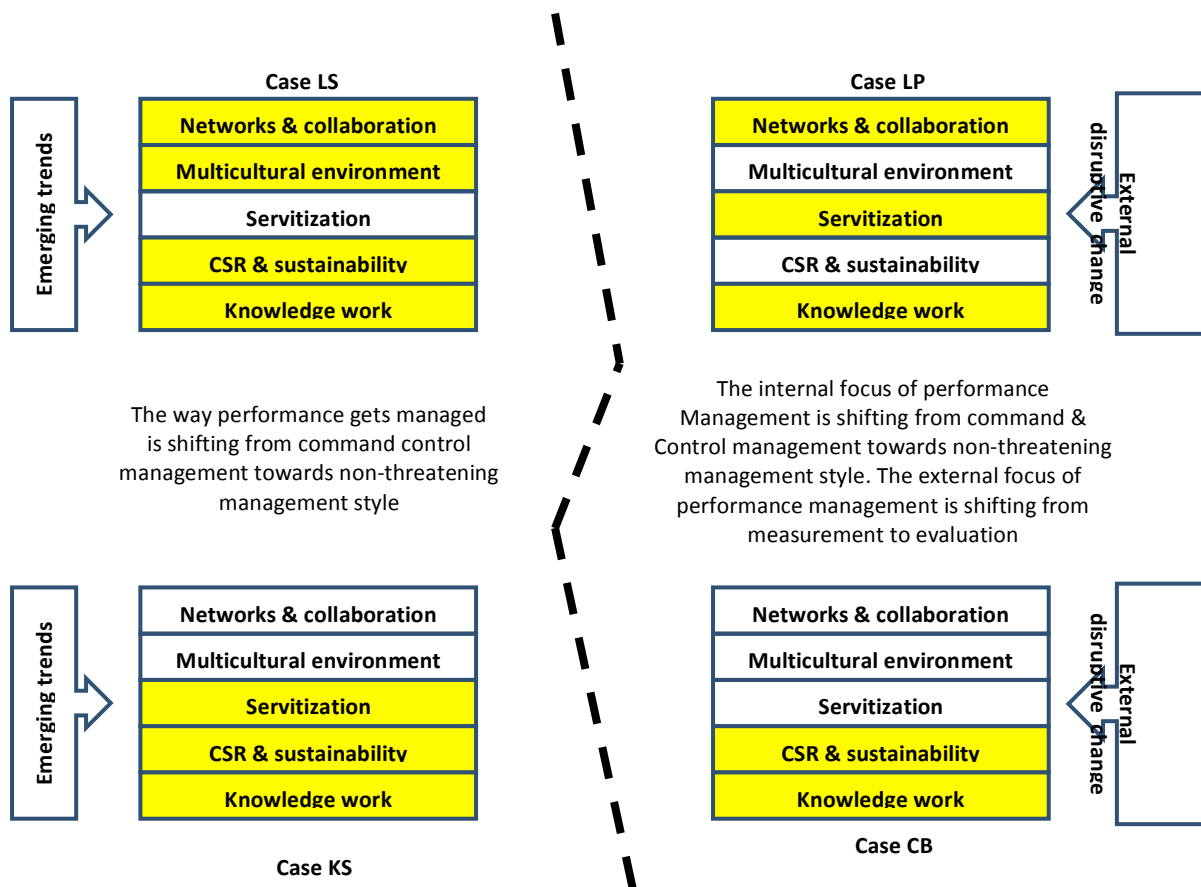


Figure 3 – Four Case Companies Responding to Emerging Changes and Trends.

Bititci et al (2012) argued the need for organisations to collaborate across global *multicultural networks* to deliver their products and services (Chesbrough and Garman 2009; Hansen and Birkinshaw 2007; Pisano and Verganti 2008). Whilst all the four case companies interact with people from different cultures during their collaboration in the supply chain, three of them (KS, CB and LP) did not manage the multicultural networks on a regular basis. However LS continuously run lateral projects involving their own employees, university students as well as emerging artists where they manage people from multi cultures all around the world to promote creativity. In LS, all the managerial and production activities are driven by the principle that design is not directed towards the single product but rather toward improving people’s lives and work through the planning of evolved, coherent spaces. By means of specific creative centre, LS created design systems, elements that can be adapted for use in every domestic space. In doing this the capability to manage multicultural environment is recognized a key element.

Recent literature underlines an increasing emphasis on *servitization* (integration of manufacturing and services) and the trend towards service-dominant logic (Lovell and Gummesson 2004; Neely 2007; Vargo and Lusch 2004, 2008; White et al. 1999) is seen as an effective means for growing and/or maintaining profits, plus potentially significantly increased control over the downstream elements of the supply chain by erecting barriers to rivals or new entrants (Mathe and Shapiro 1993; Schmenner 2009). This was clearly evident

in KS, where they are integrating additional services to their existing portfolio of product and service offerings. Firstly, they are doing this to deliver more value to its customers and at the same time creating barriers for the competitors, such as UPS, DHL who has price advantage through economies of scale. Secondly, to generate more revenues (with more work) at the same time promoting sustainability by managing the reverse logistics of its customers, i.e. recycling some of the processed materials by the customers.

Servitisation trend was also clearly evident at LP. As the complexity of providing the product has increased from track record players involving mechanical engineering skills to multimedia streaming products involving sophisticated, electronics, software and web engineering skills, thus is making installation difficult for the customer. This resulted LP to focus their product development further in servitizing their offering more user friendly. They have also established a customer contact centre as an additional service to support their product installations. It is also evident in the case of LS, where the customer experience and context of the furniture usage was studied in advance. This is in turn integrated within their product thus providing the servitized solution to its customers. However, there is no evidence of servitization in the case of CB as they believe they are already a 100% service company.

Increasing emphasis on *sustainability and CSR*, if managed properly, could become a touchstone for the organisation's future competitive advantage, as it reduces cost whilst increasing revenues and innovations (Hopkins 2009; Lubin and Esty 2010; Nidumolu et al. 2009). *Sustainability and CSR* played a key role in the case of KS where they were managing the reverse logistics of their customers to improve competitiveness and profitability. From the customer point of view, it is not only helping them in getting more value for their money, but also enabling them to concentrate and focus more on their core competence. From the organisation's (KS) perspective, they are able to reduce costs by reusing some of the processed cooking oil as bio-diesel for their vehicle fleet thus becoming environment friendly. In providing such additional services and competencies they are also gaining competitive advantage by keeping barriers to their competitors (such as UPS, DHL, etc.)

LS has adopted a green approach in designing some of its products where they will be able to quantify the impact of the product on the environment throughout its life cycle. LS believes that as more and more end-users are becoming more environment friendly and the awareness is getting saturated amongst them, developing such products and service becoming paramount to gain competitive advantage against the competition. While CB and LP appreciate the strategic importance of CSR and sustainability, it is not clearly demonstrated in this case study how they have operationalized any actions that contribute to them. In the case of CB it can be noted that actions such as converting some of the papers statements into online e-statements do contribute to sustainability.

The literature claims the importance of R&D, innovation, management of knowledge and intellectual property to the future competitiveness of an organization (References). With the increasing necessity of innovation, organisations feel shift in value from manual work force to knowledge workforce (Berry 2004; Hilton 2008; Snowden and Boon 2007; Uihøi 2004; Wenger 1999; Wenger and Snyder 2000). In all four cases, knowledge workforce played an important role in contributing to innovation and competitive advantage. While LP

and CB were operating in a sector with breakthrough changes, they experienced the need to innovate as paramount because failure to respond to these changes could have detrimental effect on their survival. In the case of LP, failure to develop the new competencies in sophisticated electronic, software and web engineering could have prevented them to take control of their own business. Without these new skills the control would have been left with their suppliers who are providing their technology through licences and never been able to come with the world's first multi-media streaming product. Prior to the launch of this new product, LP has struggled to differentiate their product from competitors and hence posed a serious threat to its survival. Over the years, LP has seen the transformation of their manual work force to knowledge work force with sophisticated skills that contributed to their competitive advantage. Within the context of CB, over the past ten years banks operating in financial sector has seen a significant growth in the use of electronic services such as ATM, telephone banking, online banking, etc. This has resulted in lack of employee engagement in the case of CB because they felt more like factory workers being measured on number of transactions completed in a given unit of time. This has resulted in poor employee morale, which affected customer satisfaction. Whilst LP has successfully addressed the breakthrough changes through product innovation, in the case of CB embracing technology (for providing electronic services) alone did not prove sufficient. It could be argued that CB being a pure service company, it requires more people involvement in delivering services that exhibit IHIP characteristics (reference). However, CB has overcome this issue by introducing SMWT projects that have ultimately improved employee engagement, productivity and customer service whilst delivering their products and services. Unlike LP, CB has felt the diminishing nature of knowledge content of the work over time. It could be argued that the developments in ICT has removed some of the knowledge content from the work. Whilst innovation is important to KS and LS, they were not operating in the sector that has seen breakthrough changes. Hence, they are under constant pressure to embrace technological developments happening in their sector. KS has exploited R&D to integrate some of the developments in the sector (such as telematics, sensor technology to their fleet etc.) in delivering their products and service to their customers. However as in the case of CB, KS has a large element of service exhibiting IHIP characteristics that requires people involvement/engagement. KS has overcome this barrier through introducing succession planning to improve the mobility of their workforce. LS believes innovation as a distinctive feature of their organisation. In addition to encouraging their work force to contribute to change and innovation for improvement, they also created a studio to attract "external contaminations" (talent of University students as well as designers all over the world). They believe innovation is not only restricted in their product or service but also in the ways of delivering them and hence constantly exploit R&D to explore these options.

Despite the managerial changes that have affected the companies investigated, there is no significant change in the four companies' performance measurement system, who continue to operate using different systems. The main change is in the way they are managing the performance of their business (Davenport and Harris 2007; Davenport et al. 2010; Johnson and Broms 2000) to answer to a change in the managerial approach. This has become clearly evident in the case of CB where there is a shift from command and control to open empowering management style in managing their performance. While the majority of the measures remain unchanged, the resolution and interval of the control were relaxed.

Traditionally productivity of each employee was measured, however after self-managed work team implementation, the productivity was measured at team level instead. Interestingly, it was observed that the organization's (CB) actions were influenced by the customer who is evaluating the business through social media communication such as chat forums, linkedin, facebook etc. Thus one can argue that performance measurement is becoming more like a social phenomenon where behaviours of the organization are shaped by the values and perceptions of the individuals and the communities within which the individual operates (Bititci et al., 2012).

While the majority of measures remained same for LP, the way they manage performance has significantly changed. The customer evaluation of their products and that of their competitors' during the demos are feedback into the business through distributors. Thus the organisation's actions were influenced by the customer evaluation based on their contextual usage and behaviour with the products and services. As shown in Figure 2, in the case of KS and LS, the performance management has not significantly changed but their perceptions revealed the necessity to shift from control to non-threatening managing style. For a long time, LS was managed promoting empowerment and autonomous and the tentative to introduce a traditional measurement system failed. In the last few year the need for growing highlighted the need to re-organized the entire organization with particular attention to R&D department, however they did not change the system but the way of use it in order to promote empowerment, continuous improvement and the company value They are trying to develop visual PM. Each area shall draw up a billboard showing the ongoing projects. Each month an audit is done in an optical lean over the area to understand the progress of projects and resolve any problems.

In summary, it could be argued that the businesses operating in a sector where there are breakthrough changes, the businesses will have a significant impact on their performance management systems. The internal focus should be shifted to non-threatening management style with the external focus to get peer evaluation from the network to quickly adapt to the fluctuating environment. Moreover, we could say that in all the companies the knowledge workers seems to be the most important factors. As underlined by Drucker (1999), the most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and knowledge workers. Our cases confirm that valuable assets should move from the *production equipment* of the 20th-century to the *knowledge workers* and their *productivity of the 21st-century*.

5. Conclusion

Companies such as CB and LP has felt the need for external disruption in the market and took it as an opportunity and embraced technical competencies to create new products and services. LP has developed their product incorporating innovative technical competencies and disrupted the market with their multi-media streaming product. They achieved this by developing a closer relationship with their own record label business and a network of artists that made their music available in a number of formats. CB has disrupted the market by offering electronic services (by replacing or in addition to existing services) by investing heavily in automating back office processing as well as merging and acquiring other businesses to drive productivity. They achieved this by incorporating ICT into their business

as well as managing and disseminating their knowledge and services to enable customers in doing self-serving. In both the cases, the external and internal disruption brought in significant changes to their business with employee dissatisfaction. This resulted in shifting their internal focus of performance management from command and control style to non-threatening management style (see Bititci et al 2007). However with the advent of social media and other ICT developments outside is shifting the focus of businesses from measuring to evaluating their external performance. On the other hand, companies such as KS and LS does not feel the necessity to disrupt the market with big step changes. However they adapted slowly but continuously in response to the emerging business trends respectively. LS and KS have slowly adapted their technical competencies in-line with the developments in their industry. While LS distinguished that innovation is key to their business and collaborated with a network of stakeholders to generate knowledge in design, KS noted that most of their business process/functions rely on knowledge based workforce and hence both of them launched projects to motivate and develop their employees respectively. As a result, these companies are shifting their internal focus of performance management from command and control style to non-threatening management style.

References

Reference will be sent on request.

Appendix 1

	LP	KS	LS	CB
Company profile	A music company operating in the precision of the sound. Founded in 1972 <i>Scotland</i> <i>Employees 160</i>	A distribution company operating in the food industry. <i>United Kingdom</i> <i>Employees 300</i>	A furniture company operating in manufacturing sector. <i>Italy</i> <i>Employees 170</i>	A bank operating in financial sector. Founded in 1839. <i>United States</i>
Purpose	Provide its customers a "music for life" through the design and development of modular and compatible systems.	Manage the supply chain of its customers through optimization supply chain, reduce costs and improve customer service.	Offer a mix of art and culture through simplicity in the forms, quality materials and accessible prices.	Offer wide range of products and service. Their vision is to be a leading financial services which is trusted by all stakeholders.
Inquiry	Lp believes that although the context changes with news digital streaming systems and toward web-engineering.	Furious competition from big players is posing a serious threat. KS is under constant pressure.	Internal and external collaborations, CSR, innovation and knowledge are distinctive features.	CB is part of a international banking group. In 1970, CB was the first bank to introduce automate banking (ATMs).
Network & Collaboration	Network with a range of organizations and individuals, but maintaining control of the technologies that underpin their product offering.	This compelled KS to exploit R&D constantly to embrace the latest technology available in the sector to enable their service more effectively and efficiently.	LS has collaborations with customers, suppliers and designers. LS created a network studio with a young university for promoting creativity and friendship.	Investment in to back office processing and customer contact centers and automation of office process. Customers do not come to branches as much but interact with the ICT
Multicultural Environment	While they operate under multi-cultural environment, they did not face any issues operating within this context.	While their customers restaurants operate around the world, KS source and supply majority of its supplies in the UK hence there is no explicit evidence provided on operating in multi-cultural environment.	LS is involved in the "lateral" projects with initiatives running in parallel with the development, production and the launch of new products. These projects see the participation of university and new artists.	
Servitization	Management routines were developed to engage everyone in product and service improvement and innovation	KS started working with its main customers to solve of their problem across the supply chain to enable better service excellence.		
CSR & Sustainability	LP recognize the growing emphasis of sustainability and government	They are in talks with customer to recycle food and plastics appropriately in future. They are undertake corporate social responsibility organizing events.	LS pays particular attention also on the surrounding area, promoting broad cultural initiative. LS adopts a green approach in designing and producing some its products	The bank is constantly looking to reduce their energy usage and waste production. They work with the community and their supply chain to promote this thinking.
Knowledge work	LP realized the need for more knowledge workforce and thus invested to expand their capabilities further through the development of core expertise in operating software that would previously have been resident in proprietary.	The employees are encouraged to move away from money motivating to development motivating attitude.	LS communicates in an innovative manner. For instance, LS proposed a living showroom in the natural environmental LS adopted lean production to increase productivity and reduce packaging.	Recognition of employee engagement problems and its impact on productivity and customer service resulting in development of a pilot programmed to increase employee engagement that introduced couple of self managed work team (SMWT)
PMS	Change of the sales indicator across two different channels: Traditional channel and Web channel Externally, the distributors are seen as an integral part of the sales PMS. Internally, they adopted a visual strategy management system that deploys to various parts of the business through this engages everyone in a conversation over top priority issue and objectives	The performance measures remained the same with few additions on indicators related to innovation and succession planning. KS has developed 100 ways of thanking the employee for changing or developing the existing service for improvements. The business has changed the way they measure and manager innovation by monitoring the inputs that go into innovation.	LS still based on the company specificity instead of structured and predefined model. Monthly, strategic performance is evaluated by the managerial team. Information on operational performance is made available based on the specific needs of each department. The employees are in the process of developing visual performance measures to assess the progress of projects and achievements.	Previously productivity of each employee was measured at a daily basis and published in league table each day. The performance is now being measured at a team level in weekly intervals. Customers satisfaction measures were measured on a quarterly basis based on customer surveys. There is significant shift from command and control to open empowering management style in managing the performance of the business.

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STRATEGIC DECISIONS CREATION- IMPLEMENTATION PROCESS

AN EMPIRICAL STUDY

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Strategic decisions creation-implementation process

An empirical study

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Abstract

Purpose– This paper proposes an empirically grounded strategic decisions creation-implementation (SDCI) process. This paper presents the process and discusses it through the sensemaking perspective lens.

Design/methodology/approach–The paper employs a case study strategy. The data were collected through semi-structured interviews with senior executives of established medium to large firms. The protocol included general demographic questions and open-ended and follow-up questions about the strategic decisions that the interviewees have recently made and implemented. Data analysis was performed through the analytic induction procedure, which was deemed appropriate given the complexity of the social phenomenon under investigation.

Findings– The study develops a holistic process of creating and implementing strategic decisions, showing that such processes are not as highly prescriptive, rational, step-wise, or formulaic as it has been widely thought of in the prevailing strategy literature for decades. In fact, data have illustrated the iterative nature and strong interplay between decisions on one hand and action or implementation on the other. The study has positioned the holistic SDCI process as a middle ground between two extremes in strategy literature: highly rational and highly reactive. Because the elements of these processes rely heavily on managerial and organizational cognitions (MOC), the findings were interpreted through the sensemaking lens. The results of using sensemaking were astonishing for the striking alignment and parallel between the SDCI process and sensemaking perspective. Consequently, the SDCI process was altered and elaborated using the related sensemaking terminology, which increased its explanatory power and improved the potential for application.

Research limitations/implications– The study is qualitative and accordingly its findings are not readily generalizable. However, this can be partially mitigated by conducting future research that may seek to collect data from other types of organizations in different contexts for comparative purposes. Also, new data can be collected to address the role of language and power in creating and implementing strategic decisions.

Practical implications– The study calls for employing a different view for creating and implementing strategic decisions using an empirically grounded, holistic SDCI process. This sensemaking-based process can be used to understand and diagnose strategic decisions and uncover relevant creation and implementation issues. This can be used to improve creating and implementing strategic decisions and eventually improve the overall performance of the organization.

Originality/value– The paper steps away from the focus on highly prescriptive, overly rational, and formulaic models for strategy development and implementation. Instead, it outlines a holistic process of

how strategic decisions are made and offers a more nuanced view of strategic decision making in organizations. As such, this paper responds to the need of managers to understand how strategic decisions are created and implemented and extends the conversation on strategic decision making in the strategy execution and performance management literature.

Keywords: Strategic decisions, success factors, creation, implementation, sensemaking

Paper type: Research papers

Introduction

This paper is based on an in-progress empirical doctoral research on strategic decisions. The main points are expressed in the body of the paper. The related details such as definitions and illustrations are presented in the appendices.

The scope of this research has developed over a period of more than 3 years of interlinked stages. The first stage was explanatory in nature and answered the question of '*what* are the critical success factors that contribute to the successful implementation of strategy?' Strategic decisions (SD), however, are a complex social phenomenon, which deserved tapping the very rich research data to explore not only what executives do to implement SDs successfully, but also how they do it. The motivation has shifted to delve into the core question of the research of '*how* are strategic decisions created and implemented?' in the first place. As a result of the study, a holistic SD creation-implementation (SDCI) process was uncovered and proposed. To try give the process some explanatory power, an in-progress part of the study has started to explain the process through a theoretical lens in order to try to answer the question of '*why* it is [the SDCI process] done this way?'

As a complex social phenomenon, the SDCI process has features that stem from managerial and organizational cogitation (MOC) field that fits into the social school of thought. Therefore, sensemaking theory or perspective is explored as a possible and viable lens to explain the SDCI process and try give it some explanatory power, especially under uncertainty and very volatile market conditions that exists in the area where the SDs were studied. Sensemaking can be regarded as an example of social construction or symbolic interpretive perspective.

Additionally, exploring the proposed SDCI process using the prevailing, classical, highly formal and rational school of thought does not seem to be very helpful in this study based on the data and results. Finally, grounding part or all of the results on social theories that explain cross-cultural aspects and issues is not part of the intent or motivation to conduct this research.

The paper is structured around the questions noted above. The next sections will position this paper in the literature, explain the research design and methods, present the analysis and discussions, and close with a brief conclusion.

Literature review

In spite of the apparent importance of effective strategy or strategic decisions implementation, literature has indicated that there has been insufficient attention to the intervening process of implementation (Heracleous, 2000, as reported in Smith and Kofron, 1996; Alexander, 1985 as reported in Al-Ghamdi,1998; Pryor et al, 2007).

Fortunately, over the last three decades research has started to address various aspects of strategy and strategic decisions implementation and analyze the factors and attributes of effective strategy implementation.

Due to the complexity of the phenomenon of strategy, this research focuses on the 'strategic decision' itself as the unit of analysis, as opposed to focusing just on a selected choice among alternatives as some researchers do (Nutt and Wilson, 2010, p. 10). In fact, Mintzberg (1977) views strategy as the cumulative outcome of a series of decisions. According to the learning school, "strategies could be traced back to a variety of little actions and decisions" (Mintzberg et al, 1998, p. 178). Also, Eisenhardt (1999) describes strategy as "strategic decision making, especially in rapidly changing markets."

For the purpose of the scope of this study, strategic decisions are overarching decisions, made by top management, have broad implications, require a lot of resources and commitments at all levels, are future oriented, and affect the firm's long-term prosperity (Pearce and Robinson, 2009, pg.8-12). Types of strategic decisions can include (Al-Ghamdi, 1995): introduce a new product or service, open and start up a new plant or facility, expand operations to enter new market, discontinue a product or withdraw from market, acquire or merge with another company, change the strategy in an operational department, and others.

The research on SDs has progressed through stages in an aim to examine, explore the nature, and unfold the characteristics of SDs. As Nutt and Wilson (2010, p. 6) noted, it started in the 1950's following the highly rational, strategic planning and content based approach. In the 1980's, more focus was on the process, which continued to the 1990's but with more emphasis on the links between decision-making and results. More recent and emerging studies, or strategy as practice perspective (Whittington, 1996; Johnson et al, 2007, p. 3), focus on the social aspects such as day to day activities, thinking, and cognition. Some authors linked decision making to organization theory through sensemaking (Weick, 1969, 1979, 1995; Weick et al, 2005), a perspective that has contributed to this research.

Strategic Decisions

A lot of literature has added value to our understanding of SDs and investigated them from different angles. However, "it is still widely recognized that our knowledge of *strategic decision-making processes* is limited (Papadakis et al, 1998).

Although early studies, such as Mintzberg et al (1976) and Eisenhardt (1999) explored strategy making from the perspective of strategic decisions, they stopped short of providing a link between creation and implementation. More recent studies, e.g., Child et al. (2010) expanded this discussion to examine various external influences on SDs; yet they did not trace the connection between SDs related to

strategy creation and those related to implementation. This work, along with similar studies focusing on the context of SDs (e.g., Snowden and Boone, 2007; Kurtz and Snowden, 2003) paved the way for a more holistic understanding of strategy making.

For instance, Nutt (2010) studied and reported action-oriented practices that could improve chances of success of SDs. Such practices included ongoing consideration of ethics, paying attention to what matters, solving problems, setting a direction, and coupling diplomatic or ethical rationality with logical rationality to achieve a win-win situation, widening the search for solutions and alternatives.

Similarly, worth noting are the 'Bradford Studies' (Miller et al, 2008, as reported in Nutt and Wilson, 2010, p. 445) in which the decisions were tracked to implementation. Although this work provided a hint for the future direction of research on SD, it stopped short of proposing a holistic understanding of strategy making that would explicitly link strategy creation with implementation.

Sensemaking in Strategy Research

The mainstream literature of strategy and strategic decisions follows the rationality model. This model presents the subject in a highly prescriptive, very formal, formulaic, and linear process, which simplifies or oversimplifies the complexities inherent in the social world such as firms. A relatively more recent and emerging literature such as MOC draws insights from social psychology, which in turn draws insights from sociology, psychology, and computer science to investigate organizational issues. The sensemaking perspective builds on MOC and offers explanations for organizational issues and behaviour.

For example, Mantere (2000) suggests that "sensemaking addresses complex social communication and understanding" and has many useful notions that can accommodate the non-linear, complex nature of human interactions and interpretations.

Our research develops this line of reasoning, adopting the sensemaking perspective as a lens for theorizing strategic decision-making process. Furthermore, this research responds to the recent calls (Papadakis et al., 2010 in Nutt and Wilson, 2010, p. 53) to "put implementation at the center of SD research" as it asks the questions of "What are the critical success factors that contribute to the successful implementation of strategy?" and "How are strategic decisions created and implemented?"

Taking such holistic approach, this research recognizes as critical the value of all the SD works that has been done to date. It takes the middle ground position between two extremes of highly rational and highly reactive. It emphasizes processual nature of SDs over formal, highly prescriptive models and frameworks. It grounds its results on data and integrates for the first time in SD literature both creation and implementation in one seamless process.

Some other SD frameworks and models are depicted in **Appendix 7**.

The next section presents the design and data collection and analysis method.

Design and Methods

Due to the complexity of the social phenomenon under study, a case study strategy was employed. The study was preceded by two pilot interviews of around 60 minutes in on average with senior executives of established, well-known, medium to large firms in the Kingdom of Saudi Arabia (KSA). As the Research Questions do not place particular restrictions on firm characteristics, case selection was done on the basis of accessibility. The interview protocol consisted of some general demographic questions followed by an open ended question about the strategic decisions that were recently made and implemented.

The meaning of what can be regarded as strategic decision was provided with examples. They were given the latitude to express openly their experiences with their SDs.

KSA is the power house of the Arabian Gulf and Middle East. Nine firms were visited and 19 SDs were collected and analysed. The top executives were interviewed. Also, where possible, other key employees related to the decisions were interviewed to tell the stories from their perspectives. That added rigor and some degree of triangulation to the data. Having an access to records was not possible, though.

The executives are educated and highly experienced. The firms are well known and mostly large organizations of various types, businesses, and sectors. The data collected through the interviews were perceived as truthful similar to the assumption made in quantitative, survey-based research methods.

All the interviews were recorded except for one in which the notes were taken as requested by the executive. All the interviews were conducted face to face. The transcribed quotes from the interviews were used to identify the factors that were helpful to implement the decision successfully or not so successfully for each strategic decision. In a given interview, some executives spoke about more than one strategic decision. The individual decisions were identified in the recordings and transcriptions to map the identified factors to the corresponding decisions.

The intent of the research was to contribute to the SD body of knowledge, literature, and theory by getting closer to the understanding of the true nature of this complex phenomenon. Therefore, Grounded Theory (GT), which deals with complex phenomenon, was used to build theory that is grounded on data conceived very broadly (Blakie, 2009, p, 99) without much a priori theory about strategy or strategic decisions implementation. GT develops theory through comparative method, "through looking at the same event or process in different settings or situations" leading to substantive or formal theory (Easterby-Smith et al, 2009, p, 100).

The list of factors of successful strategic decisions implementation was built generally in the way that was suggested by Wilson (2004) as shown in **Figure 1**. Therefore, the method also counts as Analytic Induction (AI), in which GT is rooted anyway. As noted in the above section, the study dealt with

'decisions' as units of analysis as opposed to cases that are used in other types of studies. In this study, SD's and factors were used.

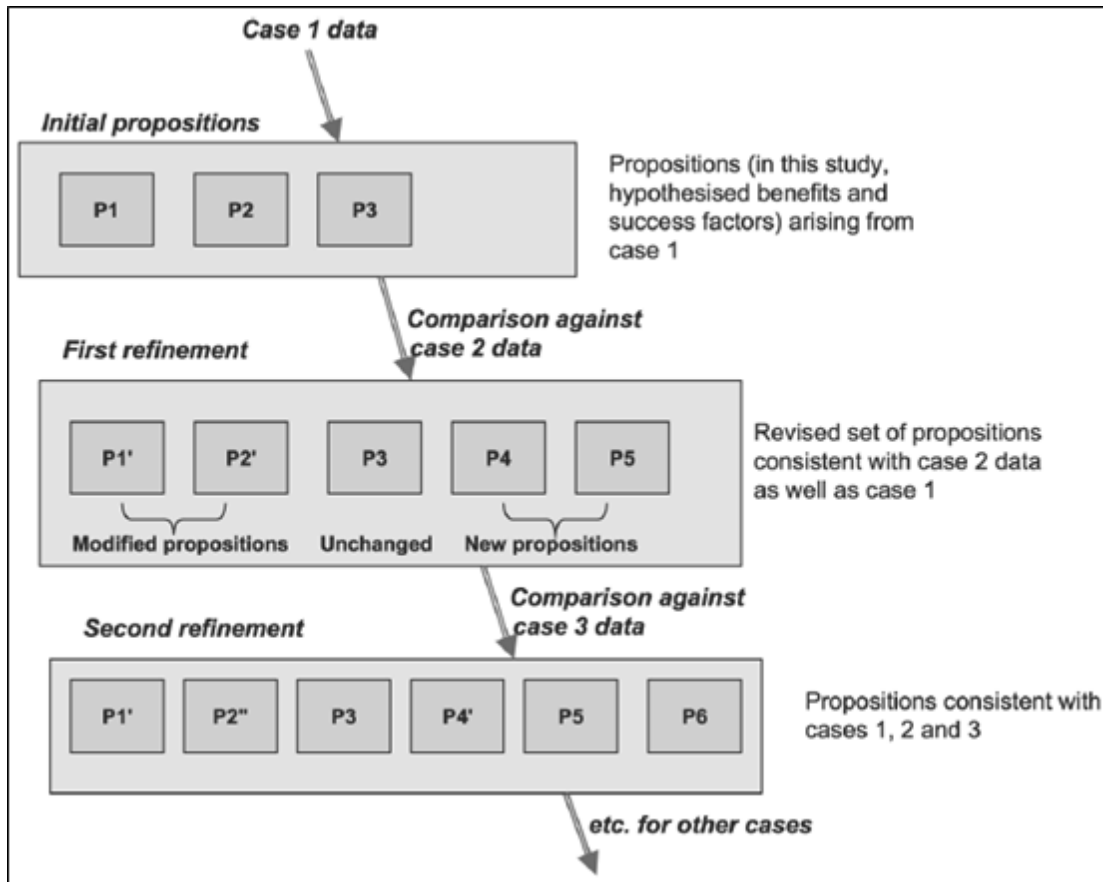


Figure 1 Iteratively developing theory using AI (Wilson, 2004)

The factors of each decision were identified and listed through several iterations covering 19 SD's until saturation or no further new factors were identified by the interviewees. The factors are viewed to be universal that hold true for the setting and context in which the research was conducted. The study can be replicated in any other countries or regions.

The open question in the interviews was about how the interviewed firms implemented their strategic decisions successfully or failed to do so (not so successfully). It was also the intent of the study to understand how the decisions were made in practice and reality in the first place. Were they based on a pre-planned, pre-determined, deliberately made, foreseeable long range strategic plans and decisions as per the prescriptive, highly rational, step wise strategy literature? The data consistently indicated a different story. **Table1** lists the strategic decisions.

Tables 1 the strategic decisions

Firm	SD#	SD
1	SD 1.1	Buy an existing and running factory
	SD 1.2	Merge
	SD 1.3	Create JV
2	SD 2.1	Foreign partnership and Restructuring
	SD 2.2	Convert from Fabricator to EPC
3	SD 3.1	Add and invest on a new major hardware product line
	SD 3.2	Add and invest on a new major software product line from a new partner
	SD 3.3	Acquire an established partner in a certain line
	SD 3.4	Create a JV with an established partner in certain line
	SD 3.5	Add a new particular type of e-business
4	SD 4.1	Create JV
5	SD 5.1	Companywide restructuring
	SD 5.2	Creating a new company
6	SD 6.1	Expanding to full agencies product lines
	SD 6.2	Companywide restructuring
7	SD 7.1	Expand the distribution network country wide
8	SD 8.1	Creating a new company
9	SD 9.1	Create a JV
	SD 9.3	Acquire a company

The data were looked at again from the perspective of the ‘how are the SDs created and implemented?’ question, which required listening to the interviews deeply and differently. Also, it required re-contacting some of the interviewees to clarify points. Furthermore, data about additional SDs were collected in an attempt to confirm further the evolving results.

In order to deal clearly and systematically with the SD’s, codes were distilled and abstracted from the data. Notes are added in the margin to denote some aspects of the process such observe, qualify, formalizing (F), and operation (O). These scripts were analyzed and led to the development of the entire SD creation and implementation process. **Table 2** depicts an example of one SD script.

Table 2 an example of one SD script that was distilled and abstracted from the data

SD #	Script	Notes
SD1.1	We believe no one can stay where he is, either you grow or you have to be back	Observing/Thinking-value
	Our performance and growth have been profitable but slow and limited	Observing/Thinking-value
	We need to invest and expand and gain bigger market share	Observing/Thinking
	We have been observing the market and our performance	Observing/Thinking
	The market started to boom, that was a good opportunity to grow	Event/Trigger=Performance , Market/Attention
	Discussion to verify the opportunity	Observing/Thinking, Timing
	SD=we decided to buy an existing and running factory	SD created
	We were unable to buy that factory because it was not assigned to the right team to conclude this transaction	Action (F) and Action (O)
	Business continued with discussions about finding ways to grow	Observing/Thinking
	Results: SD was not successful and did exit during F stage due to finding the right partner	Link to performance

As noted in the introduction, the research also intended to try to add some explanatory power to the SDCI process using a theoretical lens. The next sub section provides some thoughts on using sensemaking theory or perspective as a lens to try to explain why would the executive handle SD creation and execution the way it was described.

Findings

What factors were helpful to implement SD's successfully?

It has been found from the above data that successful SD's were not only about making good decisions, which is a pre-requisite of successful SD implementation, but also about affecting and making them work by exerting a lot of efforts and hard work and considering a host of factors. See **Figure 2**.

Appendix 1 consists of more details. Also, these factors became a component of the overall SD creation-implementation process discussed in the next sub section and depicted in **Figure 6**.



Figure 2 Successful SD implementation framework

The SDs took quite some time to roll out and longer to implement through on-going business management to reap their benefits. They were triggered by factors related largely to market conditions and continuous performance reviews. **Figure 3** depicts a high level view of a proposed SDs lifecycle in practice.

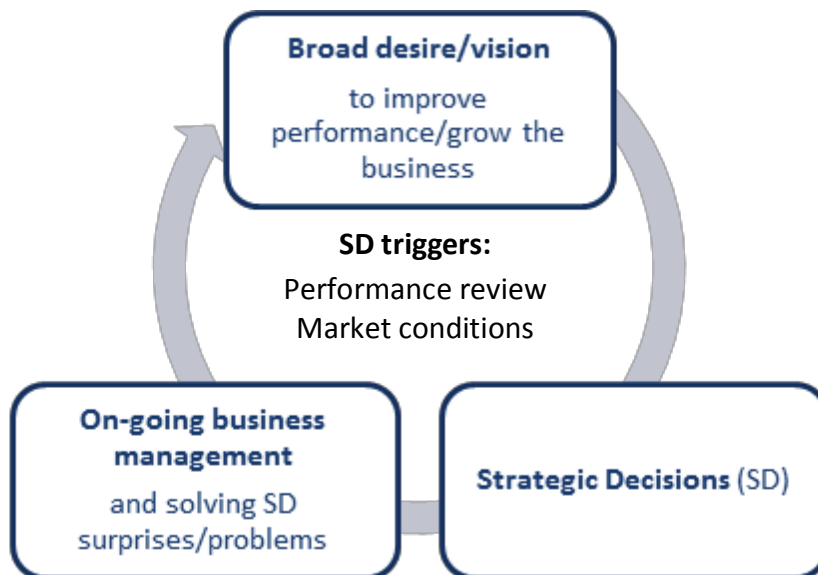


Figure 3 SD lifecycle in practice

The firms or executives always have had an underlying broad desire or vision to improve performance or grow business. The decisions were made based on triggers during on-going business management and operations, which include solving decisions' problems and surprises. Data have consistently indicated that even though the decisions were regarded as good, management have always dealt with and solved the post decision problems, and directed and led business operations into success.

Also, the SD's were not formally documented a priori. The documentations were manifested in the form of various types of formal and informal records. Furthermore, the executives view successful implementation in terms of the achieved results and bottom lines.

How are the SDs created?

With the wealth of such accumulated experiences and up to date information, firms maintain an ongoing conversations, discussions, and debates about high-level directions and alternatives. They are supported with preliminary financial analysis and represent the ground on which the decisions are made.

During the course of observing and conversing about potential moves, an opportunity or an event occurs. The opportunity captures their attention and interest. Further information is gathered and the opportunity or event becomes a key subject matter in the discussions. They qualify the opportunity when there is enough evidence that it will contribute to the firm's growth and performance improvement and directions. Qualification of opportunities is done informally though deep discussions and debates that might employ preliminary financial analysis. The SD is then created but not yet documented. It has a driving force to be deployed and succeed.

The most interesting thing about these SD's that have been reviewed was that they were not created from a highly formulaic, step-wise, pre-determined, rational process as per the teachings that have dominated strategy literature. Also, these SD's were not highly reactive and highly emergent from everyone's everyday actions and activities of both internal and external factors as per the teachings of a relatively more recent strategy as practice approach (Johnson, 2007).

These SD's sit in a middle ground that is neither highly formulaic nor highly reactive. This is the most interesting point that the data have revealed. In fact, these results have also triggered my interest about the subject to attempt to link SD's creation with its implementation as will be discussed below.

The above points are depicted in **Figure 4**, which operationalizes parts of the SD life cycle in **Figure 3**.

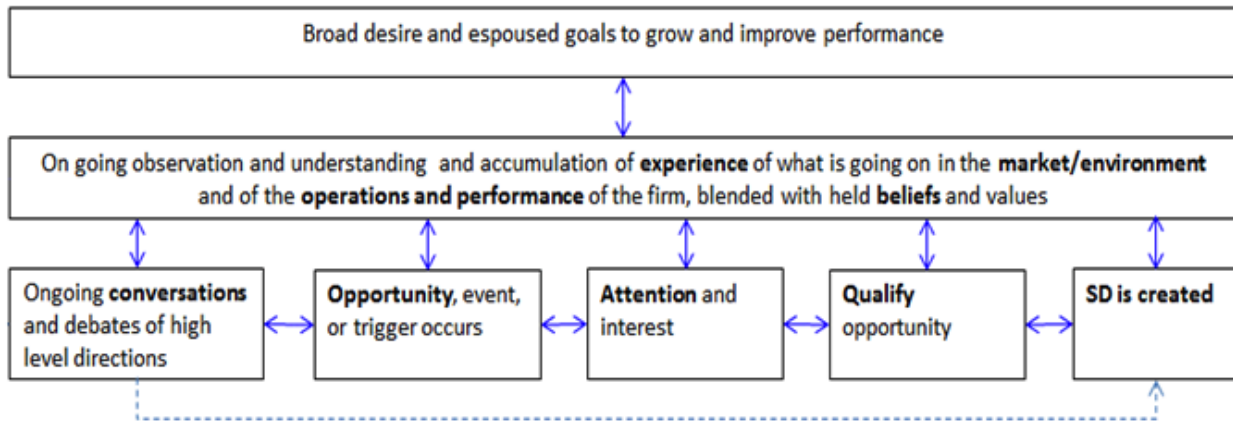


Figure 4 Creation of SD's

As shown in **Figure 4**, there are two directional links denote on-going and continuous interactions. The dotted link represents the possibility of making a decision based on a strategic plan as was noticed in one of the SD's of a firm.

How are the SDs implemented?

As noted above, even though the SD has a driving force to succeed, it is still largely verbal. Putting it into action requires passing a stage of checking whether the conditions are suitable for implementation as the timing is contingent on a host of factors.

