

**Proceedings of the
17th European Conference on
Research Methodology for Business
and Management Studies
Università Roma TRE
Rome, Italy
12-13 July 2018**



**Edited by
Prof. Paola Demartini
and
Prof. Michela Marchiori**

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**The Proceedings of the
17th European Conference on Research Methodology for
Business and Management Studies
ECRM 2018**

**Hosted By
The University of Roma TRE
Rome, Italy**

12 - 13 July 2018

**Edited by
Prof. Paola Demartini
Prof. Michela Marchiori**

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Preface

These proceedings represent the work of researchers participating in the 17th European Conference on Research Methodology for Business and Management Studies (ECRM) which is being hosted this year by Università Roma TRE, Rome, Italy on 12-13 July 2018.

ECRM is a recognised event on the international research conferences calendar and provides a valuable platform for individuals to present their research findings, display their work in progress and discuss advances in the area of Research methodology within the Business Studies Domain. It provides an important opportunity for researchers and practitioners to come together to share their experiences in this varied and expanding field. This year the conference has had a focus on Interventionist Research which has been highlighted in the pre-conference workshops and keynote presentations.

The first day will be opened with a keynote presentation by Dr. John Dumay from Macquarie University in Sydney, Australia, who will be speaking on *"Getting your Hands Dirty: A Critical Approach to Interventionist Research"*. In the afternoon there will be a speech by Prof. Anna Linda Musacchio Adorisio from Copenhagen Business School, Denmark entitled *"Broadening the Context: Interpretive Lenses for Business Research"*. Prof Paola Torroni of the University of Turin, Italy will then speak on the second day about *"Mixed Method Research"*.

With an initial submission of 167 abstracts, after the double blind, peer-review process there are 57 academic Research papers, 5 PhD Research papers published in these Conference Proceedings. These papers represent truly global research in the field, with contributions from Australia, Belgium, Brazil, Canada, Czech Republic, Denmark, Finland, Germany, Iran, Ireland, Italy, Lithuania, New Zealand, Poland Portugal, Russia, Slovakia, South Africa, Sweden, Taiwan, Thailand and UK.

We wish you a most interesting conference.

Prof. Paola Demartini

Prof. Michela Marchiori

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Biographies

Conference and Programme Chairs



Prof Paola Demartini is Full Professor in Management and Accounting at the University of Roma TRE, Department of Business Studies. She has been teaching Business administration, Managerial accounting, Financial Accounting and Corporate Governance. She co-chair of the Roma TRE Corporate Governance Lab. She has been visiting researcher at the University of Pula, Boston University, Macquarie University and Alliance Boston University. Her main research interests are intellectual-based management and financial communication.



Michela Marchiori is Associate Professor of Business Organization and Human Resource Management at the Department of Business Studies, University of Rome TRE. She is a member of the Interdisciplinary Research Program "Organization and Well-being". Her research interests include: Organizational theory, SMES's organizational design, People competencies assessment and management, Organizational Health and Safety (OHS), People with disabilities (PWD) work inclusion. She has published scientific papers in these topics in relevant national and international Journal, as well as books and book chapters.



Prof John Dumay is Associate Professor in Accounting at Macquarie University, Sydney. John's research specialties are intellectual capital, knowledge management, non-financial reporting, management control, research methodologies and academic writing. John has published many peer reviewed articles in leading academic journals. He is also on the Editorial Board of a number of leading journals, he is the Australasian Editor of the Journal of Intellectual Capital and the Editor of Electronic Journal of Knowledge Management.



Prof Maria Serena Chiucchi is Full Professor of Management Accounting at Università Politecnica delle Marche, in Ancona, Italy. She has been a Visiting Professor at University of Sydney Business School. Her research interests include intellectual capital, management control and qualitative research methods with particular reference to the case study method. In addition, over the last fifteen years, she has been conducting several interventionist research projects regarding management accounting, Intellectual Capital and more recently, Integrated Reporting. She has authored books, book chapters and Journal articles on these topics.

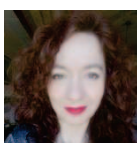


Dr Vicki Baard is Senior Lecturer in Accounting with the Department of Accounting and Corporate Governance at Macquarie University. Her areas of research and publication are interventionist research, management control systems, performance measurement, and teams and teamwork in service organisations. She is currently on the editorial board of Australasian Accounting, Business & Finance Journal (AABFJ) and is the Editor of Scholaris eJournal of Accounting & Finance, a student focused academic journal supported by the Faculty of Business and Economics.

Keynote Speakers



Prof. Anna Linda Musacchio Adoriso is Associate Professor of the Department of Management, Society and Communication at Copenhagen Business School, Denmark. She has used a narrative interpretive lens to investigate the cultural and historical context of the global transformations of the banking industry in the past thirty years, namely deregulation, internationalization and innovation. She is interested in interpretive methodologies and in the debate over the place of historical methods in business studies.



Paola Maria Torrioni is Associate Professor in Sociology of Cultural Processes at Department of Cultures, Politics and Society, University of Turin, Italy. Her research interests and experiences are mainly in sociology of cultural processes and sociology of family. She has technical skills in quantitative analysis and in longitudinal qualitative analysis. Actually she is interested in developing mixed-methods research programs. She is involved in national and international

comparative research projects focused on transition to adulthood and autonomy, socialization processes; gender studies (see for instance <http://www.except-project.eu>).

Mini Track chairs



Lino Cinquini is Professor of Management Accounting at the Scuola Superiore Sant'Anna of Pisa. His research interests are in Management Accounting and Control in private and public sector, with focus in Cost management, Strategic Management Accounting and Performance measurement. He has published in high ranked journals such as *Critical Perspective on Accounting* and *The British Accounting Review*. Since 2016 he is Editor-in-Chief of *Journal of Management and Governance*.



Dr Jonathan Lord is a Senior Lecturer in Human Resource Management and Employment Law at the University of Salford. He has previously been a H.R. Director, Manager and Consultant, working across all three sectors. Specifically Jonathan has worked within the transport and construction industries, as well as carrying out HR projects within the public and voluntary sector. Jonathan has previously undertaken mixed method research involving an analysis of Recruitment and Selection techniques within the Private, Public and Voluntary sectors, analysing the reasons why there are differences in the usage of techniques. He also recently completed a mixed method survey of UK Employment Tribunals. Jonathan is also a Chartered Fellow of the Chartered Institute of Personnel and Development, a Fellow of the Higher Education Academy and Member of the Industrial Law Society.



Hanne Nørreklit is Professor of Management Accounting at Aarhus University. Her research addresses the paradigmatic foundation, validity and social implications of performance management models. She researches in the digitalisation of accounting. She has published in high ranked journals such as *Accounting, Organization, and Society*, and *Contemporary Accounting Research*

Biographies of Contributing Authors

Marie Ashwin joined EM Normandie in 2008 as Professor of Marketing and Management after two decades of international experience. Since 2011 she has been Dissertation Coordinator adding an additional cultural dimension to her work enhancing the standing of RM amongst staff and students, and adding value to the teaching of methodology.

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Interaction Patterns: A Visual Approach to Mixed Methods Research

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Abstract: In this paper we describe an inventory of visual interaction patterns – repeatable combinations of visualizations and accompanying questions aimed at extending quantitative studies with qualitative data. More precisely, a visual interaction pattern is a systematic approach by which quantitative research results are visualized, shown to the research participants and interpreted together with the research participants. After a quantitative research phase (like a survey, experiment or card sorting), we produce visualizations (bar charts, matrices, etc.) which display the quantitative results. We then show these visualizations to our research participants in follow-up group conversations and ask questions in order to spur an exchange of interpretations and insights. We involve our research participants in the data interpretation process. We use the visualizations as centers around which we facilitate the group conversations by referring to what the visualizations are “saying” and asking what this means in the eyes of our research participants. The visual interaction patterns are elicitation mechanisms which enable researchers and research participants to jointly produce value-adding research insights. For example, the disagreement pattern provides value-adding insights by visualizing the spread of opinions and using constructive conflict as a way of collective thinking. The outlier pattern visualizes extreme dissenting views and gives voice to them. The benefits of applying the patterns include improving the correspondence of correlational models with empirical data, providing explanations for unexpected findings and alternative explanations for expected findings, enabling the formulation of post-hoc hypotheses based on the newly-discovered correlational dependencies, and providing feedback on the research procedure. The involvement of research participants in the data interpretation process enables a critical appraisal and enrichment of quantitative results. Insights extending (or challenging) the quantitative results are gathered, which leads to confirmed, revised or extended correlational models and revised or extended research procedures. These value-adding research outcomes are important for management research because they contribute to theory development, they create ideas on how to solve work-related problems, identify industry-specific dependent and independent variables, or foresee future management trends and developments.

Keywords: enriching quantitative studies, visual interaction patterns, visually supported group conversations

1. Introduction

We introduce *visual interaction patterns* – a series of light-weight, easy to use mixed methods instruments, which employ the power of digital visualization in order to, inter alia, reduce the “time and trouble of doing mixed methods research” (Freshwater 2013, p.299). The patterns involve tightly and reliably connected steps and thus contribute toward making the process of quantitative-qualitative data integration “seamless” (Leech et al. 2010, p.20). The patterns are repeatable combinations of *visualizations* and accompanying *questions* aimed at extending quantitative studies with qualitative data. More precisely, a visual interaction pattern is a systematic approach by which quantitative research results are visualized, shown to the research participants and interpreted together with the research participants in group conversations (these conversations follow the initial quantitative phase). Each pattern is easily repeatable and replicable. According to Dyllick and Tomczak (2009) qualitative studies often suffer from overreliance on descriptiveness, enthusiastic surrender to “expert” opinions, and accumulation of a ballast of anecdotal data. Our patterns have the potential to alleviate these disadvantages of qualitative studies by providing a systematic approach of eliciting qualitative insights which extend quantitative results. As part of the patterns, certain types of visualizations are used to depict certain types of data, certain questions are discussed during the follow-up conversation. The patterns are structured enough to avoid ballast accumulation. The follow-up group conversations unfold guided by the pattern-specific questions and the visualizations are (ideally) projected on a large screen in each focus group room. The patterns are, thus, structured but also flexible enough to allow for the elicitation of qualitative nuances – the participants answer the pattern-specific questions, while being free to add further and unprompted considerations during the follow-up conversations.

We hold the follow-up conversations with our research participants (shortly) after they have taken part in a survey (or experiment, or card sorting, or another type of quantitative research). During the follow-up conversations, we show visualizations that represent the quantitative results and we systematically invite feedback on these visualizations. We use the visualizations as triggers and annotation devices for deriving rich feedback from the research participants by facilitating the expression of their opinions. Our follow-up conversations yield value-adding revelations. By using the interaction patterns we involve our research participants in the data interpretation process. This is in line with the growing realization in management research that knowledge needs to be co-produced together with the research participants.

The purpose of this compilation of visual interaction patterns is to give researchers who have employed quantitative research methods an array of visual facilitation options of how to involve research participants or stakeholders in the data interpretation process. This prolonged involvement of the research participants allows to reveal the rationale behind quantitative results and trigger insights extending (or challenging) the quantitative results. The latter helps to, *inter alia*, confirm, revise or extend correlation models, get feedback on the quality of the research procedure, map future research needs or outline research-inspired action agendas. The visual interaction patterns are applicable to extend quantitative studies like, e.g., surveys, experiments, card sorting.

This paper is structured as follows. We start by a brief review on the most relevant literature. We then describe the visual interaction patterns – we provide a step-by-step procedure for applying the patterns, with examples. We discuss the theoretical background of the patterns and their value for researchers, managers, and facilitators. We offer reflections on the implications of the patterns, and conclude with a call to action for the management research community.

2. Literature review

Methodological “patterns” are rare in business and management research. One example are De Vreede and Briggs’s (2005) thinkLets – repeatable, predictable facilitation patterns. The thinkLets are aimed at eliciting certain patterns of thinking among people who are making an effort toward a goal while using a group support system (GSS). De Vreede and Briggs (2005) formulated seven basic patterns of thinking (diverge, converge, organize, elaborate, abstract, evaluate, and build consensus) and demonstrated that by focusing data collection efforts on thinkLets, rather than on the use of GSS itself, field and laboratory studies may become more replicable and better able to inform GSS development and use. Comi, Franco, and Eppler (2017) introduced five visual interaction patterns for facilitators to sustain collective sensemaking in management teams. These have the potential to improve the quality of data collected in an action research mode (i.e., by the researcher acting as facilitator), but are not geared to extend quantitative results from surveys, card sorting, or experiments alike. In this paper, we introduce visual interaction patterns, which mixed methods researchers can use to extend or challenge the results of quantitative research. Molina-Azorín and Cameron (2015) called for more mixed methods studies in business research, so as to provide more meaningful research results. Molina-Azorín (2011) found that mixed methods studies add value to management research with regard to their generic and specific contributions. For example, they may permit to develop or extend theory, identify industry-specific dependent and independent variables, determine the adequate level of analysis, or give more attention to process research. A mixed methods study that addresses one or some of these aspects may be considered pioneering work. However, mixed methods studies require more time, effort, and resources than studies that use only a single method, which poses an important barrier to carrying out mixed methods research (Bryman 2007). In this paper we address the call for more mixed methods in management research and we also address the challenge of reducing the time and effort required by mixed methods. The following two subsections are devoted to elaborating on our patterns as visual and mixed methods research tools.

2.1 The interaction patterns as visual research tools

By reviewing the literature on visual research methods (Bell et al. 2014; Meyer et al. 2013), it is possible to identify two basic approaches – practice approach and methodological. The practice approach argues that the use of visual models, maps, and representations supports organizational learning and knowledge building (see, e.g., Ewenstein & Whyte 2009; Nicolini et al. 2012). The methodological approach argues that visual artefacts (e.g., drawings) can be used as stimuli in the research encounter (e.g., interview) to elicit deeper responses from participants (see, e.g., Wheeldon 2011; Warren 2008). Our visual interaction patterns involve aspects of the methodological and practice approaches. The patterns are methodological because they envision the use of visualizations as stimuli in the research encounter (the group conversations) to elicit deeper responses from the

research participants. The patterns are also practical because they support organizational learning and knowledge building “in situ”. They function as devices that structure group conversations. The visually-mediated interaction unfolds effortlessly. This affords (Gibson 1978) and triggers a process of meaning negotiation (Paroutis et al. 2015) among participants. Such a process of meaning negotiation enables the production of qualitative data that is grounded in the interpretations of research participants, and that extends (or challenges) the results of quantitative research.

2.2 The interaction patterns as mixed methods research tools

In a purely quantitative research endeavor, the visualization of the results (if any) would be the “end” of the research process – the quantitative chart (or diagram) would be deemed unquestionable and nearly unmistakable. The interpretation of quantitative results would be seen as a prerogative of the researcher, predominantly without the involvement of the research participants. Our visual interaction patterns enable the involvement of research participants in the data interpretation process. They enable researcher-participant dialogue, motivated by the intent to exploit differences in the knowledge bases of researchers and researched to produce more insightful answers to problems of organization and management. A widely discussed mixed methods challenge is the need to make the process of quantitative-qualitative data integration “seamless” – i.e., involving tightly and reliably connected steps (Leech et al. 2010, p.20). In response to this challenge, our visual interaction patterns offer a seamless mixed-methods integration mechanism – by means of visually discussing and reviewing the quantitative output. Thus, the process of quantitative-qualitative data integration becomes more intuitive and easily operable. As a byproduct, the application of the patterns has the potential to reduce the “time and trouble of doing mixed methods research” (Freshwater 2013, p.299), thus alleviating an important barrier to the further uptake of mixed methods research in management (Bryman 2007).