From here it goes into the mobilization stage at which key players are identified and mobilized to start taking early stage actions. This includes identifying leadership, key players, required resources, conducting further study and reviews, and developing a more detailed understanding of the direction and required actions.

Next, firms go through the next stage of formalizing the SD. At this stage, the SD becomes formal as they are manifested officially and legally. This includes finding the right partners, signing agreements and contracts, conducting full due diligence, and developing structures and job duties and compensations. During this stage problems and surprises can occur. Some SD's do not pass this stage to the next 'operation' stage because some problems are insurmountable.

During the 'Operate' stage, SD's become part of the on-going business operations and business activities. This includes planning, production, sales and marketing, staffing, and operating. This stage also faces problems and obstacles that require solving. Like the previous stage, some SD's fail to yield results and drop, and some SD's pass this stage and produce positive results. **Figure 5** depicts SD's implementation stages.

The links in **Figure 5** are actually feedbacks at every stage that are connected to the SD's origin and creation point. The loops denote facing problems and solving them. **Figure 6** depicts the overall

interconnection between all the elements of the process. The feedback and learning links go to the on-going observation and conversation processes to continue the SD's lifecycles.

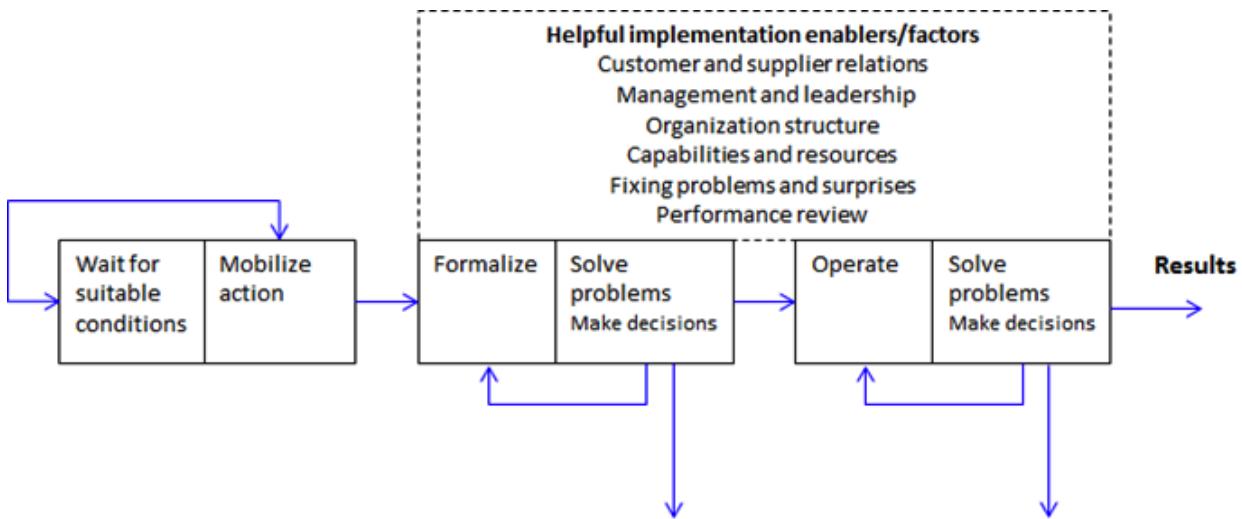


Figure 5 Implementation of SD's

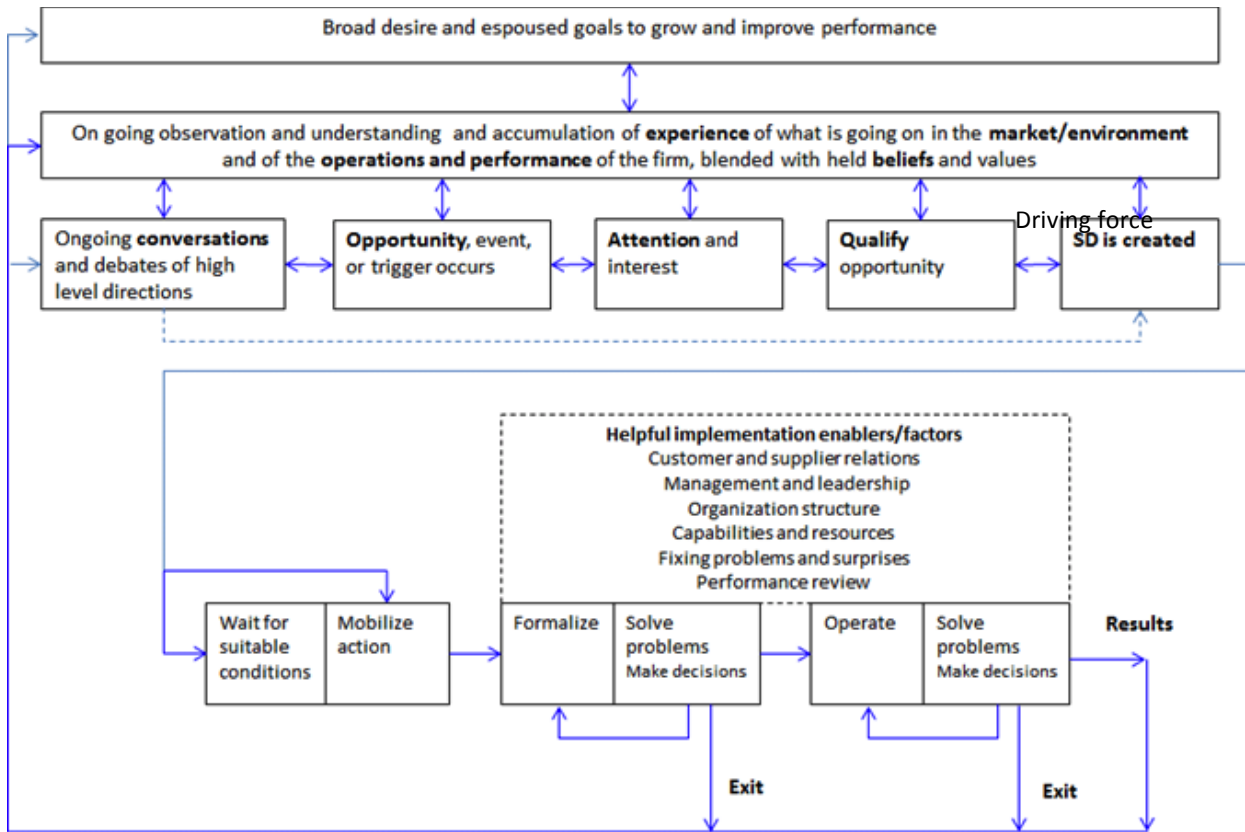


Figure 6 SD's creation and implementing process or framework

All the decisions were mapped pictorially to this holistic process. **Appendix 2** contains the descriptions of the SD creation-implementation process. **Appendix 3** depicts an example of an SD, SD1.1.

Discussion

The current literature on SDs does not present a holistic view that links between creation and implementation. The findings of this research, however, suggest that creation and implementation decisions form a unified process, which we call a *Strategic Decisions Creation-Implementation (SDCI)* process.

It is, however, important to ascertain whether this unification is theoretically legitimate. In order to do so, we employ the sensemaking perspective as an analytical lens for theorizing the findings.

SDCI process and the sensemaking lens – some explanatory power

Sensemaking is a relatively complex perspective that is hard to convey in a simple representation. However, it can be generally abstracted at a high level as depicted in **Figure 7** consisting of interrelated and iterative *cognition* and *action* components within a context.

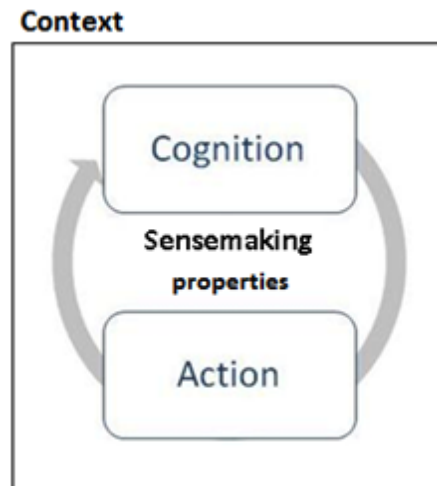


Figure 7 a general representation of sensemaking

Sensemaking can also be represented in **Figure 8** consisting of processes, activities, and properties. **Appendix 4** provides definitions of the elements of the figure. Due to space limitation, **Appendix 5** depicts a detailed view and provides definitions.

Context

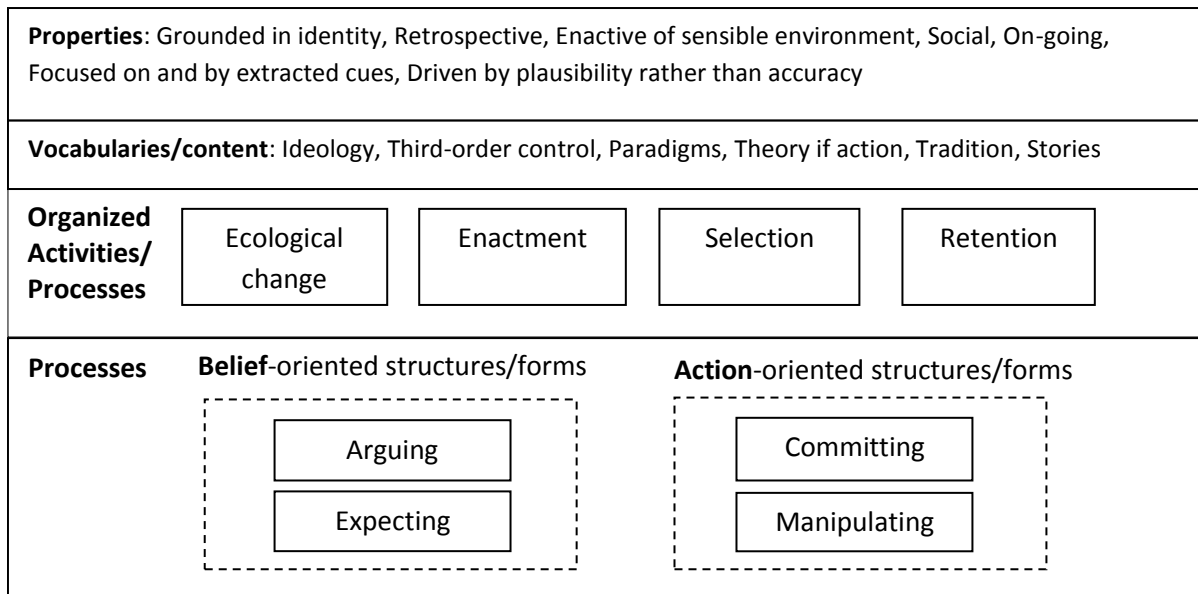


Figure 8 Main elements sensemaking

The representation in **Appendix 5** puts sensemaking and SDCI side process by side utilizing the two large components: cognitive and action.

The as-is SDCI process discussed in the previous sub section aligns in an astonishing manner with elements from the sensemaking perspective. Nevertheless, some sensemaking terminology such as cues, stimuli, interactions, motivation, solidity, faith, frame and schema, utterance, plausible, satisfice, and creation action are injected into the process in order to clarify similar terms that were used when the process was initially developed. For example, satisfice and good enough; solidity and driving force; interactions and conversations are used.

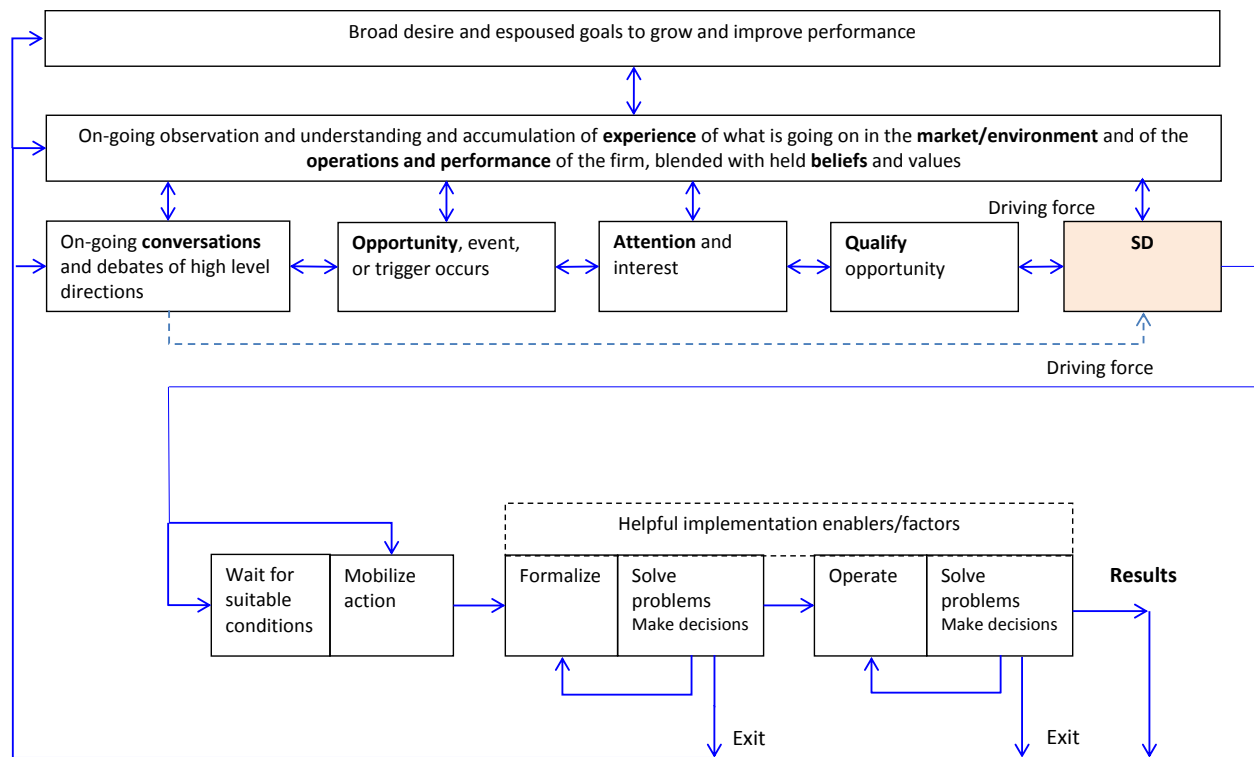
Also, some SDCI parts are elaborated such as selection, retention, and commitment were reflected in the SDCI process that touched on them. For example, it was described that the executives have a driving force to execute the SD's. The sensemaking term 'commitment' is added as an activity to the process to emphasize it. Also, the SDCI step 'qualify opportunity' is elaborated with the sensemaking activity of 'selection'. Moreover, the terms: justify, confirm, enlarge, alter, start or stop, abandon or postpone, trial-and-error, adjustments, fit between firm and environment are also added to the feedback and iterative links between action and cognition.

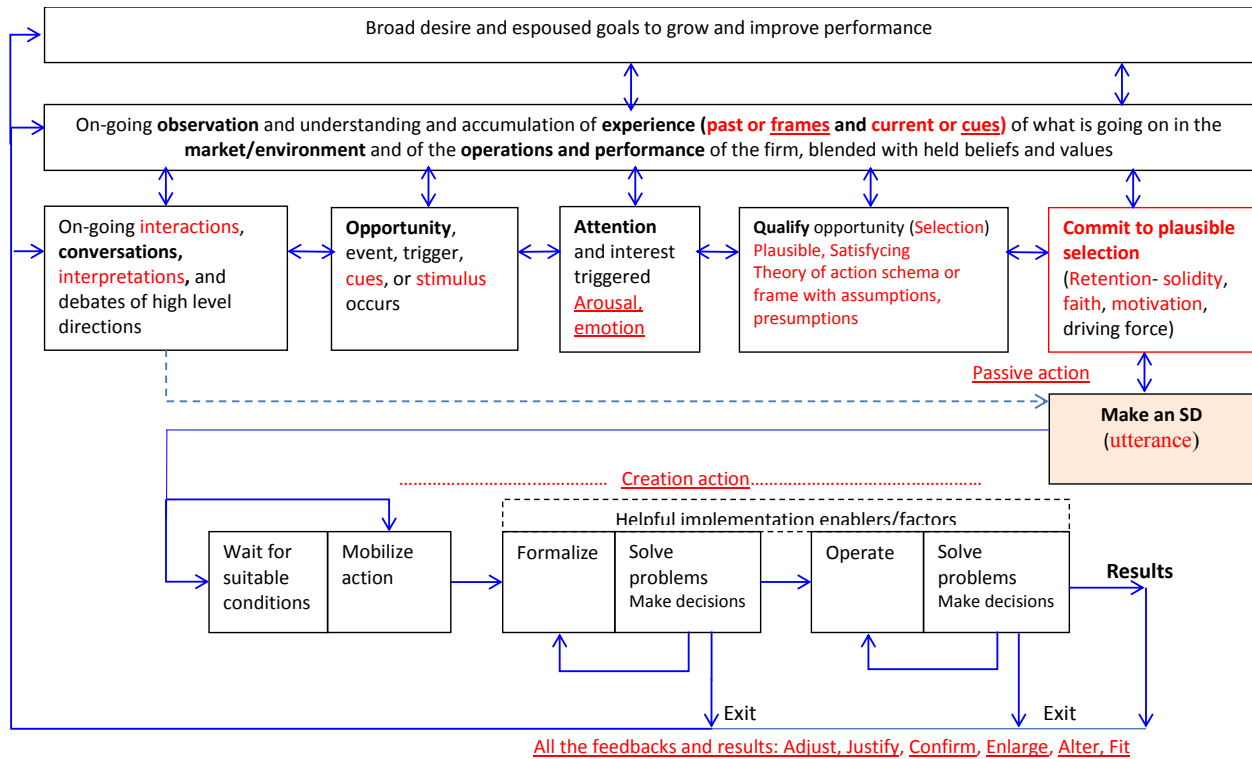
All these changes are underlined in **Appendixes 5** and **6**, which try to align the SDCI process to sensemaking. Alterations to the SDCI process and the relative sensemaking aspects are underlined for easier and convenience of following up with analysis.

These results add additional confidence to our understanding of how the executives have truly been doing 'sensemaking' of their SD's though the SDCI process. **Figure 9** depicts the as-is SDCI process.

Figure 10 depicts the altered or to-be SDCI process. The alterations are underlined for easier reference. This comparison demonstrates a striking and astonishing alignment between the SDCI process and teachings of sensemaking perspective.

In a nut shell, the lens says that the firms studied in such volatile, rapidly changing market tend to make sense of their business and SDs by understanding their internal and environment, having some views and thoughts of what and how they would like to achieve them, responding and taking advantage of on-going events to implement or alter their SDs, interacting and conversing continuously, making sensible decisions, committing to execution, and continuously fixing problems and learning.





Conclusion

It was noted above that the SDCI process has features that stem from managerial and organizational cogitation (MOC) that fits better into the social school of thought.

The developed SDCI process is arguably unique from the perspective of proposing a comprehensive, end-to-end process that linked and connected creation to implementation. It added additional insights into our understanding and sense of how SD's are made and implemented in practice

Additionally, sensemaking did explain the behaviour of the executives in the process, both the cognitive and action parts, thus adding power to the claim that decisions involved in creating and implementing strategy are indeed better understood as parts of a holistic, end-to-end SDCI process.

The SDCI process and sensemaking perspective were put side by side in order to uncover any need to do any changes in the process, the relationship and alignment was astonishing. Nevertheless, some sensemaking terminology (cues, stimuli, interactions, motivation, solidity, faith, frame and schema, utterance, plausible and satisfice, creation action) and elaboration or rearrangement (selection, retention, and commitment) were reflected in the SDCI process.

Going forward from here is to achieve the objective of applying the process in practice and using it to diagnose the SDs. This will help the firms to evaluate the decision-making process and identify ways of improvement. The results of these applications will be integrated into the final research, which will also discuss the contribution of the SDCI process with a sensemaking lens to theory and practice.

Limitation wise, the data that were collected in this study did not focus in the use of language and power in creating and implementing strategic decisions as it did to comprehend the nature of the holistic process. Also, the data did not support investigating the role of context and contingency. Future related studies can shed more light on these topics and roles.

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Appendix X

Details of factor and sub factors that can help successful SD implementation

Market dynamics	
Relations and actions to win the market	
Contextual factors related to customers, partners, competition, and regulations	
50	
Factor	Frequency
1. Customer relations	
	6
Commitment to customers, and delivering and fulfilling their need and demand	2
Gaining trust and respect of and relations with customers, especially at personal level	2
Gaining support of the customers, especially at difficult times	2
2. Partner relations	
	22
Identifying and dealing with the right partner: field and interest, trust, relations, negotiation and mutual agreement, support	16
Conducting due diligence to minimize implementation and operational problems and surprises	2
Maintaining financial control and managing or reducing uncertainty through terms of the agreement	4
3. Competition landscape	
	8
Knowledge of competition landscape	1
Swiftness of making sound decisions and executing them before the competition or losing competitive advantage	2
Considering suitable market conditions - presence, attractiveness, required and available funds and resources, availability of projects	3
Staying lean with minimum fat to stay financially healthy and compete at more difficult times	1
Focusing on core functions and critical success factors to excel and compete	1
4. Learning and change	
	5
Learning from the market conditions and results during the implementation of strategic decisions	1
Adapting to changes and responding quickly to changes in the market	3
Considering gradual growth by fixing problems at one stage before taking the next step	1
5. Local government/labor law and international industry regulations	
	5
Ability to absorb or deal with or manage regulations' impact on cost or time to market	2
Ability to deal with or managing labor regulations' impact on employee satisfaction and motivation	1
Ability to deal with or manage labor regulations' impact on availability of resources on time	2
6. Luck component	
	4
Having some luck - the right timing, funds, winning deals leading to reputation and new opportunities	4

Table a Factors related to market

Market dynamics category in Table a is a leading category in terms of the frequency of the occurrence of its factors. Interestingly enough, it receives little attention and details in strategy implementation literature, which uses the term ‘contextual’ factors, without going into what is going inside this black box. It has been found from the interviews that factors related to this category indeed have been very influential and helpful in how the firms managed to succeed in the implementation of their strategic decisions. This category includes factors related to the customers, partners, the competition, learning and change, local and international regulations, and some traces of luck. The firms did a great deal of considerations and actions to win in the market and make the SD’s successful as what is the point of successful JV, or acquisition, or expanding a new line if these SD’s did not materialize into tangible results in the market. The factors are self-explanatory, but it is worth noting that learning and adapting to market changes and being able to adapt and respond quickly goes in tandem with Mintzberg ‘s learning or emergent school of strategy. Of course, some traces of luck are there.

Management/leadership	
Leading and managing business and change	
Cultural factors related to top management/leadership and teams	
	49
Factor	Frequency
1. Top and other management	19
Having a desire/vision to give direction and improve performance and grow	4
Ability to take initiative to take advantage of opportunities to improve and grow	1
Being flexible to change	1
Informed top management - legally and financially	2
Open minded and tolerant - different opinion and diversity	5
Delegating effectively to allow more quality time to lead	3
have harmony - common direction/vision/measure of success between management - manage conflicts of interest and power relations	2
Support of other managers to the top management	1
2. Informed and motivated Teams	30
Having interactive and effective communication on the SD and sincere discussions with the involved implementation teams	5
Building relations, respect, and gaining trust of the teams, and handling complaints to reduce resistance to change	4
Supporting the teams: awareness, education, training, development, and advice to facilitate change	10
Building and developing the commitment of the teams to support management and affect change	3
Providing fair, relevant incentives and compensations, recognizing achievements, and career satisfaction	8

Table b Factors related to management and leadership

Management/leader ship category in **Table b** is another leading category. It consists of traits and abilities of management and leaders and actions done to and by teams and individuals to succeed. These are considered as cultural factors dealing with management or leadership style. This study casted more light into this category relative to literature such as having harmony, informed management legally and financially, and open minded management for opinion and diversity. Able managers and motivated teams are very helpful factors to implement SD's successfully

Capabilities and resources	
Capabilities and resources that can deliver	
Available and capable capital and human assets and management systems	
	15
Factor	Frequency
1. Capital resources	2
Ability to acquire necessary assets	1
Ability to have access to or acquire necessary funds	1
2. Human	9
Availability of necessary trained, skills for both technical and administration resources	8
Improving efficiency	1
3. Management support systems and information	3
Management support systems- Accounting & Finance, HR and compensation, Production,	3

Table c Factors related to capabilities and resources

Capabilities and resources category in **Table c** provides light on what was helpful to the firms to succeed in implementing their SD's. Capital resources such as assets and funds that fit the need to implement the SD's and well trained, capable, and efficient human resources were very helpful to the firms. Having management information systems that can support management in accounting and finance, HR, and other functions were also helpful. There was no mention, however, of the type of systems used.

Organization Structure	
Structure that can help deliver	
Organization structure factors related to functions and accountability	
10	
Factor	Frequency
1. Functions	5
Having properly altered or newly created clear business functions, processes, and procedures	5
2. Accountability	5
Having clear areas of accountability, responsibility, and authority	5

Table d Factors related to organization structure

Organization structure category in **Table d** is a fundamental category and common in strategy literature and consists of altering existing or creating new functions, processes, and procedure along with their proper threads of accountability.

Fixing problems and surprises	
Fixing and solving decision and on-going problems and surprises	
Nothing is perfect. Decisions were successful despite the problems that occurred and were fixed during implementation	
10	
Factor	Frequency
1. Solving human and other resources issues - technical and administration	4
2. Operations planning - how to run it day to day with the available resources and overall internal and external conditions	3
3. Fixing problems and issues and staying clean before going to the next strategic growth step	2
4. Learning from problems and results to improve performance and make changes	1

Table e Factors relate to fixing problems and surprises

Fixing problems and surprises category in **Table e** is an important category that deals with reality as who said that any strategic decision should be perfect from day one? Executives know that no matter how perfect the decision is, when it comes to implementation, issues can rise in various aspects such as resources, technical, or maintaining efficiency. The study also showed that executives cared about fixing problems before engaging in new SD's. This category received relatively little attention in strategy literature.

Performance review	
Reviewing results	
Setting expectations and monitoring them	
	21
Factor	Frequency
1. Performance measures and targets	8
Financial return - revenue and profitability	1
Relevant KPI's and reasonable targets	4
projects' progress	1
Prospects pipeline and customer base	2
2. Performance scope	3
individuals	1
teams, projects, and functions	1
firm	1
3. Performance review and learning	10
Utilizing financial reports and statements	3
Reviewing and feedback on plans and results and KPI's	2
Conducting regular reviews and meetings	5

Table f Factors related to performance review

Performance review category in **Table f** deals with reviewing and analysing performance. This category is common in literature and covers aspects of determining measures, setting targets, and reviewing performance regularly at all levels (individual, function, and firm), and learning and changing as needed.

Appendix 2

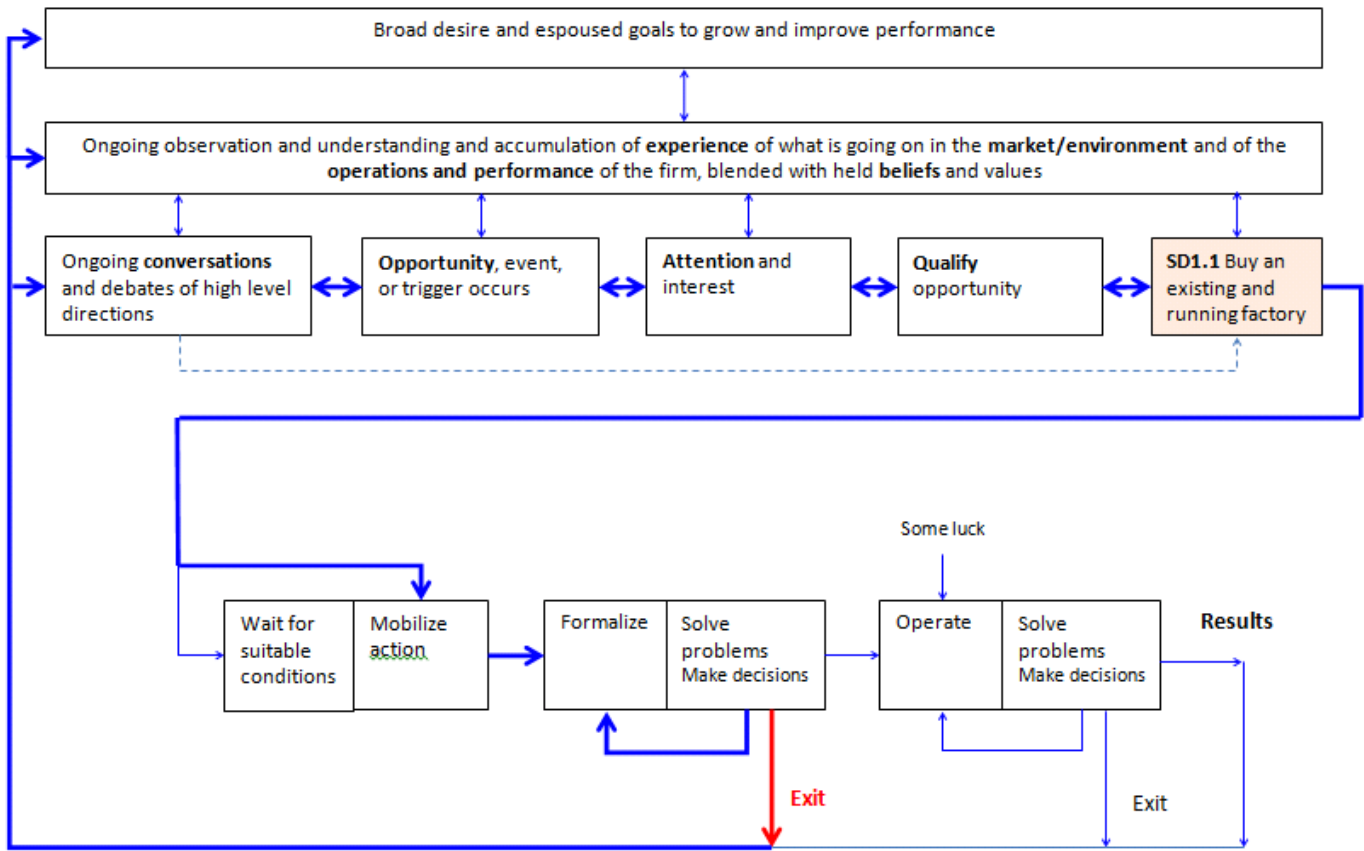
Descriptions of the SD creation-implementation process items

Stage	Description
Broad desire and espoused goals to grow and improve performance	Espoused goals to improve performance of the firm and grow. These are at the back of the minds and heads of the executives
Ongoing observation	Observation and understanding and accumulation of experience of what is going on in the market/environment and of the operations and performance of the firm. The marketplace is continuously scanned and the firm's performance is continuously monitored
Ongoing conversations	Continuous and up to date, informed conversations and debates about high level directions set that guided a search for ways to respond. These conversations are blended with held beliefs and values and accumulated experiences. General directions include what to do and how to do it
Opportunity	An opportunity or event that triggers thought and action. Opportunities can be along the same lines of the general direction or similar directions or giving rise to new directions. . Little luck might help
Attention and interest	Up to date market information captures the attention of the executives and top management and becomes a key subject matter in meetings and discussions. It becomes interesting and start getting more information about it
Qualify opportunity	New information is processed and analysed largely mentally and judgmentally, supported with preliminary financial or feasibility analysis when needed. The new idea becomes more and more convincing.
SD is created	The SD is informed by all the ongoing strategic thinking and arising opportunities, giving it a driving force to succeed in its implementation. This driving force minimizes uncertainty and enhances the chances of success. It is still largely

	verbal or mental at this stage
Mobilize action	Executives and top management demonstrate dedication to turn the decision into reality by mobilizing for action. This includes determining the key players who will take the first practical actions and the main resources that will be needed to proceed. This also includes determining a timeframe for implementation
Formalize	At this stage, related resources will engage in activities related to turning the verbal decision into formal and documented one. This includes preparing and concluding contracts, agreements, partnerships, business models, and formal structure and job assignment
Operate	At this stage, the formalized SD is put into production by operating all the related business aspects such as production planning, logistics, procurement, sales and marketing, human resources, management, and leadership. Some luck might help
Suitable conditions	Taking actual and practical action requires the right circumstances such as level of required investment versus risk. Cost and benefits are weighed
Solve problems and make decisions	Virtually all SD's face problems and issues during various stages of implementation. Some of the problems are surmountable and the SD's start to give positive results and some SD's stay in a loop longer time, and some SD's exit the loop and end.

Appendix 3

An example of mapping SD1.1 to the SDCI process



Appendix 4

Organized sensemaking process and activities (Weick et al, 2005)

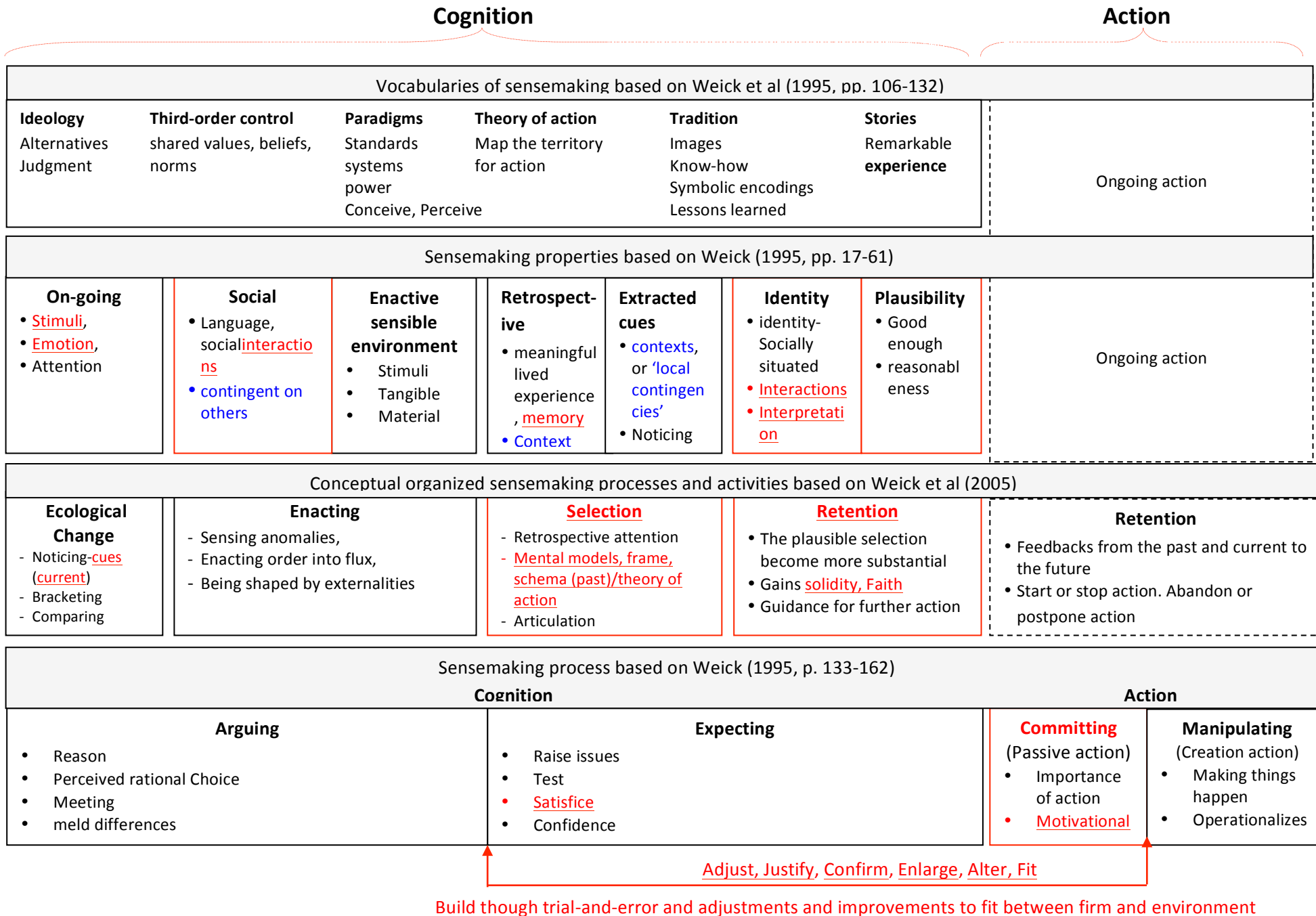
Sensemaking cognitive- and action-oriented processes and activities (Weick, 1995. Pp. 33-68)

Sensemaking element	Description
Ecological change	Environment related through the following sensemaking activities <ul style="list-style-type: none"> - Noticing and - Bracketing and comparing - Comparing
Enacting	Reciprocal exchanges between actors though the following sensemaking activities : <ul style="list-style-type: none"> - sensing anomalies, - enacting order into flux, and - being shaped by externalities
Selection	Change made meaningful and reduced number of possible meanings (plausible selected story, tentative and provisional) though the following sensemaking activities : <ul style="list-style-type: none"> - retrospective attention - mental models and - articulation
Retention	Preserved The plausible selection tends to become more substantial and gains solidity because it is related to past experience, connected to significant identities, and used as a source of guidance for further action and interpretation
Sensemaking element	Description
Arguing- Cognitive	<ul style="list-style-type: none"> • A process by which people take risk to reason their way through a perceived rational from one idea or belief to the choice of another idea or belief (Weick, 1995, pp. 135-136). • Most arguments take place in meetings, serve to coordinate and meld differences (Huff, 1988, p. 87)
Expecting- Cognitive	<ul style="list-style-type: none"> • A predicted state of the models stored in the nervous system of the world • Expectations filter input ... raise a host of issues concerning accuracy, and error, and the limits of social construction • Test for and flesh out additional implications of the cue. These additional implications are tested against new cues. If

	<p>the expectations are accurate enough (satisfying), people gain confidence in their situational assessment(Weick, 1995, p. 145-146)</p>
Commitment-Action (Passive)	<ul style="list-style-type: none"> • An organizational activity that highlights the importance of action ... and • Has motivational consequences (Weick, 1995, p. 56-68)
Manipulation-Action (Creation)	<ul style="list-style-type: none"> • Acting in ways that create an environment that people can then comprehend and manage • Is about making things happen, so that a person can then pounce on these created things and try to explain them as a way to get a better sense of what is happening • It operationalizes (Weick, 1995, p. 56-68)

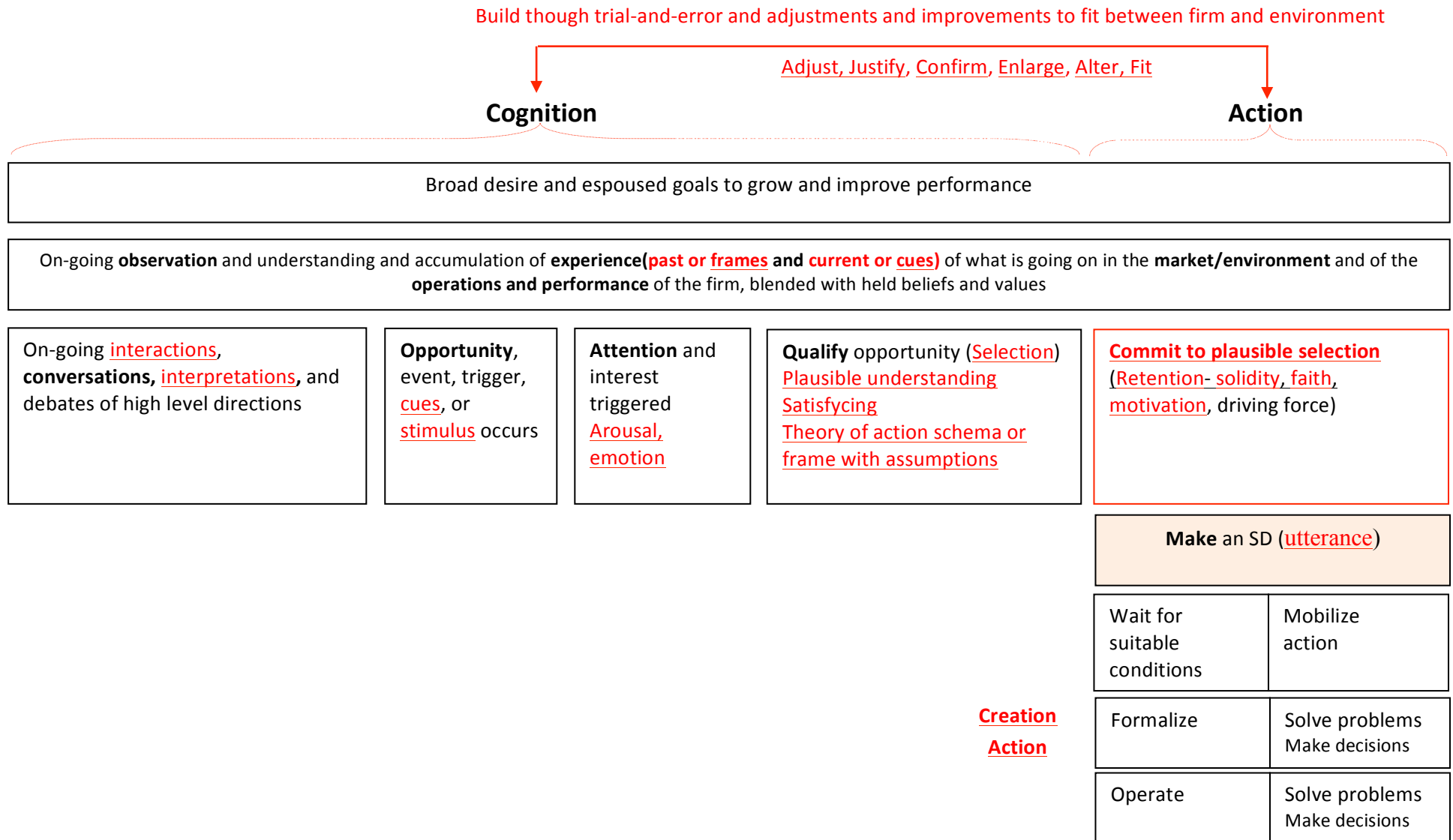
Appendix 5

A detailed view of sensemaking put side by side (cognition and action) with SDCI process – Sensemaking side



Appendix 5

A detailed view of sensemaking put side by side (cognition and action) with SDCI process – SDCI side



Appendix 6

SDCI process as explained by sensemaking perspective

SDCI	Description	Sensemaking
<p>On-going observation and understanding and accumulation of experience (past or frames and current or cues) of what is going on in the market/environment and of the operations and performance of the firm, blended with held beliefs and values</p>	<p>Observation and understanding and accumulation of experience of what is going on in the market/environment and of the operations and performance of the firm. The marketplace is continuously scanned and the firm's performance is continuously monitored</p>	<p>It is <u>on-going</u>, a sensemaking property, because it is a <u>continuous</u> flow of <u>moments</u> and <u>events</u>.</p> <p>The executives operate in a very fast <u>changing</u> and <u>continuous</u> intense competition that increases uncertainty and unpredictability. So, the executives need to <u>notice</u> and keep searching for current or new <u>cues</u> to help them <u>understand</u> and <u>make sense</u> of the <u>situation</u> or what is happening internally and externally.</p>
<p>On-going interactions, conversations, interpretations, and debates of high level directions</p>	<p>Continuous and up to date, informed conversations and debates about high level directions set that guided a search for ways to respond. These conversations are blended with held beliefs and values and accumulated experiences. General directions include what to do and how to do it</p> <p>Even though the environment and cues were interpreted in a certain way through the eyes of the senior executives of on firm, there was a continuous conversation about the meaning and understanding of the related events. There was no ambiguity or unclear meaning for the SD's. There was no room to misinterpret their meaning.</p>	<p>It is <u>on-going</u>, a sensemaking property, because it is a requirement to keep abreast with current and new moments and events and maintain real time information and <u>understanding</u>. The executives <u>meet</u> and <u>interact</u> and discuss information, and issues. They try to <u>meld differences</u> and reach into a <u>collective understanding</u>. They use <u>memory</u> and <u>experience</u> and <u>values</u> and <u>beliefs</u> or past <u>frame</u> of mind to discuss and <u>understand</u> and <u>reason</u> about new developments. They <u>share</u> and articulate information and understanding. They <u>Interpret</u> information and reach a <u>satisfying</u> meaning. They <u>argue</u> for and <u>enact</u> a meaning</p>

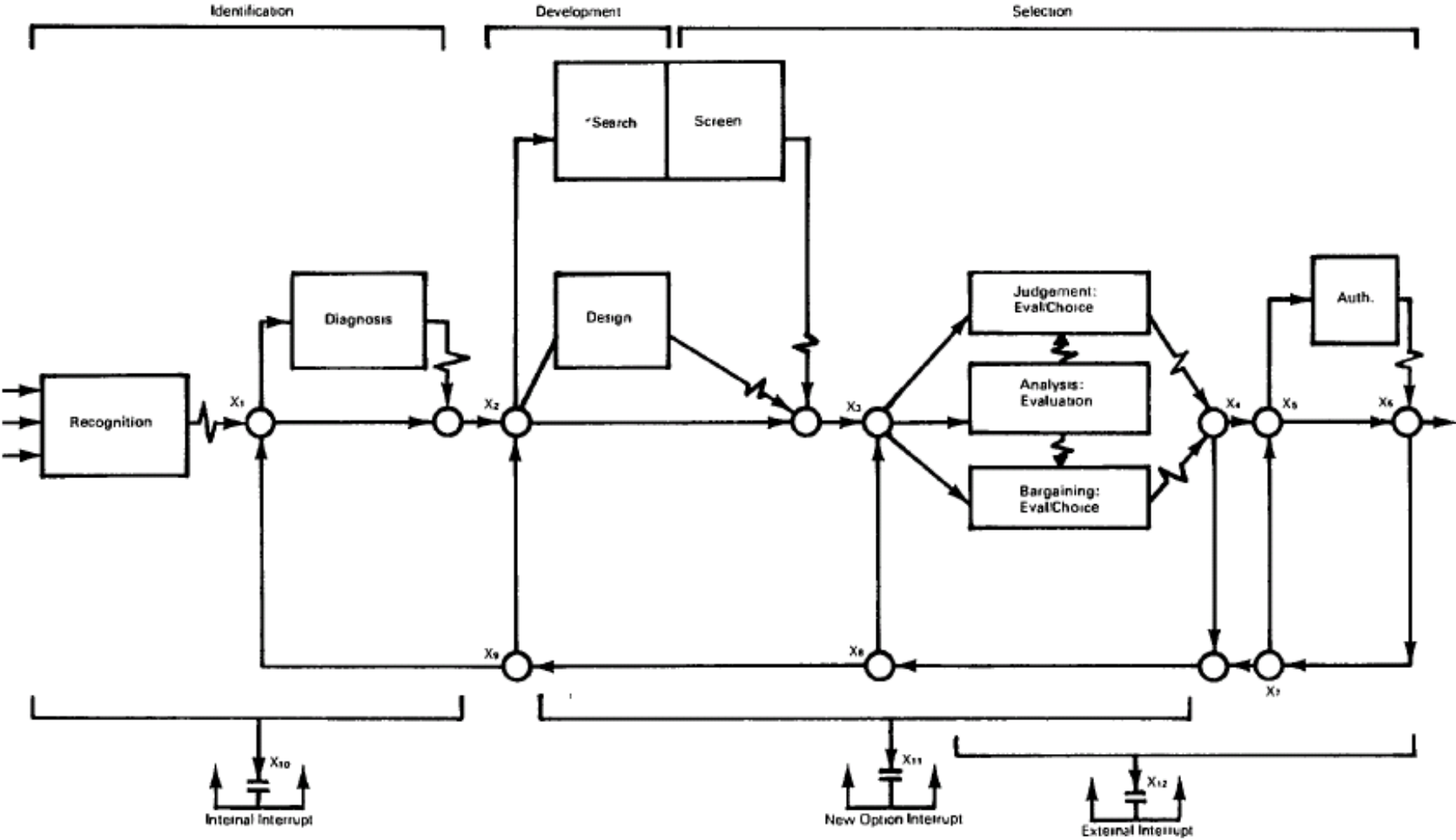
Opportunity , event, trigger, <u>cues</u> , or <u>stimulus</u> occurs	An opportunity or event that triggers thought and action. Opportunities can be along the same lines of the general direction or similar directions or giving rise to new directions. . Little luck might help	The new <u>signal</u> or <u>cue</u> or <u>event</u> or <u>stimulus</u> that gets into the executive's was while they are observing and interacting. It <u>triggers thought</u> and <u>action</u> . They <u>elect</u> a choice for meaning and <u>expect</u> a consequence for it.
Attention and interest triggered <u>Arousal, emotion</u>	Up to date market information captures the attention of the executives and top management and becomes a key subject matter in meetings and discussions. It becomes interesting and start getting more information about it	The executives do pay <u>attention</u> to what matters that captures their interest. <u>Arousal</u> triggers <u>emotions</u> behavior which develops to pay more attention.
Qualify opportunity (<u>Selection</u>) <u>Plausible understanding</u> <u>Satisfying</u> <u>Theory of action schema</u> <u>or frame with</u> <u>assumptions</u>	New information is processed and analysed largely mentally and judgmentally, supported with preliminary financial or feasibility analysis or due diligence as needed. The new idea becomes more and more convincing.	The executives <u>test choices</u> and alternatives. They use past <u>experience</u> and memory and employ a <u>theory of action</u> or a <u>frame</u> or a <u>schema</u> with assumptions to articulate a <u>shared</u> or <u>plausible</u> or <u>satisfying selection</u> . Despite the due diligence done, <u>accuracy</u> is not always attained and issues can still arise. <u>Learning</u> from past mistakes and <u>experience</u> can reduce future mistakes and issues. Power can be one possible factor.
Commit to plausible selection (<u>Retention- solidity, faith, motivation, driving force</u>)	Internal force is generated to drive them to adopt the choice and make a decision and follow it up and follow though its implementation. This is added as a step to the process for its importance rather than keeping it as a note (driving force) in the description	The choice is confirmed and gains <u>solidity</u> and <u>retention</u> as the executives build more <u>confidence</u> and <u>faith</u> in what they understand and need to act. <u>Commitment</u> and <u>motivation</u> builds up to make the decision and realize it.
Make an SD (<u>utterance</u>)	The SD is informed by all the on-going strategic thinking and arising opportunities, giving it a driving force to succeed in its implementation. This driving force minimizes uncertainty and enhances the chances of success. It is still largely verbal or mental at this stage	Here, executives finally <u>utter</u> and make the decision.

<p>Mobilize action</p> <p><u>Creation Action</u></p>	<p>Executives and top management demonstrate dedication to turn the decision into reality by mobilizing for action. This includes determining the key players who will take the first practical actions and the main resources that will be needed to proceed. This also includes determining a timeframe for implementation</p>	<p><u>Creation action</u> starts. Executives <u>interact</u> with others and give directives for the involved people to <u>make things happen</u>, They start to <u>operationalize</u> the SD.</p>
<p>Suitable conditions</p> <p><u>Creation Action</u></p>	<p>Taking actual and practical action requires the right circumstances such as level of required investment virus risk. Cost and benefits are weighed</p>	<p>The executive do not rush to <u>action</u>. They <u>think</u> and look for the <u>right time</u> and circumstances and <u>situation</u> to take real or <u>creation action</u>. The decide when to <u>start or stop</u> the action or when to <u>abandon or postpone</u> an action</p>
<p>Formalize</p> <p><u>Creation Action</u></p>	<p>At this stage, related resources will engage in activities related to turning the verbal decision into formal and documented one. This includes preparing and concluding contracts, agreements, partnerships, business models, and formal structure and job assignment</p>	<p>The executives use <u>language</u> and <u>words</u> and other <u>symbolic</u> artifacts such as papers, records, contracts to act a <u>resource of sensemaking</u> and maintain a <u>shared meaning</u> in the <u>context</u> in which the SD was made and will be implemented.</p>
<p>Operate</p> <p><u>Creation Action</u></p>	<p>At this stage, the formalized SD is put into production by operating all the related business aspects such as production planning, logistics, procurement, sales and marketing, human resources, management, and leadership. Some luck might help</p>	<p>The executives and firms engage in real life <u>experiences</u> as they <u>operationalize</u> the SD'. They use a common everyday langue. They <u>interact</u> and <u>communicate</u>. They <u>build experience and confidence in what they do though trial-and-error and adjustments and improvements to fit between firm and environment</u></p>
<p>Solve problems and make decisions</p> <p>All the feedback</p> <p><u>Creation Action</u></p>	<p>Virtually all SD's face problems and issues during various stages of implementation. Some of the problems are surmountable and the SD's start to give positive results and some SD's stay in a loop longer time, and some SD's exit the loop and end.</p> <p>Despite of the fact that the executives had strong</p>	<p>Decisions and <u>actions</u> are based on what is <u>conceived</u> as <u>plausible</u>, rather than <u>accurate</u>. Actions are taken and are expected to have issues and problems. So, performance and <u>experience is built though trial-and-error and adjustments and improvements to fit between firm and environment</u>.</p> <p>All the feedbacks and results: <u>Adjust, Justify, Confirm,</u></p>

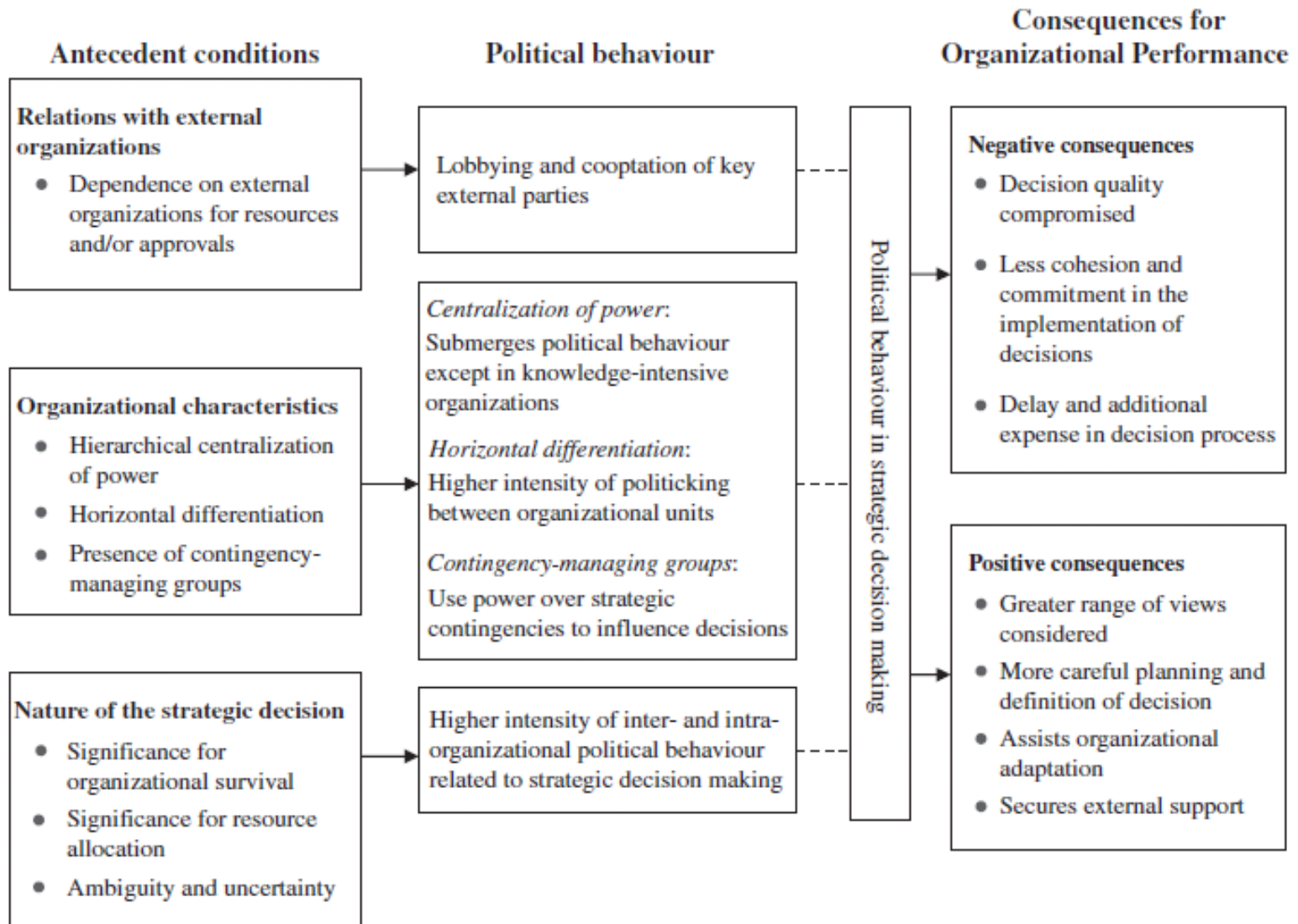
	<p>confidence in the SD's, they were accepting the fact that problems can arise and that they should deal with them. The SD's were made to the best of the available information and knowledge about the internal and external environment. They were open to learn throughout the execution and fix the problems as they go. They do not regret the decision because they believe that they have taken the measures to create them.</p>	<p><u>Enlarge, Alter, Fit</u></p> <p>Despite of the problems, they do not regret making the decisions because they believe that they have taken the necessary '<u>right and plausible</u>' measures and have <u>faith</u> charged with driving <u>emotions</u> to try to make it.</p> <p>Information is in abundance and senses are limited and <u>rationality is bounded</u>. Therefore, arguments and decisions follow plausibility and expect facing problems and issues during the operations stages.</p>
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Appendix 7
Some published SD models and frameworks

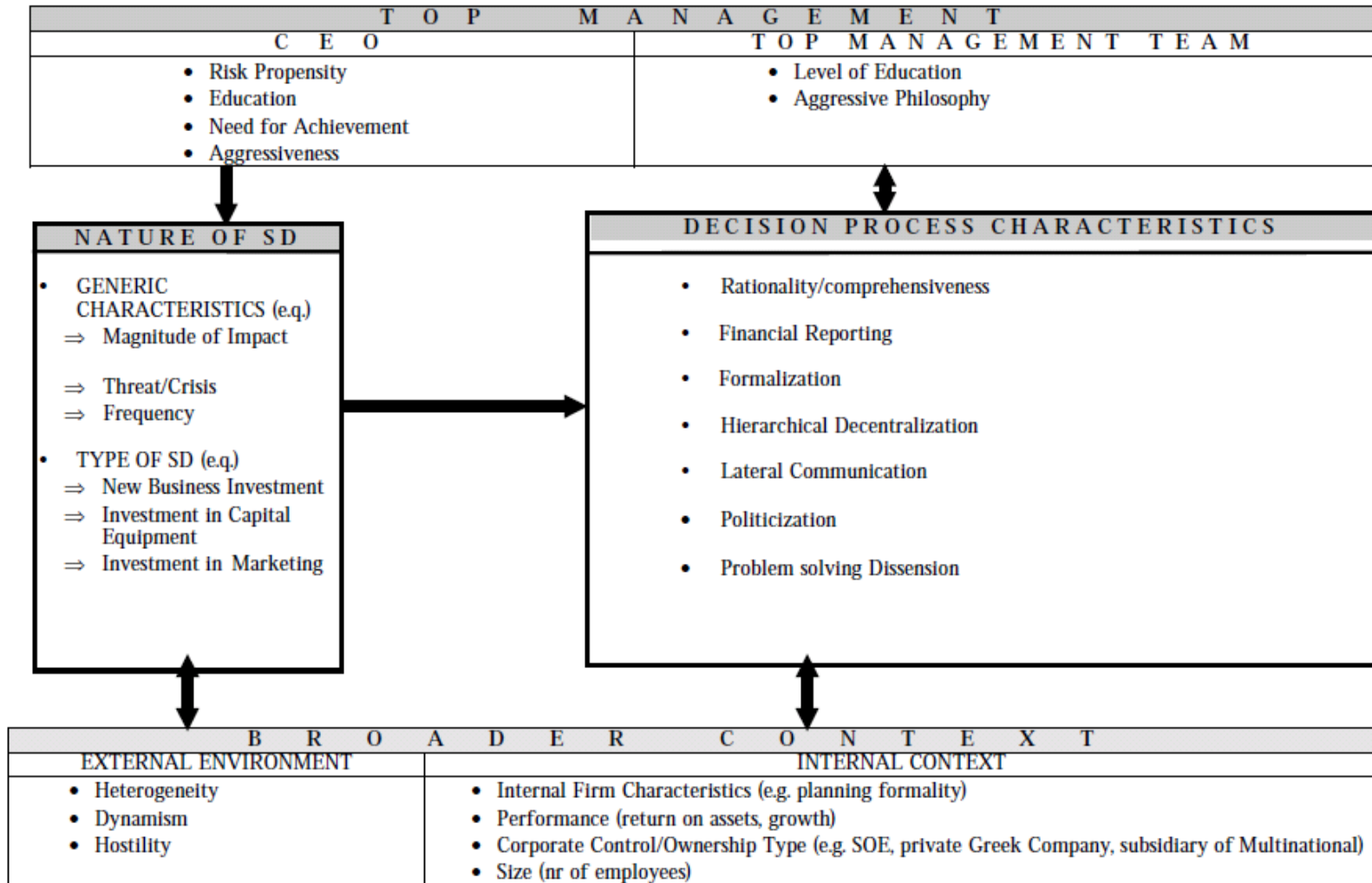
Mintzberg et al (1976) - A General Model of the Strategic Decision Process



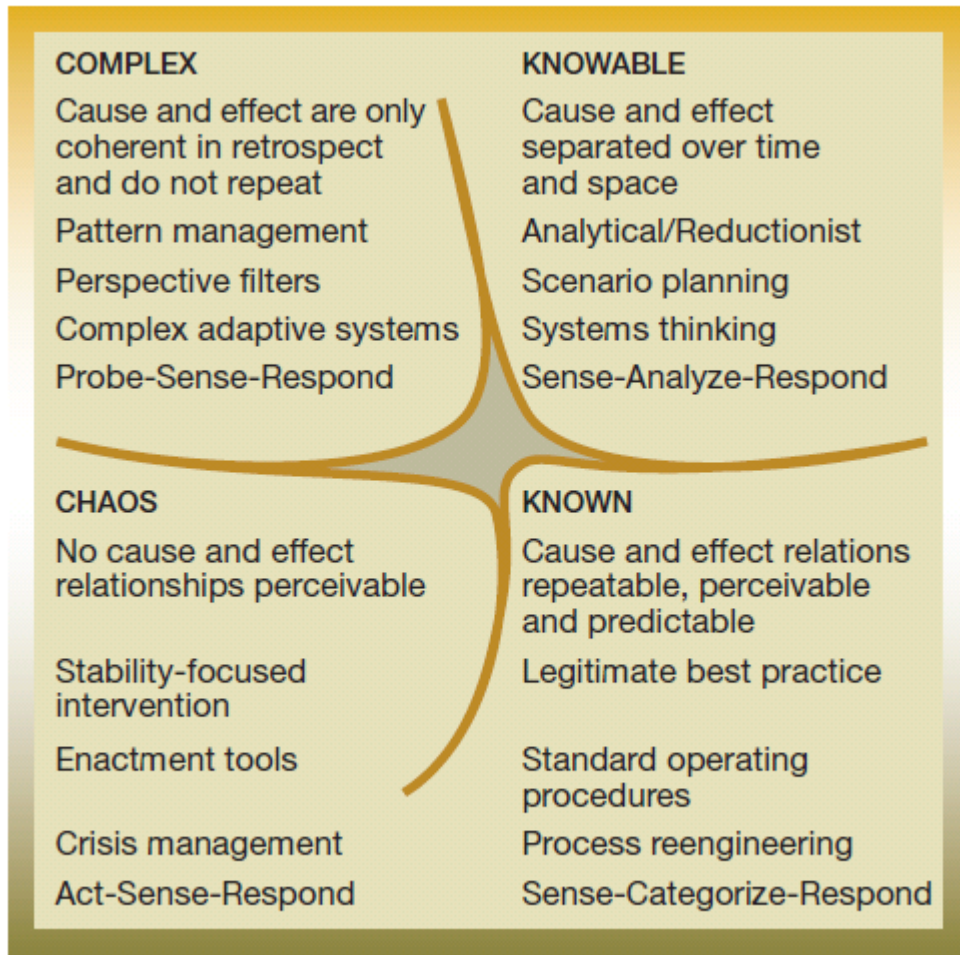
Child, Elbanna, and Rodrigues (2010, pp. 105-127) - A variance model of the political aspects of strategic decision making



Papadakis, Lioukas, and Chambers (1998) - Factors Influencing Strategic Decision Making Processes



Kurtz and Snowden (2003) - Cynefin domains



0078

UNCERTAINTY ASSESSMENT OF PERFORMANCE INDICATORS

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Uncertainty assessment of performance indicators

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Abstract

Purpose: This paper defines a model to evaluate the uncertainty in performance indicators (PIs) based on Uncertainty Components (UCs).

Methodology: The proposed work consists, in a first stage, of an assessment of the level of influence that each UC has in a given PI. Based on the questionnaire responses a matrix of UCs vs PIs is presented to show the relevance of the contribution of each UC to the uncertainty associated with a PI. The second stage of the methodology consists on the development of a model to infer the uncertainty level on a PI based on the uncertainty level of the identified UCs.

Findings: A questionnaire referring to the assessment of PIs was applied, and the results provide evidence that UCs influence the PI. A model was developed based on logical relations between the UCs and the overall PI uncertainty, and the number of empirical analyses contribute to validate it.

Originality/value: This paper presents a model to infer the uncertainty level of a PI based on UCs. The model can also be applied to propagate uncertainty among multiple related PIs. UCs definitions can guide the development of actions to reduce uncertainty in PIs, thus reducing the risk in the decision-making process.

Keywords

Uncertainty, performance indicators, uncertainty components, fuzzy logic

1. Introduction

Organizations have the need to process information to express measurements at different levels of management. For this, performance

measures systems (PMSs) are used that provide performance indicators (PIs) to measure organization's performance (Verweire & Berghe, 2003).

PIs can be considered a particular type of information and some authors suggest several classifications of Information/Data Quality (Lee & Wang, 2002). Requirements associated with the design, implementation and use of PIs have been proposed in the literature (Bourne, Mills, Wilcox, Neely, & Platts, 2000), but may not be fulfilled, causing uncertainty on the "true" value of a PI. In the traditional formulation of a PMS, most PIs are affected by uncertainties.

Galway and Hanks (2011) classify the quality problems of PIs as operational, conceptual and organizational. PIs are often associated with multidimensional concepts that may be considered as sources of uncertainty on its value. In this approach, the dimensions are identified according to the specific application contexts. For example, O'Reilly (1982) uses the accessibility, accuracy, specificity, timeliness, relevance and amount of data to evaluate the PI in the context of decision-making. Ballou and Pazer (1985) employ the accuracy, timeliness, completeness and consistency modeling deficiencies of the PI.

A variety of methods are proposed to evaluate the PI. These methodologies can be categorized as objective evaluation and subjective evaluation (Pipino et al., 2002). The objective evaluation makes use of software as a tool to measure the PI as a set of rules for the quality. The methodologies for subjective evaluation are based on the veracity of the information for use and use surveys and interviews to assess the PIs.

Sousa, Nunes and Lopes (2012) propose a set of seven Uncertainty Components (UCs) that may affect PIs. These UCs are Measurement Method, Precision and Accuracy, Human Assessment, Data Collection, Definition/Measuring, Environment and PIs Aggregations.

Generally, each PI is represented by a value (number) that is unable to represent uncertainty. The problem addressed in this work is to assess the uncertainty of PIs. Associated with problems of operational data there is an implicit assumption that, if the data are correct, the user can use them directly in making decision (Lopes, Sousa, & Nunes, 2013). The inability to cope with this uncertainty results in simplified models of reality that may increase the risk of decision-makers.

This paper is organized as follows. Section 2 describes a comprehensive methodology of assessing of PI. Section 3 presents a case example to demonstrate the propose approach. Section 4 presents some concluding remarks.

2. METHODOLOGY

The proposed work consists of a methodology comprised of five steps. The first step assesses the degree of influence that each UC has on the PI uncertainty. The second step evaluates the overall uncertainty present in the PI. The third phase, is created the input and output variables which receive the result of the influence of the UC in PI uncertainty. A fourth step is defined by the creation of rules for treatment of input and output variables and the fifth step, provides an estimate of PI uncertainty. The Figure 1 summarizes the stages of the model.

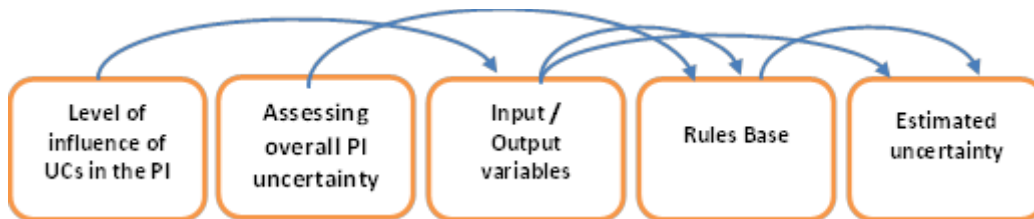


Fig. 1. Steps in the evaluation of PI

2.1. Level of influence of the UC in PI

This step starts with the presentation of the study to the specialist contacted the company, and the definition of a PI by the specialist, who will be assessed. To evaluate the influence of each UC on the PI uncertainty a questionnaire was developed and is used to guide semi-structured interviews. The questionnaire presents UCs that are the basis for the survey responses. The assessment questionnaire uses a Likert scale with three levels (Without/NA, Some or Much) that is designed to assess such influence. For a given UC, higher number of responses at the highest level of the uncertainty means that the component strongly influences the PI uncertainty.

Subjective criteria and expectations of the questionnaire responses vary from person to person; each user generates an individual report. Therefore, in the analysis phase of the PI, the results of the subjective evaluation of multiple

users need to be coordinated, because, when there is no coincidence of responses among raters for the same IP rated, the choice should be made by using the consensus of the evaluators or doing choosing the worst scenario for the PI reported.

2.2. Assessing overall PI uncertainty

The general perception of uncertainty in the PI is also recorded in the questionnaire using a five-point scale. This provides a means to capture the uncertainty through experts' perception that designed and/or use the PI.

Based on the questionnaire responses a matrix of UCs vs PIs is presented to show the relevance of the contribution of each UC to the uncertainty associated with a PI.

2.3. Input / Output variables

This stage of the methodology consists on the development of a model to infer the uncertainty level of a PI based on the uncertainty level of the identified UCs. To treat the questionnaire answers the method was based on Fuzzy Logic Theory since it allows dealing with uncertain, qualitative, and in some cases, contradictory data. The concept of linguistic constant is very useful in dealing with situations that are complex or not well-defined to be reasonably described by conventional quantitative or numerical expressions.

In this work, the uncertainty present in the PI is defined by linguistic constants given by the questionnaire responses (High, Low and Without). For treating the linguistic constants fuzzy set methodology was used.

The fuzzy method is fed with normalized input variables. Normalization is defined from the linguistic constants of table Ucs vs PI previously generated. The first input variable is defined as Relevant Components (RC), it describes the sum of UCs with answers that have value "High" answered in the questionnaire, the second input variable is defined as Influential Component (IC) the second variable, which is set to receive the value of the sum of the Ucs answered "Low" uncertainty.

2.3.1. Fuzzy logic method

In order to solve the problem of the evaluation of PI through the fuzzy logic approach, the following operations are performed (Figure 2):

- Definition of the fuzzy set of the input and output variables (*fuzzification*);
- Definition of the rules that correlate the input and output variables (Fuzzy Rule Base);
- *Defuzzification* of the results.

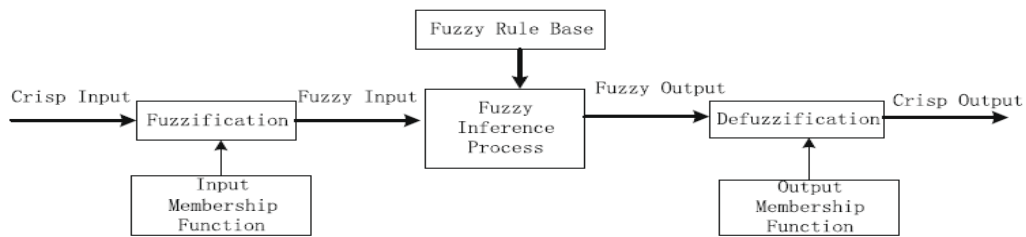


Fig. 2. Stages of Fuzzy Logic

Source: Li et al. (2010)

2.3.2. Definition of the membership function of the input and output variables (*fuzzification*)

For each input variable, the fuzzy set generates a normalized range of values between [0,7]. This range is due to the maximum number of UCs. In each input variable fuzzy sets are represented by a membership function element (MFE) triangular or trapezoidal. The choice of the type of membership function and number of elements depends on the characteristics of the available data. In order to make a general procedure a number of five MFEs is considered appropriate to use in fuzzy sets (Very Low, Low, Medium, High and Very High).

Tables 1 and 2 presents the definition of the range for each membership function elements of the input variables RC and IC respectively.

Table 1. Membership function elements – input variable RC (Relevant components)

MFE	Range
Very Low	(0; 0; 0.5)
Low	(0.25; 0.65; 1.0)
Medium	(0.75; 1.25; 1.65)
High	(1.25; 1.75; 2.25)
Very High	(2.0; 2.5; 7; 7)

Table 2. Membership function elements – input variable IC (Influent components)

MFE	Range
Very Low	(0; 0; 1.5)
Low	(0.5; 1.5; 2.5)
Medium	(1.5; 2.5; 3.5)
High	(2.5; 3.5; 4.5)
Very High	(3.5; 5; 7; 7)

The references of the membership function elements for defining fuzzy set are show in Figures 3 and 4.

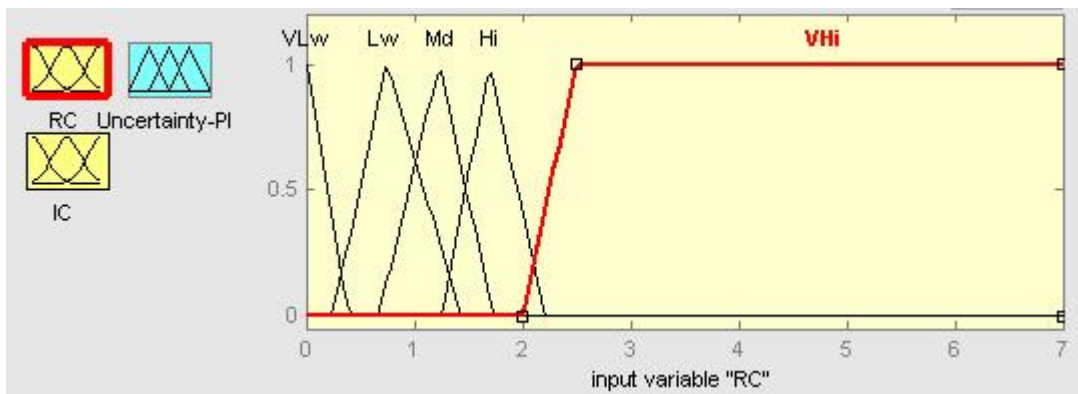


Fig. 3. Membership function elements – input variable RC

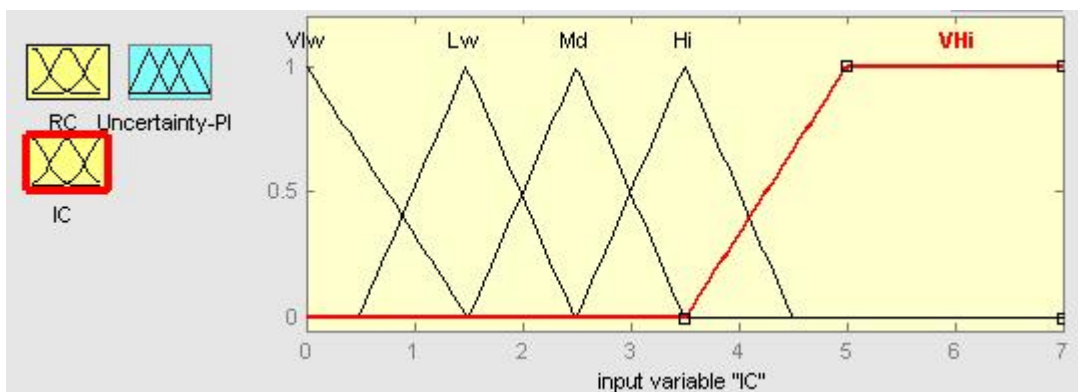


Fig. 4. Membership function elements – input variable IC

For the output variable it is defined a fuzzy set in a range that varies between [0 -100]. The use of this interval defines clarity in the outcome area facilitating

the data interpretation. The form of representation of the output variable is triangular or trapezoidal. Table 3 shows the definition of the range for the MFE and Figure 5 graphically shows the output variable “Uncertainty”.

Table 3. Membership function elements – output parameter Uncertainty

MFE	Range
Very Low	(0; 0; 15)
Low	(10; 22.5; 35)
Medium	(30; 40; 50)
High	(45; 56.5; 70)
Very High	(65; 80; 100; 100)

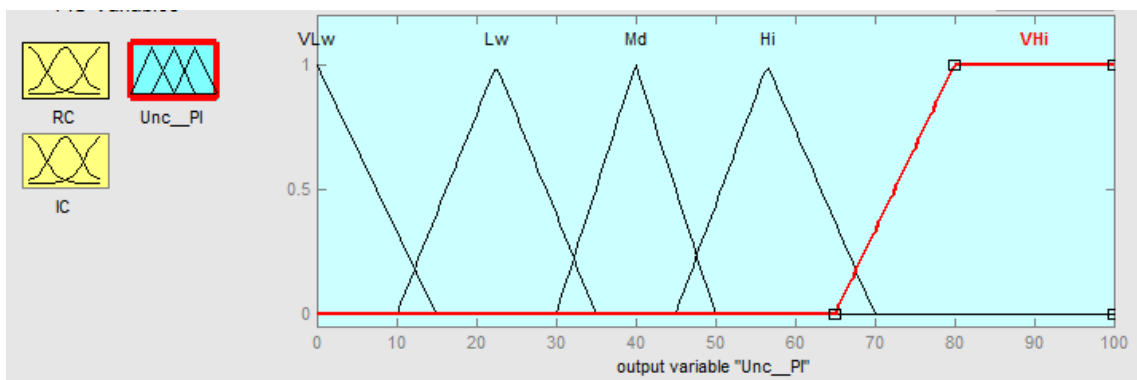


Fig. 5. Membership function elements – output variable Uncertainty

2.4. Definition of the rules that correlate the input parameters to the output (Fuzzy Rule Base)

The fuzzy rules represent the logic correlation between the input and output parameters. They correspond to decisions “if... then”, on the premise that the consequences of decisions occur only if the premise is true.

Logical operations between terms of MFE can be made through the operators AND or OR.

If fuzzy logic uses the logical operator AND, the maximum number of rules is equal to m^n , where n = number of input variables and m = the number of fuzzy sets for each of the input parameters (Zadeh, 1965). In this case, the number of rules generated for the fuzzy logic is 25, where: $n = 2$ (RC and IC) and $m = 5$ (VeryLow, Low, Medium, High, VeryHigh).

Table 4 presents the rules are defined for the logical operations between terms of MFE.

Table 4. Fuzzy Rule Base

RC / IC	VLw	Lw	Md	Hi	VHi
VLw	VLw	Lw	Lw	Md	Hi
Lw	Lw	Lw	Lw	Md	Hi
Md	Lw	Lw	Md	Hi	VHi
Hi	Md	Md	Hi	Hi	VHi
VHi	Hi	Hi	VHi	VHi	VHi

2.5. *Estimated uncertainty*

The evaluation of uncertainty in PI using the fuzzy logic approach can be described by different rules. The final result is determined by adding each rule. This adding depends on the aggregation fuzzy inference process of (FIP) adopted. This study is based on the Mamdani method (Mamdani, Assilian, 1975). They claim that, as the degree of truth of assumptions and the minimum correlation method, each active rule is a part of a specific set of fuzzy output. Thus, the result of the fuzzy problem is the union of several portions of areas activated at the same time (Zadeh, 1965). The result is obtained by the union of several portions of selected areas. The defuzzification method used to extract the results is the centroid method. In particular, the Mamdani FIP associated with the centroid method of defuzzification is the most appropriate technique to solve a widespread and pervasive problem (Cammarata, 1994).

3. **CASE STUDY**

3.1. *Context*

Companies were contacted to participate in the evaluation study of uncertainty in PIs. As a result 5 companies have shown themselves willing to participate. The next step consisted of a semi-structured interview based on a questionnaire with the person responsible for designing or using a given PI. The interviewee provides his perception about how UCs affect the uncertainty of the PI.

When the interviewee has full confidence in the PI, and the PI is well defined, it uses the option *Without / NA*, this means that the PI has no uncertainty or this component does not apply to PI reported. When the user realizes that the PI contains some uncertainty, he uses the *Some* or *Much* to define what level of uncertainty that exists in PI. After the interviewee has answered the seven UCs, he completes the questionnaire evaluating overall the PI, providing his general perception of the PI uncertainty using a five-point scale.