3. The procedure of applying the patterns

Figure 1 presents the procedure for applying the visual interaction patterns.

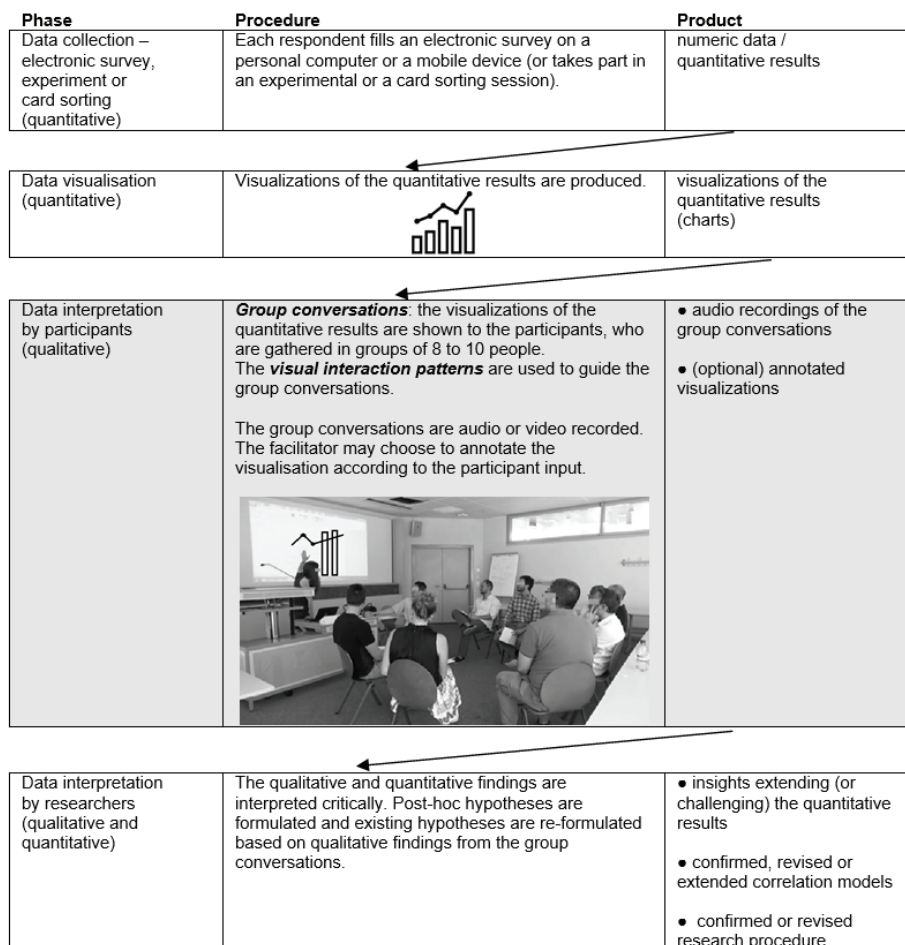


Figure 1: Procedure for applying the visual interaction patterns

The quantitative data collection phase (a survey, an experiment, a card sorting session, etc.) is followed by data visualization – visualizations (e.g., charts) representing the aggregate quantitative results are produced. These visualizations are then shown to the research participants, who are randomly split into groups of 8 to 10 people. A large screen showing the visualizations serves as a central point around which the follow-up group conversations take place. The visualizations play the role of structuration devices guiding (Suthers & Hundhausen 2003) the group conversations. Each group conversation is facilitated by one of the researchers, but the true (and more important) facilitators are the visualizations themselves. Each visualization is the center of a discussion and acts as an additional person in the room (the facilitator refers to what the visualizations are “saying” in the eyes of the participants). The researcher-facilitator uses the *visual interaction patterns* to guide the group conversations. Each pattern (as described in the following section) contains a *visualization* and accompanying *questions* to ask the participants. As a last step, all qualitative and quantitative findings are interpreted critically. This is done by seeking confirmation of the quantitative results in the qualitative findings (triangulation), seeking clarification or illustration of the results (complementarity), seeking divergence of results (extension), and discovering paradoxes and contradictions that lead to the research questions being reframed or hypotheses being reformulated (initiation) (see Molina-Azorín 2011). Insights extending (or challenging) the quantitative results are gathered, which leads to confirmed, revised or extended correlation models and revised or extended research procedures.

4. The patterns

We describe five patterns in this section – disagreement pattern, outlier pattern, labeling pattern, tag cloud pattern, and interactive correlational model pattern. We selected these five patterns (among a larger patterns repository) as most promising based on our research experience. Each interaction pattern is explained below in terms of purpose, procedure, trigger (discussion) questions, as well as outlined benefits. The documentation is common for all patterns – the group conversations are audio or video recorded. The facilitator may choose to annotate the visualizations according to the participant input. Alternatively, the facilitator may provide the participants with laser pointers or highlighters to mark areas of the visualizations, or with electronic pens in order to annotate the visualizations with question marks or comments.

4.1 Disagreement pattern

The purpose of the disagreement pattern is to get feedback from the research participants on the reasons for their disagreement (e.g., in the answers of survey questions). Table 1 contains an example of a visualization of the survey results which can be used to guide a group conversation as part of the disagreement pattern. The first bar chart (on top) represents the “index of disagreement” (Akiyama et al. 2016) of the answers given to each survey question, in descending order. The index of disagreement is calculated for each survey question by a Java-based software program. This program (the “Smart Survey Reporter”) was written by the first author in Java 8.0. Apart from calculating the index of disagreement, the Smart Survey Reporter aggregates the individual survey responses, so as to enable their visualization in online charts. The second bar chart (at the bottom, Table 1) shows the spread of answers to each survey question, again in descending order according to the index of disagreement. The spread of possible answers can be on a 5-point Likert scale (e.g., from “very important” to “not important at all”). The survey questions that yield the most discrepant answers also yield the highest index of disagreement.

4.2 Outlier pattern

The purpose of the outlier pattern is to get feedback from the research participants on the reasons for outlier opinions. An outlier opinion is an individual survey answer that lies an abnormal distance from other survey answers in the sample. The outlier pattern involves asking questions aimed at eliciting the rationale behind outlier viewpoints. The facilitator points to any visible outliers on the visualization and looks for an explanation of the outlier opinions. Trigger questions to be asked include: *“If we look at this, there are a small number of people who answered very differently. They are over here (show outliers on the chart). Help us understand their viewpoint. What might prompt someone to answer like this?”*. Potential benefits for researchers include giving voice to outlier opinions, taking outliers into consideration and revising correlational models. Potential benefits for managers and facilitators include giving voice to unpopular truths and individual realities.

Table 1: The disagreement pattern


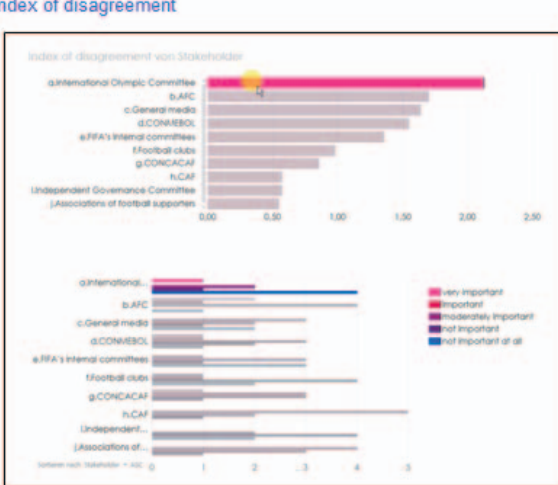

Disagreement pattern	
<p>Purpose: use visualization of quantitative results to get feedback from participants on the reasons for group disagreement (dissent)</p>	
	
<p><i>Example of a visualization of survey results (sorted in descending order based on the index of disagreement) which can be used to guide a follow-up group conversation</i></p>	
<p>Procedure: Display the survey questions in a descending order based on the “index of disagreement” ranking algorithm, i.e., place the survey questions with the most discrepant answers on top. Ask the participants to explain the reasons for their discrepant answers to survey questions.</p>	<p>Trigger questions: <i>If we look at this, you gave discrepant answers to this question. Help us understand why. What might have prompted you to answer so diversely? What are the reasons for your high disagreement regarding this issue?</i></p>
<p>Benefits for researchers: Explain the reasons for high group disagreement or reformulate/delete survey questions yielding the most discrepant answers; revise correlational models. “Unpack” variables – show whether the operationalization of variables actually reflects the underlying constructs that the variables are intended to reflect, i.e., help improve construct validity.</p>	<p>Benefits for managers and facilitators: Show managers and facilitators where the highest disagreement is, so that they can discuss these issues promptly and not rely on a pseudo consensus.</p>

Table 2: The outlier pattern

Outlier pattern	
<p>Purpose: use visualization of quantitative results to get feedback from participants on the reasons for outlier opinions</p>	
	<p>Procedure: Ask questions aimed at eliciting the rationale behind outlier viewpoints. Point to any visible “outliers” on the visualization and look for an explanation of the outlier opinions.</p> <p>Trigger questions: <i>If we look at this, there are a small number of people who answered very differently. They are over here (show outliers on the chart). Help us understand their viewpoint. What might prompt someone to answer like this?</i></p>
<p><i>Example of a visualization of survey results (showing outliers) used to guide a follow-up group conversation</i></p>	
<p>Benefits for researchers: Give voice to outlier opinions; take outliers into consideration; revise correlational models.</p>	<p>Benefits for managers and facilitators: Give voice to unpopular truths and individual realities; foresee the future based on outlier views.</p>

4.3 Labeling pattern

The labeling pattern involves asking research participants to attribute *labels* to clustered results from quantitative analysis. For example, the figure to the left of Table 3 displays a tree (dendrogram) produced by the simplecardsort.com platform and based on a cluster analysis of 104 individual electronic card sorts. The simplecardsort.com platform is unable to produce meaningful labels of the emerged tree clusters. In fact, no card sorting software or electronic platform is able to do this. The tree on the left-hand side of Table 3 is therefore without cluster labels. One way to produce meaningful cluster labels is through discussion in a group conversation with the research participants. We did this together with 104 research participants. We tested the

labeling pattern with 104 experienced managers enrolled in a part-time executive MBA program in Switzerland. The study was in the context of organizational stakeholder analysis. It can be seen in the figure on the right-hand side of Table 3 that one example group conversation has resulted in meaningful labels for the stakeholder clusters.

Table 3: The labeling pattern

Labeling pattern	
<p>Purpose: use visualization of quantitative results to get labeling suggestions for parts of the visualization from participants</p>	
<p><i>Example of a visualization used for the labeling pattern (a tree and the same tree – labeled)</i></p>	
<p>Procedure: Ask the participants to suggest the best possible labels for parts of a visualization.</p>	<p>Trigger questions: <i>What labels would you give to ... this cluster on the tree /this group of stakeholders / the four quadrants on this grid, etc.?</i></p>
<p>Benefits for researchers: Get clarity on the perceived meaning of parts of the visualization which depict emerging categories; if the quantitative analysis was cluster analysis, produce labels of the clusters (no software can produce meaningful labels of clusters).</p>	<p>Benefits for managers and facilitators: Produce meaningful labels for clusters (perceived groups) of e.g., stakeholders, products, etc.</p>

4.4 Tag cloud pattern

The tag cloud pattern (Table 4) works by producing tag clouds (with a free tool like tagcrowd.com) from the combined text of the comments written by the, e.g., survey participants (such comments are typically written at the end of a survey). In case of two opposing decisions made as part of the survey (e.g., invest or not invest), the researchers produce two corresponding tag clouds (from the comments accompanying the two opposing decisions). The researchers then place the two tag clouds next to each other and show them to the participants during the group conversation. The trigger questions to be asked are aimed at explaining the displayed differences between the two tag clouds (see Table 4). Discussing the differences between the two clouds sheds light on the rationale behind participants' decisions (e.g., to invest or not to invest). In the example visualization (Table 4) the first tag cloud is "normalized" with the help of the "Tag Cloud Normalizer" Java-based software program. This program was written by the first author in Java 8.0. The program enables a normalized comparison of two tag clouds by producing a normalized (i.e., magnified by a factor, which is the ratio of the tag counts of the two clouds) bulk text for the smaller tag cloud. This normalized bulk text is to be (re-)fed into the online tool (like tagcrowd.com) instead of the original bulk text of the smaller cloud tag. The interpretations elicited during the group conversations shed light on the meaning of certain keywords in the two tag clouds, with a focus on explaining the differences between the two tag clouds. These interpretations reveal insights which can allow to revise the construct validity of variables, i.e., they can show if the operationalizations of some variables reflect the underlying constructs that the variables are intended to reflect. Looking inside variables in order to (re-)check their construct validity is important, especially in a management context. The latter can permit to identify industry-specific dependent and independent variables (Molina-Azorín 2011) or reformulate existing variables to match a certain context.

4.5 Interactive correlational model pattern

The purpose of the interactive correlational model pattern (Table 5) is to improve correlational models' correspondence with the empirical observations. In a survey context, the correlational model is the one which served as a theoretical base for the development of the survey questions. The benefits for researchers include providing explanations for non-confirmed (discarded) hypotheses, providing explanations for newly emerged significant correlational dependencies, formulating new hypotheses or reformulating existing hypotheses. New

variables can also be added to the model or existing variables can be reformulated. The benefits for managers include improving the usefulness of correlational models utilized for collective sensemaking, problem solving, decision making, strategizing, and prediction in groups.