3.2. Data Results

The questionnaire was applied to seven persons referring to seven PIs, and results provide evidence that the UCs influence PI. A brief summary of seven PIs is presented in table 5.

Table 5. Evidence that the UCs influence PI

Uncertainty components (UC)	Frequency index	Number of days without accidents	Incident Tickets close	Time to Resolve	Quantity produced	Capacity Utilization days	Overall Equip. Effectiveness
Measurement method	High	High	Without	Low	Low	NA	Low
Precision and accuracy of measurement	Without	Low	Without	Without	Low	Low	Low
Human assessment	Low	Low	Low	Low	Low	NA	NA
Data collection	High	High	High	High	Without	Low	High
Definition / Measuring	Low	Low	Low	Low	Low	Low	Low
Environmental	Low	Low	Low	Without	Without	NA	NA
IDs Aggregating	Low	Low	Low	Low	Without	NA	NA
PI overall uncertainty perception	High	High	Low	Low	Low	Low	Low

The model is based on logical relation between the UCs and the overall PI uncertainty, and the number of empirical analysis contributes to validate the proposed model.

Completed the stage of data gathering and the creation of the matrix the next step is the treatment of the data presented in the matrix. To evaluate the PIs it was used software (Matlab v. 8) that possesses a tool to treat linguistic constants using the fuzzy logic method.

Based on the matrix (Table 5), treatment was made for each individual PI, to assess the level of uncertainty through the model studied. A structure was

created with two input variables RC and IC to receive the total sum of the values that each of these two variables is answered in the questionnaire and the output variable (defuzzification) shows the level of uncertainty present in the PI. The results obtained in the output variable are defined by the set of rules (FIP).

The Figure 6 shows the model used for treatments of language constants through the fuzzy method.

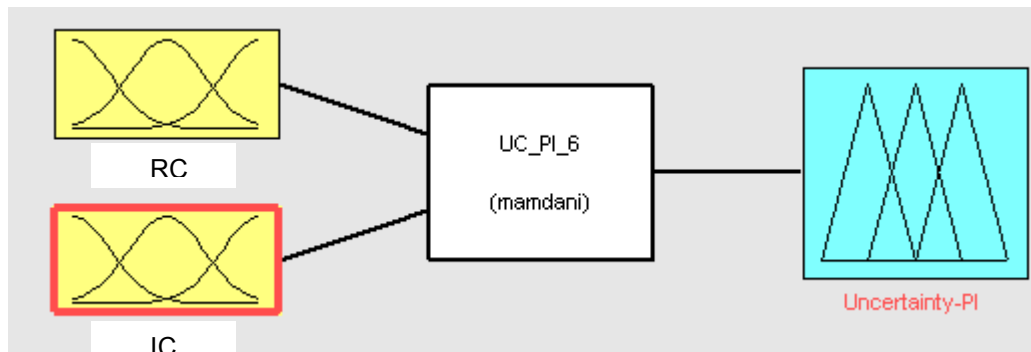


Fig. 6. Model used for treatment of uncertainty in the PI

This study used ten performance indicators proposed by companies that participate in the study. These are indicators used by business managers from various areas and, some them, simultaneously, as element to meet legal requirements. Then a brief discretion of two indicators are presented and the evaluation result of the uncertainty in PI.

Assessment of PI - Frequency Index

The PI *Frequency index* represents the number of absences of employees in a given period of time. To the respondents the overall evaluation the PI has a high level of uncertainty.

Observing Table 5 the PI has four UCs classified as "Low" and two UCs classified as "High" and one a UC with the answer "Without". With these results the RC input variable is assigned with the value 2, which corresponds to a value of "High" according to Table 1 and Figure 3, and the IC input variable, is assigned the value 4 which corresponds to a value of High / Very High, according to Table 2 and Figure 4.

With the values of variables RC and IC assigned, the method is applied for assessment of uncertainty based on the rules defined (Table 4) as the report is show in Figure 7.

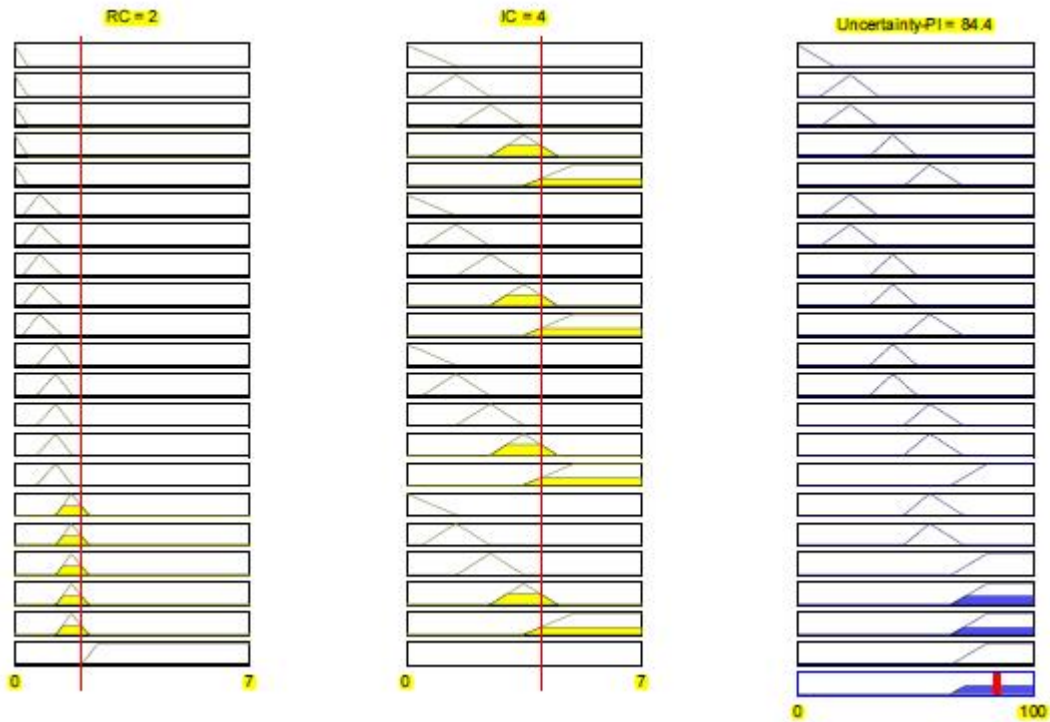


Fig. 7. Results of the evaluation obtained by the fuzzy logic method

Based on RC=2 five inference rules were positioned in "High" (Figure 2). Similarly for IC=4 eight inference rules were active representing the function elements "High" and "Very High" (Figure 3). The result shows an uncertainty level of 84.4 (0 to 100 scale) or a linguistic term of Very high.

Based on the overall evaluation of the PI provided by the respondent apparently, the result obtained by the proposed method was similar to the interviewee where both refer to the presence of uncertainty in the PI as being of "high" to "very high" uncertainty.

Applying the method presented in other PIs in Table 5 we obtain the results shown in Table 6.

Table 6. PIs uncertainty level

PI name	RC	IC	Uncertainty %	Global evaluation method	Global assessment of the expert
Number of days without	2	5	84.6	Very High	High

accidents					
Incident Tickets close	1	4	71.8	Very High	High
Time to Resolve	1	4	71.8	Very High	Low
Quantity produced	0	4	48.4	Medium / High	Low
Capacity Utilization days	0	3	30.2	Low / Medium	Low
Overall Equipment Effectiveness	1	3	49.7	Medium / High	Low

3.3. Analysis and discussion of results

Analyzing Table 5 resulting from the questionnaires applied in different areas and companies, shows that the influence of UCs has different weights according to the PI reported. This happens because of a strong subjective component of evaluations or judgments by experts. Different interpretations of concepts influenced by social or cultural issues introduce uncertainty and complicate the assessment of PIs.

One aspect to note is that in the evaluations in some cases when respondents are not convinced of the uncertainty in PI a particular UC, he replies that this uncertainty is low.

In general, the results are obtained directly through basic steps of diagnostic expert, with significant and subjective data, collected over a period of structured work processes.

Figures 6 and 7 represent the level of uncertainty associated with the data and contextual factors in PIs. They represent the result of a measurement of PI which can also be seen as a tool for decision support to the management, suggesting a revision of the PI to improve the data quality.

4. CONCLUSIONS

This paper presents a model to infer the uncertainty level of a PI based on analysis of UCs. The model is based on the logical relationship between PIs and the uncertainty of PI where, the first step of this study begins by presenting

the level of influence that the uncertainty components (UCs) has on the performance indicators (PIs), the following was done to develop a method based on fuzzy logic approach to assess quantitatively PIs uncertainty.

Through the case studies evidence suggests that: i) PIs are affected by various components of uncertainty previously defined; ii) PIs uncertainty can be estimated by a model based on Fuzzy Logic; iii) UCs definitions can guide the development of actions to reduce uncertainty in PIs, thus reducing the risk in the decision-making process.

This work is part of a larger project that aims propose study evaluation method of PIs uncertainty.

ACKNOWLEDGMENTS

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0079

HOW MANAGERS USE PERFORMANCE MEASUREMENT IN STRATEGY MAKING

GILLIAN PRATT, MIKE BOURNE

Title: (No more than eight words in length)

How managers use performance measurement in strategy making

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Performance measurement; strategy; top management teams.

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

This research set out to derive a framework to explain the role top management teams play using signals from their performance measures to evolve business strategy. The research investigated both the impact of feedback from the performance measurement system on the development of strategy and the impact of strategy formulation on the development of performance measures.

Design/methodology/approach (mandatory):

A conceptual framework was derived by exploring how strategy change and top management team literatures inform the performance measurement field.

Adopting a Realist perspective, case study research was undertaken to seek out the approaches taken by managers in four organisations operating in UK regulated industry.

Using the strategy chart developed by Mills et al (1998) in a retrospective manner and mapping changes in performance measures over the same time period, the research identified events in which changes in strategy and performance measures were linked. These event data sets were then triangulated by interviewing managers about the roles they played and specifically the actions and factors to which they paid attention during the events.

Findings (mandatory):

The strategy and performance event data and interview transcripts were used to test and develop the conceptual framework resulting in an empirical framework.

Given the Realist perspective adopted, it is understood that social activity links the development of strategy and the evolution of performance measures. The empirical framework thus describes how the managers' role in that social activity is to tend to pay attention to certain activities and factors, which are encapsulated in the framework.

The research has crystallised how top managers use signals from performance measures to evolve business strategy in regulated industries and has described the key activities of managers in this regard. These three activities are setting and evolving measures and evaluating performance. In conducting these activities, the framework indicates the factors managers may consider.

Research limitations/implications (if applicable):

Limitations are determined by the researcher's characteristics and the theoretical and methodological choices made. Given the philosophical perspective, the framework is limited to indicating the approach actors would tend to adopt, rather than it being a prescriptive model. By selecting case organisations each regulated by a different regulator, the research may be relevant and generalisable for the wider sphere of regulated industries. The scope of strategy change was focused on business strategy change, and corporate strategy change was deliberately excluded from the data due to the lack of choice by the business unit in its development and deployment. This research thus produced a framework suitable for use in regulated industry with reference to business strategy.

Practical implications (if applicable):

The framework may benefit practitioners since it describes the factors to which top management teams may pay attention in using performance measures to develop

business strategy in regulated industries.
Social implications (if applicable):
Originality/value (mandatory):
Although the empirical framework developed through this research is new, it strongly supports existing theory that performance evaluation is a process of learning and inducing change. It confirms that this can be achieved whilst balancing alignment of the measures to implement strategy and adapting them to formulate strategy (Bourne et al 2000, Gimbert et al 2010, Kolehmainen 2010, Martinez et al 2010, Micheli and Manzoni 2010, Micheli et al 2011). Furthermore the conduct of the case studies has developed our theoretical understanding of the role and key features of a performance measurement system which support the implementation and the formulation of strategy (Gimbert et al 2010 Micheli and Manzoni 2010) and finally the case studies provide rich description of what strategists actually do in crafting strategy as called for by those writing in the strategy-as-practice field (Whittington et al 2006).

0080

REVIEW OF FACTORS AFFECTING PERFORMANCE MEASUREMENT SYSTEM IMPLEMENTATION

HEATHER KEATHLEY, EILEEN VAN AKEN, GEERT LETENS

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Geert Letens
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ABSTRACT

Purpose: The purpose of this study is to identify the factors that affect the successful implementation of performance measurement systems. The initial results of the study are discussed in addition to a subset of the full results to demonstrate the legitimacy of the research design.

Design/methodology/approach: A systematic literature review is conducted which utilizes a previously-completed scoping study to develop an advanced search strategy. The design includes four databases and focuses on search sensitivity through the use of tools such as proximity operators, truncation, searching in the full text, and including all source types.

Findings: The results of this study show that this research area is in a relatively early stage of development with many inconsistencies in both terminology and conceptualization of variables. A final set of 43 factors was synthesized from the existing studies and the frequency of study is evaluated.

Research limitations/implications: Due to the scope of this paper, a subset of the full data set and analyses from this study are discussed; therefore, future work should be conducted to further analyze the dataset and complete the synthesis.

Originality/ value: The methodology used in this study provides a more comprehensive and methodological review than what currently exists in the literature. The insights gained from this review support the more strategic development of this research area and future work to complete this study is discussed.

Key Words: Performance Measurement Systems, Success Factors, Implementation, Systematic Literature Review

Article Classification: Literature Review

INTRODUCTION

Performance measurement (PM) systems have become increasingly known for both their potential to make a significant impact on organizational performance as well as the challenge of actually obtaining expected benefits. It is often reported that practical applications of PM systems are unsuccessful resulting in ineffective systems or failure to adopt the system (Bititci et al., 2012; Bourne et al., 2000; Neely & Bourne, 2005). Researchers have focused on different potential sources of this failure with a particular emphasis on the implementation phase (de Waal & Counet, 2009; Bourne et al. 2003). Therefore, a line of research has emerged which investigates the enablers and barriers of success, more generally referred to as factors, for PM system implementation (Bourne et al. 2002; de Waal, 2003).

To enable the practical application of PM systems, the factors that affect successful implementation should be identified and characterized in terms of strength of relationship and systemic inter-relationships. A review of the literature suggests that awareness and active mitigation of these factors should improve the success of the implementation process and, ultimately, the overall effectiveness and level of adoption of PM systems. For the purposes of this study, PM refers to enterprise-level systems which include certain performance management systems and variants of enterprise PM such as business or strategic PM.

This paper presents an ongoing study to comprehensively review this literature and synthesize the information about the factors. First, the previous developmental work and final methodology are discussed emphasizing the changes resulting from the previous phase. Then, due to the scope of this paper, a subset of the full results is discussed. Finally, conclusions regarding the methodology and state of the literature area are discussed in addition to future work to complete this study.

BACKGROUND

A research synthesis methodology has been developed to identify the range of factors identified in the literature, estimate their strength of relationship, and investigate their systemic inter-relationships. As an initial step in this study, a preliminary Systematic Literature Review (SLR) was conducted which identified 37 papers and 43 factors for successful implementation (Keathley & Van Aken, 2013). This review consisted of a simplified search strategy and strict exclusion criteria to control the scope of the results. The study identified the frequency of study for each of the factors but did not analyze the strength of effect. The general findings were that the field appears to be in an early phase of development and future work is needed to investigate the inter-relationships among the factors.

To further characterize the state of this research area, a framework proposed by the Enterprise Engineering Research Group at Virginia Tech was applied to analyze the research area maturity (Keathley et al., 2013). The analysis included investigation of the methods used, authorship trends, and level of dissemination from research to practice. The results suggested that the research area was rated as ‘moderately mature’ with slightly higher ratings in the breadth of variables investigated and focus on dissemination. Understanding the level of maturity for this research area provides perspective on the insights gained from the literature which allows for the more strategic development of new research which will help to develop this research area. For example, the results suggested that most of the studies in the final paper set are case studies and conceptual frameworks, whereas more advanced methods, such field experiments that include statistical hypothesis testing, should be considered for future research.

While the results from the initial SLR and maturity analysis provide valuable insights, there are several limitations and assumptions that should be addressed. First, the search strategy and the structure were simplified to reduce the scope of the initial SLR. This included a relatively narrow set of search terms to limit the sensitivity of the search. Also, the exclusion criteria were strict to allow for a highly precise search that would only identify directly related texts. In this context, the sensitivity of the search refers to a ratio measure of “the number of relevant reports identified divided by the total number of relevant reports in existence” and a precision paper focuses on “the number of relevant reports identified divided by the total number of reports identified” (Cochrane, 2011). This resulted in a focused final paper set that was relatively small and did not include papers that focused on just one specific type of performance measurement system, for example, papers describing the study of the implementation of the Balanced Scorecard.

The next phase of this study is to adjust the search strategy and complete the final SLR. The design choices address the limitations of the initial SLR and allow for a highly comprehensive review of the literature that is focused on search sensitivity rather than precision. The final SLR design is presented in the following section and will allow for a more accurate characterization of the literature.

METHODOLOGY

The SLR methodology used in this study is adapted from Tranfield et al. 2003 and consists of six phases: a scoping study, definition of the search strategy, application of exclusion criteria, data extraction, analysis, and dissemination (Tranfield et al., 2003; Cochrane, 2011). The results of the

initial SLR and maturity analysis are considered to be the scoping study which is used to develop the final search strategy and exclusion criteria.

Search Strategy

To allow for an accurate maturity analysis, databases were chosen to maximize the coverage of potential source types and disciplines. The databases chosen for this study are: ProQuest (PQ), EBSCOhost (EH), Engineering Village (EV) and Web of Knowledge (WK). The first two databases provide broad coverage and the second two provide more specifically relevant works from engineering disciplines and high-quality academic works, respectively.

Next, the central concepts of interest were decomposed into three independent concepts instead of two as shown in Table 1. In addition, an iterative exercise was used to develop an extensive list of synonyms and test their effects on the search results and capture rate (i.e., the number of papers from the scoping study that are captured with the current strategy). The list of search terms was developed to allow for a 100% capture rate across all of the databases. It should be noted that the two specialized databases, EV and WK, do not facilitate searches of the complete text. Due to the trade-off between including a wider range of search terms and feasibility of the results in terms of the number of raw results, the capture rates were slightly lower on these databases. To implement the search, a Boolean phrase was constructed that uses OR within each concept and AND between them.

<i>'Performance Measurement'</i>	<i>'Implementation Phase'</i>	<i>'Factors Affecting Success'</i>	
Performance N/4 Measurement	Implement*	Barrier	Obstacle
Performance N/4 Management	Adopt	Challenge	Impediment
Measurement Initiative	Adoption	Success Factor	Contingency factor
PMS	Dynamic	Critical Factor	Key Factor
BSC	Install	Indicator of Success	Supporting Factor
	Installation	Success Indicator	Factor
	Use	Factor of Success	Shortcoming
	Practice	Factor Affecting	Enabler
	Effectiveness	Factor Influencing	
	Program		

Table 1: Search Terms

In addition to decomposing the concepts, more advanced tools were used to further structure the search strategy to control the trade-off between quality of the search and feasibility of the results. The first tool that was used is the proximity search tool NEAR. This allows for the controlled relaxation of specific phrases to increase the sensitivity of the search. The second tool that was used is truncation which is indicated by an asterisk at the end of a word-stem. This allows the search to include all versions of the word-stem automatically. The effect of these tools were tested in each of the concepts but was only found to be useful in the implement and PM terms. In other instances, results either did not provide useful papers or was too broad resulting in a large number of completely irrelevant results.

The final decisions in the search strategy are what portion of the text should be searched and availability of the full text. Due to the scope of this paper and the emphasis on the sensitivity of the results, the strategy was designed to search the full text. As mentioned previously, only two of the databases, i.e., PQ and EH, allow for full text search. Therefore, the strategy was tested to ensure that these two databases had a 100% capture rate and the capture rate of the other two databases was maximized while maintaining a feasible number of results. In order to ensure the sensitivity of the search, all results were reviewed without the restriction that the full text be available. This allowed the researchers to explore other options to obtain unavailable papers instead of having the results limited based on the specific offerings of each database.

Paper Selection

Once the search strategy was tested and finalized, the search was conducted and the exclusion criteria were applied. This occurs in a three step process:

- Initial Review – The title and abstract were reviewed and basic relevance criteria were applied
- Application of the Exclusion Criteria – The full paper was scanned emphasizing relevant sections and figures/tables to apply the exclusion criteria
- Final Review – The paper was read in detail and the final paper set is obtained

Finally, search alerts are set-up in each database so that new results for these searches are reviewed periodically to keep the review up-to-date.

DISCUSSION OF RESULTS

To begin, the actual results for each database are the results that remained after the duplicates were removed, and the limitation that the paper is written in English was applied. The results of the initial review are shown in the ‘papers captured’ column which shows the number of papers that met the basic relevance criteria, i.e., focused on performance measurement or management and in some way addressing the success or failure of PM systems in practice. The ‘unavailable papers’ column shows the number of papers that passed the basic relevance criteria but were ultimately unavailable to the researchers from any source. However, it is important to note that many of the originally-unavailable papers were able to be recaptured using other sources (such as Google Scholar and the Virginia Tech library system including reviews of journals indexed by the library) and the percentages of unavailable papers that were recaptured is also included in the table. The resulting final paper set included 1,177 papers.

Database	Raw Results	Limited Results	Papers Captured	Unavailable Papers	Papers Recaptured	Duplicates Removed
WK	2,733	2,649	238	74	33%	-
EV	9,719	9,345	207	121	48%	47
EH	35,323	21,801	431	24	31%	69
PQ	25,864	25,524	593	34	41%	88

Table 2: Results of the Initial Review

Due to the scope of this paper and the ongoing nature of this study, the remainder of this paper focuses on the 238 papers captured in the WK results. This database was chosen as the first database to analyze due to its prevalence in the literature and reputation for indexing high-quality academic works. The scoping study identified 37 papers from three databases of which 17 are indexed on WK. In addition, the search strategy was able to capture 15 of these due to the limitation of searching All Fields instead of Full Text. For the purposes of this analysis, the two papers captured from the scoping study are included in the final paper set.

Table 3 shows the results of applying the exclusion criteria. The criteria begin with the most irrelevant papers and become more refined resulting in 200 of the 238 papers being excluded. The final paper set for this study includes the Primary Focus papers, the 38 remaining papers, in addition to the two missing scoping study papers resulting in a final set of 40 papers. While the scope of this paper is limited to those with a primary focus on implementation success factors, future work will include the secondary focus papers and indirectly related papers in the overall synthesis. Recall that the primary focus set also includes the 15 papers captured in the scoping study indicating that this search captured 23 new papers for the final paper set.

Excluded Criteria	Papers
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Not Related – PM not the true focus of the paper	26
Not Related– System effectiveness/ success not the true focus	5
Discusses Other types of PM systems (not enterprise PM)	33
Demonstrates a framework (case study/ simulation) but does not identify factors	46
Indirectly related – Focus on Implementation phase or process in general	24
Only identifies factors from other phases	22
Secondary Focus – Focus on implementation success but not directly on implementation factors	44
Total Papers Excluded:	
200	
Selected Paper Set	
Primary Focus – Papers are directly focused on implementation factors	38
Two Scoping Study Papers (not captured by search in WK)	2
Total Papers Included:	
40	

Table 3: Results of Exclusion Criteria Application

Publication Trends

First, the trends and themes in the general publication information are investigated. Figures 1a and 1b show the number of papers published per year and the distribution of disciplines. Figure 1a shows that publications in this area are relatively irregular and do not suggest a trend. However, the results do suggest that there is some level of ongoing research in this area with an approximate average of 2.8 new papers per year. Next, the disciplines of each author were investigated in order to gain some insight on the theoretical backgrounds that support this research. Disciplines were determined by author descriptions of academic department or research area, which was available for all 40 papers. This distribution supports the assertion that this field is dominated by a management/ business perspective but is becoming more multidisciplinary. In fact, 33% of the papers featured authors from different disciplines.

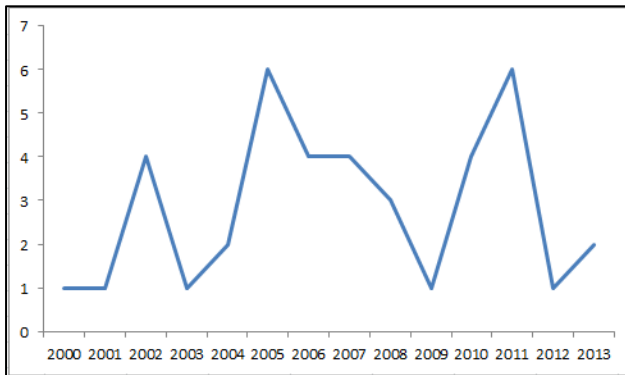


Figure 1a: Publications Per Year

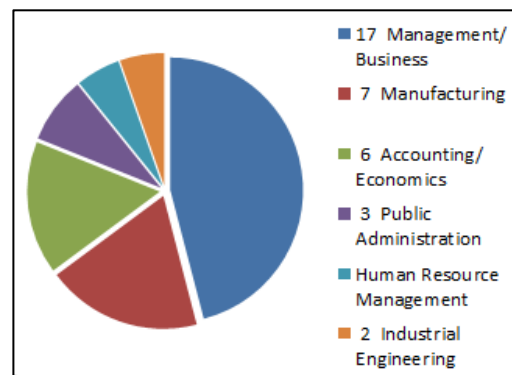


Figure 1b: Disciplines

Next, the theoretical foundations of this research area are further investigated through analysis of the publishers. The results show that only 2 of the 40 papers are conference papers and the remaining 38 are academic articles. Therefore, the frequency of publication in each journal is investigated. First, the journals that include more than two papers are International Journal of Operations & Production Management (6 papers) and Production Planning & Control (3 papers). In addition to these journals, the remaining journals were categorized and journals focused on management, healthcare, and accounting/economics were the most frequent. The preliminary analysis suggests that the results are consistent with the themes identified by the disciplines.

Finally, three focus areas were identified in the paper set which are summarized in Table 3. The three focus areas are not mutually exclusive and one paper could have multiple focus areas. The most popular PM tool in this paper set is the Balanced Scorecard which is studied in approximately 30% of

the 40 papers. Other popular focus areas include SMEs and public sector systems with approximately 32% highlighting some aspect of the public sector. Finally, approximately 37% of the papers emphasized a specific country or geographic region in case studies.

Emphasis		Sector		Location			
Tool		Public					
Balanced Scorecard	12	Government	6	UK	2	Australia	1
Business PM	3	Healthcare	5	Europe	2	China	1
Strategic PM	1	General	2	Scotland	2	Greece	1
Other		Education		Egypt	1	Croatia	1
SMEs	4	Manufacturing		Sweden	1	Middle East	1
IT Enabled Systems	4			Thailand	1	South East Asia	1
Developing Country	2			Pakistan	1		

Table 3: Summary of Number of Papers Indicating Focus Areas

Maturity Analysis

The framework used to evaluate the maturity of these results was presented by Keathley et al. (2013) and consists of three primary dimensions but only two are explicitly addressed in this paper due to the fact that focus in dissemination has not yet been operationalized. . To begin, the methods used in this paper set were coded and are summarized in Figure 2a. Similarly to the focus areas, methods were defined so that one paper may have several methods. The results show that approximately 32% of the papers use more than one method with a few significant examples of multiple-methods research. Action research and surveys are the next most frequently used methods which are closely related to the research being conducted by case study. This is primarily due to the nature of this research area where the explicit concern is to enable practical implementations. In addition, many of studies identified in this area are surveys of subjective perceptions of implementation success and impact of the factors. Figure 3 shows the distribution of methods which can provide some insights on the development of this aspect. The results show that there are no explicit trends and methods use appears to be relatively consistent in this time period.

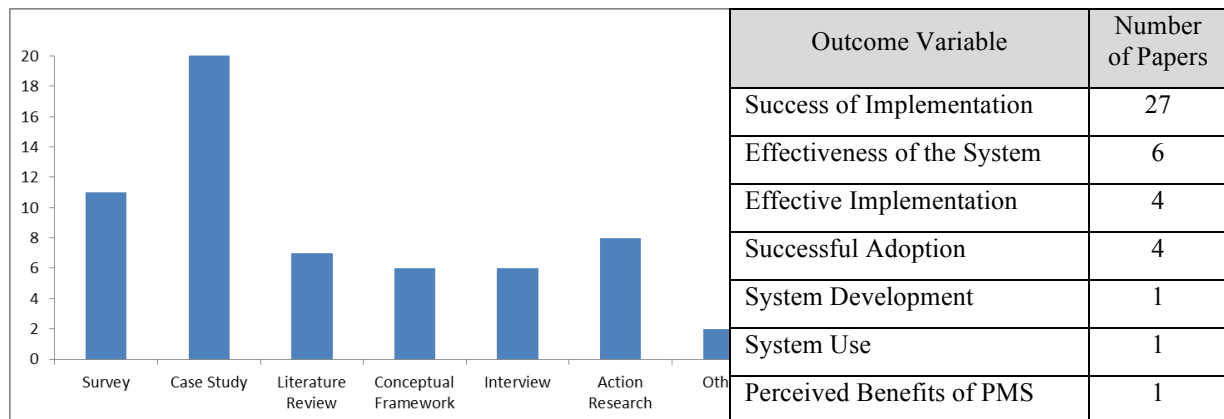


Figure 2a: Breadth of Method

Outcome Variable	Number of Papers
Success of Implementation	27
Effectiveness of the System	6
Effective Implementation	4
Successful Adoption	4
System Development	1
System Use	1
Perceived Benefits of PMS	1

Figure 2b: Outcome Variables

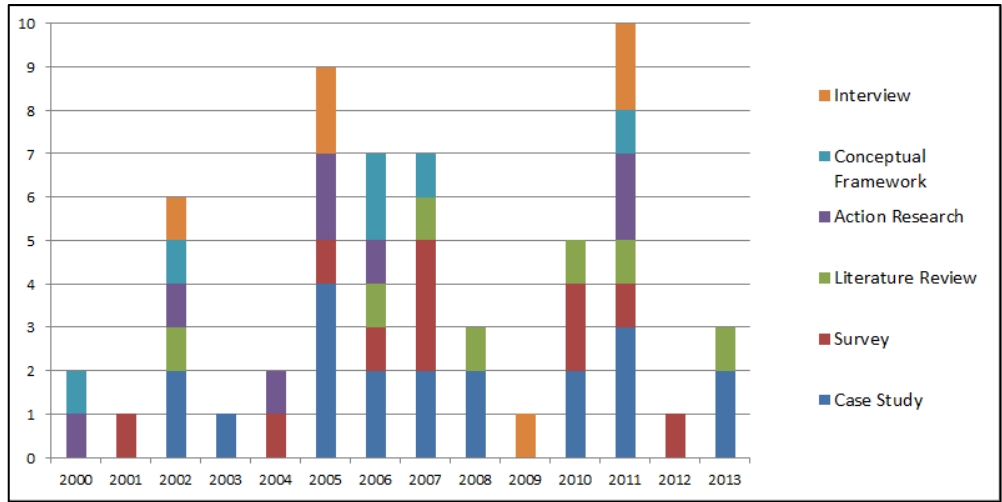


Figure 3: Distribution of Methods Over Time

Finally, it was found that approximately 10% of the papers tested statistical hypotheses, further suggesting the need for more advanced empirical investigations to develop this research area. While this sub-criterion is relatively less mature, the development and operationalization of variables is much more prevalent in this paper set. This is, again, due to the nature of identifying success factors which are commonly used as independent variables. A summary of outcome variables found in the paper set is included in Figure 2b.

Next, the criterion of authorship is investigated through investigations of authorship trends and co-authorship. There are 95 authors in the final paper set, only 13 of which are authors of more than one paper. The results show that there are four groups of authors that have worked together in this research area which are summarized in Table 4. While this does suggest that there is a cohort of regular authors in this set, the vast majority of the authors in this area have only published once and the average number of new authors per year is approximately 6 authors per year. The trend of new authors per year is shown in Figure 4. To gain a complete understanding of the authorship trends, an area chart of the frequent authors is presented in Figure 5.

Author	Year of Publication											
	'06	'05	'07	'05	'11	'00	'02	'05	'08	'02	'02	'04
Bititci, U	x	x	x	x	x							
Nudurupati, S	x	x		x	x							
Garengo, P	x		x									
Turner, T	x	x										
Bourne, M						x	x	x				
Neely, A						x	x					
Platts, K						x	x					
Mills, J						x	x					
Ariyachandra, T									x	x		
Frolick, M									x	x		
Ioannou, G											x	x
Papalexandris, A											x	x
Prastacos, G											x	x

Table 4: Co-authorship Among Predominant Authors

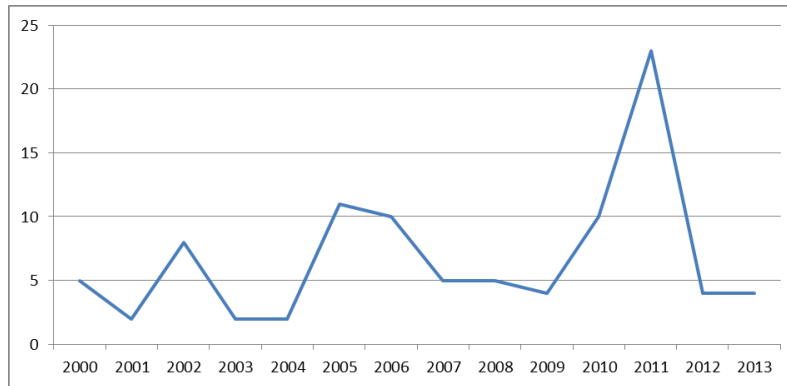


Figure 4: New Authors per Year

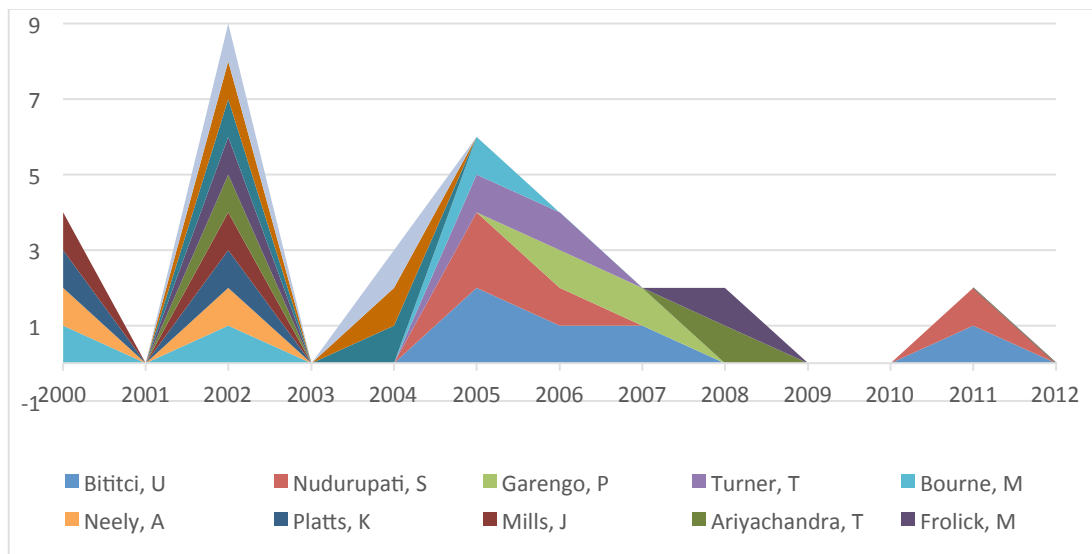


Figure 5: Area Chart of Most Frequent Authors

A review of Figure 1a shows three spikes in 2002, 2005/06 and 2010/11. By comparing this figure to Figure 4 and Figure 5, it can be seen that the increase in 2002 is due to more publications by the regular authors while the increase in 2010 and 2011 appears to have been driven by a sharp increase in the number of new authors. The increase in 2005 and 2006 seems to be a combination of regular and new authors. These results suggest a general trend of an increase in new authors in this area.

Implementation Success Factors

The synthesis of factors for this paper was used in the final set of factors that was identified in the scoping study as the initial codes for this process. Similarly to the scoping study, this paper investigates the factors in terms of frequency of study and does not attempt to estimate the strength of relationship or inter-relationship of the factors, which is reserved for future work. The consistency in the analyses in addition to using the original factor codes will allow for a more direct comparison of the two stages of this study and a more accurate estimation of the benefits of the adjusted search strategy.

There were two groups of studies included in the final paper set. Group one includes 32 papers that directly and explicitly itemize implementation factors. These papers are primarily empirical and explicitly discuss the factors. The second group includes eight papers that discuss challenges or experiences in general but do not explicitly identify their insights. The synthesis process was initially applied to the first group of papers to develop the codes for the factors and the resulting set was applied to the remaining eight papers to investigate their content. No new codes were found during

the evaluation of the second group of papers. Figure 6 summarizes the 43 factors that were identified in this study. Eight new factors were defined in this study compared to the scoping study which are highlighted and bolded in the figure. In addition to the introduction of the new factors, many of the frequencies of variables are significantly different, either higher or lower than the scoping study, which are highlighted in the figure.

19	Leadership Commitment and Support	5	Resistance to Measurement/ Policy Resistance	3	Employee Empowerment	1	Approval/ Support
16	PM System Design Quality	5	Priority/ Abandonment	3	External/ Environmental Impacts	1	Data Quality/ Completeness
9	Employee Perception and Involvement	5	Effort Required	2	Visible Use of the System and Results	1	Mandated/Required System
8	Resource Demand/ Allocation	5	System and Metric Complexity	2	Dissemination of Knowledge and Results	1	Requirements of Multiple Internal Interest Groups
8	Organizational Culture	5	Design of Implementation Strategy	2	Customer/ Stakeholder Focus	1	Goal Clarity/ Orientation
8	Informational/ Data Collection Capabilities	4	Guiding Action Team	2	State of Previous Metrics/ System	1	Legislative Mandates
7	Training/ Employee Skills	4	Incentive Programs	2	Continuous Improvement Focus	1	Significant Delays
7	Organizational Situation/ Maturity	4	Leadership Skills/ Style	1	Customer/ Stakeholder Focus	1	Use of External Information
7	IT Issues/ Lack of Technical Skills	3	Available Infrastructure	1	Trust	1	National Culture/ Societal Impacts
6	Communication of Expectations/ Strategy	3	Active Accountability/ Ownership	1	Relationship to Daily Activities	1	Existing Quality System
6	Communication of System Benefits	3	Fear of Consequences	1	Understanding of Cause and Effect		

Figure 6: 43 Factors Affecting PM System Implementation Success

There are a few minor changes in the order of the most frequently-cited papers (i.e. those mentioned in at least five papers) but the basic sequence is very similar to the scoping study results even though the two sets only overlap by 17 papers. The relative consistency of the most frequently-cited factors suggests that there is some level of consensus in the literature concerning these factors. However, there is a low level of consistency with the less frequently-cited (i.e. factors mentioned in less than five papers) factors suggesting the need for further research.

CONCLUSIONS

The results presented in this paper focus on the final SLR in an ongoing research synthesis. They show that the new search strategy and exclusion criteria captured more directly relevant papers which provide valuable insights to this research. In addition, the results of the maturity analysis show important consistencies between the scoping study results and the initial results of this phase; specifically in the methods used, authorship trends, and frequency of study for the factors. The results support the use of the final search strategy and suggest that the complete results will provide many valuable insights beyond what was obtained from the initial SLR.

Similarly to the scoping study results, the presented results suggest that the literature for this research area is relatively less mature with inconsistencies in terminology and the subset of variables studied. This in addition to the lack of commonly-accepted implementation frameworks, suggest that the synthesis is timely and can provide a significant contribution to the literature. By identifying and characterizing the full range of implementation factors, strategies can be developed to enable more successful implementations of PM systems and, ultimately, more effective PM systems in general. Awareness of the factors allows for resources, such as time, to be targeted more realistically and implementations to be carried out more in a more thoughtful way.

Future Work

Future work in this study will include completing the final SLR and maturity analysis by analyzing the results of the other three databases, application of a Meta-evaluation, and development of a theoretical framework for successful PM implementation. First, the SLR will be completed including analyzing all of the data and including secondary papers. The analyses will also be extended to include more advanced methods such as social network analysis and co-citation analysis. Finally, the characterization of the factors will be extended to include a comprehensive estimation of strength of effect, investigation of the systemic inter-relationships, and identification of the most critical factors. To complete the synthesis, a mixed method Meta-Analysis will be conducted consisting of a quantitative meta-analysis and qualitative meta-synthesis (Cochrane, 2011, Campbell, 2013). This portion of the research has also been pilot tested and the results of the initial investigation are presented in Keathley et al. (2014). The process to reduce the factors and create a theoretical framework will include statistical analysis of survey data and a Delphi study.