Table 4: The tag cloud pattern



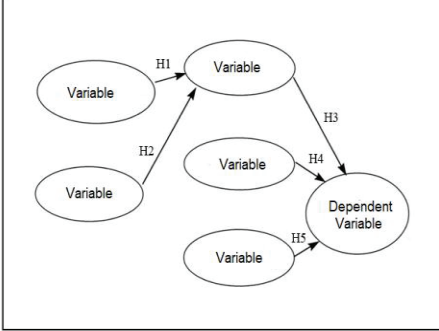
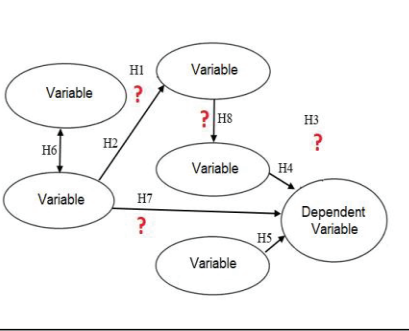
Tag cloud pattern	
<p>Purpose: use visualization of the survey comments to get feedback from participants on the rationale behind their survey answers</p> <div style="text-align: center;"> <p>Bulk text of comments of participants who agreed to invest (normalized):</p>  <p>Bulk text of comments of participants who disagreed to invest:</p>  <p><i>sample text</i> →</p> </div> <p><i>Example of a visualization which can be used as part of the tag cloud pattern (a tag cloud of the comments of survey respondents who decided to invest in green color and a tag cloud of the comments of survey respondents who decided not to invest in red color)</i></p>	
<p>Procedure: Produce tag clouds (with a tool like tagcrowd.com) from the comments written by the participants as part of a survey. In case of two opposing decisions made as part of the survey (e.g., invest or not invest), place the two tag clouds (of the comments accompanying the two opposing decisions) next to each other. Ask the participants to explain the differences between the two could tags.</p>	<p>Trigger questions: <i>If we look at this, you gave varied comments: the people who decided to invest were mostly concerned about “venture” and the people who decided not to invest were mostly concerned about “risk”. Help us understand why. Would you explain?</i></p>
<p>Benefits for researchers: Reveal the rationale behind participants' decisions (e.g., to invest or not to invest).</p>	<p>Benefits for managers and facilitators: Reveal the rationale behind decisions. Help groups make better decisions.</p>

Table 5: The interactive correlational model pattern

Interactive correlational model pattern	
<p>Purpose: use participants' voices to revise correlational models</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 10px; text-align: center;">  <p>Original Model</p> </div> <div style="border: 1px solid black; padding: 10px; text-align: center;">  <p>Revised Model</p> </div> </div> <p><small>Legend H: Hypothesis / The lack of an arrow means lack of correlational dependence.</small></p> <p><i>Example of a visualization which can be used as part of the interactive correlational model pattern (an original model and a revised model)</i></p>	
<p>Procedure: Perform a quick statistical analysis (e.g., of survey results) to test the original correlational model (the one which served as a theoretical basis for formulating the survey questions) and produce a visualization of the revised model. Show the two models on a big screen next to each other – the original model next to the revised model – and discuss the differences between them with participants. Ask the participants why some hypotheses were not confirmed, and why new hypotheses emerged. Ask also if something is missing in the revised model (if new variables should be added).</p>	<p>Trigger questions: <i>If you look at the revised model, Hypotheses 1 and 3 were not confirmed. Help us understand why. Would you explain? / If you look at the revised model, new hypotheses have emerged. Can you explain? / Is there any variables that are absent in the revised model? What kind of additional hypotheses can be tested in the future?</i></p>
<p>Benefits for researchers: Improve a correlational model's correspondence with the empirical observations. Provide explanations for non-confirmed (discarded) hypotheses. Provide explanations for newly emerged significant correlational</p>	<p>Benefits for managers and facilitators: Improve the usefulness of correlational models utilized for collective sensemaking, problem solving, decision making, strategizing, and prediction in groups.</p>

dependencies. Formulate new hypotheses or reformulate existing hypotheses. Add new variables to the model or reformulate existing variables.	
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5. Discussion

In this paper we discussed the theoretical underpinnings and proposed application of an inventory of visual interaction patterns – mixed methods research tools aimed at enriching quantitative studies with qualitative insights derived by using visualizations to involve participants in the interpretation of research findings. With the patterns, it is no longer exclusively the researcher’s task to develop theory on the basis of data interpretation. Instead, the researcher involves the research participants in the process of data interpretation. Data interpretation becomes a dialogue between researcher and participants, in a form of co-construction of knowledge (Torrance 2012).

Our patterns are, of course, not without limitations. One limitation comes from the risk of visualizing opinions on delicate issues. This limitation is mitigated by the fact that we are visualizing aggregate (group) research results, while the individual research results remain anonymous. This limitation is also mitigated by the power of visualizations to bring tough issues to the surface in a subtle way, since visualizations are typically perceived as interactively neutral, as pure information (see Meyer et al. 2013). Another limitation comes from the reliance of our patterns on human facilitators. This limitation is mitigated by the fact that the true (and more important) facilitators in our group conversations are the visualizations themselves – they are the center of the discussion and act as an additional person in the room (the facilitator is referring to what the visualizations are “saying” and how to interpret this).

6. Conclusion

We would like to conclude with a call to action for the management research and practitioner communities. In particular, we recommend employing the patterns to enable the production of new understandings. Such new understandings can confirm, extend or question the goodness of the pre-produced quantitative data. Practitioners such as team leaders, coaches, and designers of group interactions, are well advised to apply the patterns to involve practitioners in the process of work-related inquiry. The visual interaction patterns can help researchers elicit value-adding insights about the goodness and usefulness of quantitative results. The procedure of applying the patterns can play the role of a methodological boundary object between the worlds of researchers and research participants. Researchers are able to see their results with the eyes of the people who produced these results. This has the potential to yield more insightful answers to problems of organization and management. Inferences are built by exploiting the differences in the knowledge bases of researchers and participants, so that management research can make a difference in the real world.

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The Debatable Paradigm of Mixed Methods

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Abstract: The role of mixed methods research methodology has been growing. Yet in spite of this, there has been a contest as to whether mixed research methods is to be considered as a methodology let alone as research paradigm. In this study, eleven controversies are deliberated upon and recommendation is thereafter made. The users of mixed methods as well as those aspiring to make use of the qualitative and quantitative research methodologies shall find the controversies raised applicable and may spur further debates into the nomenclature surrounding the mixed methods. This subject is deliberated at a time when diverse research methodologies are being sought especially in emerging fields in entrepreneurship and will therefore be a desirable issue in attending to the semantics and nature of emphasis in conducting research involving both paradigms. Does mixed methods add anything in terms of value to research besides what the two methodologies advance? This happens to be one of the controversies dealt with in this presentation.

Keywords: methodologies, world views, philosophy, paradigms, controversies

1. Introduction

Research paradigms have at times been referred to as research philosophies. The several research paradigms have been pointed out as representing world views. The world views embedded in this belief help in determining the strategies, techniques, design as well as processes for the knowledge of enquiry's investigation or reinvestigation (Saunders, Lewis and Thornhill 2009). The rest of the paradigms shall be addressed in the next sections of this work. Though there has been usage of different paradigms in research yet there have been controversies raised against the mixed methods. This paper shall deliberate on these controversies as well as propose some solutions to the dilemma that is in existence. Before dealing with the controversial aspects detailed in this presentation it is worth understanding the various paradigms that are in existence. However, does mixed method constitute in being a new research design or has it been evidenced in earlier works? What is the force behind mixed methods and does it have its own design or does it appropriate other designs? These are some of the eleven issues raised in the controversies in this presentation. The immediate laid out sections deal with the various philosophies that have been in operation for a long while in the world of research.

2. The realism philosophy

This philosophy has been understood for two attributes. Among the assumptions of realism for which it is well known is the difference of the researcher from what is being investigated. The other attribute is related to data collection, in that data collection in that there should be uniform method for collecting data for any scientific or social research (Bryman and Bell 2011). There are subdivisions in realism in that in the phenomenon's advancement realism becomes divided in to two areas: they are the direct realism and the empirical realism (Bryman and Bell 2011). For the achievement of the world's true picture, Saunders et al (2009) states that the perception of the social actor should be derived from their senses. In the case where the actor gives a wrong perception as such, then another option is made available named critical realism. The critical realism enables the actor to allow questions to be raised that finally the realisation of a true world view. The need to get the true world view is based on the fact that actors can at times be deceived. For critical realism, the actors must involve in learning process [Dabson (2002) in Saunders et al (2009)]. The changing circumstances therefore demand that in certain circumstances it may not be applicable as such.

3. Interpretivism

The phenomenological and symbolic interaction led to interpretivism (Saunders et al 2009). Phenomenology explains the conception of the social actors lived world (Saunders et al 2009; Goulding 2005; and Lester 1999). There is significance in the role of the symbolic interactions and the continuing interactions of the lived world. The values as well as activities are generally shaped by the actors interactions as shaped by discussions and actions with each other (Bokberger and Melen 2011; Saunders et al 2009). In the interpretivism domain the distance between the object and the actor does not get removed. Kelliher (2011) and Saunders et al (2009) consider this as an alternative to positivism since it does relate to natural sciences research. Interpretivism has it that the behaviour being investigated and the researcher cannot be in isolation or separation. There is also a caution on the bias views influencing the researcher's outcome of the work. Among other things pointed out

against interpretivism is the challenge of generalising results due to issues on validity and reliability(Kelliher 2011).

4. Positivism

Positivism has the understanding that assessable and visible objects under observation should be generalized in pursuit of true knowledge. There is a strict call for the object under study and its meaning to be different from the researcher in positivism (Bryman and Bell 2011). It is without doubt that Saunders et al (2009) have referred the positivism research strategy as objective. It is an epistemological stance in positivism that the researcher and the object be separated. This affirmation of the object under study being different from the researcher is noticeable in natural sciences during the process of investigation. It further noted that positivism’s ontological perspective on the social phenomenon is the distinctness of the object under study and the actor (Bryman 2012). So far this is in complete contrast with the constructivist ontological perspective which consider that the views of the actor do result in the social construct (Bryman 2012). The social constructivists are thereby known to build constructs through joint efforts (Maylor and Blackmon 2005). It is the axiological beliefs of the positivists that consider that the scientific nature of the process is also value free. Moreover even the concept itself is considered as an object (Samuel 2012). Since the objectivist philosophical approach goes hand in hand with the quantitative approach, the positivist tend to abide by it. This however in complete contrast to the phenomenological stance that holds it that the researcher’s perceptions and views impact on the nature of results interpretation.

5. The pragmatism stance

The pragmatism research stance is that it does deal with situations, actions and consequences that are under investigation. Pragmatism makes use of a multiplicity of methods in achieving outcomes that are better (Creswell 2009a). It is under this method that the researcher is free to sue any method to produce improved results (Freshwater and Cahill 2013). The pragmatists have often been known as those that see the diversity and do engage in using various techniques in dealing with various challenges in the process of presenting the work (Creswell 2009a; Johnson and Onweugbuzie 2004; Hanson et al 2005). The various philosophical stances have been tabulated in the table below:

Research philosophies	Positivism	Realism	Interpretivism	Pragmatism
Epistemology: the investigator’s perceptions of what constitutes satisfactory knowledge.	Only observable objects are capable of providing reliable data and facts. Emphasis is on cause, effect, impact and law to make generalisations. It reduces constructs to the simplest elements.	Observable objects offer reliable data and facts. Inadequate data implies imprecisions in feelings (direct realism) while objects provide feelings which are vulnerable to misconceptions (critical realism). Emphasis is on discussions within the framework.	Centres on perceptual meanings and social constructs. Emphasis is on the information surrounding the situation, the background of the information, perceptual values and rationale behind the actions.	Any or combinations of observable constructs and perceptual values can lead to acceptable knowledge. This is dependent on the nature of the research questions at hand. Emphasis is on applied research, adopting multiple techniques for data collection and interpretation of results.
Ontology: the investigator’s perceptions of what constitutes the nature of reality.	Objects are seen as external and possess a reality that is different from that of the investigator.	Objective in nature, its existence is completely different from the thoughts, and beliefs of social actors (realist); its interpretation comes from social circumstances (critical realist)	Social constructs built into social interactions and actions of others. Subjective and variation is inevitable	Emphasis is on better ways to provide answers (solutions) to the research questions (problem). The decision on the suitable techniques is dependent on the research questions.
Axiology: the investigator’s perceptions of the	The investigation is carried out in a value-free way; the	Investigation is value loaded; the investigator’s point of	Investigation is value assured; the investigator is part of	Values play a significant role in interpretation of

Research philosophies	Positivism	Realism	Interpretivism	Pragmatism
role of values in investigation.	investigator is alienated and upholds an objective mind set.	view is subjective based on their social experiences and background which often impact the outcomes of the study.	the investigation, not possible to be indifferent; this makes the whole exercise sometimes subjective.	results; the investigator adopts both objective and subjective perspectives.
Main methods of data collection.	Very organised, big samples, measurement, quantitative and permitted to use qualitative when necessary.	Techniques adopted must be align with the research questions, qualitative or quantitative.	Takes small samples with deeper examination, more qualitative.	Takes mixed or multiple approaches, that is, qualitative and quantitative.

Source: Saunders et al. (2009: 119).

6. Mixed methods controversies

The use of mixed methods is something that has been in use for some while, nonetheless, the method is being contested as such. Although the method has been used to develop analytical power, Sandelowski (2000:246) however argues that though prevalently used, it is neither a paradigm nor method linked. The comprehensive use of the qualitative and quantitative as combined technique still lacks direction. Consequently there have been a number of controversies raised as such. Among the controversies on mixed methods is the definitive aspects of mixed research methodology. The mixed methods definitions are said to have through shifts. Authors such Greene, Caraceli and Graham (1989:256) did define mixed methods as those that include at least as one quantitative method(designed to collect numbers) and one qualitative method (designed to collect words) where neither type of method is fundamentally linked to any particular paradigm of enquiry. Nonetheless, in ten years' time, the definition took another angle in which it involved all phases of research and not simply mixing the two methods. This led to it becoming a methodology (Tasshakori and Teddlie 1998). The mixed methods was defined as quantitative and qualitative combined approaches. At some point mixed methods was considered to have advanced with its own world view having its own vocabulary and techniques (Tasshakori and Teddlie 2003). Other authors with time progression named mixed methods as a method of enquiry with its own philosophical assumptions (Creswell and Plano Clark 2007). It was at this point that the data collection, as well as analysis was enabled in that it enabled it to provide a better understanding than quantitative or qualitative separately. An analysis of 19 different definitions on mixed methods by leading mixed methods researchers led to a definition that did not include paradigm nor method as indicated below:

Mixed methods research is a research in which researcher or teams of researchers combine qualitative and quantitative research approaches for the purposes of deep understanding and corroboration (Johnson, Onwuegbizie and Turner 2007). Paradigms were mentioned by Green et al (1989). The changing definitions have therefore been noted as in the case of spanning of points of view to inferences besides it is no longer viewed as data collection application but rather as a combination that includes both the quantitative and qualitative approaches.

Another criticism labelled against mixed methods is its ability to realise a solution that is not achieved by other paradigms. In response to this assumption is the question of what is the good fit that is between the qualitative and quantitative paradigms in a single study. The question of what fit is achieved between the qualitative and quantitative methodologies? This is noted besides the questionable fact that do researchers have an equally good competency for both qualitative and quantitative methods? It is this the lack of playing fields in these grounds that gets pointed out in this scenario.

In consideration of the controversies in mixed methods, it is important to realise that the approach of mixed methods does not simply refer to data collection but it deals with paradigms and designs. There is a dichotomy or binary that minimises the diversities of methods and which is considered unacceptable (Green, 2007).. Green has urged the observance of philosophies and this is achieved by not intermingling the methods as such. Since the final design does not necessarily hold words or numbers, it has been considered as a categorical mistake by Vygot (2008). In place of mixed methods, the collection of multiple data sources in either quantitative or

qualitative is thus a welcome development (Shank 2007; Vogt 2008). The use of quantitative and qualitative data of data collection simply known as multiplicity of sources (Morse and Niehaus 2009). The different positions between the quantitative and qualitative are distinct and can be helped thus can be reinforced through a binary distinction (Creswell 2011).

One of the controversies is related to the fact that mixed methods is termed as a new paradigm. This has been under objection in that earlier researchers from as early as 1920's were gathering data using mixed methods. This is besides the call for an equal footing of both qualitative and quantitative research (Patton 1980). Mixed methods has been termed by some authors as a third methodological movement (Tashakkori and Teddlie 2003) whereas others term as a third research paradigm (Johnson and Onweugbuzie 2004) while others still terms it as a new star in the social science sky (Mayring 2007).The combination of the two methods for research is something that has often been mentioned by earlier researchers. Having observed informal combination of both the qualitative and quantitative methodologies, Sieber (1973) did call for the combining of the methods. A number of studies conducted by Sieber which involved interviews and surveys had required this type of data collection (Sieber and Lazarsfeld 1966).It is further argued that earlier authors used the word 'interplay ' with both methods but had limited possibilities for design (Cresswell and Plano Clark 2011).