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CHRONOLOGY OF THE ORGANIZATIONAL PERFORMANCE MEASUREMENT RESEARCH

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Chronology of the Organizational Performance Measurement Research

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Structured abstract

Purpose:

The purpose of this paper is to analyze the evolution of the models that exist in the field of Performance Measurement and identify the key concepts involved in this evolution, whereby allowing the proposal of future possibilities or trends that may be applied in the development of new models.

Design/methodology/approach

A literature review on the key discussion points relevant related to Organizational Performance Measurement was conducted on the main journals of Management and Performance Measurement areas.

Findings

Knowledge in the area of Organizational Performance Measurement has undergone many influences and interactions with various areas of Management during its evolution, using the concepts from other disciplines when they offered the necessary theoretical backgrounds for the needs found and vice versa. Likewise, the field of study has been recently interacting with some concepts, while some trends were identified: the strategic orientation of the models; the multidimensionality of the models; the inclusion of external aspects and stakeholders; the performance management as a form of internal management as well as external communication and the institutional legitimacy.

Practical implications:

The challenge in the area is to understand if the organization can monitor the expected results, in order to truly meet all stakeholders in its processes, whether internal or external to the organization.

Originality/value:

Identifying the key concepts involved in the Performance Measurement area evolution, it is possible to observe how they shifted from one perspective to another along the time. It demonstrates how this academic theme is influenced by others disciplines in Management.

Chronology of the Organizational Performance Measurement Research

Category: Conceptual paper

Keywords: Performance Measurement; Performance Management; Models; Literature Review; Stakeholders.

1 Introduction

Organizations' performance and the methods used to measure and manage it have been a recurrent and important topic in both management theory and practice. The number of publications devoted to this area of study has grown exponentially: one new scientific article on the subject is published every seven hours (Neely, 2007).

Measuring performance in organizations usually involves the implementation and monitoring of the organizational strategy that sets a standard ratio between the goal proposed and the results obtained (Simons, 2000). Thus, through these control actions, the organization is able to propose methods to improve business (Halachmi, 2005), to implement better processes and maintain high performance standards (Cocca and Alberti, 2010) in addition to meeting the set goals (Nanni *et al.*, 1990).

However, this area of study is still developing, given that its principle reference studies date from the 1990s, and studies of any relevance published before this period focus more on methods of analysis (Neely, 2005). Notwithstanding, doubts still remain about its actual use and effectiveness (Neely *et al.*, 1995) and the lack of a structured approach consolidated among academics (Marr and Schiuma, 2003; Neely, 2005).

In light of this, the purpose of this paper is to analyze the evolution of the models that exist in the field of Performance Measurement and identify through literature review the key aspects and concepts involved in this evolution, whereby allowing the proposal of future possibilities or trends that may be applied in the development of new models. The study follows the approach of other authors (Neely *et al.*, 2007; Tezza *et al.*, 2010), who also identified and described the principle models and factors related to organizational performance measurement.

2 The history of organizational performance models

2.1 The first half of the 20th Century

According to Tezza *et al.* (2010), at the start of the 19th Century, factory managers made their decisions based on information regarding the hourly cost of transforming raw materials into finished products. This information was used to award bonus pay to employees. The objective of these first attempts was to measure performance and efficiency using a structured methodology. Later, around the mid-20th Century, the financial managers of the railroads developed a new performance measurement: the operating index, which correlated the ratio of operating costs with the revenue (Tezza *et al.*, 2010). Methods deriving from scientific management were incorporated into the management of the first large scale corporations like DuPont and General Motors in the 1920s (De Waal, 2003). These initial concerns with measuring organizational performance were, for the most part, directly related to the preparation and control of financial reports and cannot realistically be linked to strategic plans (Halachmi, 2005).

Nevertheless, the first recorded performance measurement model, called the *Tableau de Bord*, was created in 1930s France by process engineers seeking new ways to improve production by developing a better understanding of the cause-effect relationship (Epstein and

Manzoni, 1997). They named the method the *Tableau de Bord* (literally: dashboard) due to its functional resemblance to the dashboard or instrument panel of a ship or airplane (Lauzel and Cibert, 1959).

The *Tableau de Bord* is defined as a set of measurements that include both **financial and non-financial indicators** that aim to breakdown the organization's mission and vision into goals. The model also highlights the importance of a **set of balanced indicators** to define performance and which would prove to have similarities and differences with the 'Balanced Scorecard' developed 60 years later (Epstein and Manzoni, 1997).

2.2 The 1950s, 60s and 70s

The 1950s signal the first concentrated growth of performance measurement models. Martindell (1950) had already formulated an appraisal standard of quantifiable performance however, albeit somewhat conceptually underdeveloped due to the subjectivity attributed when establishing the criteria. Ridgway (1956) corroborated the idea of quantifying performance measurements defending that everything that could be quantifiable and measurable; the organization should consider these aspects so that the administrator could handle the **indicators and the performance of the activities monitored**. This approach was also adopted by Drucker (1954), who elaborated the **management by goals** model in which the organization considered performance indicators from different areas and in which the respective indicators were measured.

However, concern with merely establishing independent goals in organizations, without interacting with other important elements for measuring performance, also had its critics. Keeley (1978) posits that models based solely on meeting the targets established are insufficient to assess an organization as a whole. This deficient approach, according to the author, creates problems comparing the appraisal of organizations and because it does not lead the organizations towards the necessary changes, either as a result of its routine or the surrounding influences.

Additionally, performance analyzed solely by financial indicators proved to be focused exclusively on the short-term (e.g. Hayes and Garvin, 1982), which created a narrow analytical perspective, something that concerned those who studied the area. This concern was caused by the concepts elaborated by the older researchers, who understood that the senior management's guidance should be in line with the established (Drucker, 1954) goals and that the performance should be fruit of an **analysis of future possibilities** (Buchele, 1962). Not considered sufficient, the information acquired by financial systems did not appear to be accurately updated which in turn meant the information they provided was worthless for manager (Johnson and Kaplan, 1987). Furthermore, many indicators, such as quality, customer satisfaction, employee satisfaction and innovation, were not recorded in the accounting and financial measurements (Ittner and Larcker, 1998), which limited the understanding of other, non-financial goals. Therefore, the system of predominantly financial information, which had prevailed since the 1920s, started to show signs of inadequacy when faced with a new corporate reality.

2.3 The 1980s

Thus, the end of the 1970s and 1980s led to the dissatisfaction with the purely financial performance measures for measuring the performance of organizations (Bourne *et al.*, 2000). Venkatraman and Ramanujam (1986) already showed that the financial evaluation was not sufficient to provide a complete analysis of the performance of the organization's business. The authors claimed that the financial performance domain was contained within the evaluation of the organization's business (**financial evaluation plus operational evaluation**),

in a concept that authors admit they reflect the new conceptual trends and greater coverage contained in the research area at that moment.

In addition, with the intensification of international competition, mainly due to the success of Japanese management models, the performance of companies began to rely on precepts of Industrial Administration (what is currently called Operations Management) to find operational measures that could complement financial measures, as there was a great interest in measuring performance by the Operations Management (Neely, 2005).

It was at that time that the precepts of Total Quality Management in the field of Operations gained notoriety in industrial practices. The advent of these concepts to the area of Performance Evaluation brought up the use of statistics to calculate the **operational performance measures** (Deming, 1986), the use of measures that measured activities related to the **quality and standardization of products and processes** (Juran, 1969) and the concern for their **continuous improvement** (Taguchi and Clausing, 1990).

By these applications and proximity, it is understood that studies on Operations Management and Performance Management studies end up having an intertwined development (Smith and Goddard, 2002). Thus, studies focused on industrial organizations started focusing on the planning process and the difficulties to implement this plan (*e. g.* Bourne *et al.*, 2000), as in the development of performance measures of efficiency, of operational and financial nature, reinforcing the use of non-financial indicators in conjunction with the financial indicators.

Afterwards, the ideas of internal and external perception that were brought by the concepts of Strategy, combined with the dissatisfaction generated by the use of a one-dimensional perspective of performance analysis (the financial perspective), would lead to the intersection of these concepts. Thus, Keegan *et al.* (1989) developed a 2x2 matrix called Performance Measurement Matrix, which allowed the visualization of aspects based on cost in one dimension and in the internal or external direction in the other.

Also at that moment the field of Strategy consolidates itself and becomes an important reference for the management of organizational performance, since the concepts of business performance measurement are in the core of strategic management (Venkatraman and Ramanujam, 1986).

2.4 Early 1990s

With the increasing importance during the strategy in the 1980s, there is a trend to include these elements by performance measurement models, or as it was now considered, it will be after the establishment of a strategy that defines the goals of the organization that performance measures must be developed (Kaplan and Norton, 1992). Based on this premise, the performance measurement system of organizations allowed managers to have a global management control of the organization and thus **operationalize the strategy established, because the performance measures derive from the global strategy of the organization** (Kaplan and Norton, 1996), ensuring that the actions of organizations would be in line with their goals and strategies (Lynch and Cross, 1991).

Fitzgerald *et al.* (1991) suggested a model for evaluating performance with six dimensions, two of which would be related to the results of the strategy adopted (competitiveness and financial performance) while the other four dimensions were the determinants of these results (quality, flexibility, resource utilization and innovation). At the same time emerges the Balanced Scorecard (BSC) of Kaplan and Norton (1992), with four dimensions, in which the financial and customer (results) perspectives would be determined by the perspectives of learning and growth and internal processes (determinants) of the organization. This approach starts to reinforce the need and importance of the **cause-effect relationships** for the organizational performance measurement models, which later gave rise

to the **strategy maps** (Kaplan and Norton, 2004), where maps explicitly set the cause-effect relationships among the different perspectives of the organization, establishing the determinants that guide the ultimate goals. It also culminated in the development of **assessment models balanced between the multi-dimensions of the organization** (Bourne *et al.*, 2000).

This indicates that there is a series of business units or departments that follow the corporate goals, however, each in their own way and seeking their own efficiency (operating performance measures). There was the need for indicators of various operational areas and the challenge was to interconnect them within the organizational strategy, which Kaplan and Norton (2006) later called **strategic alignment**, even though the idea was not necessarily new (Chandler, 1962).

Thus, the great revolution in the area occurred when it was realized that financial performance measures were not sufficient to meet a complete and comprehensive view of organizational measurement (Eccles, 1991). As a result, another concept that has gained considerable relevance in the area was the idea of having a model capable of **integrating the different performance measures** (Bititci *et al.*, 1998). That is, different measures should be simultaneously contained within the same performance analysis plan.

At this moment, several models were developed aiming to understand the organization as a whole, covering the various perspectives existing within the organizations and trying to measure them. The need to create indicators led to the **scorecard format**, covering various information (Lohman *et al.*, 2004) of multiple perspectives of the organization, which started gaining popularity and ended up being adopted by many researchers and practitioners in the area. Thus, based on the evolution of all these precepts, the 1980s and 1990s were marked by the creation of models of greater complexity, seeking to analyze the organizations in a global and systemic manner, covering not only one perspective of the organization, but rather a set of perspectives that operate in an interconnected manner and balanced with each other.

Therefore, all these elements culminated in the development of organizational performance measurement models. Besides BSC, many others were developed under these precepts, such as Strategic Measurement Analysis and Reporting Technique (Lynch and Cross, 1991), Integrated Performance Measurement System (Bititci *et al.*, 1998), Skandia Navigator (Edvinsson, 1997) and Sigma Sustainability Scorecard (The Sigma Project, 2003).

After the stage where these new or alternative performance measurement systems were created and subsequently adopted and implemented by the organizations, the field of research starts focusing on a new dilemma in the late 1990s and early 2000s: How to use and manage data provided by these performance measurement systems (De Waal, 2003). Therefore, they realized the **need to migrate the discussions in the area on performance measurement to performance management** itself (Folan and Browne, 2005).

With the accumulation of measures and indicators, mixing new indicators with old ones, without having the new priority stressed and priority indicators properly considered (Meyer and Gupta, 1994). This is an indication that the administration of performance starts taking the responsibility to **constantly review the performance system of the organization**, while previously the focus was only to create applicable measures. In other words, one of the tasks of performance management is to **provide the effective use of performance measures** of the organizations generated.

2.5 Late 1990s and 2000s

Until then, the existing models were developed focusing mainly on the internal aspects of the organization, usually with the final goal seeking financial aspects – such as the BSC – which generated criticisms to the model (Norreklit, 2000). The models developed until then were not intended to meet, in a broad manner, the stakeholders of the organizations, which

was necessary due to the external pressures and strategic needs (Neely *et al.*, 2000; Neely and Adams, 2001).

Performance measurement systems had no guidance that established the **strategy as an integrator between the internal operations of the organization and the needs of key stakeholders**. Thus, the ideal starting point for these models gained strength to be reviewed. The formulation of performance models no longer derived from the organization's strategic vision for the development of specific and operational performance goals. The models began to consider external aspects of the organization, understanding that it should **meet the needs and interests of their stakeholders** and then establish their strategies (Neely *et al.*, 2000). Still on this external perspective, there was a concern with performance also in the **social and environmental** areas (Figge *et al.*, 2002; Neely, 2007), establishing the so-called **triple bottom line** (Savitz and Weber, 2006).

Based on that, there was the creation of models such as the aforementioned Sigma Sustainability Scorecard (The Sigma Project, 2003), the Performance Prism (Neely *et al.*, 2000; Neely and Adams, 2001) and the so-called Sustainable Balanced Scorecard (Figge *et al.*, 2002). These models have as the main pillars the search for a performance beyond the financial scope for the organization as central in its strategy and the integration of organizational stakeholders as elements whose expectations are met by the performance of the company in its various dimensions. Thus, a new demand emerges in the area in view of the general trend for having more **transparency, control and efficiency** in the operations of organizations. In this sense, there were attempts to also consider intangible elements in measurement models.

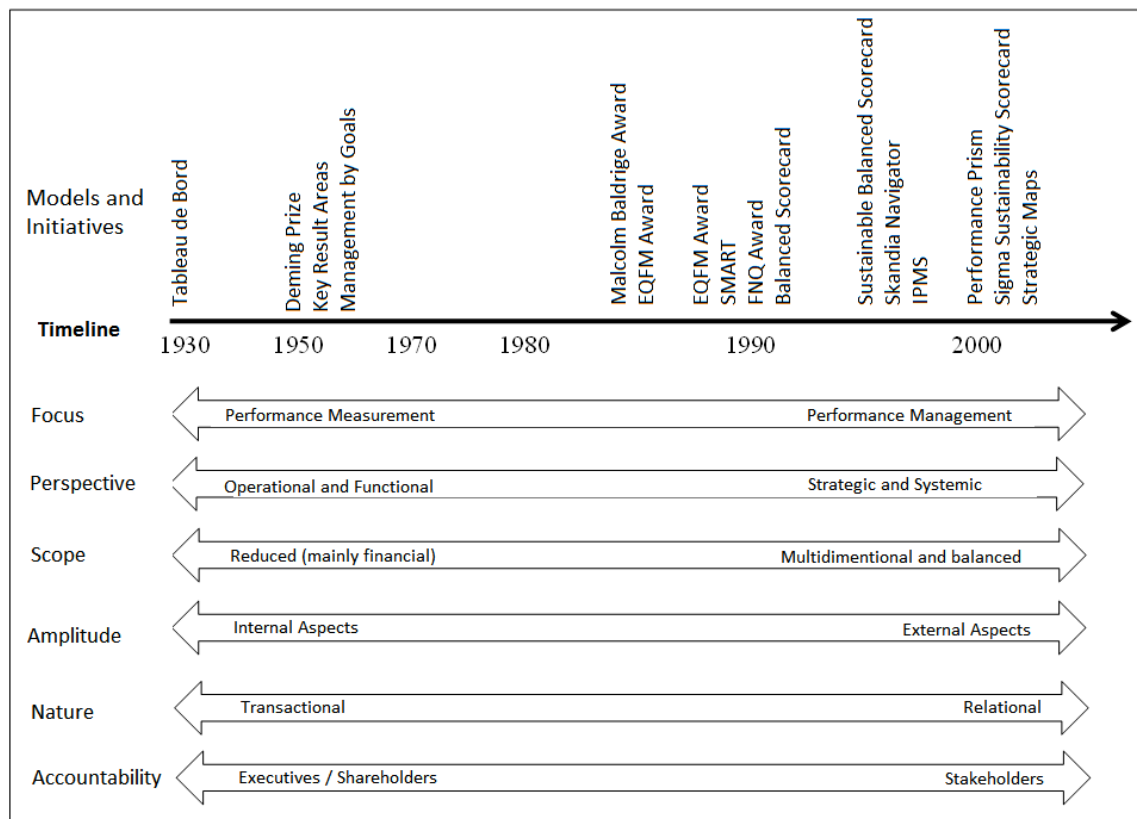
3 Overview of the evolutionary framework

Given the above, it is evident that the knowledge in the area of Organizational Performance Measurement has undergone many influences and interactions with various areas of Management during its evolution, using the concepts from other disciplines when they offered the necessary theoretical backgrounds for the needs found and vice versa. Likewise, the field of study has been recently interacting with some concepts, while some trends were identified:

- the strategic orientation of the models: based on a proposal of simple control and monitoring until it becomes a critical element in the strategic management of organizations (Kaplan and Norton, 1992).
- the multidimensionality of the models: in the attempt to incorporate the complexity of the organizational reality (Bourne *et al.*, 2000).
- the inclusion of external aspects and stakeholders: the widespread understanding that the goal of the organizations is to serve its stakeholders, who may be not only the shareholders of the organization, but also customers, auditors, investors, employees, suppliers, and others (Neely *et al.*, 2000; Neely and Adams, 2001).;
- the performance management as a form of internal management as well as external communication (Simons, 2000) and the institutional legitimacy (Henri, 2009), characterizing a change from transactional to relational nature (Broadbent and Laughlin, 2009).

Figure 1 shows briefly the evolution of the concepts discussed above.

Figure 1
Evolution of Organizational Performance Measurement over time



Source: Elaborated by the authors.

4 Final Considerations

4.1 Academic implications

Several models addressed by researchers on the evaluation of organizational performance indicated as aspects responsible for the variation of performance of companies the existence of exogenous variables to their models, justifying these changes through inexorable and intractable variables that restricted and pressured this evaluation (Meindl & Ehrlich, 1987). That is, understanding the contextual nature of the models in management is critical for models to be developed in the academic environment and be incorporated into the organizations, and vice and versa.

The challenge of the field of study is no longer the mere development of models and indicators, but rather facilitating the management of information that these models generate. Thus, there is a clear demand for performance measurement models that meet the new organizational needs, given the increasing complexity. However, much of the general models, such as those covered in this paper, is facing difficulties in their process of implementation in the organizations within the particularities of each economic sector, because the activity should cover specific problems of each type of organization, as recommended in the literature (D'Souza and Williams, 2000).

4.2 Practical Implications

Attention should be given to a critical issue from the manager's standpoint: the effectiveness of the process; in other words, the models should be seen as tools that can help them translate their complex reality into a strategic management tool. Without that, the discussions will be innocuous from the practical standpoint.

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EXTENDED ENTERPRISE PERFORMANCE MANAGEMENT

A VALUE CO-CREATION PERSPECTIVE

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Extended enterprise performance management: a value co-creation perspective

Abstract

The allegiance of partnering organisations and their employees to an Extended Enterprise performance is its proverbial *sword of Damocles*. Literature on Extended Enterprises focuses on collaboration, inter-organisational integration and learning to avoid diminishing or missing allegiance becoming an issue. In this paper we will argue that interrelating the marketing literature on the Service Logic with the performance management literature on Extended Enterprises will provide a new perspective on how to deal with this issue. Simultaneously flexible co-created performance indicators play a key role in enhancing this perspective.

Keywords: extended enterprise, value-creation, value co-creation, collaboration and improvement processes, flexible co-created performance indicators

Design/methodology/approach

This paper is of conceptual nature and builds upon recent development on performance management and measurement of extended enterprises. By adopting an perspective of value co-creation it goes beyond the production focus of previous frameworks and deliberately addresses the collaboration and improvement processes of an extended enterprise.

Findings

The theoretical perspective of value co-creation on extended enterprise performance management literature addresses the hitherto missing need for a service logic among the partnering organisations as an important aspect in the management of Extended Enterprises. Addressing the performance measurement of extended enterprises from a value co-creation perspective reveals there is a need for flexible co-created indicators and that value co-creation is applicable beyond dyadic relations.

Originality

For a scholarly and practical audience the paper provides an understanding of the significance of the discerned value co-creation processes and the related need for flexible co-created performance indicators for the performance of an extended enterprise.

Paper type: Conceptual paper

1 Introduction

In an extended enterprise (EE) various actors, both suppliers and customers, focus on maximising the value of their overall supply-chain output. They do this through collaboration, inter-organisational integration, decentralisation and the exchange of knowledge to learn how to maximise their supply-chain output for the benefit of their customer. (O'Neill and Sackett, 1994, Bititci et al., 2005, Braziotis and Tannock, 2011). In performance management literature the coming into being of an EE is frequently seen as an organic process of moving from sharing information to co-ordination and collaboration (Braziotis and Tannock, 2011) (Estampe et al., 2013). With this the relation between the partnering organisations moves from inter-organisational contact to trust-based collaboration. Simultaneously the focus on the organisations' own organisational objectives and output becomes

aligned with the EE's overall objective and outputs. Therefore the biggest threat to an EE's performance is considered to be the allegiance of the partnering organisations to their own organisation. Not surprisingly, performance management and measurement literature on the extended enterprise focusses on collaboration factors, the interlinking intra-and inter-organisational performance measurement and learning. However, what is missing in this literature is the organisational logic that contributes to the focus of the partnering organisations on an EE's objectives and output. In this paper we suggest that the marketing stream of literature on the Service Logic can fill this missing link. From a Service Logic perspective it is argued that the focus of supplying organisations should be on the value creation of the customer, to enable value co-creation between customer and supplier. We argue that it is this value co-creation perspective that can enhance our understanding of the performance of the extended enterprise and that the co-creation of flexible performance indicators among the partners can contribute to the performance measurement of the extend enterprise.

In the following section we will shortly elaborate on extended enterprise performance management and introduce the *Extended Enterprise Performance Management Model* of Bititci et al. (2005), after which we will introduce the concept of value co-creation . Then we will relate the concept of value co-creation to performance management and measurement of an EE and introduce our Extended Enterprise measurement framework from a value co-creation perspective. We finish with a short discussion conclusions .

2 Extended Enterprise performance management: the essence

An EE is a special kind of supply chain that integrates the related processes of both supplying and customer organisations in maximizing the value of the supply chain's output for the customer(s). (O'Neill and Sackett, 1994, Bititci et al., 2005, Braziotis and Tannock, 2011). Bititci et al. (2005, p.25) developed the Extended Enterprise Performance Measurement Model (EEPMM) to capture this interrelatedness. The EEPMM (fig 1) is a generic framework that provides the necessary information for managing an EE's performance. The EEPMM describes the overall objectives and scorecards, hereafter performance indicators, of the strategic level of the partnering organisations separately. Subsequently the objectives and performance indicators of the interrelated organisational sub-units are linked and transformed into strategic objectives and performance indicators at the EE-level, path 2 in the EEPMM. The strategic objectives of the EE are translated in the EE business process and then to the sub process, path 3. Each enterprise of course also has its own strategic objectives and will translate these to their own business units and processes, path 1.

The EEPMM reveals the complex structure of the EE's performance management and measurement. The EEPMM underpins the importance of inter-organisational relationships involving matters like joint planning, implementation, monitoring and evaluation in order to revise the joint strategy when and where necessary. Therefore the challenge of an EE is a management challenge. The more so because conventional organisational hierarchy can neither control, nor lead the performance of an EE. (O'Neill and Sackett, 1994, Post et al., 2002, Braziotis and Tannock, 2011). Instead of top management taking decisions regarding performance, decisions are taken throughout the EE in multi-organisational teams. The efficiency and effectiveness of these teams depend on the social skills of the involved, the fit between the interrelated processes and the allegiance to the purpose of the EE. (O'Neill and Sackett, 1994, Jordan and Lowe, 2004). According to O'Neill and Sackett (1994, p. 44) the performance of an EE therefore needs:

“... a common standard of ‘meaning’ to enhance the sharing of information between people, rather than organisations...”(ibid., p.44).

A standard-of-meaning that is understood in a syntactic, semantic and practical manner (Carlile, 2004) enabling not only the mutual knowledge exchange on ‘how to balance the interrelated supply chain output-processes’, but also the joint learning on ‘how to improve on and account for it’; both from the intra- and inter-organisational perspective. In an EE-setting this standard-of-meaning thus has to be steered from an organisational logic that counteracts the opportunistic behaviour of individual partners and strengthens the collaborative effort. This requires a change from the *Goods-Dominant Logic* to a *Service Logic* to enable *value co-creation*.

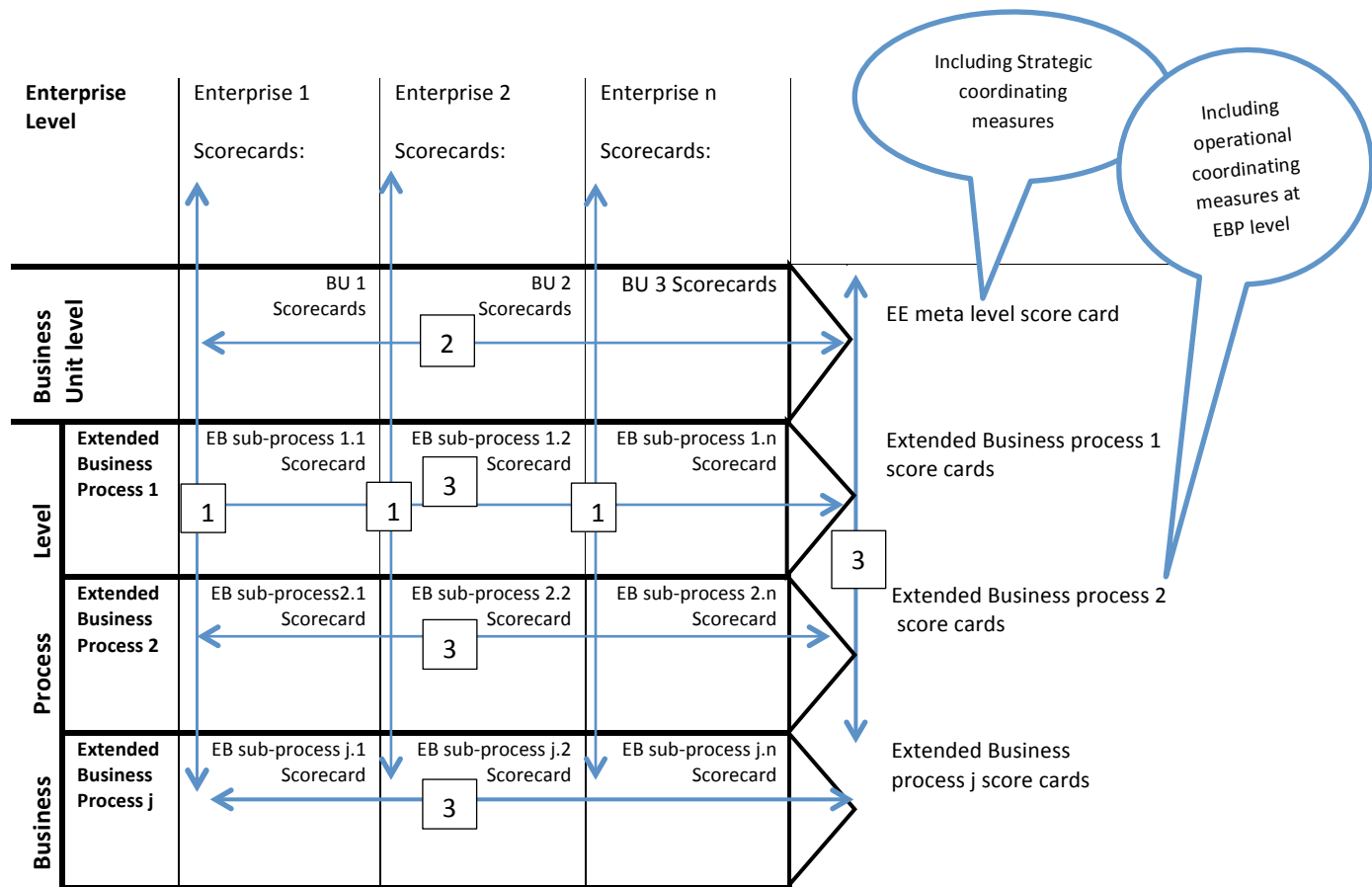


Figure 1: The extended enterprise performance measurement model after Bititci et al. (2005, p.23)

3 Value co-creation: the missing link

Since Adam Smith’s *Wealth of Nations* in 1776, value increasingly became synonymous to the exchange of a supplier’s product for customer money. This growing importance of exchange-value officially condoned a single-mindedness on the own organisation without necessarily taking customers and society into account. Vargo and Lusch (2008) call this organisational logic that focusses on exchange-value, the *Goods Dominant Logic* (GD-logic). To organisations reasoning from this logic, inter-organisational relationships or collaboration with suppliers, customers let alone competitors is at best an additional task and at worst a compulsion. While collaborating the allegiance of these organisations’ representatives is with their organisation. A situation which in the worst case may lead to opportunistic behaviour, a deadly ingredient for collaboration. (Jordan and

Lowe, 2004). This focus on exchange-value is still prevalent, though changing due to environmental concerns, increasing customer knowledge and demands, and ever more complex technologies that transcend the capacity of stand-alone hierarchical organisations. Consequently in the organisational landscape inter-organisational and collaborative relationships like EEs become more and more important. (Bititci et al., 2012), requiring organisations to apply a *Service logic*.

In contrast to the GD-logic, organisations using a *service logic* reason that value is experienced by those perceiving it, which makes the customer the value creator (Vargo and Lusch, 2008) (Grönroos, 2008). Consequently the product or service of all product producing or service delivering organisations should be *valuable 'in use'* (Ng et al., 2010), i.e. the customer uses the provided product/service to improve its life or business. In contrast to the GD-logic this logic is called *Service Dominant Logic* by Vargo and Lusch (2008). Grönroos (2008, p. 300) argues that the term *Service Logic* would be more appropriate, because

“Adopting a service-centred perspective is not a matter of adding weight to the service aspect of a logic in order to become service-dominant. Rather, it is a new logic in itself.” (ibid., p.300)

To us dealing with value from a phenomenological perspective indeed is a new logic, that goes beyond a supplier giving attention to the customer. Instead the customer's value creation process is the starting point, to which the supplier's service or product delivery is tailored. Therefore we choose to use the term Service Logic too. A new logic that is slowly gaining ground, e.g. customers not buying an engine, but paying for the trouble-free, enduring use of the engine. (Ng et al., 2009).

The customer being the value-creator' (Grönroos, 2008, Grönroos, 2011, Vargo and Lusch, 2008, Ng et al., 2010) infers that the supplier is a provider of potential value. Since the customer realises the supplier's outcome, the supplier needs to understand the value creation process of the customer, which makes direct interaction with the customer vital. (Payne et al., 2007). The more so when the interaction with the supplier is initiated by the customer, because this may lead to value co-creation. (Grönroos, 2011).

From a service logic perspective value co-creation does not concern a supplier requesting customers advice on how to improve its product or service. In this case the customer is used as a resource to improve the exchange value of the supplier and a case of 'old wine in new bottles'. Value co-creation may occur when a customer invites a supplier to assist in improving their value creation process. (Grönroos, 2011). A supplier may start such a process, but seen the prevalence of the goods dominant logic the chances are high that the initial value creation focus will change into an exchange-value focus. Grönroos and Voima (2013) claim therefore that value co-creation is only possible in the joint sphere where the value creation process of the customer is connected to the output-process of the supplier through direct interaction. It is in this joint sphere where learning about the value creation process and the contributing supplier output processes takes place and the necessary information for their improvement is obtained.

The essence of a well-functioning EE therefore is its ability to develop a standard-of –meaning that is based on the value-creation processes of its customers and geared towards value co-creation.

4 The performance management and measurement of an EE from a value co-creation perspective

Creating a standard-of-meaning that leads to value creation needs a relationship that enhances mutual knowledge and understanding of the involved parties in their intra- and inter-organisational situation. This goes beyond the present prevalent practice of dyadic relationships (organisation-supplier, organisation-employees, organisation-customers), and deals with multi-actor relationships (Post et al., 2002). The predicaments and possibilities of the different organisations in relation to the value creation process have to be mutually known, because only this leads to a realistic standard-of-meaning enhancing this process. In addition, this mutual understanding is the ingredient needed to take up joint action on future intra- and inter-organisational performance.(Reams, 2010). Hence, collaboration is key for an EE. Braziotis and Tannock (2011) suggest that beyond the contractual factors related to the formal strategy (the who, what and where), the performance changing difference of the EE is caused by the *enabling collaboration factors* related to the “how” (like training of multi-organisational teams, operational methods for the EE etc.) and *enhancing collaboration factors* related to the “when” (the intensity of the collaboration). The enabling and enhancing collaboration factors can contribute to a standard-of-meaning among the EE-partners that goes beyond simply copying patterns of thought and related actions from the past. For example, the training and subsequent implementation of an operational method how to deal with an unplanned interruption in interrelated sub-processes can enhance the internalisation of the standard-of-meaning of the EE among those trained.

Jointly developed performance indicators that capture standard-of-meaning of an EE are necessary to further instil and improve it. For example the why of ‘conflicts of allegiance’ can be used to come to a standard-of-meaning about what collaboration entails. Based on this standard a joint performance indicator on collaboration can be created that is useful for the intra- and inter-organisational level, e.g. the number of hierarchical escalated conflict-resolution meetings. At the same time information derived from this co-created performance indicator may contribute to the standard-of-meaning on the value-creating collaboration within the EE. These co-created performance indicators thus are based on and contribute to an EE’s standard-of-meaning. As such they contribute to both individual and interactive learning, which is needed for innovative intra- and inter-organisational change. Co-created performance indicators are especially important for the standard-of-meaning of an EE, because:

- the context in which an EE operates may differ per organisational region, e.g. different constellation of partnering organisations.
- the constellation of an EE may change during time, due to changing supplying and customer organisations.
- the individual and interactive learning per differing context may lead to an improvement in performance that needs readjusted or new performance indicators.

Given these reasons, flexibility of an EE’s performance indicators is an important characteristic too, to create a best fit for these changing contexts.

The EE’s necessity for flexible co-created indicators is in contrast to the present practice of translating an organisation’s strategic strategy throughout the organisation by means of financial and technical measures. This practice and the use of only these indicators is more and more criticised, because of their enhancement of delivering what is being measured. The enhancement of this

attitude has a negative influence on individual and interactive reflective learning needed to cope with changing circumstances. (Antonsen, 2014).

As underpinned before the EE's standard-of-meaning depends on learning. In addition, the EE's future performance depends on learning from and improving the collaboration and the value creation and output processes too. Hence, steering this learning and improvement process is also vital for an EE and will need performance indicators too. The value creation and related output process, in addition to the collaboration and learning and improvement processes, therefore form the core processes of an EE.

5 Extended Enterprise: a value co-creation framework

Managing the core processes of an EE at strategic, tactical and operational management level is an intra- and inter-organisational responsibility. Based on Bititci et al. (2005, p. 23) Extended Enterprise Performance Measurement Model (EEPMM) we developed a framework for the performance measurement of an EE from the perspective of value co-creation. In this framework the organisation specific strategic objectives and performance indicators are their own prerogative. Subsequently the objectives and performance indicators of the organisational sub-units that are interlinked are transformed into strategic objectives and performance indicators at the EE-level. At this level the EE-strategy and the overall planning and implementation process are monitored, evaluated and revised, when required.

The EEs strategic objectives are translated into interrelated sub-unit output and value creation processes, the needed collaboration and learning and improvement processes and their performance indicators. With regards to the performance indicators of the output and value creation processes of the existing organisational sub-unit performance indicators will be checked and used when applicable. In case the performance indicators are not fit for the purpose of steering and learning from the performance of these processes, relevant performance indicators for both the intra- and inter-organisational situation will be sought in addition to the objectives and performance indicators on the core processes.

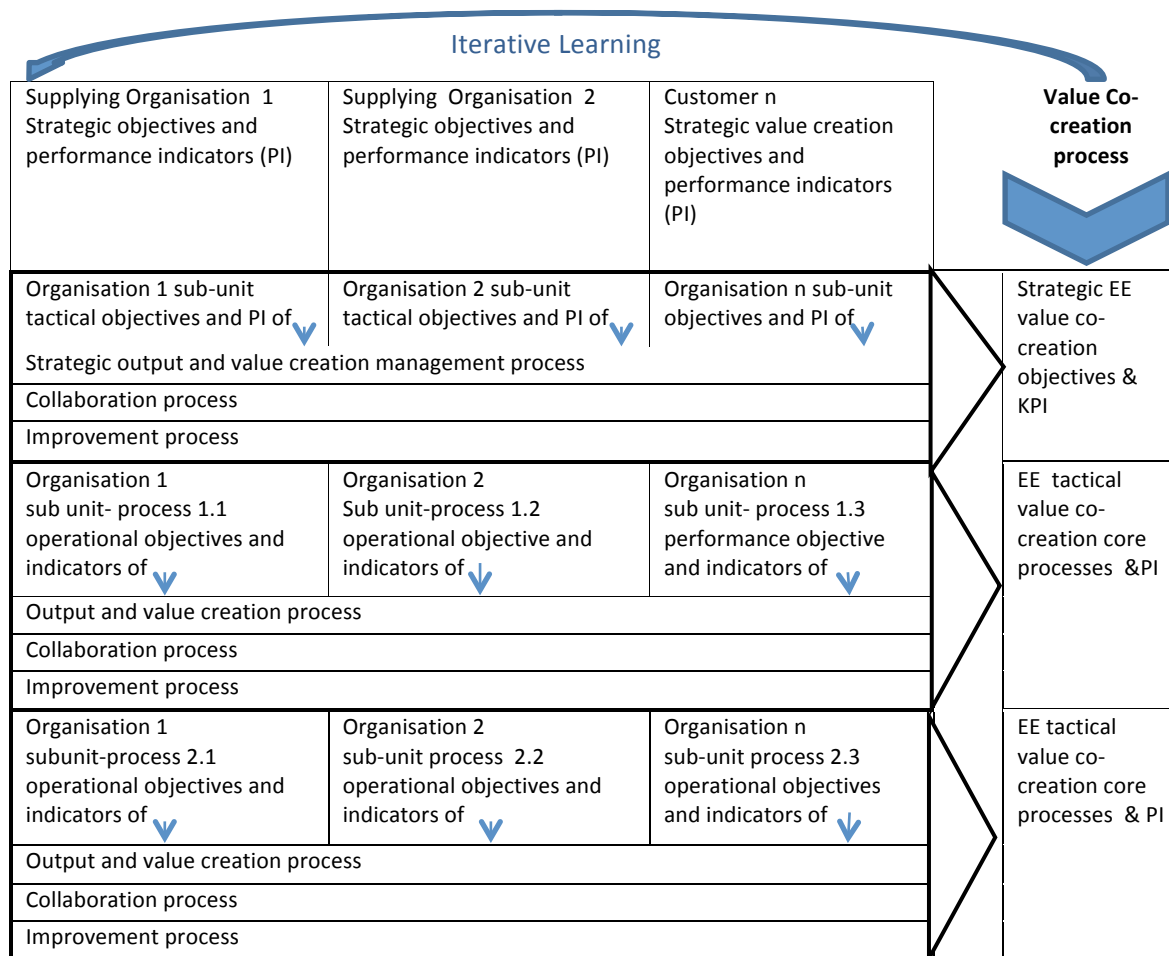


Figure 2 Extended Enterprise measurement framework from a value co-creation perspective

Discussion and Conclusions

The value co-creation perspective on an extended enterprise framework stresses the need for a service logic among the partners. In doing so it uncovers the goods-dominant logic practice that needs to be addressed by the collaborating partners to enhance the performance of EEs. These joint lessons can strengthen the standard-of-meaning within the EE and be transferred to improvements by making use of enabling collaboration factors (like a training on an operational method, or the delegation of a responsibility to a joint EE-team at operational level). The intended improvement of these collaborative factors can be captured in flexible co-created performance indicators to obtain information about how to increase collaborative and counteract opportunistic behaviour. Hence, the discerned core-processes are crucial to obtain value co-creation, and an optimal performance of the EE.