The driving force in the mixed methods research has been part of the controversy in mixed methods research debate. The ideology of use less to do more which was notable especially in 1990's had a global impact (Giddings 2006). At one point the funders are said to have changed the research design which was meant initially to be quantitative and then later on qualitative as exemplified when Miall and March (2005) were made to change the questions by the funders. A scenario such as this was at one time termed as 'depersonalisation of the technicians' by the mixed methods research. In spite of the fact that mixed methods tended to reduce the researchers, the pluralism in research is said to have gained its stamina through the use of qualitative research. It is furthermore argued that the interdisciplinary approaches between the quantitative and qualitative did aid in developing interdisciplinary approaches to issues that are complex (Mayring et al. 2007). Before acceptance by researchers the post modernists have called upon researchers to ' critically digest ' mixed methods before it's a full acceptance (Freshwater 2007:145). The philosophical contentions of paradigms is one of the controversies embedded in mixed methods controversy. The possibility of mixing has been negated by the rigidities aligned to the world views. This aspect has been raised by Holmes (2006) who points out the contradiction of how two opposite or competitive views can be shared in a single project. The 'incompatibility thesis' categorises this position (Howe 2004) and this position has also been associated with a purist stance (Rossman and Wilson 1985). The strictness of this approach is better avoided on consideration that there are aspects within paradigms that can be blended (Guba and Lincoln 2005; Creswell 2009c). Each paradigm in mixed methods has to be honoured since the new insights and tensions are likely to be found (Greene and Caracelli 1997). A study may start with apostpositivist quantitative view and yet in the following phase use a constructivist paradigm using a group discussion on a qualitative basis (Creswell and Plano Clark 2007).

Another controversial issue is on the post positivism favouritism in mixed methods. What has been associated with mixed methods is conservatism the challenging of the qualitative enquiry (Denzin and Giardina 2006). This is very much evidenced when objective and systematic findings are more emphasised as terms of reference in the mixed methods research with the result that there is a marginalisation of the qualitative consequently, hence post positivism is evidenced. Another example in this case is noted in the case when the No Child Left Behind Act (NCLB). In this particular research model the aim was to have a reliable and valid knowledge suing a methodology that was rigorous and systematic (Ryan and Hood 2006). In this context, the need to make emphasis on performance of students' scores as well as accountability being the main objective ended up marginalising the qualitative side of the research. It is also noted that the social differences as expressed by gender, ethnic grouping, race, linguistic status as well as other knowledge is thus missed unless attention is drawn to it in the process (Lincoln and Canella 2004). In his article entitled 'Mixed Methods Research: Positivism dressed in a drag', the overemphasis is thus captured. The relegation of the qualitative into a secondary role is the emphasis that the author denotes. The relegation of one aspect into the secondary role has been noted sometimes with the qualitative or even the quantitative itself (Creswell and Plano Clark 2007).

One of the issues dealt with in the controversies regards the control of mixed methods as such. Who exactly controls mixed methods? There are rules or assumptions to be followed before anything is thus accepted in an academic discipline. There is therefore a question of the total acceptance of mixed methods without any critique (Freshwater 2007). There is a call by the author for the hybridisation of methods in the format of mixing genres,

conventions and forms. In the same tenor the researcher is thus free and should thus avail their experience (Freshwater 2007:144). There is need to carefully consider the call by the author of this proposition in that if the call is adhered to, then a subjectivist leaning will have resulted in the call. It is observations such as this that may link mixed methods to the controversy that it has not as yet gained independence by which it differentiates its existence.

In dealing with the controversies of mixed methods, comes in the concern of the bilinguality of language. This then sparks the question as to whether mixed methods does not have its own unique language other than using the quantitative and qualitative languages thus far. Do words such as ‘trustworthiness and authenticity’ be used in qualitative validity as new words (Lincoln and Guba 1985)? Or would words such as legitimisation be used to replace validity in the mixed methods topic (Onweugbuzie and Johnson 2006). In psychology words such as qualiquantology have been formed and this is consequent on the use of the nomenclatures of qualitative and quantitative terminologies (Stenner and Rogers 2004). The use of one method more than the other has often been associated in the mixed methods routine in writing, this is well exemplified as in the case of the use of the word ‘inferences’, which is often associated with the quantitative vocabulary than anything else (Teddle and Tashakkori 2009). In certain cases other examples do include the use of words such as construct validity, such occurrence of words in mixed methods are closely associated to the quantitative methodology (Leech, Dellinger, Brannagan and Tanaka 2010). Whereas other terms such as personal transformation do however gear towards to qualitative side of understanding (Mertens 2009).

There is another area besides the above the research design controversially arises in mixed methods. Normally the balancing wheel between the opposite areas of objectivity and subjectivity is the research design which as well avoids overreliance on one area or methodology as such (Creswell 2011). In search of new methodologies, authors such as Maxwell and Loomis (2003) conceptualised a 5 dimensional systematic approach that were interactive. These approaches were: the questions, the methods, conceptual framework and the purpose alongside the validity issues. Although authors such as Denzin and Lincoln (2005) have proposed the need for mixed methods to have teams with diversity expertise in research yet the main challenge remains as the need for the uncontested designs in the mixed methods area. The basic assumptions governing both methodologies are being violated by the mixed method researchers is one of the controversies that is labelled against mixed method researchers (Morse 2005). There is an accusation that mixed methods uses a naturalistic method but dresses itself in a positivistic outlook (Giddings and Grant 2007). Among those accused of violating the principles are the novices from emerging fields (Niglas 2009). One of the issues cited however has been poor research which is a problem associated to both paradigms. Indeed one of the problems that novice researchers are faced with is the challenge of a philosophical stance choice explicitly and an enquiry framework for their work (Rolfe 2006; Miyata and Kai 2009).

Another issue on a conclusive note when dealing with the issues regarding the controversies of mixed methods is the possibility of misappropriation of other designs. This is exemplified in areas such as scale development which is termed as a quantitative design and this has been used in this design for a long time (De Vellis 1991). Following this example is the content analysis which is considered a quantitative style which initially starts with qualitative data collection and later quantitatively analysed using a transformative process. In spite of the above the process has still been termed as a mixed method design (Sandeloweski et al 2009). Although this point is raised but there is need to understand that mixed methods does use content from both paradigms and therefore as long as both designs are respectfully treated there should be acceptance. However, if any of the styles stated is considered as solely a mixed method style then there is a controversy indeed in this too.

A table below summarily gives the controversies of mixed methods:

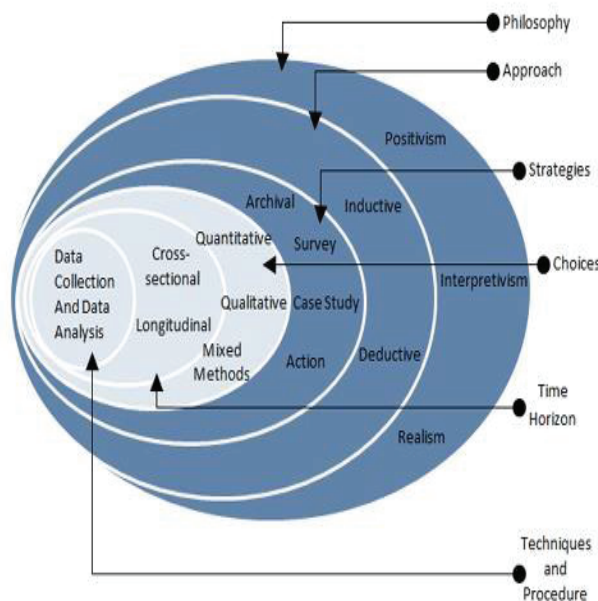
Mixed Method Controversies

Controversies	Questions being raised
1-The changing and expanding definitions of mixed research.	What is mixed methods research? How should it be defined? What shifts are being seen in its definitions?
2- The questionable use of quantitative and qualitative descriptors.	Are the terms qualitative and quantitative useful descriptors? What inferences are made when these terms are used? Is there a binary distinction being made that does not hold in practise?

Controversies	Questions being raised
3- Is mixed methods a 'new' approach to research?	When did the conceptualisation of mixed methods begin? Does mixed methods predate the period associated with its beginning? What initiatives begun prior to the late 1980's?
4- What drives the interest in mixed methods?	How has interest grown in mixed methods? What is the role of funding agencies in its development?
5- Is the paradigm debate being discussed?	Can paradigms be mixed? What stances on paradigm use in mixed methods have been developed? Should the paradigm on mixed methods be based on scholarly communities?
6- Does mixed methods privilege postpositivism?	In the privileging of postpositivism in mixed methods, does it marginalise qualitative interpretive approaches and relegate them to secondary status?
7- Is there a fixed discourse in fixed methods?	Who controls the discourse in mixed methods? Is mixed methods nearing a metanarrative?
8- Should mixed method adopt a bilingual language for its terms?	What is the language of mixed methods research? Should the language be bilingual or reflect quantitative and qualitative terms?
9- Are there too many confusing design possibilities for mixed methods?	What designs should mixed method researchers use? Are the present designs complex enough to reflect practice? Should entirely new ways of thinking about designs be adopted?
10- Is mixed methods research misappropriating designs and procedures from other approaches to research?	Are the claims of mixed methods overstated (because of misappropriation of other approaches to research?) Can mixed methods be seen as an approach lodged within a larger framework (eg ethnography)?
11- What value is added by mixed methods beyond the value gained through quantitative or qualitative research?	Does mixed methods provide a better understanding of a research problem than either quantitative or qualitative research alone? How can the value of mixed methods research be substantiated through scholarly enquiry?

Source: Creswell (2011:270)

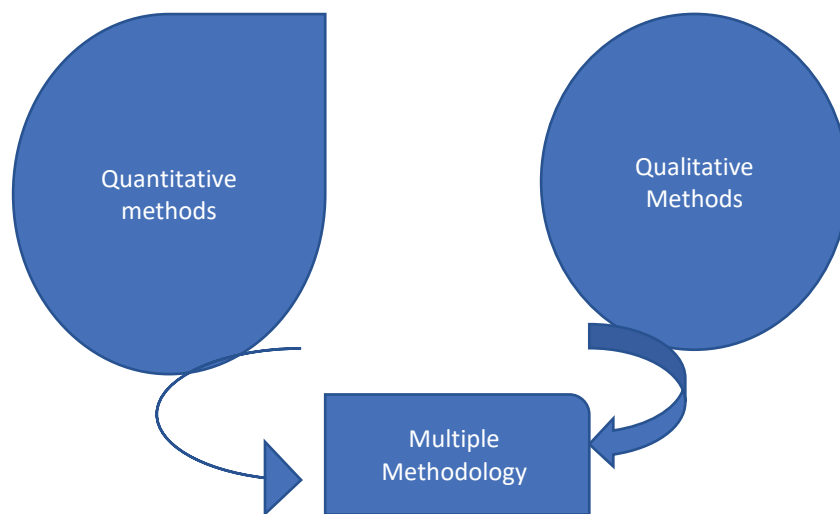
In spite of the above controversies there is a need for the researcher to be well guided in their investigation in terms of whether they will be guided by an interview or a survey as such (Saunders, Lewis and Thornhill, 2009). Authors like Johnson and Clark (2006) have cautioned business and management researchers in underscoring the philosophical commitments through the strategic choice they make since it impacts on their investigation. This however may not be considered as limited business and management researchers but it could possibly cut across the art of research as such. The onion figure displayed by Saunders, Lewis and Thornhill (2009) shows the research designs that can be applicable. This onion figure is displayed below:



The reflection of how well the research is on the chosen philosophies other than other philosophies and it should not necessarily be of how well informed philosophically it is (Johnson and Clark 2006;Saunders, Lewis and Thornhill, 2009) .

7. Recommendations

Following the various controversies regarding mixed methods, it should be highlighted that the great issue is not the use of the various methods per se, rather the main point is the understanding that there is an existence of a new paradigm and it has its own vocabulary. Given this challenges, it is recommendable that the application of both paradigms is likely to enhance research in one way or another and should not be discouraged. It is also recommended that since the methods are not necessarily mixed as such in the sense that they do not produce a hybrid, let another word be made use such as multiple methods research. This would perhaps settle the controversial issues raised in this paper. This recommendation can be diagrammatically featured below:



8. Conclusion

The controversies surrounding mixed method research have been addressed in this presentation. Though the controversies have several arguments as such, there is an understanding over all that the use of alternate methodologies in gaining understanding of phenomenons is unquestionable. The recommendations forwarded in this presentation are meant to spark an overall debate in regard to the right naming of a combined approach of research which is needful in a number of areas among which is the area of entrepreneurship. The claims associated with mixed methods such as a new paradigm or the third research methodology need reconsideration by those in the field given the basis of the challenge so far presented. The shortcomings ranging from the varying definitions and lack of independence of the so called new paradigm also need revalidation by those in the field. Otherwise the use of multiple methods in exploring or investigating a phenomenon remains as the unchallengeable aspect in spite of all.

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Student Perceptions of Self-Directed, Independent Learning During Master-Level Research

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Abstract: The paper investigates the situation on a five-year Master programme in a French Grande Ecole where students are required to design a research project, undertake research and write up the study in the form of a final year dissertation. Specifically, student perceptions of engaging with the research process. It identifies the need to develop the capacity to engage in self-directed research within a didactic education culture characterised by its high levels of structure with low levels of student autonomy. Issues around various stages of a research project have been examined and a typology of student engagement styles (Coates, 2007) identified as a tool to guide future developments. The objective of the survey was to explore student perceptions of independent learning and the increased freedom they experienced during the process. In particular their interactions with the processes and the key support systems in place during the lifetime of the research project. Data for this exploratory study was collected from Master's level students in the early stages of their research journey. Whilst it was found that students accepted the challenges of a Master-level dissertation project many had difficulty engaging with 'doing research' and experienced serious challenges in several areas. In particular, the results revealed that in spite of Research Methods (RM) classes and Supervisor support they were poorly prepared to undertake and write a critical review of the literature. Another issue was that of the level of engagement with their Supervisor during the lifetime of the research project. It became apparent that only 38 percent of students were actively engaged and accepted the responsibility for instigating and managing supervision meetings. 80 percent confirmed that they prepared before each meeting however only 40 percent sent work to their Supervisor in advance. It is of concern that only 12.5 percent completed the Supervision Log, a required element of the final document. These findings would suggest that the majority of students are engaging 'passively' in the research process.

Keywords: self-directed learning, independent-learning, master's level research, student engagement

1. Introduction

Developers of Higher Education programmes often structure them to include a dissertation at the end of the period of study, citing its importance as the vehicle to consolidate learning by using a range of different elements studied throughout the programme as well as giving the student the opportunity to undertake independent research on a topic of their choice.

The *raison d'être* of the French Grande Ecole (GE) system has always been the training and development of future managers for the world of business. Students entering this elite management career development hierarchy have already successfully completed a rigorous admissions procedure which traditionally recognises their ability to 'think critically and in the abstract' (Barsoux and Lawrence, 2009). Graduates are expected to have the ability to take their existing knowledge and develop their professional competence within the organisation that employs them. Consequently, historically there has been little formalised academic research activity for either staff or students within the GE culture, nor has there been a curriculum to develop students' critical thinking skills that it was anticipated they already possessed. Evolution within the sector, namely the need to obtain international accreditation, has resulted in many strategic decisions and, significantly, an increasing emphasis upon research for both staff and students.

As a result the institution in question requires all final-year students to complete a dissertation. Throughout the life of their research project students are expected to demonstrate the capacity for independent learning, moving away from the traditional didactic French education culture which is teacher-centred within a dependent structured-learning environment.

This study sets out to examine student perceptions of the self-directed, independent-learning experience connected with Master-level research. It hopes to identify the key elements which contribute to student engagement and the appropriate level of structure and guidance required for such an independent learning experience. The paper discusses issues around choosing a topic and the preparation needed before undertaking

research including Research Methods (RM) classes, Documentation and Supervision evaluating student perceptions of the support mechanisms available throughout the lifetime of a research project.

2. Background

Previous developments within the Institution have focused upon the design and implementation of a formal framework/process for final-year students undertaking research. These actions were in direct response to the requirements of three international bodies that have accredited the Institution in recent years, namely AACSB (2009), EPAS (2011) and EQUIS (2016).

Although the students have participated in many self-directed learning activities throughout their time in the Institution, they have rarely been called upon to work completely alone. Group projects have offered opportunities to share learning experiences with other students within clearly defined frameworks. The philosophy behind the Business Challenges and field projects encourages student groups to interact with organisations whilst investigating a contemporary issue linked to the subjects taught during their specific year of study. With prescribed objectives and outcomes agreed by all parties, the students then work in a semi-autonomous or autonomous manner. The group is responsible for managing the distribution of tasks, setting the milestones to review progress and coordinating the work of individuals to produce written and oral feedback meeting the project objectives. Throughout the project they are mentored by a tutor from the Institution and a representative from the company (Ashwin and Hirst, 2013).

The final-year dissertation is usually the first time that students find themselves working alone and having to set their own boundaries and manage the process. At the same time they are completing course work as well as preparing for and undertaking a six-month final-year internship. For many students this is often the first time in their years of study that they are expected to work totally independently, albeit with the support and guidance of a Supervisor. The Institution's commitment to Blended Learning is demonstrated by the range of online support mechanisms available for students undertaking research. Electronic-based on-line learning activities have been shown to help students develop their understanding of the dissertation process as well as offering support beyond the existing supervision provision, in the form of targeted interventions throughout the process (Sloan et al, 2014). A detailed Dissertation Guide is accessible online for easy reference, together with the project calendars, evaluation criteria and feedback sheets. The template for the Supervision Log form and the Harvard Format Referencing Guide prepared by the Learning Resource Centre are also available.

The engagement and participation of students in 'added value activities' to support their learning is higher when they understand the context of those activities (Sloan et al, 2014). A key factor for successful completion of a project is communication between student and Supervisor. The Supervisor's involvement in the process is influenced by their overall philosophy towards supervision (Spear, 2000). Three broad categories of supervision style are identified within a continuum spanning strong, intermediate and weak interactions. Spear (2000) does not however address who instigates the communication nor its value, although it is generally considered that strong interactions, such as those found amongst students and Supervisors working together on highly complex activities, are more valuable than those resulting from irregular communication with minimal student-Supervisor involvement.

One driver of this research is the desire to move the focus within the Institution from studying to learning and encourage students to be engaged in their own learning experience, drawing upon things that occur both within and beyond the classroom environment. Moving beyond the formal support mechanisms this also includes external informal support mechanisms identified by the students. A current project with the Blended Learning development team concentrates upon moving from simply providing resources to students when they begin their research to developing interactive activities for the different stages of the research process. The intention is that activities to help them develop study skills, and ultimately successfully undertake research, will be available from the moment they enter the Institution.

Decisions on content and activities for this learning resource have been focused upon the key concept of self-directed learning, as well as academic competences such as literature search, critical thinking, and academic writing. The initial stages of the project have mapped the parameters for the conceptual space within which students work when engaged in final-year research projects.

3. Communication during the research process and interactions with the supervisor

All master students in the Institution are allocated supervision hours for the dissertation process and it is crucial that they develop a one-to-one relationship with their Supervisor. The levels of communication and interactions with the Supervisor during the research process will impact upon the quality of the final document (Spear, 2000). Weak interactions between a student and Supervisor, with lack of guidance and critical feedback, will result in a low level of independence. Alternatively a student maintaining regular contact with their Supervisor will be able to seek guidance and critical feedback, enabling them to become a more independent researcher.

The key communication contact points on the student's research journey begin with RM classes and access to the online documentation (Figure 1) supporting students during what has been clearly identified as a different learning experience. The Dissertation Guide presents the Institution's requirements regarding the structure and content of the final document and how it will be evaluated. The roles and responsibilities of both the student and the Supervisor are clearly defined. Together with calendar of key dates, marking criteria and feedback sheets the guide provides the structured environment essential for self-directed learning (Holec, 1979, 1981) and enables the student to identify exactly what they have to do and when they have to do it. The Harvard Format Referencing Guide prepared by the library staff gives details of how to present and reference their work.

Online documentation available to students include :
Dissertation Guide
Research Calendar
Harvard Referencing Format
Marking criteria
Feedback sheets
Student Supervision Log

Figure 1: Online documentation available to students

The allocation policy in the Institution is individual supervision for each student. Details of the allocation are published mid-October. It is the student's responsibility to manage the research process and as such the Student Supervision Log is a critical element which provides evidence of the research journey. It is the student's responsibility to record their supervision experience including their actions and feedback on those actions. This log identifies how events impact upon subsequent planning and the stages of the research process.

There are two formal evaluation points, the first taking place at the beginning of Semester Two with the submission of the Research Proposal. The second evaluation point is the submission of the final document. As a self-directed learner, the student manages how and when communication occurs throughout the life of the research project.

4. Independent learning

The conceptual work of Holec (1979/1981) focused upon widening access to education for adult learners within the Language Resource Centre of the University of Nancy (France). He made the distinction between separating the desirable learning situation (self-directed learning) from learner autonomy, which he defined as the capacity (competence) for such learning. He argued that students did not necessarily have the capacity to move beyond the dependent-structured learning environment to which they had become accustomed. As such, they lacked the competence to make decisions normally made by the institution or the teacher, or those linked to support materials such as textbooks.

The list of decisions students have to make outlined by Holec (1979/1981) mirror the requirements for the successful completion of a dissertation:

- Identifying objectives
- Making decisions about content
- Developing a calendar for scheduling activities
- Deciding on methods and techniques for data collection and analysis
- Self-management including time management
- Ensuring they understand the evaluation procedures to be used.

In contrast to Smith's (2008) view that students need to be 'trained' to learn how to exercise some control over their learning Holec (1979) states that decision-making in self-directed learning was genuinely in the hands of the learner. Many institutions of higher education emphasise the independent learning as a key criteria in the learning experience. Although the need to work independently is inherent in many programmes, Smith (2008) argued that few opportunities to develop this competence exist beyond decisions about how and when to study. He saw the role of the teacher in supportive engagement of the learner's experience as an important basis for the progressive development of this transferrable skill.

Willison et al. (2017) argued that a 'claustrophobic' educational experience does not provide an environment enabling a student to develop the skills and competences necessary for life beyond graduation. They do however question how much 'conceptual space', defined as the extent of autonomy, students need when involved in a self-directed activity such as a research project.

The research question of this paper is therefore "What are the students' perceptions of engaging in the research process and the key support mechanisms available when undertaking Master-level research."

5. Methodology

In order to evaluate the evolution of the formalised dissertation process that has been developed and implemented over recent years data was collected from final-year students. Using an on-line questionnaire the investigation reviewed student perceptions of contact points throughout the life of their research project including preparation, support materials and communication processes.

A list of the key communication/contact points on the student's research journey was produced to structure this study and identify key variables for the development of the questionnaire (Figure 2).

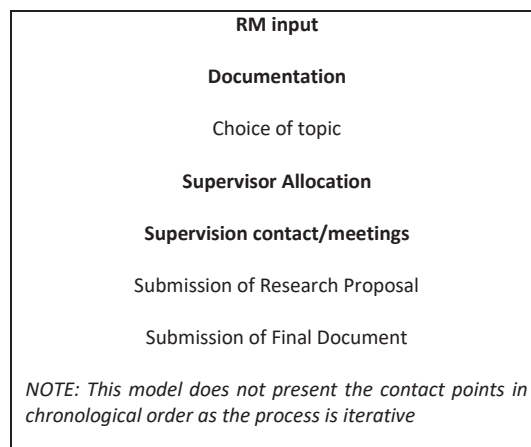


Figure 2: Key communication/contact points on the student's research journey

The survey instrument was designed to gather the student opinions and personal perspectives (Cohen, Manion and Morrison, 2007; Saunders, Lewis and Thornhill, 2017) on key issues. These included RM classes, documentation provided and support mechanisms within the Institution including supervision and learning resources. In addition students were asked about their perceptions of their own readiness for research activities and the skills and competences necessary for successful self-directed learning. The questionnaire had both open-ended and closed questions to enhance quantitative responses with some qualitative feedback.

As this was the first time that most students were confronted with working on a rigorous academic project requiring a solid foundation in the academic literature the section on RM classes first addressed the scheduling of classes in either the fourth or fifth year depending upon the specialist programme of study. It covered both the content and support materials provided by the lecturer. In addition students were asked to say how accessible they found the classes and identify their perceived levels of engagement with the subject-matter.

To evaluate the documentation provided (Dissertation Guide, Feedback sheets, Supervision Log) students were asked about three things – clarity, ease of use and actual use.

Ives and Rowley (2005) identified that communication between a PhD student and their supervisor is the key to a successful outcome for a research project. The view of the authors is that this is true at all levels of education and, as such, the third section of the questionnaire addressed issues around supervision including accessibility and levels of support offered beyond the formal feedback on work submitted.

As students had already travelled some way along the research journey they were asked to reflect on their own sense of readiness as well as their awareness and understanding of the requirements of an academic Master-level research project. They were asked to consider their levels of engagement with the project and identify anything that they felt would have facilitated their progress.

The online survey was posted using Google Forms to all final-year students a few weeks before the submission of their Research Proposal. This ensured a wide range of possible respondents, who were actively working on their research projects, across all programmes. The questionnaire was relaunched one week after initial posting to maximise responses.

6. Results and discussion

The questionnaire link was sent to 590 students involved in final-year research projects. After two weeks a response rate of 4% although low was not surprising due to the workload of students at that time of year who were finishing the taught elements of their programme, sitting examinations, finalising their six-month internship arrangements as well as working on their dissertations. The first milestone of the dissertation, the submission of the research proposal, was due one month after the data collection period.

One third of students reported had already completed an academic dissertation at another institution. Explanations of the purpose of a final-year dissertation were mainly positive, whilst a few were less favourable asking why such academic work was required as they “would never have to quote theory in the workplace.” Reassuringly 25 percent of students identified the importance of the link between theory and practice “it helps to develop our critical understanding, which can also help companies”. Other comments focused upon the need and benefits of developing critical thinking skills and the ability to be objective “to have an analytical mindset on some topic [...] and be able to explain it in an objective way”.

7. Practical preparation for research

RM classes introduce students to the concepts and methods they will need to choose between for their projects. During the induction week each year they also have a formal reminder about the Institution’s Academic Integrity Charter addressing plagiarism and academic fraud. The Harvard referencing format is reviewed using a short question and answer format during the presentation as well as discussions about examples shown as illustration.

When asked how prepared they felt they were to undertake research 62.4 percent responded positively, slightly fewer (56.3 percent) confirmed that the RM classes had helped them prepare for the project. Almost 30 percent of the students gave strong negative responses to this question, highlighting perhaps a lack of engagement with the concept of Master’s level research, the course content itself or even the perceived value of the RM classes. Engagement appeared to be a double-edged sword for a minority of students who appear to have ‘committed’ to the work without really understanding what they were doing or why. Several made comments reflecting their instrumental motivation, highlighting a practical view that “it had to be done to complete the diploma.” If students are to acquire the skills and abilities necessary to work autonomously on the dissertation they need to understand the academic and methodological requirements and the role of the RM classes in developing them.

Students had online access to all the documentation relating to the dissertation at the beginning of the academic year. When asked at the beginning of Semester Two if they had read the Dissertation Guide 79.2 percent confirmed that they had. It is of some concern that 20 percent had not done so one month before the submission of the first evaluation, the Research Proposal.

8. Critical review of the literature

Whilst the assessment vehicle of the RM classes is a critical review of academic articles many students revealed that they had difficulty with this work. The lack of the required study skills together with limited exposure to academic articles before the need to use them for their research was reported as the causes of confusion and stress. Over 70% of students reported having had trouble identifying academic articles linked to their subject.

Of these over half did still not feel confident that they had 'got to grips' with what was required. One reason provided for the difficulty in identifying what was an acceptable source was that in previous assessments students mainly based their work on professional and general published materials.

The amount of time spent during the RM classes on demonstrating how to identify and locate an academic article and the skills required to read, understand and synthesise it varied across the programmes. It was reported that some RM tutors spent time demonstrating how to undertake a literature search using a range of databases including ScholarGoogle, EBSCO and CAIRN. It was also seen that a minority of students had been involved in in-class activities requiring them to search and find articles. Again this was linked to the programme and content of individual RM classes.

9. Choice of topic

Several questions addressed the choice of topic asking what the decision was based upon as well as when and how it was made. Over 50 percent of students stated that the choice of subject was linked to their future career intentions whilst 25 percent said it was connected with previous or current work experience. Only 20 percent revealed that the topic had been chosen because of a subject they enjoyed studying. 37.5 percent of students confirmed they had started to think about a topic for the project before starting their final year of studies.

Students were asked to identify how they had focused their ideas and who had helped them in the initial stages. When asked about formal Institution-based support 12.5 percent said they discussed possible ideas with the RM tutor both during and outside scheduled classes. Once their Supervisor was identified, 33.3 percent made contact within two weeks to address the issue of focusing their research project. Students were also informed that other teaching staff had expertise in many subjects and that if they could identify someone working on their area of interest it would be useful to contact them to discuss things. A small take-up of this suggestion was revealed with only 4.2 percent of students having consulted other teaching staff to discuss their ideas and identify possible subjects.

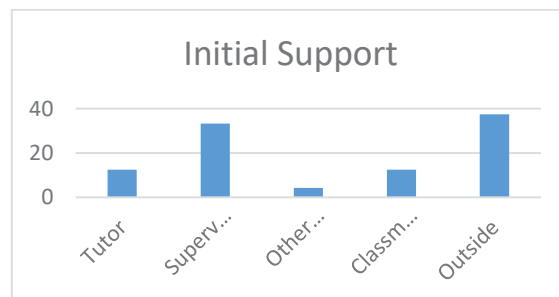


Figure 3: 12.5 percent of students reported having discussions with classmates and peers in the Institution whilst 37.5 percent confirmed they had talked through their ideas outside the Institution. The wide range of opinions sought support the idea that experiences outside the learning environment were seen to be important by the students and offer some evidence of engagement in the process

10. Support mechanisms including supervision

The role of the Supervisor is emphasised in both the RM classes and the Dissertation Guide. Details of supervision allocation were communicated mid-October. Almost half (45.8 percent) of students said they had contacted their Supervisor within four weeks, three quarters of whom said their first discussion with their Supervisor was linked to the evaluation of the RM class as they wished to confirm their topics, research questions and/or objectives with them before submitting the work to the RM tutor. Although a small minority (16.7 percent) contacted their Supervisor for the first time at the beginning of Semester Two it is heartening to see that 83.3 percent had done so before the Christmas break.

Questions about the process of supervision cover three main areas, methods of communication, preparation before contact and feedback from the Supervisor. Not surprisingly the vast majority of students (79.2 percent) use email to communicate with their Supervisors. This is encouraging as it means they have already established this habit before beginning their six-month internships, most of which take place more than 200 km from the Institution and often overseas. Only 16.7 percent confirm that they mainly communicate during face-to-face

meetings but this could be explained by the fact that staff and students are not necessarily based on the same campus or even on campus at the same time.