In Marketing literature the Service Logic and consequently value co-creation concerns dyadic relations between customer and supplier. Value co-creation is the joint sphere where the supplier actively contributes to the value creation process of the customer and learns how to improve its output process in return. The EE measurement framework from a value co-creation perspective

captures this joint process in the horizontal interrelated processes and shows the continued independent value-creation in the vertical separate organisation lines. In the framework it is shown that the service logic's value co-creation is well applicable to extended enterprises and clearly goes beyond dyadic relationships.

However, the practical applicability of this framework relies on the willingness of the concerned organisations to share inside information, which needs a thorough explorative research in co-operation with the concerned to detect the key improvement issue within the core processes of their EE and to co-create performance indicators for them. In the next phase of the research we will investigate this in two different regional railway-infrastructure management regions of an Extended Enterprise on railway infrastructure performance in the Netherlands.

Acknowledgements

This research is part of the Explorail Research Programme, funded by NWO -the Netherland's organisation for scientific research- and ProRail, the Railway Infrastructure managing organisation of the Netherlands.

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0084

INTEGRATION OF SUSTAINABLE DEVELOPMENT GOALS (SDG) IN MEASURES FOR SUSTAINABILITY PERFORMANCE IN CORPORATE VALUE CHAINS REPORTED TO MULTI- STAKEHOLDER STANDARDS

THOMAS KJÆRGAARD

Title:

**Integration of Sustainable Development Goals (SDG)
in Measures for Sustainability Performance
in Corporate Value Chains
reported to Multi-stakeholder Standards**

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Sustainable Development Goals, Sustainability Performance, Corporate Value Chains, UN Global Compact, Global Reporting Initiative, Collaborative Governance

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

In recent years corporate reporting on sustainability has become more performance-focused as has the most adopted multi-stakeholder standards for reporting like the Global Reporting Initiative (GRI) and the UN Global Compact (UNGC). However, despite these advances neither of these standards seem to be on par with the advancement of sustainability performance frameworks and models in the literature. The GRI is a leading capacity in the ongoing work on integrative reporting aiming to develop standards using measures that are more material to the corporation's strategy, practice and performance. The UNGC on the other hand is a leading capacity in stimulating corporate engagement in sustainable development; latest exemplified by the inclusion of corporations in the global consultation process towards new Sustainable Development Goals (SDG). Alignment between these measures and goals is essential for progress on either, but although the GRI and the UNGC recognize this and their complementarity, the extent of their collaborative governance is very limited.

A key purpose of this paper is to illustrate the potential for collaborative governance between the GRI and UNGC standards in the context of corporate value chains. A It is also a key purpose to demonstrate how the potential can be reaped and support both corporate performance and sustainable development through the design of dynamic reporting standards and innovative governance mechanisms.

Design/methodology/approach (mandatory):

The findings of a series of interconnected empirical studies are discussed and cases are presented; leading to a conceptualization of collaborative governance in this context and perspectives for future research.

Findings (mandatory):

Both GRI and UNGC measures respectively inform on corporate sustainability performance, but the value is synergistically greater when the two different measures are combined and viewed over more years of reporting. However, both standards lack in maturity when it comes to measures for sustainability performance in corporate value chains, as is the literature hereon. The referenced studies address these shortcomings and demonstrate how studies applying relevant organizational theory can drive the development of measures, which are not only material to the corporations, but also integrates the goals for sustainable development.

Research limitations/implications (if applicable):

This research implicates that future research on these topics should be more cross-diciplinary and not only of a re-active nature, but study phenomenon with multiple lenses aimed at proactively contributing the further development of e.g.

<p>the standards. An obvious limitation concern the generalizability of the finding across corporations, industries, countries etc.</p>
<p>Practical implications (if applicable):</p>
<p>The practical implications could be profound if the findings could serve as inspiration to the GRI's and UNGC's further development of collaborative governance. Also corporations could adopt the approach and develop more performance streamlined reports, which could increase transparency for stakeholders and leverage a stronger engagement with them.</p>
<p>Social implications (if applicable):</p>
<p>The social implications can be significant in the longer perspective if the approach demonstrated is adopted by multiple proactive researchers, which then contribute to the alignment of sustainable development goals with measures for corporate sustainability performance.</p>
<p>Originality/value (mandatory):</p>
<p>Most research on collaborative governance is conceptual and reactive, whereas this paper is based on strong empirical studies aimed at contributing proactively to practice. And to the knowledge of this researcher no previous paper deals with the integration of sustainable developments goals into sustainability performance measures.</p>

0085

PERFORMANCE MEASUREMENT SYSTEMS AND ORGANISATIONAL PERFORMANCE

LITERATURE REVIEW

MAGDALENA PARTAC, LESTER LLOYD-REASON, FRANCIS GREENE

Title: (No more than eight words in length)

Performance Measurement Systems and Organisational Performance: literature review

Keywords: (Provide not more than 10 keywords, which encapsulate the principal topics of the paper)

Performance measurement systems, performance management, performance results

Abstract: (Your abstract must use Normal style and be between 300 and 1000 words. Do not enter author details)

Purpose (mandatory):

This paper aims to review the literature on the effects of performance measurement systems (PMS) on organizational performance. There is a considerable amount of literature dedicated to the development and implementation of PMS, but there is a lack of consensus concerning the effects of PMS on organizational performance. Present research aims to systematize existing knowledge on the effects of PMS on organizational performance in order to build the foundation for future research.

Design/methodology/approach (mandatory):

The paper explores the literature based on Tranfield's (2003) methodology for developing evidence-informed management knowledge. A literature review was conducted focusing on empirical papers (published between 1980-2013) that analyse the link between PMS use and organisational performance.

Findings (mandatory):

Results show that different researchers and organisations have different views on the purpose of the PMS. These distinctions influence the way PMS are implemented and used. As a consequence, the effects of PMS vary significantly between organisations. Moreover, the size of the companies is an important factor that affects the effectiveness of PMS. Larger companies seem to benefit more from the implementation of PMS while SMEs report no significant results. The measures used to gauge the PMS effects also differ across studies. The most common measures are perceived performance and system satisfaction. Most studies report improved perceived performance. The results of studies looking at the effect on financial performance are mixed.

Research limitations/implications (if applicable):

Write here...

Practical implications (if applicable):

Write here...

Social implications (if applicable):

Write here...

Originality/value (mandatory):

Through a literature review, this study analyses the effects of PMS use, factors that influence the implementation of a PMS and the various measures used to assess PMS effectiveness. Considering the vast amount of literature and the lack of consensus, it is important to systemize existing knowledge and identify avenues for further research.

0090

SUSTAINABILITY ASSESSMENT VS BUILDING PERFORMANCE

An Innovative Review

FODIL FADLI

Sustainability Assessment Vs Building Performance; An Innovative Review

Fodil Fadli, Assistant Professor of Architecture & Urbanism
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Fodil Fadli is an Assistant Professor of Architecture & Urbanism at DAUP, Qatar University. He previously worked as a Senior Architect in design practices in Algiers, Tunis, Paris and Leeds. He did his PhD in Sustainable Modeling and Assessment in Architecture & Urban Design in the UK. He was an academic at Huddersfield University, Landmark Leeds, Ulster University and the University of Liverpool. Dr. Fadli research spans (but is not limited) sustainability assessment and modeling, the use of BIM for sustainable design, safe built environment, safeguarding vulnerable historic structures, conservation...

ABSTRACT

PURPOSE: For more than two decades, the concept of sustainable development (SD) in general and sustainability (S) in particular has remained the subject of intense debate. Furthermore, existing sustainability assessment tools such as BREEAM and LEED are mainly proposed for assessing the sustainability in America and Europe. Recently, tools and frameworks have been developed to become sustainability assessment models for the MENA region and Gulf countries, such as the city of Doha in Qatar. In the face of its rapid economic development, population growth and construction boom, there are issues related to the impact of such development on the socio-environmental components of Doha, especially with the upcoming 2022 FIFA world cup. The paper aims at elaborating an innovative review of existing major international and regional Sustainability Assessment Tools (SATs) through a SWOT analysis and their test through the eco-villa pilot study. This innovative review aims to develop guidance protocol to enhance sustainability assessment tools to encompass holistic building performances involving the 3 dimensions of sustainability.

APPROACH: The study develops an initial stage based on a theoretical framework reviewing major existing SATs worldwide and regionally in the MENA region. The core of the study will be double staged; firstly, a set of parameters is identified in order to conduct a rigorous SWOT analysis of 4 major SATs: BREEAM (UK), LEED (US), Estidama (UAE) and GSAS/QSAS (Qatar). Secondly, applications will be conducted to deliver the practical side of SATs and relate to building performance strategies adopted by each mode. This latter part uses initial results obtained in the test of GORD Eco-Villa pilot study.

FINDINGS: Results obtained through the study will identify major issues and points related to the SATs process and its relation to Building Performance Evaluation (BPE) procedures in the built environment.

PRACTICAL & SOCIAL IMPLICATIONS: The study aims at delivering guidelines in using SATs in the built environment encompassing holistic building performance evaluation and involving the 3 major dimensions of sustainability Socio-cultural, economic and environmental (inc. technological). This innovative review is holistic and adaptive to the built environment BE. However, despite its current limitations BE only, further expansions to other fields of applications can be sought in other areas.

ORIGINALITY: The review of SATs VS BPE is innovative as it bridges the gap between the practical and theoretical aspects of sustainability assessment and building performance evaluation from the centered end-user approach. It involves both qualitative (perceptual and behavioral) and quantitative (physical measurements) data analysis and synthesis. The outcomes of the study will be beneficial for researcher and academics in all fields of performance evaluation and its co-relation to innovative sustainability measures.

KEYWORDS & PHRASES: Sustainability, Assessment, Building Performance, Tools, Impact Analysis, Innovative Design

Introduction:

There are as many definitions of sustainability and sustainable development as there are individuals and interest groups trying to define the term. All the definitions however, share a common concern for: i. Living within the limits, ii. Understanding the interconnections between economy, society, and environment, and iii. Equitable distribution of resources and opportunities. The debate regarding the appropriate definition of Sustainability as a concept is still evolving, often with competing and sometimes contradictory interpretations. Sustainability refers to systems which ‘continue’ or ‘endure’ or ‘are maintained’. Sustainability branches into three major inter-linked dimensions forming the ‘triple bottom line’; environment, economic, and social sustainability (King Sturge, 2009). The complexity and interdependencies of these elements is not yet well understood.

Understanding sustainability

Why is there so much diversity in viewpoint regarding the meaning of sustainability? After all, Brundtland report definition of sustainable development appears to be a reasonable stance (WCED, 1987). Some of the fundamental reasons for this are illustrated in Figure 1, where sustainability is represented by a change in a property referred to as ‘system quality’. A term opened to various sort of value judgments. Sustainability equates to a situation where, quality remains the same or increases (Fig. 1- case a:1-2); or when quality declines (Fig.1- case a-3), then the system can be regarded as unsustainable. This may at first sight be clear, but there are numerous problems that arise even in this simple graph (Costanza, 2010, Edwards, 2009; Fadli, 2013).

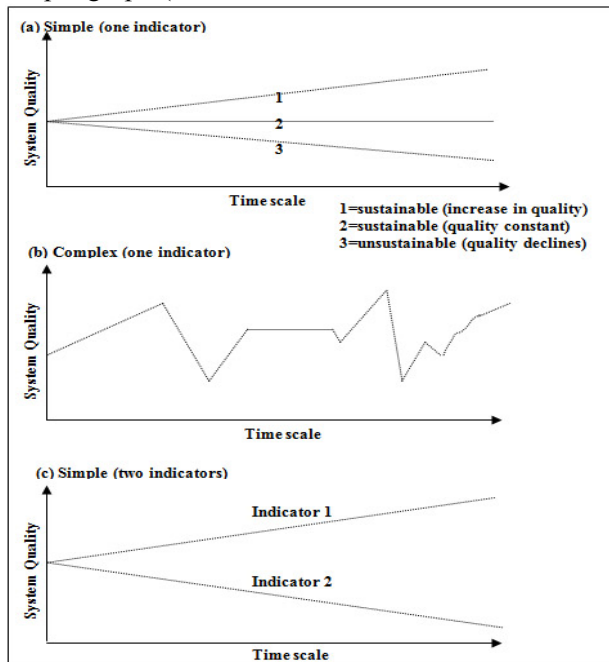


Figure1. *System quality and sustainability* - adapted from Bell & Morse (2008) and Costanza, (2010)

Assessing sustainability in the built environment

Earlier views of “sustainability” and “system quality” focused on the natural resource (the original field of sustainability is agriculture and biological/natural sciences), with emphasis on physical entities such as water and air quality, biodiversity, soil erosions...and so on. Measuring these over particular spatial and time scales may be difficult and therefore, interpreting the results is open to debate. But, at least one is dealing with measurable indicators, and ‘system quality’ may be expressed in a manner, which is a composite of these indicators (Bell & Morse, 2008; Brandon & Lombardi, 2011). In other words, sustainability applied in architecture brings the three dimensions of environmental, social and economic. This new paradigm into architectural thinking lays the basis of a new reinvigorated architecture for the new millennium.



Fig 2. Sustainable Built Environment, a three-legged holistic system (Fadli, 2007, adapted from various)

In 1981, Malcolm Wells in his book “Gentle Architecture” suggested a matrix, which appears to be the first attempt to use indicators to help achieve sustainability. It was first published in *Progressive Architecture*, in June 1974 (Wells, 1974). Although, Wells’ matrix was invaluable, it was still far from comprehensive. It did not either elaborate real complexity or recognize value shifts and differences in the sustainable design process. In 1990, Kroner has further developed the matrix with categories and sub-categories, while Salem enlarged it by adding a priority tab. It was further refined during the last decade but remained limited to environmental factors mainly (Fadli, 2007). Assessments of sustainability can help inform the societal discussion and influence the environmental governance towards the main objectives of sustainability. The effectiveness of an assessment system in this regards requires that it matches up well against a number of requirements, in such a way that it can be seen to be: *i. Hopeful, ii. Holistic; iii. Protective, iv. Harmonious, v. Participatory, vi. Habit forming* (Author adapted from: Hardi & Zdan- BelaggioSTAMP, 2009; Brandon & Lombardi, 2011).

Scope, aim and approach of the study

This study aims to investigate and review the viability, practicability and efficiency of the Global/Qatar Sustainability Assessment System (GSAS/QSAS). The research question to be addressed is how fit and adequate is QSAS in its local, regional and international context?

Based on recent research work conducted by the author and funded by the Qatar National Research Funds (QNRF) under the Undergraduate Research Experience Program (UREP); this study develops an initial stage based on a theoretical framework reviewing major existing SATs worldwide and regionally in the MENA region. The core of the study will be double staged; firstly, a set of parameters is identified in order to conduct a rigorous SWOT analysis of 4 major SATs: BREEAM (UK), LEED (US), Estidama (UAE) and GSAS (Qatar). Secondly, applications will be conducted to deliver the practical side of SATs and relate to building performance strategies adopted by each mode.

Sustainability Assessment Tools (SAT) are systems which examine the performance or expected performance of a ‘whole building or development’ and translate that examination into overall assessment (Fowler and Rauch, 2006). Building upon a thorough review of sustainability assessment systems worldwide, the study develops an analytical evaluation of the selected assessment systems. The collected data was publicly available on the internet, conference proceedings, journal articles, and most importantly systems manuals and protocols of usage. Furthermore, the study also used primary data collected through informal interviews with the developers and innovators of the reviewed tool; GSAS. The innovative review is categorized in adequacy with a frame of characteristics where possible, describing the types of assessed buildings, system maturity, structure, design and flexibility, phases life cycle, and the form used to present the aggregated global results. The categorization and analysis of the assessment system drew on the published work of previous research in the field, such as the work of Cole, 1998; Brownhill & Rao, 2002; Fadli, 2007; Reed et al., 2009; and Alwaer & Clements-Croome, 2010. The study sets-up guidelines to enhance SATs to help improve the BPE in the built environment.

SUSTAINABILITY ASSESSMENT MODELS (SAMs) IN THE BUILT ENVIRONMENT

International Overview

The recent decades have witnessed a maturing of concern and interest in building performance that is increasingly evidenced in building design. Sustainable or green design is not simply about attaining higher environmental performance standards or investing in new values; it is also about rethinking design ‘intelligence’ and how it is placed in buildings. During the last two decades, the science of ‘assessing sustainability in the built environment’ has flourished and the number of assessment tools exploded dramatically to reach over 100 tools worldwide (BRE, 2004a). These assessment systems and tools share much in common but also evidence differences of scope, approach, reporting and mitigation measures.

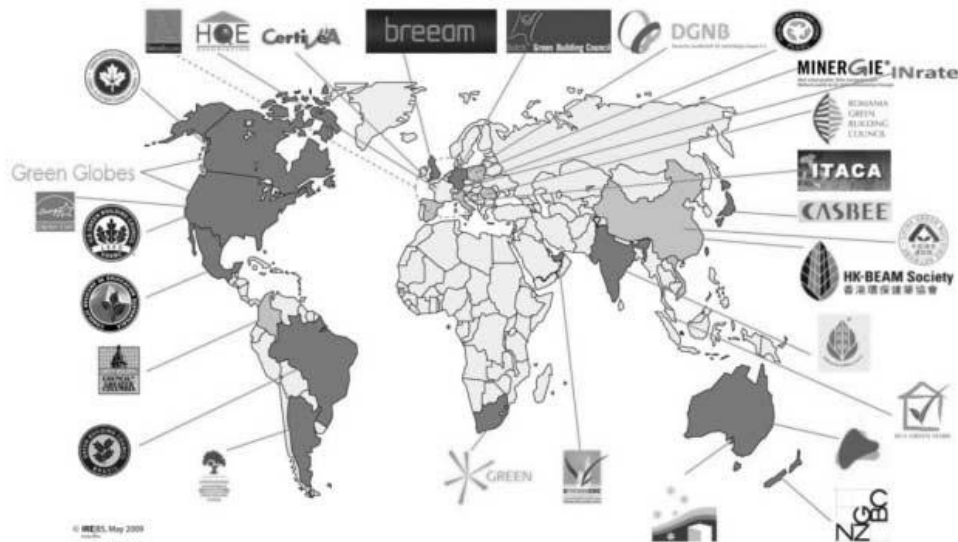


Figure 3: Sustainability assessment tools worldwide (Reed & al., 2009 based on WGBC data)

Worldwide, there are many building evaluation tools that focus mainly on different areas of environmental performance and are designed for different types of projects. Commonly-used tools worldwide are performance and/or predicted performance based systems. Each features a suite of tools developed for different buildings and projects such as residential, commercial, industrial, retail, etc...

Major International SATs

This study notes that the two mainly used building rating systems today are BREEAM (UK) and LEED (US). However, globalization has also introduced a new set of choices for sustainable buildings resulting in a variety of different ratings systems originating in different national markets and with different scopes (Hirigoyen et al. (2008). Despite the fact that the basis of SATs in the built environment started as early as 1974 (Wells' matrix), it is generally accepted that the current era of rating tools commenced in 1990 with the introduction of the BREEAM rating tool in the UK (Cole, 1999, Fadli, 2007). This was followed later by LEED (US) in 1998. Further analysis of figure 4 and table 1 confirms that the evolution of rating systems into different countries and regions is largely based on the pioneering systems of BREEAM and LEED. The British Research Establishment Environmental Assessment Method (BREEAM) is an environmental assessment method and rating system for buildings that addresses wide-ranging environmental and sustainability issues, enabling designers and building managers to demonstrate the environmental credentials of their buildings to clients, planners and other initial parties (BRE, 2008). LEED (Leadership in Energy and Environmental Design) is a green building certification system developed by the USGBC in 1998 and used by 2000. The LEED system is developed through an open, consensus-based process of a balanced and transparent committee structure that ensure scientific consistency and rigor, opportunities for stakeholder comment and review, member ballot of new rating systems, and fair open appeals.

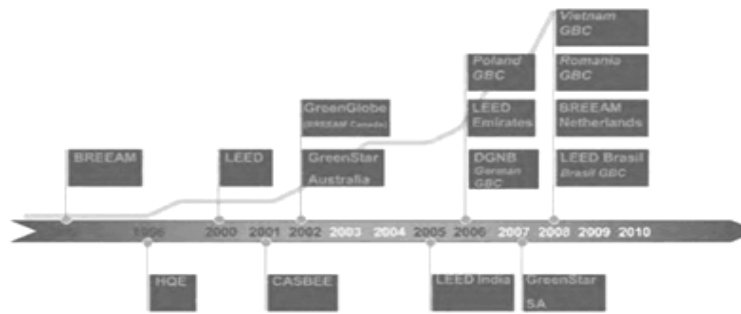


Figure 4: The evolution of Sustainability Assessment Tools since BREEAM in 1990 (adapted from Reed et al., 2009)

Table 1: Rating Systems origins, location and date of development and launch(Author, 2012)

Building Sustainability Assessment Rating System-Development Basis	Country of Origin	Continent	Year of Dev. /Launch-Use
BREEAM (Building Research Establishment's Environmental Assessment Method)	UK	Europe	1990
The German Sustainable Building Certificate (DGNBSea)	Germany		2008
The Haute Qualité Environnementale	France		2004
Innovation and Transparency of the Contracts-Protocol ITACA (Protocollo ITACA)	Italy		2003
PrqomisE	Finland		Apx., 2010
VERDE of GBCe (& BREEAM derivative)	Spain		Apx. 2010
BREEAM NL (Netherlands)	Netherlands		2009
Green Globes™ US	USA		2004
LEED (Leadership in Environmental and Energy Design)	USA	North America	1998
Sustainable Building Challenge (SBC- formally known as Green Building Challenge-GBC)	Canada		1996
AQUA/LEED Brazil (& BREEAM derivative)	Brazil	South America	2009
Consejo Mexicano de Edificación Sustentable	Mexico		2010
Building Environmental Assessment Method (HK-BEAM)	Hong Kong	Asia	1996
Green Building Rating System	South Korea		2004
Green Mark and Construction Quality Assessment System (CONQUAS á)	Singapore		2008
Comprehensive Assessment System for Building Environmental Efficiency (CASBEE)	Japan		2001
GRIHA (Green Rating for Integrated Habitat Assessment) and LEED India	India		2008
GB Evaluation Standard for Green Building	China		2006
Pearls rating system of Estidama	UAE		2008
QSAS (Qatar Sustainability Assessment System)	Qatar	MENA-GCC	2009
ARZ	Lebanon		2008
Egypt Green Pyramid Rating System	Egypt		2009
Idama	Jordan		2009
Green Star SA	South Africa	Africa	2008
NABERS, National Australian Built Environment Rating System	Australia		2005
Green Star	Australia	Australia	2002
Green Star NZ	New Zealand		2005

Frameworks design and variations worldwide

Each assessment tool leads to the rating and/or labeling of the building. LEED uses a scale of platinum, gold, silver, and bronze to indicate a higher or lower rating; whereas BREEAM adopts a scale from pass to excellent. Some regional variation are appropriate; for example, the ongoing drought in Southern US states implies that water economy measures are of high importance locally, whereas in the northern region of the U.K. where higher rainfall is a result of climate change to-date and water economy is not such an important environmental measure in contrast to arid countries. Many of these tools measure sustainability in the built environment have been developed to determine if any capacity exists for further development, or whether a development is sustainable, or whether progress is being made towards sustainable development. ‘Sustainability Indicators’ (SIs) constitute the cornerstone for these tools. They are the measurement means that relate to what can be measured to show trends or sudden changes in a particular condition (BRE, 2004b, Therivel, 2004). The intention with these tools is to benchmark some key sustainability standards and then over time to increase the standards, so while some are weak in certain areas, changes will occur in future. In summary, evidence suggests that built environment professionals

have embraced the SD agenda across many developed countries and are looking to the increased use of assessment tools. As yet, however, we know relatively little about the equivalence of the tools used internationally.

Regional Overview: Building sustainability assessment tools in the MENA region

Globalization and environmental challenges led to the introduction of new rating tools over the past few years in many countries in order to improve the knowledge about the level of sustainability in each country's with its own unique building stock. It can be argued that the individual characteristics of each country; such as the climate and type of building stock necessitate an individual sustainability rating tool for that country and this may very well be the argument that has led to newly developed green building rating systems in the MENA region, including: Estidama's PEARL system in the United Arab Emirates, ARZ in Lebanon, EDAMA in Jordan, the Egyptian Green Pyramid Rating System (EGPRS) in Egypt and Global (previously Qatar) Sustainability Assessment System (GSAS) in Qatar.

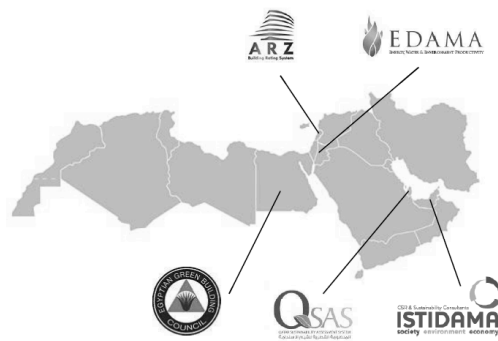


Figure 5: Majors Sustainability Assessment Tools in the MENA and GCC countries

The MENA region (inc. GCC countries) faces a myriad of environmental challenges ranging from local to global pollution problems, water scarcity, degradation of arable land, solid waste problems, and/or illegal or over-harvesting problems due to the lack or slack regulation. Therefore, countries of this vast region have particular needs and realities that must be taken into account in assessment tools development and capacity building. These requirements are being given increasing attention, although the documentation may not be readily available or accessible (El-Fadl & El-Fadl, 2004). These environmental challenges appear to have sparked the creation of Qatar's Sustainability Assessment System (QSAS) as Qatar's green building rating system.

GSAS: a Holistic Performance Evaluation based tool

In line with expected changes in legal, legislative and environmental conditions in Qatar, the Middle East and the rest of the world, GSAS (ex. QSAS) was designed to guarantee greater flexibility when laying down future prospects by seeking a balance between developmental requirements and sustainable objectives. GSAS has been developed by Barwa & Qatari Diar Research Institute (BQDRI) in collaboration with T.C. Chan Center at the University of Pennsylvania, USA between 2007 and 2009.

GSAS provides assessment of different type of buildings during design, construction and operation. The initial form of GSAS (QSAS) was applicable only for three type of building including; school, Residential and commercial building . However, in its current form, it considers Residential, Commercial, Core & Shell, Mosques, Hotels, Light Industries, and School buildings plus Sports for the upcoming FIFA World Cup, and most importantly urban districts and neighbourhoods.

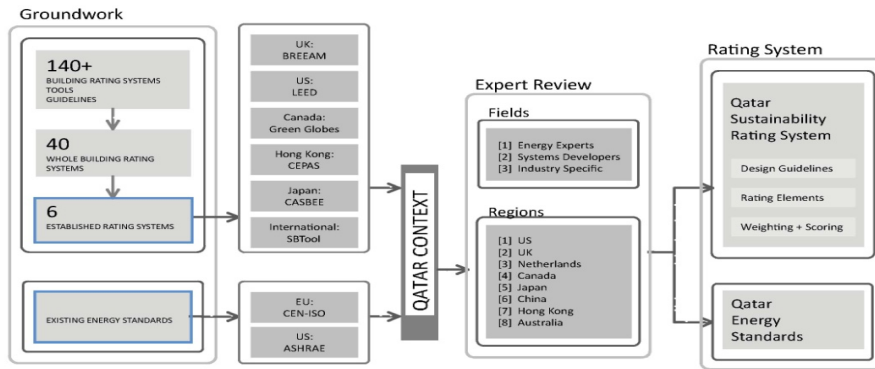


Figure 6: QSAS development process: a schematic diagram (GORD, 2011)

SAT and BPE: Mechanism and process review of GSAS

Looking beyond what could be achieved through the widely know, popular and widespread sustainability ratings systems of LEED or BREEAM, Qatar can be commended in its introduction of QSAS which aims to address Qatar’s individual environmental, social and economic impact areas so that Qatar’s final building products achieve much higher standards than those embedded in LEED and BREEAM rating system. However, and like any other building rating system, QSAS has room for improvement through cyclic upgrades. Other primary QSAS system mechanism process are shown in figures 7, 8 and 9, and are described as...“*all categories, criteria and measurements are defined to be performance-based and quantifiable; a flexible scoring method which has overcome the limitations of other international rating systems; complete control over the development, customization and future modifications or expansion of the QSAS system*” (GORD, 2011a).

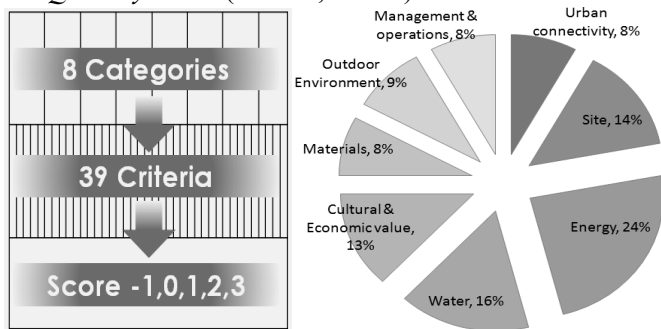


Figure 7: GSAS indicators and criteria summary (GORD, 2011b)

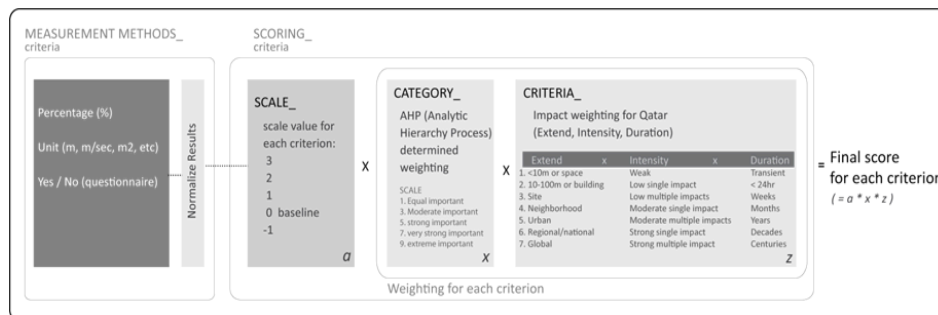


Figure 8: GSAS measurement methods and process (GORD, 2011b)

The assessment mechanism process of QSAS and its rating of buildings follow a systematic process of calculation of the criteria composing a single SI. In its turn the group of selected SIs would provide a

holistic reading of the sustainability level of a building after finalizing all necessary measurements and calculations using the QSAS toolkits provided for this purpose. Despite the fact that QSAS assessment mechanism process is still complex, further developments would provide simpler ways of gathering and synthesizing results obtained through calculations. On the graphic display aspects, GORD is advised to deliver more reflective display systems based on radar diagrams instead of the 2D-bars chart.

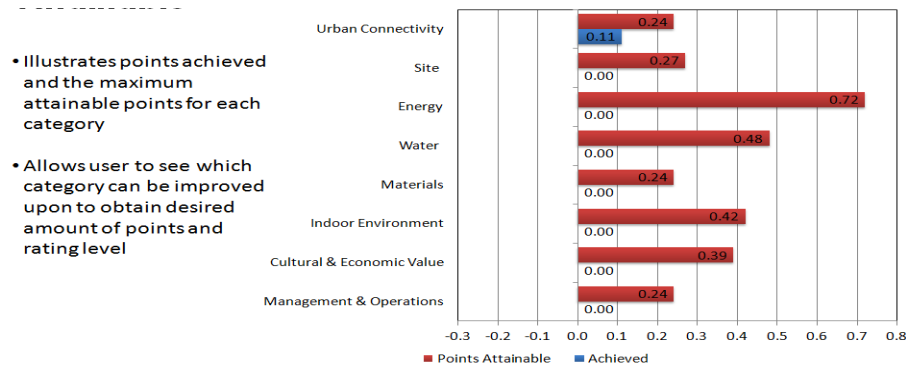


Figure 9 QSAS Building Assessment-Graphical representation of Achieved Vs Attainable points (GORD, 2011b)

“GORD Eco-Villa” Pilot Study, and initial outcomes analysis

The eco villa has been designed to achieve high star rating based on the Global Sustainability Assessment System (GSAS), as it offers a genuinely sustainable, smart and healthy living environment for residents while preserving the Qatari vernacular architect. It is located in the vicinity of the college of North Atlantic (figure 10).

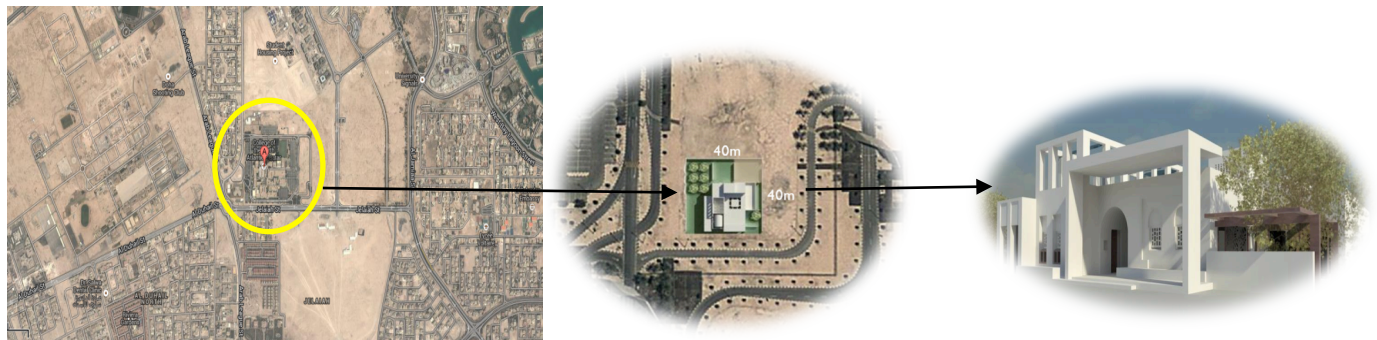


Figure 10 Eco-Villa location map and details (Author et al, 2013)

Space organization and hierarchy:

- The house is organised on the traditional model, around a ‘Hosh’ or ‘Sahan’ courtyard.
- Its ‘Madkhal’ entrance is bold and welcoming, scaled to address the public presence of the house from the highway.
- To either side of the entrance are the male and female Majlis; each taking its place within the public and private hierarchy of the house.
- All main spaces look out onto the garden spaces of the house. To the rear is a service wing with outdoor kitchen and staff quarters.
- This prototype design of the Eco-Villa is capable of being extended to a full upper floor, to become a five to six bedroom house. For the demonstration house however, three bedrooms are accommodated on the ground floor and it has a single ‘roof Majlis’ on the upper floor.

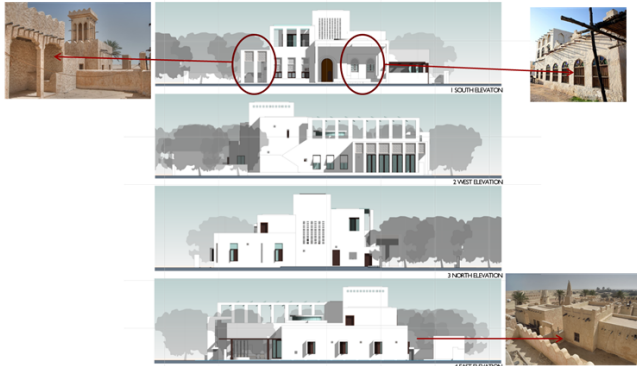
Area	sqm
Ground Floor Area	800sqm
First Floor Area	132sqm
Staircase Area	24sqm
Site	1645sqm

Sample Measurement on the Pilot study

UC.3 Public transportation:

Public Transportation Distance from Site	Quantity (Q)	Weight (W)	Performance Value V = (Q*W)
<= 240m	0	2.75	0.00
240m < X <= 320m	0	2.00	0.00
320m < X <= 400m	0	1.25	0.00
400m < X <= 480m	1	0.75	0.75
Public service is provided from site to transport stop(s)	3	1.00	3.00
Performance Indicator			0.75

Performance Indicator (X)	Score
X < 1.25	0
1.25 < X <= 2.00	1
2.00 < X <= 2.75	2
X > 2.75	3
Targeted Criterion Score	0



No.	Category / Criteria	Points	weight
UC.3	Public transportation (*)	0	3
UC.7	Proximity to Amenities (*)	-1	3
(S) Site		Min	Max
S.4	Vegetation	-1	3
S.13	Shading (I)	-1	3
(E) Energy		Min	Max
(W) Water		Min	Max
W.1	Water consumption (*)	-1	3
(M) Materials		Min	Max
M.1	Regional materials (*)	-1	3
(IE) Indoor Environment		Min	Max
IE.2	Natural ventilation (*)	-1	3
IE.5	Daylight (*)	-1	3
(CE) Cultural & economic value		Min	Max
CE.1	Heritage & cultural identity (*)	-1	3
CE.2	Support of national economy (*)	-1	3

- 1- Dodonaea viscosa
- 2- Phoenix dactylifera
- 3- Washingtonia Filifera
- 4- Leucopodium frutescens
- 5- Conocarpus lancifolius
- 6- Lawsonia inermis
- 7- Morus nigra

Native Vegetation Analysis (b)		
% of Native Vegetation	Score	
0% - 20%	-1	
20% <= X <= 40%	0	
40% <= X <= 60%	1	
60% <= X <= 75%	2	
X >= 75%	3	
Score (b)		3

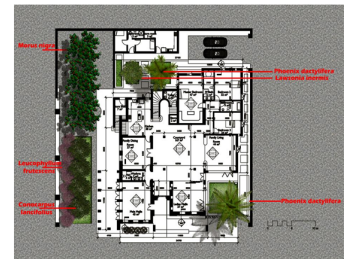


Figure 11 GSAS apps on GORD Eco-Villa, Initial impact assessment outcomes visual capture (Author et al, 2013)

Evaluation and review discussion

To understand the indicators, criteria, design and mechanism process of sustainability assessment tools, a focus-comparative chart of category weighting was drawn based on GSAS related categories. GSAS is a performance-based system and quantifiable on the scale of -1 to 3 which represents an underlying uniform ordinal scale from unacceptable (-1) to optimal (3). Unlike LEED & ESTIDAMA, GSAS is indicating the weight for each criteria below certain indicator in a conform logical consistency and accuracy. Eligibility of project in such rankings is different for each framework. While there is only 4 ranking level LEED, BREEAM and GSAS has 6. Hence, a building can score differently when assessed through two sustainability assessment systems. Furthermore, GSAS has a flexible scoring method which has overcome the limitations of other international rating systems, A score is awarded to each criterion based on the degree of compliance. Criteria are assessed using scales that are based on local benchmarks of "typical" practices; buildings can score -1 if below typical practice, 0 for minimum acceptable performance, or from +3 to +5, representing good to very high performance. All criteria are scored, thus providing a complete assessment of the building. Both benchmarks of typical practice and weightings of criteria are established by the sponsoring organization-GORD- to represent national, regional, or local codes, practice, context, conditions, and priorities. QSAS consists of six certification levels. Certification can only be achieved when the final score exceeds 0, earning 1, 2, 3, 4, 5, or 6 stars (AlHorr, 2011).

Table 2. GSAS/QSAS rating equivalency (GORD, 2011b)

Score	Certification Level	QSAS Certification
X < 0	-	Certification denied
0.0 <= X <= 0.5	★	Certification achieved
0.5 < X <= 1.0	★★	
1.0 < X <= 1.5	★★★	
1.5 < X <= 2.0	★★★★	
2.0 < X <= 2.5	★★★★★	
2.5 < X <= 3.0	★★★★★★	

Table 3. Substantial Sustainability Indicators' (SIs) Criteria Proportional Ratio (author, 2013)

Sis /	SAT	BREEAM	LEED	QSAS	Istid's PEARL
Urban connectivity-Integrated Design Process-FM		4%	5%	7%	3%
Site, Ecology and Natural systems		20%	13%	7%	12%
Energy Efficiency		33%	33%	23%	23%
Water Efficiency		2%	6%	15%	22%
Materials & Resources		12%	14%	8%	13%
Indoor Environmental Quality Management		12%	15%	12%	17%
Management		11%	6%	7%	8%
Innovation & added Values		6%	8%	8%	2%
Cultural & Economic Values		0%	0%	13%	0%

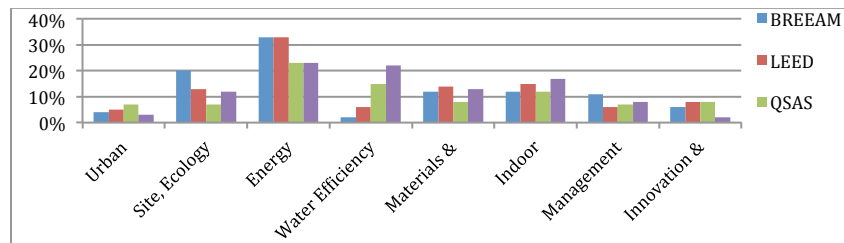


Figure 12: SWOT-analysis evaluation based on the comparative analysis (author, 2014)

Summary and Conclusions

SATs, on their own, are not sufficient to achieve genuine sustainability in the built environment. What is needed are more ambitious sustainability targets than those necessarily assumed by any present building performance evaluation based system. For countries in general, this means thinking beyond the green building rating systems now used. The challenge for the world is to think beyond SATs, as this on its own may not be sufficient to achieve genuine sustainability for the built environment worldwide. What is needed is a pioneering and innovative approach and the seeing of more ambitious sustainability targets than those that can be achieved through BREEAM, LEED and GSAS or any presently existing green building rating system. Construction companies and other institutions need to rise to the challenge and turn obstacles into opportunities with forward-thinking leadership, originality and rigorous testing. This will allow building projects in Qatar to be created that are closer to “true sustainability” without a net adverse impact on society or the natural environment while adding long-term value to economy, society and environment.