Regularity of contact between student and Supervisor continues however to be of concern as only 38 percent report being on the positive side of the 7-point Likert scale used whilst no student used either of the two highest points. It is essential to remember that the Dissertation Guide clearly stipulates that it is the student's responsibility to maintain contact. Another area of concern surrounds engagement with the need to use the Student Supervision Log as only 12.5 percent of students reported that they completed it after each meeting. This is in spite of the fact that it is identified as a compulsory element and should be submitted in the Appendices of the final document.

Students were asked to identify whether they prepared for their supervision meetings and if the response was positive what they had done. Although 79.2 percent said they did prepare in advance only 37.5 percent sent anything to their Supervisor prior to the meeting. It is acknowledged that questions about feedback are limited to the preparatory stages as the first formal evaluation point has yet taken place. 74 percent of students responded favourably about supervisor feedback of which 37 percent were very/extremely positive about its usefulness. Of the 26 percent who reported low levels of usefulness 8 percent were on the lowest point of the scale.

11. Independent-learning

It was felt important to gauge student perceptions of their readiness for independent learning. 58.3 percent reported they felt confident about this of whom almost half were very/extremely confident. Of the remainder 17 percent were not at all confident at the prospect of having to manage their own learning. It is important to note that the specific reasons for this have not been investigated at this time so it cannot be said that the lack of confidence is directly linked to the dissertation.

Reading and writing a critical review of the academic literature are two key elements of any research project and it was felt that questions on these areas were important to develop a clear idea of students' perceptions of their readiness to undertake research. When asked whether they felt they had the necessary skills to critically review the academic literature alarmingly 54.2 percent did not feel confident, of whom 37.5 percent were at the lowest point on the scale 'not at all confident'.

In terms of the writing skills necessary just over half of the students (52 percent) felt confident that they could use the Harvard referencing format correctly with 33 percent stating they felt extremely/very confident. The fact that 48 percent do not feel confident is concerning as there are presentations by the Academic Integrity Service at the beginning of every year during their time at the Institution as well as support from RM tutors and Supervisors throughout the lifetime of the research project.

12. Conclusions

A student undertaking Master's level research is expected to be autonomous and self-directed throughout the life of their project. Many students are moving into the unknown as they have never before undertaken robust academic research to complete a dissertation. The findings from this study suggest that after four years of study in a teacher-centred, dependent structured-learning environment with relatively low autonomy the concerns of most students are that they are required to change their learning style to a more sophisticated student-centred model. Respondents have identified varying degrees of engagement with the key communication and contact points throughout their research journey.

All students attend RM classes in preparation for research and have a Supervisor to support them during the lifetime of their project. It is of concern that 42 percent report that they do not maintain regular contact with their Supervisors. Looking at the process 40 percent report sending something to their Supervisor prior to any meeting whilst only 12.5 percent complete the Supervision Log after each meeting even though it is a compulsory part of the final document. These findings suggest that there is a low level of engagement with the research process in terms of content and process.

It would appear that the issue of working with the academic literature is something that needs to be focused upon in the future as more than three quarters of the respondents report that they experienced problems with

the critical review of academic articles. It appears that there is a need for further developments in this area to ensure that all students have the necessary skills to search for, identify and review articles linked to their research project. Data was not collected to identify student nationalities so it has not been possible to correlate this issue with their origins. Nor is it known how many students based their work on literature published in their mother tongue and how many used articles published in other languages. This could theoretically have an effect upon the difficulties they describe with reading and comprehending articles.

It appears that the combination of the unknown (academic research) together with the lack of skills for study within a self-directed, independent learning environment are key issues preventing students maximising their potential whilst working on their Master's level dissertations.

A typology of student engagement styles prepared by Coates (2007) presents academic orientation on the horizontal axis and social orientation on the vertical axis. The four styles of engagement identified (INTENSE/INDEPENDENT/COLLABORATIVE/PASSIVE) refer to “transient states rather than student traits or types” (Coates, 2007:132).

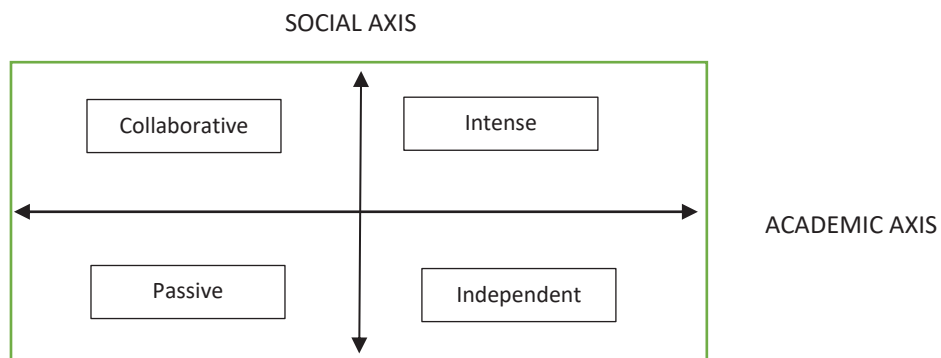


Figure 4: Student engagement styles (Coates, 2007)

The findings of this research would suggest that the majority of students are situated in the ‘passive engagement’ quadrant, although several reflect a collaborative style. By using this model it will be possible to identify the range of student engagement within the Institution and help to develop solutions to guide them along the Academic axis of the model.

Coates (2007: 121) concluded that online technologies “might be leveraged to enhance campus-based student engagement.” This view is reflected in a current development project within the Institution involving academic staff and the Blended Learning team which focuses upon mechanisms to develop a culture where-in students develop an understanding of the reasons why they are required to do research and what they are expected to be able to do. The ultimate aim of this development is that student engagement will be enhanced and as a result the research journey in the final year, and the results of that journey, will be valued and valuable as they move into their professional lives.

13. Limitations

The study is limited by the fact that it focuses upon a single Institution, a French Grande Ecole, and the small number of responses to the survey. It is felt, however, that the study highlights the important issues of independent, self-directed learning in the dissertation process that need to be addressed within this specific Higher Education environment. The results of this exploratory study would suggest that further research is needed to investigate the concept of independent learning and the emerging issues around autonomy. It would be beneficial to expand the focus in different educational cultures, both within and outside France, with representative samples of self-directed learners across other student populations.

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A Presentation of the Storyline View of a Novel Research Method: BNML

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Abstract: Students are getting better over time but perhaps it is, at the same time, getting ever more difficult to capture their attention in class, especially as regards research and research methodology. The Business Narrative Modelling Language (BNML) has been used (Oliveira and Ferreira, 2011; Gonçalves et al., 2013; Au-Yong-Oliveira et al., 2015; Gonçalves et al., 2016) to portray and discuss research findings. With qualitative research, in particular, the research process may be more transparent, more objective and faster by following the rules of BNML. Throughout the first semester for 2017-18, and on a Strategy and Competitiveness course, at the master's level, the advantages of BNML were shown on several occasions. Students were required to present what was for most of them their first research case study. BNML uses both the narrative and pictorial representations to showcase and highlight research results. In the age of the smartphone, icons and emojis, students respond well to pictorial representations. However, on the other hand, one has to acknowledge that children go from doing drawings to represent everything in their lives to unexpectedly stopping giving drawings to their parents and siblings and friends on all occasions – including for Christmas and for birthdays. Therefore, it is still a challenge to get adult students to understand BNML, especially in large classes. What is still lacking is a handbook on how to use BNML – despite the existence of a number of publications on the topic. This article thus seeks to shed further light on this research tool. Sharper master's students, doing a dissertation and one-on-one with the lecturer, quickly comprehend and grasp the essence of BNML and its use of key words and game patterns to tell the research case story, over time. Movement and colour and emotion may all be seen in BNML – which remains intuitive, and thus true to qualitative and interpretive research. In Portugal, qualitative research is still not seen, by many researchers, to be a serious research method, especially by the more conservative of researchers, who favour the use of statistics and thus of “more scientific” quantitative research methods in management research. We hope to contribute to a change of mind-set with our article.

Keywords: qualitative research, business, management, narrative, pictorial representations

1. Introduction and background

The debate on when to use a qualitative or quantitative methodology, or indeed whether to use a mixture of both approaches, is still a contemporary issue (McKim, 2017). This article is about a novel approach to qualitative research. Qualitative research has been subject to some criticism, in certain geographical regions, in so far as it is not considered to be “real” research, in the business arena. Furthermore, qualitative and interpretive research is seen to be very time-consuming – involving trips to firms for interviews which may take as long as one hour or more to perform, each time; and which may require up to eight hours in order to transcribe a one-hour long interview – as researchers struggle to understand the language used and to make sense of what was said by interviewees. Qualitative research is thus also very expensive, as “time is money”. Posting a questionnaire online, and treating the data with specialized software (at times as simple as clicking on an icon, or two, in order to produce statistical results), leads to quicker and thus more publications. Qualitative research is also at times undistinguished from journalism, when done poorly, and in the absence of methodological techniques, such as data triangulation and research being performed until data saturation occurs. The identification of patterns in qualitative data is also very difficult, when researchers are faced with pages and pages of interview transcriptions, following hours on end of interviews (or focus group interactions). What should one do with the data? One of the authors recalls having performed 78 interviews for his master's degree, in management, a

process which was so difficult to manage that he vowed to himself that he never again would endeavour to do qualitative research. Qualitative research may have that effect on you. The Business Narrative Modelling Language (BNML) has been developed to overcome some of the shortcomings mentioned above. For example, BNML resorts to patterns set out in Bjork and Holopainen (2005), simplifying the pattern identification process as it calls upon a list of patterns so complete that most of the time it will satisfy the research needs of the research project in hand. Why keep “reinventing the wheel” when material is at hand which may be implemented straight away? Additionally, BNML uses both the narrative as well as visual representations to set forth and present [field] research results. We live at a time of icons and videos and so visual presentations are easily related to, by millennials and baby-boomers alike (yes, even the older generation has adapted well to social networks and smartphones, among others). Business ontologies are also used to simplify and standardize the research process. Herein, we provide some definitions of some core concepts and then give two simple examples of the application of BNML to two separate case studies – Sage and Silamos – which are based on field work done by the authors. An example using BNML to describe the effects of a smart parking app is also set forth – a case which, similarly, also involved field research. We then provide some guidelines to using BNML – for the construction of the storyline view. While seeking to be more intuitive and less time-consuming than other alternatives, BNML has been able to bring students closer to academic discussions on strategy and on the representation of business research field work results. By following the BNML rule to write up your research as soon as possible, and as close as possible to the data gathering events (e.g. within 24 hours), leads to richer results and to quicker qualitative research, thus making it a more competitive research methodology at a time when competition in academia is at a high and when academics are expected to: a) lecture; b) mark exams and course work; c) win European-funded projects; d) manage degrees; and e) publish – all in a 35 hour week (for example, in Portugal). BNML thus reaches us at a time when qualitative research needs to be simplified and expedited as much as possible – as academics’ survival depends upon it.

2. A definition of some of the research concepts being discussed

Qualitative research “primarily uses words and images as the primary data source” (Remenyi, 2014, p.148). This definition perfectly fits what we aim to do with BNML, which best fits the qualitative research paradigm. We agree with Mason (2002) that qualitative research is exciting and very relevant – bringing richness, depth and complexity to social issues. Furthermore, the qualitative paradigm has been used very successfully in business research to produce very positive and interesting research in methodological terms (Runfola et al., 2017). However, criticism exists in the sense that qualitative research is seen to be interpretivist and thus (Mason, 2002):

- Unsystematic;
- Anecdotal (e.g. unreliable, hearsay, amusing);
- Casual;
- Illustrative, but no more than that.

Qualitative research is also seen to be very expensive and time-consuming, involving trips, observation, interviews and / or focus groups, which need to be transcribed (the transcribing of a one hour interview may take up to eight hours, depending on the quality of the recording and on the comprehensibility of the language used). The aforementioned problems work against the acceptance and more wide-spread use of qualitative research in academia.

Another problem with qualitative research is that it may be confused with the writing journalistic-type prose, especially by those who do not follow a rigorous method.

On the other hand, quantitative research, which seeks to objectively quantify research realities, by providing and using numbers, and by using for the most part statistics software for what are, at times, quite complex calculations, is well-looked upon by the more conservative of academics and research journals. One master’s dissertation supervisor (who was head of the department at the time) stated to one of the authors, many years ago: “you may use whatever research method you like, as long as it involves statistics”. This stance is quite illustrative of what is expected of research designs in top business schools.

Research design is a major concern and may be qualitative, quantitative or a mixture of both (Creswell, 2014). The use of theory – “systematically organized knowledge [...] to analyse, predict or otherwise explain the nature

or behaviour of a specified set of phenomena” (Remenyi, 2013, p.161) – in quantitative research is normally distinct from its use in qualitative research. “In quantitative research, researchers often test theories as an explanation for answers to their questions [...] In qualitative research [...] the inquirer may generate a theory as the final outcome of a study and place it at the end of a project, such as in grounded theory [...] Qualitative enquirers use different terms for theories, such as patterns” (Creswell, 2014, p.51). Patterns are also a term used in BNML, as we shall see below, to designate certain social interactions, which take place in the organizational environment. Bjork and Holopainen (2005) provide quite a comprehensive definition and selection of patterns, used in the gaming context, and which are seen to be useful to business studies also.

3. The importance of student engagement and the use of BNML

Student engagement is a concern of all areas of teaching and learning and across all levels of education. The ability to engage students in the teaching-learning process is increasingly complex due to related factors, such as the use of technologies, the use of teaching methodologies (still based on expository methodologies), the lack of interest and intrinsic motivation by the school, among others (Kahu and Nelson, 2018). In this context, it is possible to present several approaches to this definition. Two of the definitions that frame practically all areas of teaching and learning are presented by Savin-Baden (2016), who indicates that it involves “student connection with the learning context, discipline, peers, and tutors that enable transition and voicefulness in learning”, and stresses that it also includes “the degree of interest and attention students show when they are learning”. Grier-Reed et al. (2012) indicate that “student engagement is often cited [as] the most crucial factor in predicting educational success.” In Shryock (2015) a proposal is presented that aims to show how learning can be increased through the use of active engagement tools. The results show that active engagement tools helped students become active learners, increased interaction with peers and instructor, and helped them evaluate whether material was understood to motivate further learning. BNML is intended to be a research tool close to students, involving both the narrative and pictorial representations – in an era dominated by icons and visual representations, including videos.

Furthermore, learning outside educational institutions is increasingly encouraged in order to motivate students, such as visiting museums, laboratories, and others. The use of laboratory visits for learning and studying real questions, in a real context, is very beneficial (Grasso, et al., 2017). With BNML we also advocate field research involving interviews and focus groups, for example, as students learn more by interacting and “feeling” (seeing, hearing, touching, tasting, smelling, etc.) the experience rather than just reading about what someone else did.

4. Business narrative modelling language (BNML) – storyline view guidelines

The Business Narrative Modelling Language (dating back to Oliveira and Ferreira, 2010) seeks to bring incremental innovation and change to the qualitative research domain so as to attract those researchers who have stayed away from qualitative research due to its much publicized short-comings and lack of usability.

Using the BNML method to perform qualitative research is simpler and more convenient due to the following BNML benefits:

- Shorter time frame necessary to analyse the data gathered.
- Shorter time frame to portray and represent empirical results.
- Added comprehension of results portrayed, including outside academia, due to the visual and narrative content of BNML.

BNML in its current state has two views: the storyline view and the plot view. The storyline view is constructed as follows:

I – The interviews:

- Ask interviewees to set aside 30 – 60 min. for the interview (in our experience interviews have lasted between 30 min. and 90 min.).
- Interview the main organizational actors involved in the value network you wish to portray – preferably one-by-one and at their work stations / in their work environment where they feel “at home” and comfortable (for example, you might decide to interview each department head as well as the CEO of the company).

- Cease interviewing when you feel that new interviewees are not bringing in anything new and you feel that you have reached sufficient depth in your analysis (the point of saturation has been reached).
- Bring an audio recorder to the interviews and ask permission of the interviewees to record the interviews. Note-taking can occur even if the interview is being audio recorded.
- Communicate to the interviewees that all information gathered and intended to be published will be sent to the interviewees beforehand to gain their validation and agreement to go ahead with the publication.
- If necessary gain agreement to publish the material anonymously, using fake names and such.
- Ask questions from your previously prepared interview script but be flexible and leave space and time for other issues which the interviewees might want to bring up and discuss (semi-structured interview format).
- During the interviews (preferably towards the end of the interview, when all the desired items of perceived importance have been discussed) have the interviewees draw out the value network in which he or she operates – that is, using a blank piece of paper have the interviewee draw ovals with the names of individual actors inside (one actor in each oval). Try and space the actors out evenly on the blank piece of paper (at least A4 in size).
- Then, once you are satisfied that all of the actors with whom the interviewee interacts have been represented on the piece of paper, have the interviewee then add the deliverables exchanged between each actor to the figure – the transmitting actor will have an arrow going out to the receiver. Tangible deliverables (deliverables that need to be registered in the general ledger / deliverables that mean money exchanges hands) require that a solid line go out to the receiver; intangible deliverables (that do not require general ledger annotations, where money is not involved) require that a dotted line go out to the receiver (Allee, 2008).
- Once the interview is over, ask for the e-mail and telephone number (e.g. cell phone) of the interviewee for future validation purposes and if certain issues need to be clarified after the interview. Senior management needs to give the final authorization (clearance) before publication.

II – After the interview:

- Important: right after the interview the interviewer has [preferably] 24 hours, while everything is fresh in his or her mind, to: a) Annotate important “feelings” about the interview, notes which need to be added to the initial interview notes; b) Draw out on the computer (for example, using Microsoft PowerPoint) the value network from the interviewee’s point of view and while referring, if necessary, to the interview value network as well as to the interviewee’s narrative duly recorded in audio. Certain specialists in qualitative research recommend that the “24-hour factor” be adhered to as added detail still exists in the researcher’s mind during that period. Tony Buzan’s work (Buzan, 1996) on the power of memory confirms that the 24-hour period after an interview is crucial – the researcher’s world should ‘stop’ for 24 hours; or the interviewer should at least leave room in his or her agenda for the tasks mentioned above during the 24-hour period after the interview.
- Draw out the storyline view of BNML – using the same actors as in the value network now give a beginning, a middle, as well as an ending to the narrative told by the interviewee (interactions occur over time). The deliverables should now be exchanged vertically between actor storylines and along a time line, rather than being exchanged between actor ovals (you may use, for example, Microsoft PowerPoint – open a new slide presentation and on a blank slide first define the different roles in the network, on the left side of the slide; then draw the coloured storylines, representing the movement of the players in the story; then add detail to the storylines, in the form of keywords; and so on).
- Solid straight lines between actor storylines portray interactions that are ‘one-off’ occurrences.
- Spiralled or curved lines between actor storylines portray interactions that occur repeatedly during the narrative.
- White ovals at the receiving end of an interaction portray intangible exchanges.
- Grey ovals at the receiving end of an interaction portray tangible exchanges.
- Code the narrative along the storyline by using the game patterns available in Bjork and Holopainen (2005). Each pattern used must be justified by “points of extraction” (Costa and Ferreira, 2012) or excerpts from the interviews. We suggest that you do this in a table, setting the game pattern chosen alongside the

interview text excerpt; but also along the text of your publication, thus fully justifying your pattern choices for readers to comprehend.

- A storyline interaction can have one or more game patterns linked to it.
- Add each game pattern denomination to the visual BNML storyline figure in an ‘avenue’ below the storyline exchanges to which they refer, using, for example, distinctive bold lettering.
- Parameterize the game patterns identified with Uschold et al. (1998) enterprise ontology terms (added within square brackets alongside the game pattern they refer to).
- Add the assets built and used to the bottom of the figure, in a separate ‘avenue’ of data.
- Assets used are portrayed by white ovals.
- Assets built are portrayed by grey ovals.
- Assets should only be used after they have been created but this creation may occur before the BNML story being told – a CEO, for example, may have had knowledge prior to the beginning of the organizational narrative being represented, acquired elsewhere. Organizational cultures also have ‘memories’ and so organizations “possess knowledge” about numerous processes, with organizational learning occurring along a continuum and over a number of years and over a number of different “stories”.
- Add business model canvas building blocks to the top of the figure in a final ‘avenue’ of data; each storyline interaction can have one or more business model canvas building blocks “attached” to it.

The storyline view of BNML is now complete.

Simple applications of BNML concepts follow below.

5. A look at the Sage and Silampos cases through BNML

The authors performed field research involving two firms: Sage and Silampos (Oliveira et al., 2007; Oliveira et al., 2013). Sage sells enterprise software solutions (<http://www.sage.com/company>). Silampos sells all sorts of pots and pans for cooking and has been a pioneer in the area in Portugal for many years now (<http://www.silampos.pt>).

We may analyse the Silampos case as one of extreme rivalry and diminishing innovation – or at least it is now harder for Silampos to innovate. Silampos has lost precious ground to its competitors, with regards, for example, to the pressure cooker, a product which was at one stage very important to its history of success. Customers – such as the big hypermarkets – are also becoming more concentrated and thus larger and in lower numbers – meaning that they have more bargaining power in terms of the Five Forces model of Michael Porter, than do suppliers such as Silampos.

The Silampos case is somewhat in contrast to the Sage case – where they are innovating by acquisition and by increasing the sharing of knowledge between the different regions in which they are situated and where they have subsidiaries. Buying market leaders in various regions of the globe is very expensive but also leads to very good revenues and profits – which are then reinvested in more acquisitions.

What would you do if you were the CEO of Silampos? Would you phase out the business, to eventually close down, or invest more in open innovation and collaboration initiatives with universities and other research entities? What strategic options do they have at Silampos?

When thinking about strategy one thinks in terms of competitive advantage. What is the competitive advantage at Silampos? Can having relatively low wages (in Portugal), but high electricity (again, a reality in Portugal) and other costs, and having a good, solid product and brand, mean competitive advantage? When compared to other more low-cost countries (e.g. China) and other more innovative organizations Silampos may be at a crossroads in terms of decision-making for the future.

Think also in terms of the environment. Internal and external. External environments bring opportunities and threats. Threats such as added competition. Which will not go away, but will only tend to increase, in ever more global environments, and in a technologically interconnected world. Internal environments signify the need for resources and competences – which one may not have but may need to acquire (through a hiring process or

through training). Acquiring and developing resources and competences, though, is expensive. Meaning that we need financial resources, to sponsor our growth. If we do not have the competences for the management of innovation, for example (as mentioned above), we may have to get qualified professionals from the market, to manage the process – in the hope of closing the skills gap.

Going to university is always a question of language. Acquire the language on strategy: *rivals, internal environment, external environment, competitive advantage, resources, competences, ability to innovate, low cost leader, differentiator, and bargaining power*. If you are able to talk strategy, then your strategic and competitive direction may become more apparent and what you need to do and follow, to achieve success, may materialize in itself.

One might have, for example, as an objective to draw a diagram or diagrams using BNML (Oliveira, 2012) symbolizing the strategic challenges at Silamos and Sage, as described in the case studies by Oliveira et al. (2007) and Oliveira et al. (2013).

Figures 1 and 2 show strategic issues and paths for Sage and for Silamos (using simpler applications of BNML). At Sage senior leadership’s main preoccupation is the successful acquiring of leading target companies operating in the same enterprise software and technology segment. Acquired industry leaders must then maintain the management and operational teams that they possess and which made them successful. Otherwise the acquisitions will make no business sense and will become not only expensive but very risky also. Why change a winning team? To that end the trust of the acquired management teams must be gained – to convince them to stay on after the acquisition. Then, valuable product and service knowledge will need to be shared – between the acquirer and the acquired – which will lead in turn to yet greater innovation output.

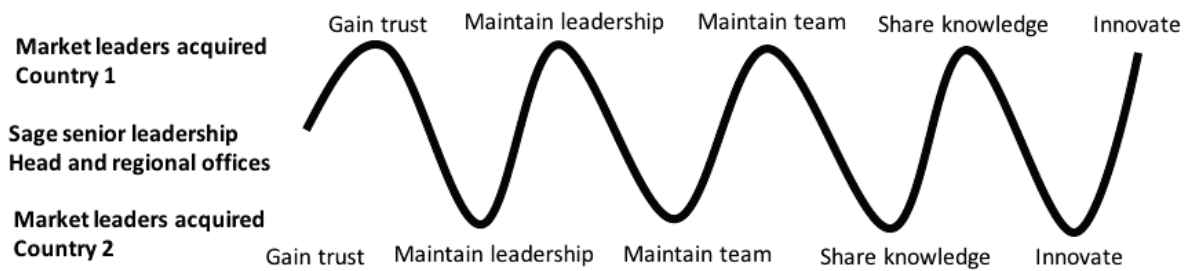


Figure 1: Sage strategy and BNML (Au-Yong Oliveira, 2017)

At Silamos, operating in an extremely competitive market, with ever fewer corporate customers – due to a concentration having occurred in the hypermarket industry – and where product differentiation is hard to achieve, with rival firms including firms from low-cost China – the main strategic issues involve: product innovation, keeping prices as low as possible, ensuring product quality (which cannot be compromised); in an interminable cycle. In the medium term, these strategic issues will repeat themselves until there is a major paradigm shift brought on by a start-up or perhaps by an incumbent – which might originate the disappearance of current market leaders altogether – such as occurred, to a certain extent, with Nokia, Motorola, BlackBerry and Kodak, which were once uncontested market leaders in their industries.



Figure 2: Silamos strategy and BNML (Au-Yong Oliveira, 2017)

Figures 1 and 2 suggest movement and crucial strategic key words which the firms Sage and Silamos need to adhere to and get better at – including leveraging technology to do so.

6. Smart parking and BNML

BNML has also been utilized to represent the benefits of a smart parking solution. Figure 3 shows a simple BNML representation developed with a student for a master’s degree project (Lima et al., 2017). Smart parking apps help car park administrators manage their parking spaces while improving quality of life for citizens, who have more freedom due to having spent less time looking for a parking space. The environment will be less polluted as the time needed to find a car parking space has diminished. In order to adhere to a smart parking app users will need to score high on innovativeness and want to use technology to improve their lifestyles.

ROLES

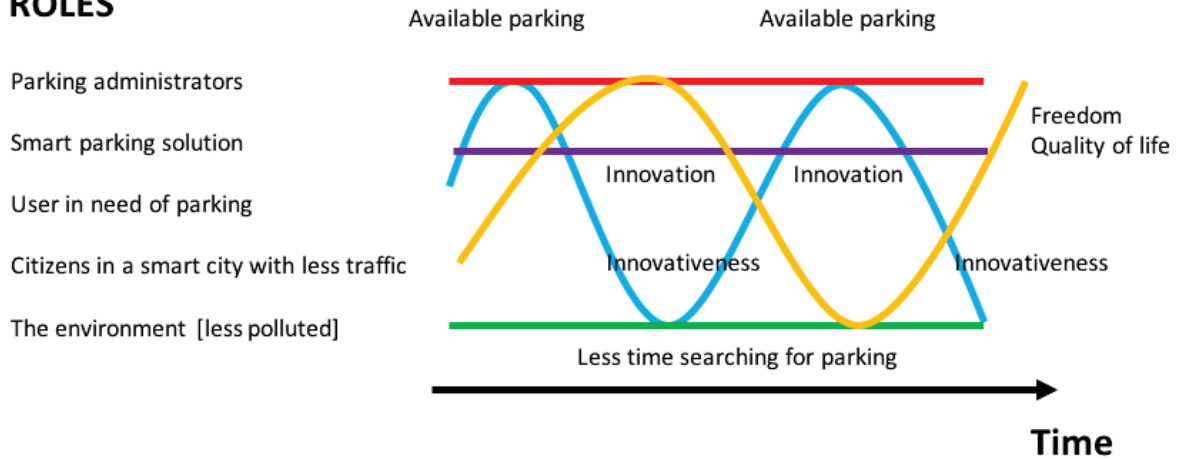


Figure 3: BNML - smart parking benefits to the local community (translated from the Portuguese version in Lima et al., 2017)

Figure 4 (drawn on a blank slide in Microsoft PowerPoint) shows another aspect of BNML. Assets, listed on the left of the drawing, are created (grey ovals) and utilized (white ovals) during the story and by the different actors in the network. Each phase of asset creation and utilization is linked to a different game pattern, taken from the extensive list in Bjork and Holopainen (2005). The creation of a smart parking network relies on cooperation; mobility relies on constructive play between the players; civilized conduct is the result of team play; quality of life is a consequence of improved abilities (and infrastructure); a culture of commitment to the city is a result of committed play.

Assets created with the smart parking app

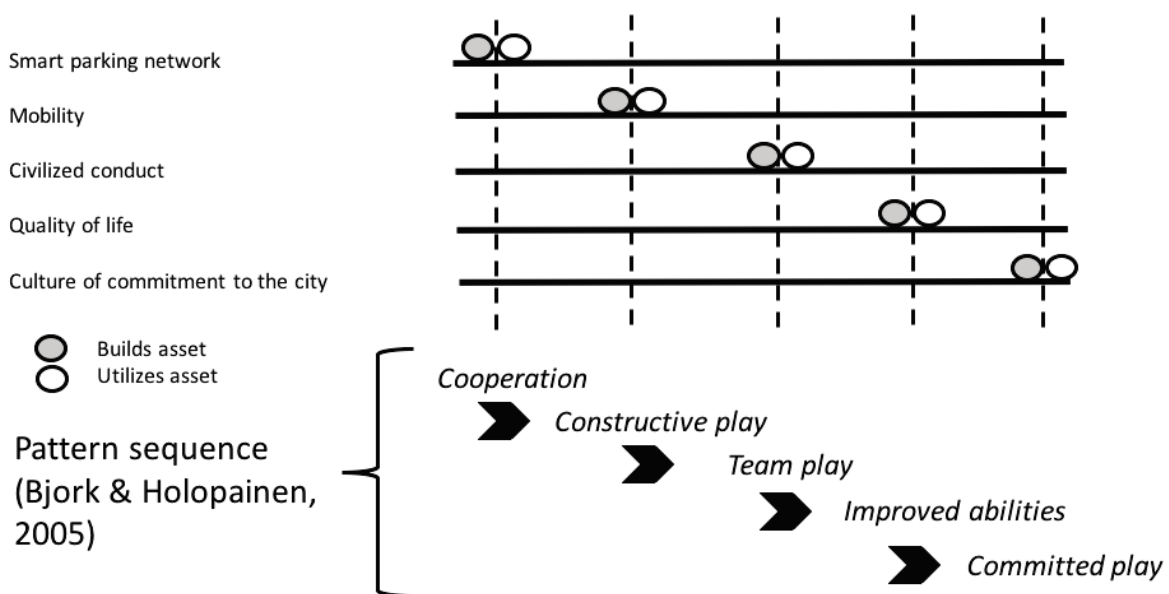


Figure 4: BNML - assets created with the smart parking app (translated from the Portuguese version in Lima et al., 2017)

7. Conclusion

By using BNML in class to communicate a number of essential management and business model concepts to students, lecturers may also develop greater research awareness for field work and its representation in business studies. BNML may especially be utilized in case study research as it is used to represent organizational stories occurring over time. Getting students to be creative with their representations is also a goal, while communicating the perspective that ontologies and previously defined game patterns may supply a ready-made framework which simplifies the research process. Qualitative research need not be as time-consuming as it has been in the past and we hope, with our method described herein, to contribute in whatever small way to a greater popularization of the qualitative research methodology.