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0091

MANAGING ORGANIZATIONAL FIT FOR SUCCESSFUL SERVICE ALLIANCES

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Managing Organizational Fit for Successful Service Alliances

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Structured Abstract

Purpose - This study explores managing structural configuration for service alliance success.

The aim of the research is to explore structure fit problems and alignment mechanisms to increase adopting a service alliance strategy.

Design/methodology/approach – A holistic multiple-case study method is used. Data from literature review, informal conversations, interviews and company documents was used to explore experienced problems and their relation to organizational structure.

Findings - The results reveal organizations mainly experiencing formation problems when doing their internal assessment, though few studies on alliance management enhance intra-organizational management. Furthermore, results revealed that organizations should mainly

reconstruct the design of individual jobs and the organization's lateral structure to increase managing a successful service alliance.

Research limitations/implications - Though previous studies and practices suggest a step-to-step approach to gain relationship experiences to increase alliance success, our results indicate that organizations lack institutionalizing collaborative experience. Furthermore, the results contribute to existing structuration theory by enhance understanding of structure influencing alliances and management influencing structure. The research is limited by focusing on establishing vertical service alliances within a sector.

Practical implications – The results recognize central responsibility of, and includes suggestions for, intra-organizational management for strategic potential of service alliance to become realized.

Originality/value – The perspective of this paper is original, which is because few studies explore intra-organizational service alliance management.

Keywords - Relationship Strategy, Servitization, Strategic Service Alliances, Cooperation Risks, Alliance Formation, Alliance Management, Fit Problems, Structure Alignment, Alliance Structure Design, Design Parameters.

Article Classification - Research paper

Introduction

Today, interorganizational cooperation is viewed as a 'conditio sine qua non' for innovation of competitive products and services (Baken et al., 2006). The old model of expecting a corporate in-house team to be the majority provider of new innovative product or services is moving to a new model of proactively building alliances of innovation partners (Taplin, 2007). Within the alliance each organization brings with it a good knowledge. The linkage

between cooperating organizations becomes an innovative breeding ground for generation of new, win-win, business opportunities. Because of their value-creating potential, Schiffrin (2001) suggests that top executives should consider alliances as a key part of the firm's strategy. Despite their increased application, alliance's failure rate is high. There are many reasons for the high failure rate, but most studies show that success depends on overcoming serious problems in the early years (Draulans et al., 2003). In addition, leadership plays a key role to manage these problems for the success of alliance (Jiang, 2007). Most studies on alliances focus on managing the relationship between organizations, for example by creation of trust and experience. In addition, we see in practice that executives often launch their organization into a 'just do it' approach, hoping that by starting small inter-organizational projects, risks and investments remain limited and the success of the alliance will grow by experience. Lessons learned however indicate that these approaches are often sub-optimal (Levering, 2012). To help organizations successful manage the formation of an alliance, this research explores organizations structural configuration. By adopting an intra-organizational perspective on alliance management, we also fill in the literature gap on intra-organizational management influencing interorganizational performance.

Alliance Strategy and Organizational Structure

Alliance Strategy: Towards Service Alliances

Over the last twenty years, organizations have become increasingly interested in IORs in order to successfully face challenges (Zott and Amit, 2010). Most studies on IOR try to classify the type of relationship. For instance, Carleton-Acher et al. (2005) explain that the type of relationships can be categorized according to the intensity of cooperation (from low transactional to high relational) and type of interdependency (from horizontal or pooled interdependency to vertical or sequential interdependency). Furthermore, Kale et al. (2013) distinguish true transactional exchanges as simple, discrete, one-time events, whereas high rela-

tional exchanges are new organizational forms such as networks or joint ventures and alliances lie in between. A business strategic alliance can be defined as a shared cooperative strategy in which two or more independent organizations commit, by informal handshake agreements or formal contracts, to share core capabilities to increase companies' competitive value (Arino et al., 2000; Elmuti et al., 2001; Ter Wiel, 2012). An organization might be motivated to form a strategic alliance when it faces strategic gaps in critical capabilities; developing these internally would be too expensive or would take too long. By means of an alliance, unlike conventional sourcing and service agreements, an organization can get access to a subset of another organization's capabilities. Furthermore, the collaborative initiative aims at synergy hoping that the benefits obtained will exceed individual efforts (Ireland, 2002). In addition, the term alliance covers a broad range of relationships, from short-term projects to long lasting relationships (Long et al., 2010). Nevertheless, when an alliance is limited in duration and scope, it is referred to as a transactional instead of strategic alliance (e.g. collaborative advertising or shared distribution) (Harbinson et al., 1998). Strategic alliances are an important driver of global consolidation. They may also become a pivotal tool to maintain a firm's sustainable competitive edge when facing opportunities and challenges accompanying the liberalization of trade (Jiang, 2007). As part of the increased complexity of technological systems, organizations are investing in service alliances. A service alliance is defined as two or more organizations involved in long-term relationships concentrating on service business development and implementation to increase competitive value (Wallin et al., 2012). As a result of cooperation, service becomes a co-created process between customer and supplier and customer and supplier are seen as resources integrators (Lusch et al, 2006). Being resource integrators causes mutual interdependence between enterprises, requiring effective management to reduce high risk of service alliance failure (Cova et al., 2008).

Effective Alliance Management

Effective management includes determining alliance's scope, which is one of the most challenging, comprehensive and critical activities (Joncas et al., 2002). Decisions involve both an internal and market assessment, before formalizing the cooperation by contract negotiations and establishment of governance structure. The internal assessment involves studying the core competence and defining the motivation and objective for cooperation, whereas the market assessment involves defining partner selection criteria - e.g. partners' strengths and weaknesses, cultural norms and values - (Ireland et al. 2002). Few studies however focus on understanding the problems occurring in the formation phases of inward- and outward-looking analyses. Instead, most studies on alliances focus on managing what comes after; the business interaction. These studies thus only explore problems resulting from a clash of operating procedures and leadership attitudes by cultural differences between organizations, rather than within (Briscoe et al., 2012). Nevertheless an alliance strategy requires also internal consistency; there should be coherence between all the activities within the organization so that business processes are working together towards achieving the corporate's and alliance's objectives (Pintelon et al., 2006). This requires organizations to be capable to align or adopt their coordinate of work to changing demands in the task environment (Birkinshaw, 2002). Before exploring organization's alignment capability, it is important to understand how an alliance is intertwined within the cooperating organization.

A Dynamic Perspective on Organizational Structure

Alliances can be highly integrated within the cooperating organization by sharing resources such as management staff, machinery, infrastructure, support functions such as R&D or purchasing. Conversely, others may be more independent from their cooperating organization.

The option is, to separate out individual and alliance activities, so that their are business units responsible for achieving corporate's and others for alliance's objectives. This approach ensures that both activities can occur separately, but it increases organizational inefficiency due to duplication of effort and lack of integration across the activities. For maximizing the value of both business units, management should ensure greater integration and alignment between the activities, involving a high level of work ambiguity. In essential, management should design business structures to align and coordinate work for organization's and alliance's performance. Therefore, we consider organizational structures to be the most determinant factor for successful integration between the corporate and alliance strategy. Structures direct all actions towards the most efficient and effective achievement of the strategic goals (Wolf, 2011). While forming a service alliance, when doing the internal assessment, management needs to analyze and possibly redesign existing organizational structure. Nevertheless, management finds it difficult to (re)design cooperating organization structure for alliance alignment (Douma, 1997). In addition, few studies - like that of Raethe (2011) on interaction between structure and implementing technologies - identified specific mechanism that organizations could use to reconcile alignment. Mechanisms are being applied by organizations for coordinating work and they change when business matures and environment changes (Canning et al., 2004). In fact, if an organization does not change its coordination mechanism when business or environment changes (e.g. new laws and tax regulations), structure fit problems occur (Turnbull, 1998). Internal structure fit problems are caused by a miss-match between the intra-organizational business conduct and corporate strategy. External structure fit problems are caused by inappropriateness of the configuration of the intra-organizational structure for dealing with the organization's environment (Siggelkow, 2001). Fit is also dynamic, in other words changes in the coordination of work can influence the environmental or strategy performance (Douma, 1997). Organizations can use alignment mechanisms to re-

duce internal or external fit problems and therefore they lie at the heart of management's capability (Sydow et al., 2009). For example, to adopt a successful outsourcing strategy, organizations requires centralized control from cooperating organization's headquarters to deal with cultural and technical barriers, since without the strategy will not be efficient as it engenders greater reliance on the suppliers' capabilities (Sako, 2010). If an organization lacks centralized control, management should use a mechanisms such as liaison experts, to gain direct supervision of outsourced performances. Mechanisms influence structure components such as (a) job design or individual positioning (b) meta routines or distribution of manpower (c) planning and control structures and (d) decisions authority (Mintzberg, 1992; Adler, 1999, Brikinshaw, 2002; Raeth et al., 2011).

Research Framework

This research combines a dynamic capability and relationship-based view on strategy into an overarching view, by exploring intra-organizational capability to enhance the interorganizational relationship. Few studies contributed to understanding ambidexterity of existing organizational structure for successful managing alliances. The aim of the research is to explore fit problems and mechanisms to increase management's success. The research framework can be seen in Figure 1.

Insert Figure 1

Methods

Context and Design

Our research was conducted by a holistic multiple-case study. We studied the structural configuration of 9 multinational actively seeking to establish service alliances. A qualitative case study method was considered appropriate to deepen insight into the relation of organizational structure and managing alliance. We focused specifically on multinationals within one single sector, being the maritime industry. This way, we avoided the impact of structural differences across industries. We chose the maritime industry, since this sector increased efforts of forming service alliances as a strategy to increase efficient and predictive maintenance (Dinalog, 2014). As one manager reported: „*Previously, investing in service was viewed as increasing overhead but recently we are becoming aware that our strategy should include services since more and more customers validate us on the level of service*” (CP). The sector mainly deployed vertical service alliance initiatives; relating to the value chain of naval system manufacturers, shipbuilding companies, service suppliers, and shipping companies.

Sampling and Data Collection

We gathered information from three asset owner, three OEMs and three service suppliers. Within the 9 cases, we conducted approximately 20 face -to-face interviews and informal conversations to gather richness data. By using a snowball approach, we were able to interview managers from all ranks of the organization and from different value components, such as purchase managers, service managers, lawyers and senior executives about their experiences regarding structural adaptation for adopting alliance’s strategy. All interviewees were asked about their work history, their roles in inter-organizational cooperation and their experience of changeovers. Interviews were set up by a semi-structured protocol in order to give room for the interviewee’s experience and written in the interviewee’s native language

(Dutch) to prevent misperception of research questions. To ensure accurate information was provided, the interviewees were assured that their names and the organizations' names would not be disclosed. For the validity and reliability of the data, interviewees were asked to read and revise the transcription when needed. As additional mean, we triangulated the data by secondary data (Yin, 2012), gained by examining a broad range of company documents, maritime sector newspapers, and minutes form management meetings.

Data Analysis

To analyze how organizations' structural configuration changes while adopting alliance's strategy, we explored both initial fit problems experienced and management's actions. We adopted a method of content analysis of our data. It is „*A systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding.*” (Stemler, 2013). First, we created coding frames by combining experienced problems of structural configuration by the previous described definitions for internal or external fit problems. Second, by taking a micro perspective on structure we compiled problems and presented them in a table, which displays the relation of problems to structure components. Third, cross-case analysis was conducted in order to identify key alignment mechanisms across case examples. Table 1 shows the table that was constructed.

Insert Table 1

To ensure the anonymity of reported responses, each organization was allocated a 2 letter case code descriptor. In order to distinguish asset owners from OEM's and service providers, the codes are successively made bold, italics or underlined. Since people also tend to present

problems experienced by others as their own, the results explicitly do not represent how often a certain problem is experienced to avoid perception of severeness.

Findings and Analysis

According to the table 1, while adopting service alliance strategy managers most experience internal fit problems related to structural component of job design. The component of job design or individual position constitutes distribution and regulation of tasks and behavior of employees. In other words, - see problems number 2 and 5 - when adopting a service alliance strategy managers mainly experience both a mismatch regarding the flexibility to assign additional service tasks, and resistance of employees due to lack of job enrichment. In order to enhance successful adaptation of alliance's strategy, managers should put effort in redesigning the job construction. Another notable result regarding internal fit is that most are experienced by top management and by OEMs. Regarding the first, we assume this is because top management is first involved implementing a new strategy. Regarding the last, we assume that OEM's experience more internal fit problems due to tension between alliance's service strategy and corporate's manufacturing strategy - requiring an ambidexterity of structure-, since maintenance is often already an integrated policy within asset owners' or service providers' business strategy.

Furthermore, according to the table most external fit problems are related to the component of performance control. The component of performance control or lateral structuring, constitutes constructing quality, stability and consistency with the organization to enhance optimal performance and to meet good employment practices. In other words, when adopting a service alliance strategy, managers mainly experience a mismatch regarding existing organizational structure to deal with requirements out of their environment, such as customers', the

alliance partner's and trade unions'. As can be seen by problems number 9 and 10 - most of these stakeholders require performance metrics giving them insight to support business changes.

This is also addressed by an alliance manager saying: „Data talks, an organization should be able to prove the conduct of work before being able to change the way of work” (NR).

Furthermore, in reference to problem number 6, we experience organizations lacking institution of relationship experiences to manage knowledge. We observed within the 9 multinational no procedures made of relationship experiences between the alliance partners. Moreover, we did not find experienced alliance managers. This management shortfall, is endorsed by an alliance manager reporting: „*Relationship management at all levels, as I see it, takes a back seat*” (NR). In addition, organizations are observed as being skeptical about applying relationship experiences, as one manager explained: „*If I, as being an operational-engineer, have a trustworthy and high-effective relationship with one of our suppliers, they ask me what benefit I attain from it personally*” (NR).

Another notable result regarding external fit, is that most problems are experienced by lower management and by asset owners. Regarding the first, this is because it is in particular tactical management's responsibility to assess performance risks. Regarding the last, we assume that mostly asset owners experience external fit problems, since they are particular lacking service performance metrics. We are supported in this believe, by a manager saying: „*All business processes were not provisioned for alliance. Practices were not prescribed to control service quality and actual work was not registered to control efficiency. Potential for audits was thereby limited, reports were lacking and process control was limited*” (NR)

Discussion and Conclusions

Contributions of the Research

This exploratory study explored the structural configuration of maritime organizations while adopting a service alliance strategy. The results from our literature review reveal organizations experiencing problems forming a service alliance when doing the internal assessment, though few studies on alliance management enhance intra-organizational management. In addition, by empirical research, our case studies revealed that organizations should mainly reconstruct the design of individual jobs and the organization's lateral structure to increase managing a successful service alliance. As such, we suggest provision of service training and alliance information to improve employee's motivation working for a service alliance. To be more concrete, we suggest establishment of an alliance board, included with functional experts given decentralized responsibilities over alliance's decisions. Having such a board enables direct supervision over aligned business processes and contributes to institutionalizing of collaborative experiences. Furthermore, we recommend using supporting information technologies between organizations to give insight in process performance, hence increase stakeholders' trust.

As such, the conclusions of our research have contributed to theory as follows. First, though previous studies and practices suggest a step-to-step approach to gain relationship experiences to increase alliance success, our results indicate that organizations lack institutionalizing collaborative experience. Second, our results recognize central responsibility of intra-organizational management for strategic potential of the service alliance to become realized. Third, our results contribute to existing structuration theory by understanding structure influencing alliance strategy and management modeling structure to manage work ambiguity. Our research has implications for practice as well. In addition to our results, - since alignment mechanisms are highly interrelated and inter-influential between structure constructs - we

suggested the usage of few but appropriate mechanisms to preserve the balance between change and stability.

Limitations and Future Research

Our research was restricted by focusing on the maritime sector. Future research might explore cross-industry establishment of alliances to increase understanding of interindustry structural differences. Our results included suggestions to redesign structure. Their appropriateness might however change over time as a result of environmental changes or changes in the policy of the organization. Nevertheless, the results have demonstrated potential for follow-up research to test and develop parameters into mechanism „with teeth” (Collins, 2000) that contribute to pluralistic structures for ambidexterity (Adler et al., 1999). In other words, to increase managing successful service alliance without creating unpleasant results to corporate strategy (Schultz et al., 2006). In follow-up research, we will perform action research by conducting longitudinal multiple-case studies to interactive redesign organizational structures. The aim is to develop a checklist for organizations, on the basis of which they can decide how to alter their structure to increase fit for successful service alliance.

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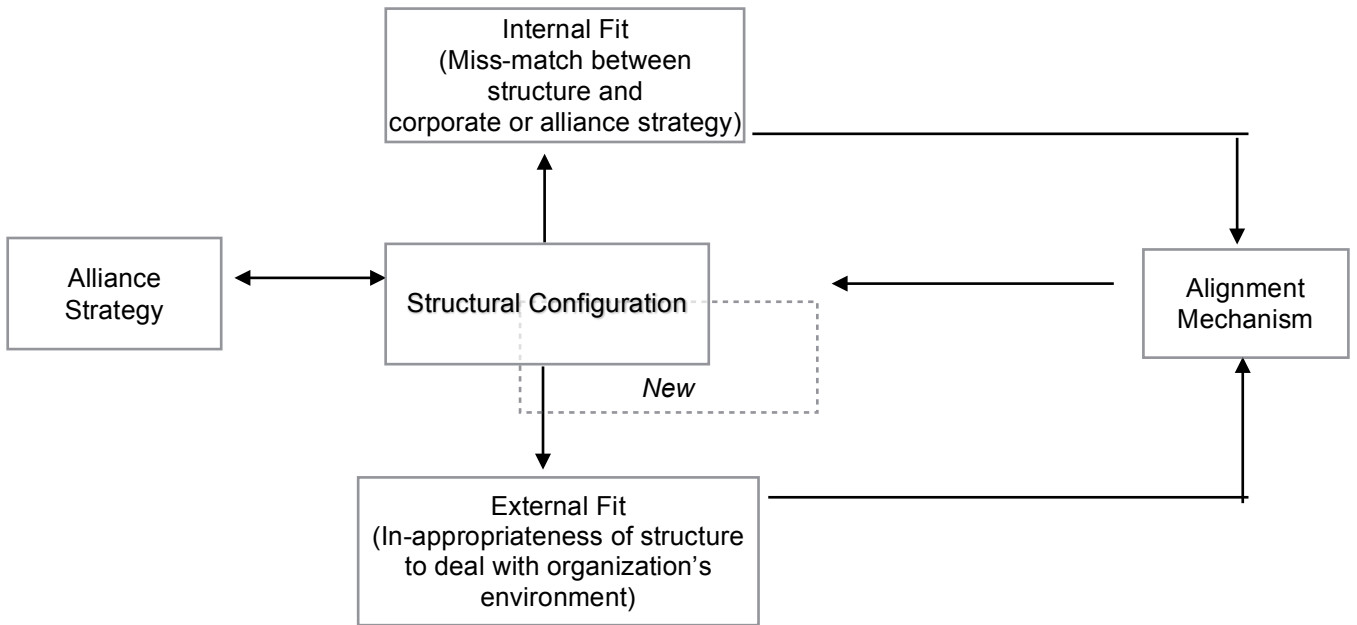


Figure 1. Research framework

REFERENCE NR.	ORGANIZATIONAL LEVEL SOURCE	EXPERIENCES REGARDING STRUCTURAL CONFIGURATION	JOB DESIGN	METAROUTINES	PERFORMANCE CONTROL	DECISION AUTHORITY
		INTERNAL FIT				
1	Strategic management:	Lack of supervision on business processes (<i>LT, NR, LS</i>)	0	1	0	0
2	Tactical management:	By reducing employee-surplus, losing the ability to perform ancillary tasks (<i>ND, NR</i>);	1	0	0	0
3	Tactical management	Vagueness how the top management wants to achieve service alliance objectives (<i>LS, NR, SW, WL</i>);	0	0	0	1
4	Tactical management	Fail to ensure the quality of service process, stability and consistency within the organization (<i>LS, LT, NR, WL</i>);	0	0	1	0
5	Operational management	Lack of knowledge and skills (nor experience and culture) suitable to control the service process (<i>LT, ND, CP</i>).	1	0	0	0
		SUM	2	1	1	1
		EXTERNAL FIT				
6	Strategic management:	Incapable to evolve relationship capabilities (<i>KV, LT, LS, ND, NR, WA, WL, SW</i>);	0	0	1	0
7	Tactical management	Lack of legal, accounting and tax experts in the early process of building the alliance to analyze concerns and give advice well in advance (reducing overlong process towards approval) (<i>NR</i>);	0	0	0	1
8	Tactical management	Lack of surveys about customer service requirements (<i>CP, NR, LS, LT, WL</i>);	0	0	0	1
9	Operational management	Lack of planning and control devices within the organization to justify efficiency and fair usage of resources and capabilities for service performance (<i>KV, LT, LS, ND, NR, SW, WA, WL</i>);	0	0	1	0
10	Operational management	Trade unions' resistance to alliance formation, due to employees' risks of losing their working conditions or job (<i>KV, NR, WL</i>).	1	0	1	0
		SUM	1	1	3	2
		TOTAL	3	2	4	3

Table 1. The relation of problems to structure components

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THE ROLE OF PERFORMANCE MANAGEMENT IN THE HIGH PERFORMANCE ORGANISATION

ANDRÉ A. DE WAAL, BÉATRICE I.J.M. VAN DER HEIJDEN

The Role of Performance Management in the High Performance Organisation

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Purpose

In order to create a High Performance Organization (HPO), managers and employees have to behave in such a way that the objectives and goals of the organization are achieved on a world-class level. In practice, this means that the organization's performance management system has to provide the right information so that the organisation's members can behave in a performance-driven manner. This article goes into the relationship between performance management and the HPO.

Design/methodology/approach

For this research, the Performance Management Analysis (PMA) and the HPO Framework and were used. A questionnaire, which combined questions on PMA dimensions and HPO factors, was administered to two Europe-based multinationals. Based on 468 valid questionnaires, a correlation analysis was performed on the PMA dimensions and the HPO factors in order to test the impact of the latter in the light of organizational success.

Findings

Theoretically, a strong correlation between the PMA and the HPO Framework was predicted. The research results indeed showed strong and significant correlations between all the PMA dimensions and all the HPO factors, indicating that a performance management system that fosters performance-driven behaviour in the organisation is indeed of critical importance to create an HPO.

Originality/value

This research adds to the literature in the sense that factors of high performance have now been correlated with the characteristics of the performance management system. This makes it possible for organizations to work in a more focused and targeted manner towards improving the organization's performance management system and herewith on strengthening the organization.

Keywords: performance management, performance-driven behaviour, performance management analysis, PMA, High Performance Organisation, HPO

Article Classification: research paper **Track:** Organizing for performance

INTRODUCTION

In recent years, a consensus seemed to have emerged about the advantages of applying performance management in an organization. Increasingly, researchers found that performance management enhances the financial results of an organization, in the sense that revenue and profits increase while costs decrease (Malina and Selto, 2001; Sim and Koh, 2001; Davis and Albright, 2002; Said et al., 2003; Braam and Nijssen, 2004; Davis and Albright, 2004; Neely et al., 2004; Robinson, 2004). They also reported considerable non-financial advantages of performance management, such as improved communication, closer collaboration, better knowledge sharing, stronger focus on what really matters and on the achievement of results, better strategic alignment, higher operational efficiency, higher commitment of organizational members, higher innovativeness, higher employee satisfaction and customer satisfaction, and a strengthened reputation of the organisation (Malina and Selto, 2001; Shulver and Antarkar, 2001; Lovell et al., 2002; Baraldi and Monolo, 2004; Heras, 2004; Neely et al., 2004; Papalexandris et al., 2004; Robinson, 2004; Lawson et al., 2005; Tapinos et al., 2005; Meekings et al., 2009; Maley and Moeller, 2014).

However, Waal and Kourtit (2013) did find some disadvantages from using performance management, such as information overload, too much subjectivity, too much financial and backward-looking information, and a too expensive and bureaucratic approach, but these disadvantages were only found on a limited scale. In summary, it can be said that implementing performance management is considered to be a constructive means for an organisation to gain competitive advantage and to continuously react and adapt to external changes (Chau, 2008; Cocca and Alberti, 2010).

As such, performance management may be a useful tool for organizations to support them in their journey toward becoming an high performance organization (HPO). An HPO is defined as an organization that achieves financial and non-financial results that are exceedingly better than those of its peer group over a period of five years or more, by focusing in a disciplined way on that what really matters to the organization (Waal,

2012). In order to create a sustainable HPO, managers and employees alike have to behave in such a way that the objectives and goals of the organization are achieved on a world-class level. In practice, this implies that the organization has to be structured to such an extent that its performance management systems provide the right information so that the organisation's people can behave in a performance-driven manner. In this article, the relationship between performance management and the HPO is investigated on a detailed level, using the Performance Management Analysis (PMA) (Waal, 2010) and the HPO Framework (Waal, 2012), in order to evaluate which dimensions of performance management have the highest impact on achieving high performance. This is important because the outcomes of this research can be used by organizations to shape their performance management systems, which, in turn, will help them in their quest to become an HPO. This article is structured as follows. In the next two sections, the HPO Framework and the PMA are described. Then the methodological approach and research results are given. The article ends with a conclusion, the limitations of the research, and opportunities for future research.

THE HPO FRAMEWORK

The HPO Framework was developed on the basis of a descriptive literature review of 290 academic and practitioner publications about high performance (Waal, 2012, 2014). Out of each of the reviewed publications, those elements were extracted that the authors regarded as essential for becoming an HPO. Because the authors of the various scholarly contributions used different terminologies, the identified elements were grouped into categories which constituted possible HPO characteristics. For each of the possible HPO characteristics, the 'weighted importance' was calculated, i.e. the number of times that it was mentioned in the publications. Finally, the possible HPO characteristics with the highest weighted importance were included in an HPO questionnaire which was administered worldwide and which encompassed more than 3,200 respondents. In this questionnaire, the respondents had to grade how well they thought their organizations were performing with respect to the HPO characteristics (on a scale of 1 to 10), and also what their organizational results were compared to their

peer group (consisting of to their organization comparable firms). By performing a statistical analysis, 35 characteristics which had the strongest correlation with organizational performance were extracted and identified as the HPO characteristics. The correlation was as expected: the high-performing organizations scored higher on the 35 HPO characteristics in comparison with the low-performing organizations. This means that organizations that pay more attention to these 35 characteristics achieve better results than their peers, in every industry, sector and country across the world. Conversely, organizations which scored low on the characteristics appeared to rank at the bottom of their industry performance-wise. A factor analysis, performed during the statistical analysis, resulted in the determination of five distinct HPO factors.

The five HPO factors are described underneath (for a detailed description see Appendix 1):

1. *Management Quality*. In an HPO, belief and trust in others and fair treatment are encouraged. Managers are trustworthy, live with integrity, show commitment, enthusiasm, and respect, and have a decisive, action-focused decision-making style. Management hold people accountable for their results by maintaining clear accountability for performance. Values and strategy are communicated throughout the organization, so that everyone knows and embraces these.
2. *Openness and Action-Oriented*. HPOs have an open culture, which means that management values the opinions of employees and involves them in important organizational processes. Making mistakes is allowed and is regarded as an opportunity to learn. Employees spend a lot of time on dialogue, knowledge exchange, and learning, to develop new ideas aimed at increasing their performance and make the organization performance-driven. Managers are personally involved in experimenting thereby fostering an environment of change in the organization.
3. *Long-Term Orientation*. An HPO grows through partnerships with suppliers and customers, so that long-term commitment is extended to all stakeholders. Vacancies are filled by high-potential internal candidates, and people are encouraged to become leaders. The HPO creates a safe and secure workplace (both physical and mental), and lays off people only as a last resort.

4. *Continuous Improvement and Renewal.* An HPO compensates for dying strategies by renewing them and making them unique. The organization continuously improves, simplifies and aligns its processes and innovates its products and services, creating new sources of competitive advantage to respond to market changes. Furthermore, the HPO manages its core competences efficiently, and out-source non-core competences.
5. *Workforce Quality.* An HPO assembles and recruits a diverse and complementary management team and workforce with maximum work flexibility. The workforce is trained to be resilient and flexible. They are encouraged to develop their skills to accomplish extraordinary results and held responsible for their performance, as a result of which creativity is increased, leading to better results.

The HPO Framework is build upon the idea that there is a direct and positive relationship between the identified HPO factors and competitive performance: the higher the HPO scores the better the performance of the organization, and vice versa. An organization can empirically investigate its HPO status by having management and employees fill in an HPO questionnaire and calculating the average scores on the HPO factors.

When looking in more detail at the HPO characteristics, several characteristics can be noticed that have a direct relation with performance management: “The organisation is performance-driven”; “The management of the organisation focuses on achieving results”; “In the organisation everything that matters to the organisation's performance is explicitly reported”; “In the organization both financial and non-financial information is reported to organizational members”; “Management coaches organizational members to achieve exceptional results”; “Management focuses on achieving results”; and “Management inspires organizational members to accomplish extraordinary results.” Thus, theoretically, a strong correlation between performance management and the HPO Framework can be predicted. To evaluate whether this is the case, the performance management system of an organization has to be empirically tested on its ability to actually support the organization toward high performance. This can be done by relating the HPO Framework to the so-called performance management analysis.

THE PERFORMANCE MANAGEMENT ANALYSIS

A technique which can be used to assess the quality of performance management in an organization is the performance management analysis (PMA) (Waal, 2010). The PMA makes a distinction between the structural and the behavioural side of performance management. The 'structural side' deals with the systems' architecture which needs to be in place to be able to use performance management. This usually involves determining Critical Success Factors (CSFs) and Key Performance Indicators (KPIs), and designing a Balanced Score Card (BSC). The 'behavioural side' deals with the organizational members and their use of the PMS. The PMA is based on the principle that the two sides, that is, the structural and the behavioural side, need to be given equal attention in order to establish a performance-driven organization. There are many things that can be measured and reported in an organization, but they will be of little value if organizational members do not use this performance information. Conversely, goodwill of organizational members does not account for much when they cannot access the performance information needed to display performance-driven behaviour. The PMA enables an organization to actually assess the degree of performance-driven behaviour.

The nine PMA dimensions are described underneath (for a detailed description see Appendix 2):

1. *Responsibility structure* (structural dimension): A clear parenting style and tasks and responsibilities have been defined and these are applied consistently at all management levels.
2. *Content* (structural dimension): Organizational members use a set of financial and non-financial performance information, which has a strategic focus through the use of CSFs and KPIs.
3. *Integrity* (structural dimension): The performance information is reliable, timely and consistent.
4. *Manageability* (structural dimension): Management reports and performance management systems are user-friendly and more detailed performance information is easily accessible through ICT systems.

5. *Alignment* (structural): Other management systems in the organization such as the human resource management system, are aligned with performance management, so what is important to the organization is regularly evaluated and rewarded.
6. *Accountability* (behavioural dimension): Organizational members feel responsible for the results of the KPIs of both their own responsibility areas and the organization as a whole.
7. *Management style* (behavioural dimension): Senior management is visibly interested and involved in the performance of organizational members and stimulates an improvement culture and proactive behaviour. At the same time, it consistently confronts organizational members with lagging results.
8. *Action orientation* (behavioural dimension): Performance information is integrated in the daily activities of organizational members in such a way that problems are immediately addressed and (corrective or preventive) actions taken.
9. *Communication* (behavioural dimension): Communication about the results (top-down and bottom-up) takes place at regular intervals as well as the sharing of knowledge and performance information between organizational units.

RESEARCH APPROACH

Sample and Procedure

For this research, the PMA and the HPO Framework were combined in one questionnaire, which was distributed to two multinational companies operating in Europe. One of the organizations was a bank of which the Dutch branch offices participated. The other organization was a car rental agency of which the sales offices in five countries (Netherlands, UK, Spain, Germany, France) participated. In the questionnaire, managers and employees of an organization were asked to rate their organization on the 35 HPO characteristics and the nine PMA characteristics, on a scale of 1 (the organization does not satisfy the characteristic at all) to 10 (the organization satisfies the characteristic completely). The scores of all respondents were averaged for the five HPO factors and the nine PMA dimensions. In total, 468 valid questionnaires were received, out of a possible total of 2,024 respondents, implying a response rate of

23.1 percent. Using the final valid sample of 468 respondents, a correlation analysis was performed on the HPO factors and the PMA dimensions.

Measures

In Table 1 the reliability of the PMA dimensions and the HPO factors is given, using Cronbach’s alphas.

Table 1: Reliabilities of the PMA dimensions and the HPO factors

Dimensions / factors	Items in dimension/ factor	Cronbach’s alpha
<i>PMA dimensions</i>		
Responsibility structure	4	.732
Content	5	.722
Integrity	5	.872
Manageability	5	.823
Alignment	5	.709
Accountability	5	.881
Management style	5	.819
Action orientation	5	.823
Communication	5	.804
<i>HPO factors</i>		
Management Quality	12	.897
Openness and Action-Orientation	6	.783
Long-Term Orientation	4	.818
Continuous Improvement	8	.877
Workforce Quality	4	.651

As can be seen from Table 1, all PMA dimensions and all HPO factors (with the possible exception of Workforce Quality) show a high reliability. This means that a relevant correlation analysis can be performed.

RESEARCH RESULTS AND ANALYSIS

Theoretically, strong correlations between the PMA dimensions and the HPO factors was predicted. As can be seen in Table 2, there are strong and significant correlations

(using Pearson's r correlations, one-tailed) between all the PMA dimensions and all the HPO Factors, indicating that a performance management system that fosters performance-driven behaviour in the organisation is indeed of critical importance to create and sustain an HPO.

*Table 2: Correlations between the PMA dimensions and the HPO factors
(all correlations are significant on the 0.01level)*

PMA dimensions /HPO factors	Management Quality	Openness and Action-Orientation	Long-Term Orientation	Continuous Improvement	Workforce Quality
Responsibility structure	.499	.414	.403	.469	.400
Content	.473	.465	.443	.520	.396
Integrity	.402	.437	.420	.526	.340
Manageability	.401	.431	.370	.481	.375
Alignment	.477	.510	.381	.391	.397
Accountability	.503	.482	.449	.523	.440
Management style	.456	.397	.307	.305	.367
Action orientation	.353	.353	.323	.329	.312
Communication	.440	.547	.402	.487	.418

The results depicted in Table 2 can be rearranged to show which PMA dimensions have the strongest impact on which HPO factor. Table 3 gives the results of this rearrangement in qualitative terms.

Table 3: The order of impact of the PMA dimensions on each HPO factor

PMA dimensions / Order of impact	Management Quality	Openness and Action-Orientation	Long-Term Orientation	Continuous Improvement	Workforce Quality
1	Accountability	Communication	Accountability	Accountability	Accountability
2	Responsibility structure	Alignment	Content	Integrity	Communication
3	Alignment	Accountability	Integrity	Content	Responsibility structure
4	Content	Content	Responsibility structure	Communication	Alignment

5	Management style	Integrity	Communication	Manageability	Content
6	Communication	Manageability	Alignment	Responsibility structure	Manageability
7	Integrity	Responsibility structure	Manageability	Alignment	Management style
8	Manageability	Management style	Action orientation	Action orientation	Integrity
9	Action orientation	Action orientation	Management style	Management style	Action orientation

Based on Table 3 a “ranking” can be made of the PMA dimensions according to their impact on the HPO factors (see Table 4).

Table 4: The impact ranking of the PMA dimensions

Order of impact	PMA dimension	Type of dimension
1	Accountability	Behavioural
2	Communication	Behavioural
3	Content	Structural
4	Responsibility structure	Structural
5	Alignment	Structural
6	Integrity	Structural
7	Manageability	Structural
8	Management style	Behavioural
9	Action orientation	Behavioural

It is clear from Table 4 that the PMA dimension Accountability has the strongest positive effect on creating and sustaining an HPO. This is in line with the outcomes as reported by many authors who found a positive relation between accountability and performance (see for instance GAO, 2005; Hochwarter et al., 2007; Wunsche, 2007; Marsh, 2010), For each of the other HPO factors there is a different order of impact of the PMA dimensions. This undoubtedly has to do with the specific nature of each HPO factor. It is interesting to note that the behavioural dimensions “bookmark” the

structural dimensions of the performance management system. It seems clear that certain aspects of the behavior of people in the organization are decisive for creating high performance but that this behavior has to be rooted in a robust performance management structure.

When an organization pays emphatically attention to strengthening the PMA dimensions, the HPO factors will be strengthened as well, which, in turn, will help improve the results of the organization. For sake of clarity, Table 3 has been depicted schematically (see Figure 1).

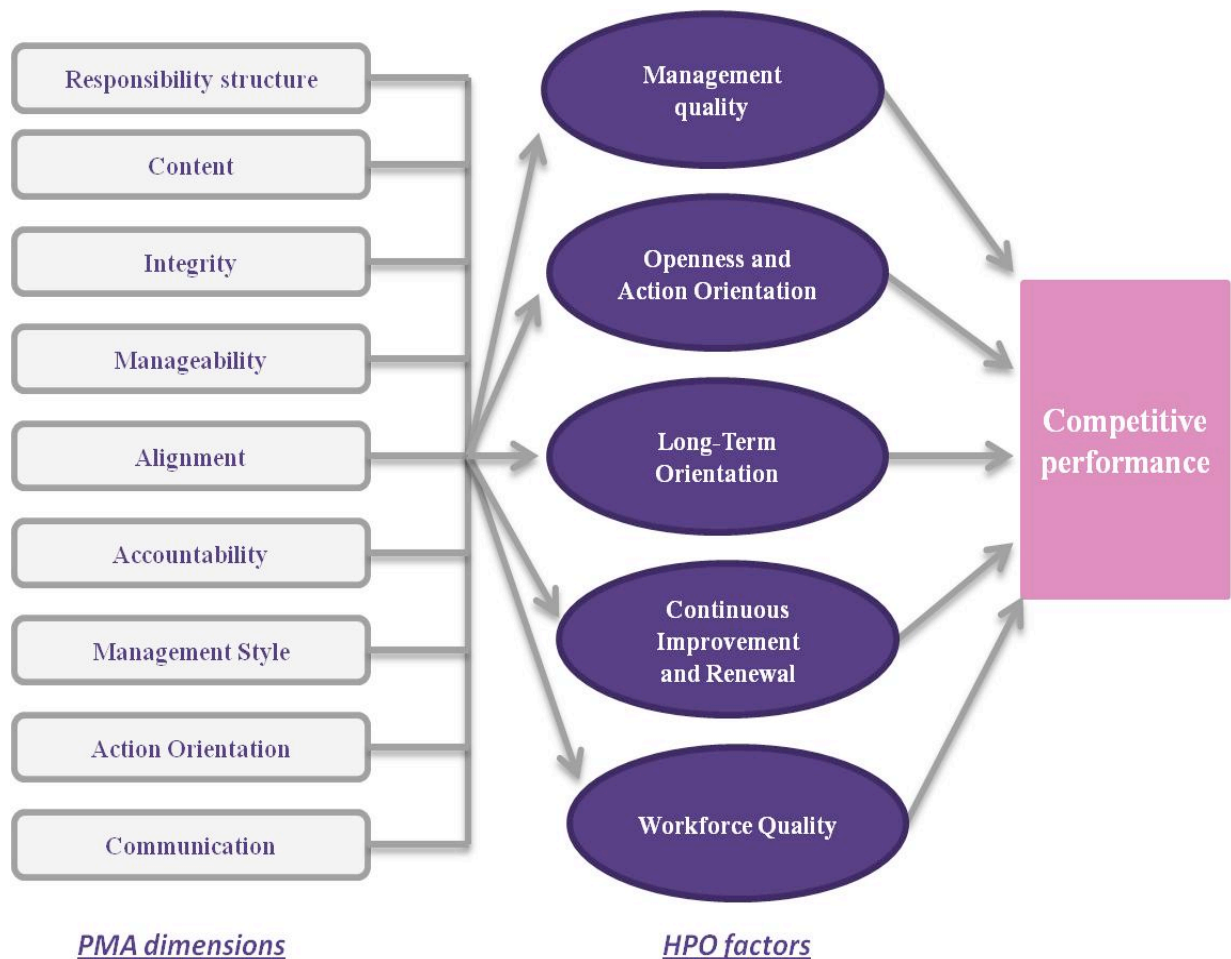


Figure 1: The relations between the PMA dimensions and the HPO factors, and competitive performance

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

Now that the correlational pattern is known, an organization knows the dimensions which need to be present in its performance management system in order to have organizational success. Moreover, the organization has gained more insight into the order in which the PMA dimensions have to be improved in order to optimize the chance to strengthen specific HPO Factors. In this way, the chance of creating an effective performance management system is considerably increased. The research described in this article adds to the literature in the sense that factors of high performance have now been correlated with the characteristics of the performance management system. This makes it possible for practitioners to work in a more focused and targeted manner on improving the organization's performance management system and thus on strengthening the organization.

An important limitation of the research is that only two profit organizations, that operate in different industries in the Western world, and that both comprise large cooperations have been investigated. This means that future research is needed that should focus on empirically investigating the performance systems in use in specific industries, including non-profit and governmental sectors, in order to evaluate how these support HPO. Other opportunities encompass studying whether there is a relationship between performance management and HPO in a non-European context, and whether this relationship exists for small and medium-sized companies as well.

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APPENDIX 1: THE HPO FRAMEWORK

In this Appendix, the five factors and their underlying 35 characteristics of the HPO Framework are listed.

<i>HPO FACTORS + CHARACTERISTICS</i>
<p><i><u>Continuous Improvement and Renewal</u></i></p> <ol style="list-style-type: none">1. The organisation has adopted a strategy that sets it clearly apart from other organizations.2. In the organisation processes are continuously improved.3. In the organisation processes are continuously simplified.4. In the organisation processes are continuously aligned.5. In the organisation everything that matters to performance is explicitly reported.6. In the organisation both financial and non-financial information is reported to organizational members.7. The organisation continuously innovates its core competencies.8. The organisation continuously innovates its products, processes and services.
<p><i><u>Openness and Action-Orientation</u></i></p> <ol style="list-style-type: none">9. Management frequently engages in a dialogue with employees.10. Organisational members spend much time on communication, knowledge exchange and learning.11. Organisational members are always involved in important processes.12. Management allows making mistakes.13. Management welcomes change.14. The organisation is performance driven.
<p><i><u>Management Quality</u></i></p> <ol style="list-style-type: none">15. Management is trusted by organisational members.16. Management has integrity.17. Management is a role model for organisational members.18. Management applies fast decision-making.19. Management applies fast action-taking.20. Management coaches organisational members to achieve exceptional results.21. Management focuses on achieving results.

22. Management is very effective.
23. Management applies strong leadership.
24. Management is confident.
25. Management is decisive with regard to non-performers.
26. Management always holds organisational members responsible for their results

Workforce Quality

27. Management inspires organizational members to accomplish extraordinary results.
28. Organisational members are trained to be resilient and flexible.
29. The organisation has a diverse and complementary workforce.
30. The organisation grows through partnerships with suppliers and/or customers.

Long-Term Orientation

31. The organisation maintains good and long-term relationships with all stakeholders.
 32. The organisation is aimed at servicing the customers as best as possible.
 33. Management has been with the company for a long time.
 34. New management is promoted from within the organisation.
 35. The organisation is a secure workplace for organisational members.
-

APPENDIX 2: THE PERFORMANCE MANAGEMENT ANALYSIS

In this Appendix, the nine dimensions and underlying 44 characteristics of the PMA are listed.

Structural dimension: Responsibility structure of the organization

1. The organisation has a clear parenting style
2. There are clear tasks and responsibilities in the organization
3. There are clear guidelines for the planning and target-setting process
4. The chosen parenting style is consistently applied

Structural dimension: Content of the performance information

5. There is a balance of financial and non-financial information
6. A strategic focus is created through applying CSFs and KPIs
7. There is strategic alignment throughout the organisation
8. The targets are ambitious and relative to the competition
9. Ranking between organizational units is applied

Structural dimension: Integrity of the performance information

10. The information is reliable
11. User needs are regularly inventoried
12. The information is always on time
13. There is high consistency between data elements
14. Relevant data elements are standardized

Structural dimension: Manageability of the performance information

15. The information is user-friendly
16. The volume of information is limited
17. Exception reporting is used
18. Accessibility of underlying data is high
19. Tools for information presentation are integrated

Behavioural dimension: Accountability

20. Relevance of information to users is high
21. Managers use KPIs continuously
22. The influence of users on KPI results is high

23. Commitment of users to achieve results is high

24. User involvement in changing KPIs is high

Behavioural dimension: Management style

25. Commitment of managers to achieving results is very visible

26. Managers have high interest in employees' results

27. There exists a continuous improvement culture in the organization

28. Coaching by management is frequent

29. There is high consistency in management's behaviour

Behavioural dimension: Action-orientation of the organization

30. There is frequent analysis of results

31. Performance information is daily used

32. Corrective action is always taken

33. Prognoses are frequently made

34. Decision-making is always based on information

Behavioural dimension: Communication about performance

35. There is frequent top-down communication about results

36. There is frequent bottom-up communication about results

37. There is an open communication structure in place

38. There is frequent knowledge sharing between units

39. Strategy formulation always takes place in cooperation with organizational units

Alignment

40. The evaluation system is linked to the performance management system

41. The reward system is linked to the performance management system

42. The training system is linked to the performance management system

43. The organization achieves improved results through the use of the performance management system

44. The attitude of people towards performance management is positive

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VARIATIONS IN THE CIRCUMPLEX MODEL OF AFFECT ACROSS CONTEXTS

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Variations in the Circumplex Model of Affect Across Contexts

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Abstract

Although Russell's circumplex model of affect is one of the most widely used models for capturing self-reported emotions, few, if any, studies have examined whether this model is appropriate for measuring changes in emotions in different contexts. We construct an experiment which enables us to manipulate emotions and study the consequences of these manipulations over time. We find that self-report data at the end of our experiment match well with the circumplex model of affect, but that the model changes with experimental context over time. We suggest methods to determine when the circumplex model of affect is constant across different contexts and can be used to compare changes in emotions. Further we suggest a pragmatic solution when such comparisons cannot readily be made.

Keywords: Emotion, Circumplex, Variation, Measurement, Context.

Variations in the Circumplex Model of Affect Across Contexts

Over the last decade, the influence of emotions on information processing, decision making, and action has been increasingly recognized. Clearly, when linking emotions to action it is crucial that the relevant emotions are measured appropriately. Emotions are often captured through self-report data using questionnaires. Here, an often-used model is Russell's (1980) circumplex model of affect. Yet there are challenges related to the model; relating both to its mapping into the two dimensions, valence and arousal (Feldman, 1995; Watson & Tellegen, 1985), as well as to its applicability in different contexts (Russell, Lewicka, & Niit, 1989). Regardless of these challenges, the circumplex model of affect remains widely used (Barsade, 2002; Bartel & Saavedra, 2000; Gerber et al., 2008; Huy, 2002; Russell, et al., 1989).

Little attention, however, has been given to the influence of context on the measurement of emotions. When linking emotions to action, it is important to be able to compare samples taken in different contexts. The purpose of this study is to capture how variations of emotions across contexts can be measured. For this purpose we conducted an experiment to study the development of emotions across different experimental conditions at three time periods and measured emotions at each of the time periods using the 28 items from Russell's (1980) questionnaire.

Because our goal is to compare individual emotional states across contexts, we are not only interested in the positions of the 28 emotional terms from the questionnaire in terms of the underlying dimensions of valence and arousal, but also the positions of individual participants on these same dimensions. Common techniques to perform this reduction from 28 to 2 dimensions are factor analysis and multidimensional scaling.

Here we use multidimensional scaling (MDS). An MDS solution gives the distribution of the 28 emotional items in two dimensions that are usually interpreted as valence and arousal. In what follows, we refer to this distribution as the model. By using MDS unfolding procedures, we also obtain the position of the individual respondents on the valence and arousal dimensions. These positions are then used to track changes in the emotional state of individuals across contexts. For such a comparison to be meaningful, the underlying emotional dimensions should not change. That is, the model, in our parlance, should be relatively constant to assess differences in individuals' emotional states.

Our study shows that self-report data at the end of our experiment match well with Russell's circumplex model of affect, but that the model changes over time and under different experimental conditions. We suggest a method to determine when the circumplex model is constant across contexts and thus can be used to compare changes in emotions. Further, we suggest a pragmatic solution when such comparisons cannot readily be made.

Our paper proceeds as follows: First, we review previous literature on measuring emotions, in particular the use of the circumplex model. Next, we present our experimental design and our results. Finally, we discuss the implications of our results in terms of using Russell's circumplex model for studying emotions across different contexts.

Literature Review

In 1980 Russell published his seminal article on the circumplex model of affect (Russell, 1980). Prior to this, it was common to describe affect as a set of bipolar and independent dimensions such as pleasure/displeasure and happiness/sadness. The number of such dimensions varied between six and twelve depending on the study (Russell, 1980). Based on contradicting research that suggested that the dimensions of affect were interrelated in a systematic way, Russell constructed a spatial representation of the dimensions, shown in Figure 1 (Russell, 1980). Here he found 28 emotion-denoting adjectives to be located in a circular structure, based on a multidimensional scaling solution from 24 participants' semantic ratings of the 28 emotional terms.

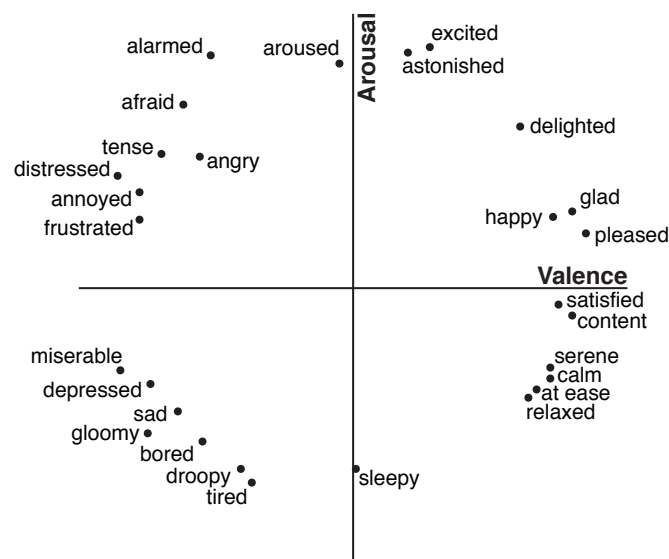


Figure 1. Russell's results from multidimensional scaling (Russell, 1980, p. 1168). This MDS solution is derived from judged dissimilarities of pairs of emotion terms, and thus represents how similar subjects rate the concepts. Accordingly, it is termed the semantic circumplex model of affect. Russell obtained different, but similar, configurations based on self-report.

The analysis that Russell conducted showed that the spatial representation of the affect dimensions through the circumplex model accounted for a substantial proportion of the variance in the data.

Despite its wide use (Barsade, 2002; Bartel & Saavedra, 2000; Gerber, et al., 2008; Huy, 2002; Russell, et al., 1989), previous studies have pointed to a number of problems relating to the circumplex model of affect. One of the limitations of the original study by Russell was that it was conducted solely on data collected from English-speaking students. Later research conducted by Russell showed, however, that the circumplex model of affect was quite consistent across languages and cultures (Russell, et al., 1989). Self-reported affective (state) data from Estonian, Greek, and Polish respondents with differing ages, educational levels, and social backgrounds were used. The analysis showed that applying the same analytical approach across different cultural settings yielded similar results. Kring, Barrett, and Gard (2003) also found general support that the circumplex model is useful for representing affective phenomena across diverse populations.

Nevertheless, Larsen and Diener (1992) argued that the model is open to misinterpretation, particularly when its limitations are not recognized. One potential problem they pointed to was that there are no basic dimensions in the circumplex model and that rotation can confuse the interpretation of the dimensions.

Further, some studies (e.g., (Mehrabian, 1996; Morgan & Heise, 1988; Russell & Mehrabian, 1977; Shaver, Schwartz, Kirson, & O'Connor, 1987) have discussed whether a two-dimensional solution would sufficiently discriminate between emotions, or whether more dimensions should be included. It would seem quite natural that adding more dimensions would capture more variance, but since our purpose here was to test the stability of the Russell (1980) model over different

contexts, we only included the two dimensions contained in the original model. One issue which has not been fully explored, however, is the ability to use the circumplex model of affect for comparisons across context. This seems to be an important omission, as proper attention has to be paid to the influence of context on the measurement of emotions, especially in studies linking emotions to action.

Ekkekakis, Hall, and Petruzzello (2005) examined whether the structure of the so-called AD ACL (Activation Deactivation Adjective Check List), used in several studies to assess affective responses to bouts of physical activity, approximated a circumplex model. In their experiment, 165 subjects completed the AD ACL before and after a 10-minute walk. The researchers found that a circumplex model provided a close fit for data before the walk, but lower fit, albeit still reasonable, after the walk. Thus, they concluded that the assumption of cross-situational structural invariance of the circumplex was violated, in that there were departures from the circumplex structure when participants were presented with a stimulus such as physical activity.

This finding, together with Larsen and Diener's (1992) comment that there are no basic dimensions in the circumplex model of affect and that rotation may confuse the reading of the dimensions, suggests that the applicability of the circumplex model across context should be examined. For example, if we want to compare the emotions of individuals in a context hypothesized to lead to positive emotions to the emotions of individuals in a context hypothesized to lead to negative emotions, we need a stable model of emotion. Similarly, if we want to examine how emotions change over time, we need an underlying model of emotion that is constant. Thus, we constructed an

experiment in which we induced different emotions and assessed whether the circumplex model was constant across context.

Method

Participants

The participants were 153 students at Aarhus University, Denmark (78 male, 75 female) who responded to an electronic recruitment flyer posted on the university's intranet. The participants were volunteers and not recruited or selected upon any basis other than that they were all students. The students were paid DKK 214 (approx. USD 36) to participate in the experiment. The amount was stated in the recruitment flyer. The experiment was such that each individual would be assigned to work in a group. Each group consisted of three participants of the same sex. Participants' availability determined which group they were assigned to. Within each group, participants were assigned to one of two emotional conditions (described below).

Task

The task chosen for the experiment was to produce origami sailboats in an interdependent work flow (see (Kane, Argote, & Levine, 2005), for a description of the task). The experimenters explained to the participants that they would produce origami sailboats in an assembly line and earn one point for each complete sailboat that met the product specifications that were explained to the participants. The participants were told during the introduction that the best performing group of the day would win a DKK 150 reward.

Figure 2 illustrates the conduct of the experiment as a time line. A total of five production periods or trials were performed, illustrated by the shaded areas 1, 2, 3, 4, and 5 in Figure 2.

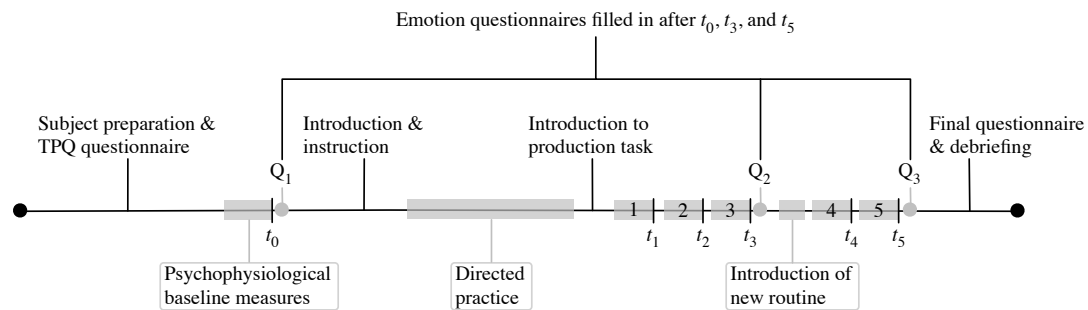


Figure 2. Time line of the experiment from the initial meeting of the experimenter with the participants until the participants leave (shown as solid black dots at each end of the time line). The time line is divided into segments that represent the phases in the experiment. The gray segments represent phases where we have information about the time at which each phase starts and ends. The five 4-minute trials are the gray segments labeled 1–5. The intervals between the gray segments are phases of preparation, instruction, pauses between trials, and debriefing. The emotion questionnaires Q_1 , Q_2 , and Q_3 are filled in immediately after times t_0 , t_3 , and t_5 respectively.

Each three-person group worked on a sequentially interdependent production task – constructing an origami sailboat.

Each participant was assigned to one of three sequential assembly line roles and was not allowed to swap roles. The assembly line roles were sequential and interdependent, requiring coordination and adherence to the individually assigned roles. The construction of origami boats made it unlikely that the task would be familiar to participants, and thereby helped to control for prior task experience. Group outcome was enforced by informing participants that the group of the day with highest point score would win a DKK 150 (USD 30) prize.

Procedure

Significant events in the experiment are listed in Figure 2. We are particularly interested in the effect of the emotional inducement, the main manipulation of the experiment, at the three different times when the emotion questionnaire was administered to each participant. That is, we examine how participants' self-reported emotions were affected by the emotional inducement, by working together to produce sailboats, and by the opportunity to use a new production routine.¹ All individuals in a given group were induced to feel either an active and pleasant or inactive and unpleasant emotion. To induce these feelings, the experimenters followed the facial, vocal, and postural indicators of unpleasant vs. pleasant and active vs. inactive moods, outlined in Bartel and Saavedra's (2000) "observers' instrument for work group mood." This method was also used in Barsade (2002). The inducement was in effect from the initial meeting with the participants until the debriefing session at the end of the experiment. Seventy-eight groups (39 male, 39 female) were induced to feel pleasant/active, and seventy-five groups (39 male, 36 female) were induced to feel unpleasant/inactive. At the beginning of the experiment (the leftmost black dot on the time line in Figure 2), each participant was randomly assigned to one of three roles in the assembly line. The participants were seated next to each other at a table, in the order dictated by their sequential roles in the assembly line. Participants faced the experimenter who provided them with instructions. In addition to self-report questionnaires Q₁, Q₂, and Q₃ (cf. Fig. 2), we also recorded various psychophysiological measures (to be reported on elsewhere). A subset of participants

¹ We tested whether the fact that group members were not independent influenced the outcome of our analysis. As appears from the empirical findings section, this was not the case.

were asked to fill out Cloninger, Przybeck, and Svrakic's (1991) tridimensional personality questionnaire (TPQ). A baseline of the psychophysiological measures was completed during a five-minute rest period.

After the rest period the participants filled out a questionnaire containing the 28 emotional terms from Russell's (1980) circumplex model of affect (questionnaire Q_1 immediately after time t_0 in Fig. 2). Based on Barsade (2002), the questionnaire read: "This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment." Each item was rated on a five-point Likert scale (1 = very slightly or not at all; 2 = a little; 3 = moderately; 4 = quite a bit; 5 = extremely). The experiment was then introduced to the participants, who were told that they would learn to fold origami sailboats and then produce them in a three-person assembly line.

The participants were trained by the experimenter, who first demonstrated the folds and then led the participants through a directed practice. Participants then practiced making boats on their own. Then each three-person group worked together to produce as many origami paper sailboats as possible during three consecutive four-minute trials, which were each separated by a short, 30-second break. Participants were not allowed to talk during the breaks.

After the third production trial at t_3 , the emotion questionnaire, Q_2 , was administered. The experimenter informed participants that the R&D department had developed a new routine. They were introduced to this new routine by video. In the video a person

of the same sex as the participants, who did not show either active/pleasant or inactive/unpleasant emotions, demonstrated a new origami-folding routine. This routine was superior to the routine they had been trained to do because it involved a fewer number of total folds to complete. The superiority of the routine, however, was not clearly obvious because its performance benefits (in terms of higher productivity) were hard to discern. Trial 4 began immediately after the introduction of the new routine. The groups were given no time to practice, and therefore had to decide right away if they wanted to adopt the new routine or not. Two production periods (Trials 4 and 5), each consisting of four minutes, followed after the introduction of the new routine.² After the fifth production trial at t_5 , the emotion questionnaire, Q₃, was administered, and the experimenter informed participants that the experiment was complete. Participants were then thanked and debriefed.

Results

We compared the changes in participants' emotions as the experiment evolved over the experimental context. If we can place subjects in the circumplex model of affect, their emotions can be described by two dimensions: valence and arousal.

We used multidimensional scaling (MDS) to derive two dimensions that we can identify as valence and arousal from the original 28 dimensions in our questionnaire

² We recorded whether groups adopted the new routine or not in Trial 4 and in Trial 5. We also measured the productivity of the groups in each trial. Productivity was measured by counting the total number of sailboats made during the production trial.

data. The input to multidimensional scaling was a set of pairwise dissimilarities or distances between the 28 terms that are the elements of a distance matrix.

We analyzed three types of data: the original questionnaire data, the distance matrices, and the dimensionally reduced data (i.e., the circumplex model resulting from MDS). The first type is closest to the original data and therefore less susceptible to methodological errors, biases, and assumptions, so we worked “downwards” from this type and checked results for the other types. The analyses we perform are as follows:

First, the self-reported emotion data were analyzed using a paired sample t-test on the 28 emotional statements collected in Q₁, Q₂, and Q₃. This shows which of the emotion terms differ significantly between the three questionnaire samples.

Secondly, we constructed a distance matrix of the 28 dimensions and tested whether the structure of the distance matrix varied between the three samples. In order to test for differences in the structure of the distance matrix, we applied the Mantel test (Mantel, 1967).

Finally, we calculated MDS solutions that reduced the questionnaire data to two dimensions that can be identified as valence and arousal. To compare MDS solutions from the three samples, we perform a Procrustes analysis.

Empirical Findings

We examined the changes in emotions across Q₁, Q₂, and Q₃. As previously mentioned, the experiment started with the participants being asked to relax for 5 minutes. This enabled us to record a baseline. After this period, the first self-reported emotional data, Q₁, were collected. The 5 minutes of relaxation is an induced low-arousal state. The question is whether or not it affected the self-reported data collected in Q₁ compared to data collected in Q₂ and Q₃. This was tested using a paired sample t-test. For 23 of the 28 emotions we found significant differences between time periods at the 5% level. These results are shown in Table 1.

Table 1. Differences in Self-reported Emotions Over Time

	Mean values			Mean value differences		
	Q ₁	Q ₂	Q ₃	Q ₂ ,Q ₁	Q ₃ ,Q ₁	Q ₃ ,Q ₂
Astonished	1.58	1.78	1.80	0.20	0.22	0.02
Afraid	1.26	1.13	1.03	-0.13	-0.23	-0.10
Alarmed	1.28	1.43	1.28	0.15	0.00	-0.15
Angry	1.07	1.24	1.17	0.17	0.10	-0.07
Annoyed	1.37	1.54	1.47	0.17	0.10	-0.07
Aroused	1.92	2.67	2.35	0.75	0.43	-0.32
Bored	2.18	1.46	1.50	-0.72	-0.68	0.04
Calm	3.74	2.75	2.82	-0.99	-0.92	0.07
Content	2.93	2.68	2.86	-0.25	-0.07	0.18
Delighted	2.20	2.47	2.68	0.27	0.48	0.21
Depressed	1.20	1.15	1.13	-0.05	-0.07	-0.02
Distressed	1.48	1.42	1.43	-0.06	-0.05	0.01
Droopy	1.80	1.43	1.40	-0.37	-0.40	-0.03
At ease	3.43	2.77	2.91	-0.66	-0.52	0.14
Excited	2.46	3.07	2.97	0.61	0.51	-0.10
Frustrated	1.24	1.61	1.54	0.37	0.30	-0.07
Glad	2.67	2.80	3.01	0.13	0.34	0.21
Gloomy	1.68	1.59	1.61	-0.09	-0.07	0.02
Happy	2.79	2.90	3.04	0.11	0.25	0.14
Miserable	1.10	1.10	1.06	0.00	-0.04	-0.04
Pleased	2.61	2.76	2.97	0.15	0.36	0.21
Relaxed	3.72	2.76	3.13	-0.96	-0.59	0.37
Sad	1.18	1.16	1.11	-0.02	-0.07	-0.05
Satisfied	2.84	2.84	3.07	0.00	0.23	0.23

Serene	3.22	2.62	2.63	-0.60	-0.59	0.01
Sleepy	2.80	1.65	1.68	-1.15	-1.12	0.03
Tense	1.64	2.06	1.71	0.42	0.07	-0.35
Tired	2.34	1.80	1.80	-0.54	-0.54	0.00

Note: Differences highlighted in boldface are significant at the 5% level.

Most of the significantly different dimensions are between Q₁ and either Q₃ or Q₂, but the consequences of these differences in terms of valence and arousal are not clear. To investigate this, we reduced the data to two dimensions using multidimensional scaling, which allowed us to relate emotions to arousal and valence.

To estimate the circumplex model of affect, a matrix of distances between the 28 emotions is needed because this is the basis in the MDS method. In order to study the effect of the differences shown in Table 1 we constructed a distance matrix based on the self-reported data collected at Q₁, Q₂, and Q₃ using Euclidean distances. The distance D_{jk} between emotional terms j and k is given by

$$D_{jk} = \sqrt{\sum_{i=1}^N (q_{ij} - q_{ki})^2}$$

where q_{ji} is the answer (on the five-point Likert scale) by subject i to the question relating to emotion j , and N is the number of subjects. The analysis on the three matrices will return similarly shaped circumplex structures if the structures of the three distance matrices are similar. This means that the correlation between the three distance matrices should be close to 1.

Because the distances in the matrices are not independent, the relationship between the matrices cannot be assessed directly through the correlation between the two sets of distances (Mantel, 1967). The Mantel test overcomes this problem by applying a permutation test to assess the significance of the correlation between the two distance

matrices (Mantel, 1967). The Mantel test was conducted with the vegan package in the statistical software R (Oksanen et al., 2011). The results from the three pairwise Mantel tests are shown in Table 2.

Table 2. Results from Mantel Tests.

	Q ₁ , Q ₂	Q ₁ , Q ₃	Q ₂ , Q ₃
Mantel statistic <i>r</i>	0.75	0.78	0.96
Significance	0.001	0.001	0.001
Empirical upper confidence limits (95%) of <i>r</i>	0.87	0.90	1

Table 2 shows that the correlation between the distance matrices based on the self-reported emotional data collected at Q₁ and Q₂ is 0.75, and it is 0.78 between the distance matrices from Q₁ and Q₃. Thus, the structure of the distance matrix from Q₁ is different compared to the structures of the distance matrices from Q₂ and Q₃. The correlation between the distance matrices from Q₂ and Q₃ is, however, 0.96 with an upper confidence level of 1, which means that these two distance matrices have similar structures.

Thus, the structure of the distance matrix from Q₁ is different from the structure of the distance matrices from Q₂ and Q₃, which influences the outcome of the dimensional reduction. The difference in data structure affects the outcome of any attempt at dimensional reduction.

The results are not influenced by the fact that the individuals worked in groups. A Mantel test of individual distance matrices versus group distance matrices showed that these had identical structures since the upper confidence level of r was equal to 1.

Based on the data on self-reported emotions collected at Q₃, we estimated an emotional circumplex model through the use of the classical ALSCAL routine in SPSS. The outcome of this analysis is shown in Figure 3.

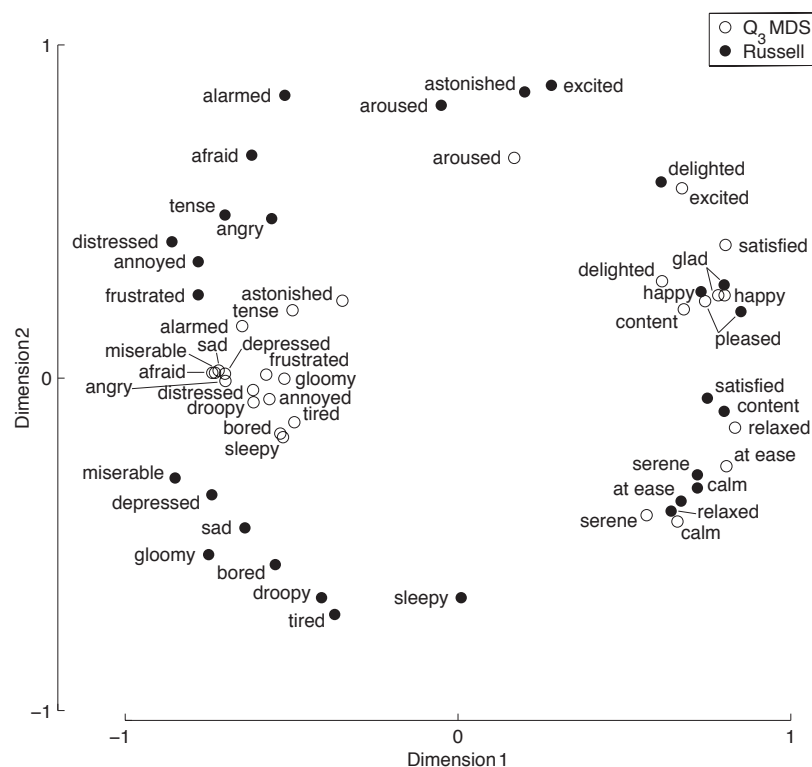


Figure 3. MDS solution based on the distance matrix derived from data from questionnaire Q₃ (open circles). This is compared to the semantic circumplex obtained by Russell (solid circles, also shown in Figure 1). The MDS solution has been rotated clockwise by 5.4° to obtain the best agreement between the dimensions of the MDS solution and Russell's original semantic circumplex model of affect. We can thus interpret dimension 1 as valence and dimension 2 as arousal. It is noticed that the arousal dimension is slightly compressed in our MDS solution compared to the semantic circumplex.

The model in Figure 3 is similar in structure to the original semantic circumplex model (Russell, 1980), suggesting that the circumplex structure is relatively

independent of the specific context in which data are collected. The same is true for the data collected at Q₂. The most conspicuous deviation from the semantic circumplex model is that our MDS solution has less variability in the arousal dimension, i.e., the structure is more “elliptical” than circular. This is a well-known difference between the semantic and self-report circumplex models (Feldman, 1995).

The model based on the data collected at the beginning of the experiment (Q₁) is shown in Figure 4. The same overall structure is repeated, but with clear outliers: serene, at ease, calm, relaxed, and sleepy. As can be seen from Table 1, these terms have very high mean values in the Q₁ sample (along with “content,” the five terms have the six highest mean values in the sample). This is not surprising since the questionnaire data for Q₁ are collected right after the five-minute relaxation period during which the psychophysiological baseline measure was recorded. The effect of these high mean values on the resulting emotional structure shown in Figure 4 is a “distortion” relative to the circular structure of the semantic circumplex and the elliptical structure of the self-report circumplex obtained from Q₂ and Q₃.

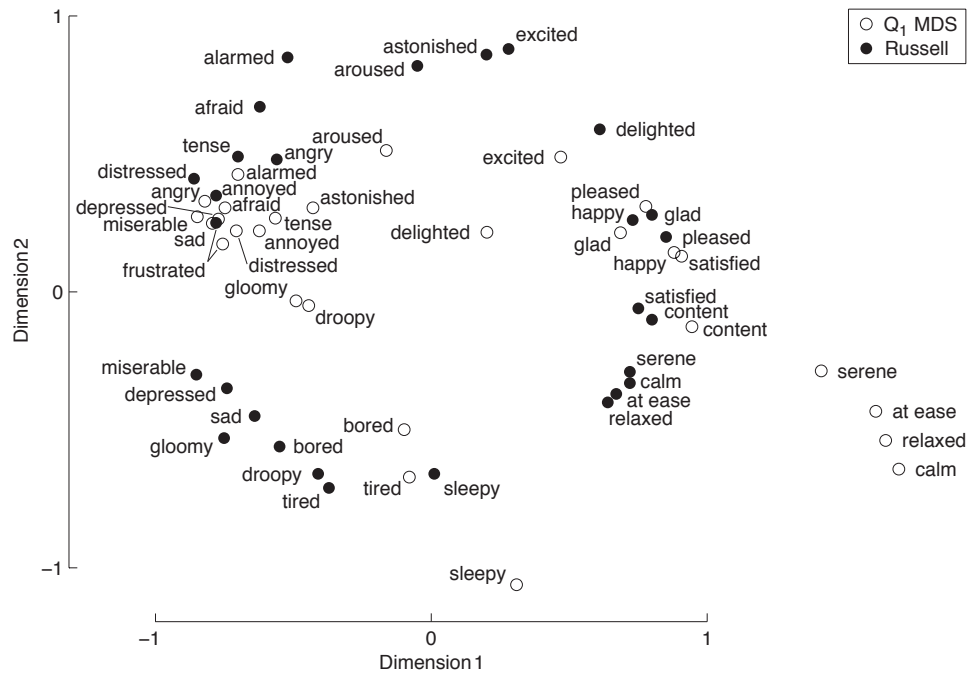


Figure 4. MDS solution based on the distance matrix derived from data from questionnaire Q₁ (open circles). This is compared to the semantic circumplex obtained by Russell (solid circles). The MDS solution has been rotated clockwise by 15.7°. In the Procrustes analysis, where our MDS solution is matched to Russell's semantic circumplex, the terms serene, at ease, calm, relaxed, and sleepy have been omitted, because they are considered outliers. But they have been subjected to the same transformation (translation, rotation, scaling) as the remaining terms. This gives the Procrustes statistic $d = 0.28$ as opposed to $d = 0.30$ when the five terms are included. As in Figure 3 we see a clear compression of the arousal dimension relative to the semantic circumplex. But the most conspicuous deviation from the semantic circumplex is that the terms serene, at ease, calm, relaxed, and sleepy are, in our MDS solution further from the origin than their semantic counterparts, while lying at roughly the same angle. This effect is attributed to the fact that Q₁ data are collected right after the 5-minute relaxation during which the physiological baseline was measured. Hence the subjects scored higher on those terms, which is also evident from Table 1.

In order to compare the MDS results from two different samples, we need to make sure that the dimensions are the same. The two dimensions produced by MDS are in a sense arbitrary, because we can choose an arbitrary rotation, translation, reflection, or scaling of the solution and obtain an equally valid MDS solution. In a Procrustes analysis (Borg & Groenen, 2005; Cox & Cox, 2008) the transformation that minimizes the sum of squared differences between two solutions is found. A Procrustes analysis serves two purposes: it tests how similar two MDS solutions are,

and by applying the optimal transformation it ensures that the dimensions are the same provided the two solutions are not too different.

In Figure 3 and Figure 4 the MDS solutions have been subjected to a Procrustes analysis and subsequent transformation that brings them in the best possible accord with Russell's original semantic circumplex. We chose the semantic circumplex as the common external reference in order to be able to interpret the dimensions as valence and arousal. The MDS solution based on Q_3 that is shown in Figure 3 only had to be rotated by 5.4° to minimize the sum of squared differences, whereas the MDS solution based on Q_1 had to be rotated by 19.8° . Without these rotations a straightforward comparison between the two solutions would mix the valence and arousal dimensions.

Because the solution based on Q_3 only required a 5.4° rotation, the dimensions in the MDS solution for this sample can readily be interpreted as valence and arousal. In order to compare the results from Q_1 , Q_2 , and Q_3 we keep the solution for Q_3 fixed and transformed the other solutions to achieve the best fit relative to that. We performed the Procrustes analysis using the statistics toolbox in MATLAB (Mathworks, 2011), and the results of this analysis for all three pairs of solutions are shown in Table 3.

Table 3. Results from Procrustes Analysis

	Q_1, Q_2	Q_1, Q_3	Q_2, Q_3
d	0.26	0.25	0.038
θ	23.2°	21.6°	1.7°

d is the normalized sum of squared differences for the optimal solution ($d = 0$ is a perfect fit). θ is the angle that the first solution is rotated to optimally fit the second solution. In addition to the rotation, the first solution is also translated and scaled by a small amount.

The results in Table 3 show that the MDS solutions obtained from Q₂ and Q₃ are very similar, because the Procrustes statistic is only 0.038. In contrast, the MDS solution obtained from Q₁ is not in very good agreement with either Q₂ or Q₃.

This result is in accordance with the result of the Mantel test shown in Table 2.

As already mentioned, we compared our MDS solutions to the semantic circumplex derived by Russell (Russell, 1980) in order to make sure that our dimensions represented valence and arousal. Thus, we should rotate the solutions relative to this reference model. The result of a Procrustes analysis of our MDS solution based on Q₃ relative to Russell's semantic circumplex is $d = 0.30$, $\theta = 5.4^\circ$. The agreement is at about the same level as that between Q₁ and Q₃. The semantic circumplex is circular, whereas the self-report circumplex is elliptical. The transformations applied in a Procrustes analysis preserve this difference, so our self-report circumplex solutions cannot achieve complete consistency with the semantic circumplex.

The MDS solutions and the Procrustes analysis show that the results depend on context. The solutions based on Q₂ and Q₃, which are sampled in a similar context (right after a production trial), are very similar to each other, whereas the earlier sampling of questionnaire Q₁, which was done in a different context, leads to a different solution.

Discussion

Russell's circumplex model of affect is one of the most widely used models for capturing self-reported emotions. Nevertheless, few, if any, studies have examined whether this model is indeed appropriate for measuring changes in emotions in different contexts.

We constructed an experiment which enabled us to manipulate emotions of our participants and study the consequences of these manipulations over time. To examine whether the circumplex model of affect was stable over different contexts, we first used a t-test which showed that there were significant differences in the mean values of questionnaire items over our three time periods (Q_1 , Q_2 , and Q_3) for 23 out of 28 emotions. The majority of the significant differences were related to differences between Q_1 and either Q_2 and Q_3 . Hence, there were changes in self-reported emotions as the experimental context changed over time.

To examine the consequences of these differences in terms of the two dimensions underlying Russell's model, valence and arousal, we first used multidimensional scaling to reduce the data into these two dimensions. The input for this analysis was a distance matrix of the 28 emotions.

To examine whether the structures of the three distance matrices were similar, we used the Mantel test. Based on this test, we were able to conclude that while the structures of the distance matrices for Q_2 and Q_3 were similar, Q_1 was clearly different. Next, we estimated a circumplex model based on the self-report data that was collected at Q_3 . From this, it was evident that the model ensuing from this was similar in structure to the original semantic circumplex model contained in Russell (1980), and that the same was true for the data collected at Q_2 . For Q_1 , however, this was not the case. This therefore indicates that the Russell (1980) model is indeed not constant across contexts.

For future studies that wish to use the Russell model across contexts, we therefore suggest a Procrustes analysis. This is because a Procrustes analysis allows a comparison of two multidimensional scaling models by assuring that the dimensions are the same.

In our data, the differences, or the instability of the model, were caused by the differences in the emotional states after the relaxation period, where answers to a subset of the questions in the emotion questionnaire were given particularly high scores. This resulted in answers that were on average significantly different from those given in the later samples. This difference affected the results of the multidimensional scaling solution and produced an unconventional model of the emotion space.

Ekkekakis et al. (2005) showed that the structure of affect changed over time, possibly because of physical activity. They used a different questionnaire, model, and analyses than we did. Therefore their results and ours are not directly comparable. Nevertheless, both studies indicate that physical activity or lack thereof has a significant effect on the perceived structure of affect.

Either way, it is clearly important to assure the stability of a model across different contexts when comparing changes in emotions over time. This has valuable implications for the measurement of emotions and the application of the circumplex model of affect, as it is common practice in experiments involving emotions to perform a manipulation, either at the beginning of the experiment or continuously, and then use a questionnaire at a later stage in the experiment to check whether the

manipulation was successful. Our results show that such manipulation checks are highly dependent on the context of the self-report. One important implication of this result is that the hypothesis tests of experimental results can potentially lead to different conclusions, depending on when such manipulation checks are made.

For future research interested in capturing changes in emotions over different contexts, our paper contains useful suggestions for data analysis and methods to apply. First, we suggest that the analysis of different emotional structures should initially be based on the underlying emotional items, rather than on the derived circumplex model. Further, the Mantel test comparing two or more contexts provides a test for assessing whether the emotional structure has changed. Finally, the Procrustes analysis finds the optimal rotation and can show if the circumplex models result in the same dimensions.

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