BNML has been used over the years with some success and in diverse contexts (Oliveira and Ferreira, 2011; Gonçalves et al., 2013; Au-Yong-Oliveira et al., 2015; Gonçalves et al., 2016) and so with this study we have set forth a novel approach which may be used in similar and specific contexts.

8. Limitations of BNML and future research efforts

BNML has its limitations. For example, it is somewhat time-consuming to build the colour figures using Microsoft PowerPoint; especially for the novice. No automatic figure-building tools exist, to date. Future efforts may be aimed at developing such a tool. Furthermore, though expediting the research process in general, a degree of intuition is required in order to choose the patterns from Bjork and Holopainen (2005) which fit the research project in hand; otherwise, researchers may be somewhat taken aback by the immense list of pre-defined patterns in the aforementioned publication, not knowing how to proceed. Therefore, some research maturity may be required to apply BNML.

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At the Intersection of Business History and Organization Theory: An Interdisciplinary and Process-Based Method for Studying Organizational Change

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Abstract: This contribution presents the methodology and the main results of a research program aimed at understanding and explaining the historical development and the trajectories of organizational change in small and medium enterprises belonging to the service industry (hotels) in a specific geographical area (Rimini, a mature tourist destination on the Italian Adriatic coast). While both organizational change and the history of hotels have been largely investigated by relevant literature, our research activity has peculiar elements of novelty, namely: the development of interdisciplinary methods to study the organizational history of enterprises; the adoption of a process perspective on organizational change; the focus on small hotels that are not part of large hotel chains; the active involvement of hotel owners and managers in every phase of the research. In particular, the adoption of a process perspective for investigating organizational change in Rimini hotels required the definition of a consistent research methodology, able to focus on the history of organizational processes to identify antecedents, alternatives and outcomes of major or pivotal changes: it means investigating and studying organizational and historic processes not as separated but interconnected phenomena but as a single subject of research. In this way, we have been able to understand the actual configurations of hotels by investigating their evolutionary paths and to explain phenomena related to generational shifts and competency and capability development. Results depict the evolutionary paths, the success factors and the dynamics of organizational changes that have been taking place in Rimini hotels for the last ninety years.

Keywords: interdisciplinary research methods, mixed research methods, organizational change, business history, organization theory

1. Introduction

This contribution presents the methodology and the main results of a research program aimed at understanding and explaining the historical development and the trajectories of organizational change in small and medium enterprises belonging to the service industry (hotels) in a specific geographical area.

While organizational change has been investigated by relevant literature, the theoretical reflection on organizational change in hospitality industry is rather limited. Beyond contributions that slavishly apply the most relevant managerial theories (Mullins, Dossor, 2013), the analysis is aimed at specific dimensions of organizational change: organizational configurations (Chacko, 1998; Chiang, 2010; Enz, 1993), formalization and bureaucratization (Raub, 2008), resistance to change (Okumus, Hemmington, 1998; Øgaard et al, 2008), approaches to leadership (Chew et al, 2006; Mullins, Davies, 1991; Tracey, Hinkin, 1996; Hodari, Sturman, 2014), management of human resources (Baum, 2015; Blum, 1996; Erstad, 1997).

The lack of a general framework for understanding the dynamics of organizational change in hotels inhibits the development of scientific debates on this issue. In this paper, through a longitudinal analysis of the history and of organizational choices of the hotels of this tourist destination, we propose the methodological framework to understand and explain the trajectories of organizational change of hotels.

The main goals of our research are:

- to understand the process of organizational change of hotels by studying their organizational history;
- to develop a framework able to explain the evolution of organizational solutions.

In order to achieve these goals, we focus on an iconic tourist destination in Italy: Rimini. Rimini is a long-lasting tourist destination with a dynamic and competitive hospitality industry, located in the northeast of Italy. Its history as a tourist destination dates back to July 1843, when the first bathing establishment was inaugurated. Since then, Rimini has changed many times its tourist products and has been able to renovate its life cycle more than once in order to maintain a leading position in Europe. With its 150.000 inhabitants, the city welcomes about 1,6 M tourists per year, corresponding to more than 7 million overnight stays. Even if Rimini is a historic city and hosts an important trade fair, in 2014 more than 70% of the arrivals was concentrated in the months between May and September, consistently with the traditional vocation of a sun and sand destination. In few words, Rimini is the most important tourist destination in Italy (excluding art cities as Rome, Venice and Florence) and the reference point for seaside tourism. The backbone of the city hospitality industry is a multitude of small and middle-sized hotels (in 2014 they were exactly 991), most of them established between the 1950s and the 1970s (but the oldest one was established in 1908 and many others in the 1930s).

The paper, after a description of the extant perspectives for studying organizational change, presents the research method adopted and the results achieved, with particular reference to the framework developed for explaining organizational change in hotels. A brief discussion will conclude the contribution.

2. Theoretical background

Mainstream literature on organizational change adopts a functionalist perspective: the organization is a predetermined system pursuing survival by maintaining a state of dynamic equilibrium with its environment (Parsons, 1956; Lawrence, Lorsch, 1967); organizational change is therefore dependent on the evolution of exogenous (environmental) factors that impose a functional adaptation. Flexibility becomes critical at any organizational level (strategic, structural and operational). This approach considers organizational change as the movement from an equilibrium to another, a top-down process that follows classic steps: unfreezing, movement, refreezing (Lewin, 1947). Hence, change is driven by exogenous forces, is intermittent, is unavoidable. This approach proposes detailed explanations of organizational change phenomena and is able to deliver best practices and effective methods for adapting to the environment (according to objective or functional causality: *if... then...*). However, the generalizations upon which best practices and organizational strategies are developed are often too strong, thus resulting in an over-simplification of both problems and solutions.

On the other hand, interactionist literature considers the organization as a socially-constructed system that is created and recreated over time. In this perspective, the organization is continually enacted by the actors that compose it, through games of power (Crozier et al, 1977) or sense-making processes (Weick, 1979) that determine the social construction of the system. Neo-institutionalist approaches (DiMaggio, Powell, 1983) also explain organizational change as an adaptive and unintentional process, driven by exogenous constricting forces ("isomorphic forces") that the organization must adhere in order to obtain legitimacy and political power. Even postmodern approaches share the view of the organization as a world-making process (Chia, 2003). From this point of view, organizational change is continuous and inevitable, is emergent and takes place without any deliberate design process and therefore it can be detected only ex-post. The interactionist perspective is able to understand change processes taking place in any organization but then this knowledge cannot be generalized, and, in any case, it cannot generate recommendations for action (since change is not deliberately designed). Explanations are anecdotal and localized.

If, instead, we consider the organization not as a reified system, but as a process of actions and decisions affected by bounded rationality (Maggi, 2003), organizational change become an inevitable characteristic that is inherent to any organization; it does not occur erratically and is addressed by intentional decision-making processes but is exposed to uncertainty and therefore is never perfectly controllable (March, Simon, 1958). Hence, trajectories of organizational change can be explained by identifying the causal factors that have been more relevant – according to a concept of adequate causation (Weber, 1922) – in addressing decision-making processes over time.

In the following, we present an interdisciplinary research method aimed at studying organizational change by adopting a process-based perspective.

3. Methodology

In 2013, in order to understand the trajectories of organizational change experienced by the hospitality industry in Rimini, the Center for Advanced Studies in Tourism (CAST) of the University of Bologna and Uni.Rimini spa, in collaboration with the Rimini branch of the Association of Italian Hoteliers (AIA Rimini), launched an Interdisciplinary Research Program, also involving the Strategic Plan of the Municipality of Rimini, the Rimini Trade Fair, and the local Chamber of Commerce.

The research activities have been conducted by a multidisciplinary team (with Business History, Organization Studies, and Management Studies background).

The adoption of a process-based perspective for investigating organizational change in Rimini hotels required the definition of a consistent research methodology (Decker et al., 2015). In particular, it has been necessary to focus on the history of organizational processes to identify antecedents, alternatives and outcomes of major or pivotal changes: it means investigating and studying organizational and historic processes not as separated but interconnected phenomena but as a single subject of research. The history of the organization has not been treated as a background or as a summary of past activities but as the development of processes of action and decisions over time (Maggi 2013: 20).

This central role for business history in organizational analysis is supported by relevant literature. Decker et al. (2015: 31) state that “historical research [...] is often aimed at uncovering sequences and processes, or synthesizing complex developments related to the phenomenon being studied, rather than verifying specific claims”, while Kieser (1994: 611) sustains that “historical analysis teach us to interpret existing organizational structures not as determined by laws but as the results of decisions in the past choice opportunities”.

In fact, we adopted the approach that Kipping and Üsdiken (2014) named “history in theory” by applying together historical and organizational analysis to understand and explain organizational change. In this way, we have been able to understand the actual configurations of hotels by investigating their evolutionary paths and to explain phenomena related to generational shifts and competency and capability development.

We gathered data by multiple methods, in particular: (a) historical analysis of documents and archives; (b) survey of the literature on organizational change in hotels; and (c) direct interviews to a selected number of hotel managers.

An additional tenet of this research method was the active involvement of hotel managers: they have been directly involved in every step of the research, from goal-setting to the design of the interviews to the interpretation of results. Their participation fostered greater consistency between research activities and operational issues. In addition, it encouraged the development of a climate of trust and openness between the research team and the business operators.

The interviews, semi-structured, were focused on the history of the hotel and of the family, with particular emphasis on the issues of generational shift and organizational change. We realized 28 in-depth interviews to hotel managers and owners. The interviewees were selected to reflect different hotel categories and sizes and different generations of managers.

The qualitative research has been performed through a thematic analysis (Guest et al., 2012) of the interviews and the development of ideal types (Weber, 1949). We transcribed the 28 interviews, segmented the texts and generated the codes; each segment has been labeled with one or more consistent codes. Then, we reorganized the texts by putting together all the segments sharing the same code within a new document, thus obtaining a transversal perspective on the same topic. We carefully read and re-read all the texts pertaining to the same code and we highlighted similarities, differences, and trends. Eventually, we have been able to identify the most relevant themes. Finally, we accentuated and polarized these themes in order to define the main dimensions of our ideal typology.

This methodology is consistent with process of development of ideal types proposed by Weber (1949: 90): “an ideal type is formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are

arranged according to those one-sided emphasized viewpoints into a unified analytical construct (*Gedankenbild*). In its conceptual purity, this mental construct cannot be found empirically anywhere in reality. It is a utopia” (Weber, 1949: 90).

It is important to note that the application of ideal-typical formulations to historical cases is one of the methods proposed by Kieser (1994) to connect organizational studies to historical analysis.

In this way, we have been able to understand the actual configurations of hotels by investigating their evolutionary paths and to explain phenomena related to generational shifts and competency and capability development.

4. The ideal types

To bring order into the variety of organizational solutions adopted by Rimini hotels, an ideal typology has been developed basing on the main results of the thematic analysis.

The thematic analysis has been conducted on the transcriptions of the 28 in-depth interviews and implied the definition of 4 macro themes, composed of 21 codes (third-level codes were also identified):

- History [of the hotel; of the hotel manager; of the manager’s family];
- Strategy [competitive strategy; types of customers; relationships with customers; relationships with competitors; cooperative networks; innovation; marketing];
- Organization [hotel characteristics; jobs and roles; departmentalization; regulation processes; decision-making processes; power-dependence relationships and authority system];
- Human resource management [workforce; leadership style; selection and recruitment; rewards and career; worker participation in decision-making processes].

Basing on our analysis, two macro themes appeared fundamental to explain the differences between hotels: (a) the perception of the manager about her relationship with the hotel (hotel as a home or hotel as a business) and (b) the managerial approach adopted (efficiency-based or based on service development). Each theme has then been detailed in terms of consistent codes (Tables 1 and 2).

Table 1: Relevant codes for the definition of the home-business theme

	<i>Home</i>	<i>Business</i>
<i>Manager’s attitude toward the hotel</i>	Intimate relationship, identification	The hotel is a business, and as such is to be managed
<i>Decision-making processes</i>	Empathic	Analytical
<i>Regulation processes</i>	Based on informal rules	Based on formal procedures
<i>Jobs and roles</i>	Polyvalent	Specialized
<i>Source of authority</i>	Charisma/Traditions	Rules
<i>Guest relationships</i>	Rich and informal	Formal

Table 2: Relevant codes for the definition of the efficiency-service development theme

	<i>Efficiency</i>	<i>Service development</i>
<i>Competitive strategy</i>	Supply-driven and aimed to cost leadership	Demand-driven and aimed to differentiation
<i>Main skills requested to workers</i>	Flexibility and willingness to learn	Education and experience
<i>Worker involvement in decision-making processes</i>	Low	High
<i>Innovation</i>	Sporadic and reactive	Continuous and proactive
<i>Leadership style</i>	Transactional	Transformational

Subsequently, consistently with Weber's method of developing the ideal typology, we accentuated and polarized these dimensions and we obtained four ideal types, as shown in Table 3.

Table 3: Ideal types

	Hotel as a home	Hotel as a business
Efficiency	Traditional hotel	Bureaucratic hotel
Service development	Renewed hotel	Managerial hotel

The *traditional type* is directed by managers who identify themselves with their hotels and base their decision-making processes on emotional and traditional premises. Organizational rules are informal, and jobs are not specialized. Authority is legitimated basing on the charisma of the manager or on tradition. Relationships with customers are informal and imply the development of social linkages. The competitive strategy is supply-driven (it depends on the characteristics of the hotel) and aimed at achieving a cost leadership. Workers should be able to be polyvalent and ready to do their best in any job; their involvement in decision-making processes is very limited. Innovation is sporadic and mimetic, usually imposed by competition. Leadership style is traditional.

The *bureaucratic hotel* is managed as a business (no emotional relationship between manager and hotel), and decision-making processes are analytical and based on economic premises. Organizational rules are formalized into operational procedures. Jobs are specialized. Authority stems from a system of written rules that states the attributions of each job. The relationship with the customer is formal. The competitive strategy is supply-driven (it depends on the characteristics of the hotel) and aimed at achieving a cost leadership. Workers should be able to be polyvalent and ready to do their best in any job; their involvement in decision-making processes is very limited. Innovation is sporadic and mimetic, usually imposed by competition. Leadership style is traditional and transactional.

The *renewed hotel* is directed by managers who identify themselves with their hotels and base their decision-making processes on emotional and traditional premises. Organizational rules are informal, and jobs are not specialized. Authority is legitimated basing on the charisma of the manager or on tradition. Relationships with customers are informal and are imply the development of social linkages. The competitive strategy is demand-driven (it depends on the needs of the customers) and aimed at achieving differentiation. Workers should be able to perform specialized jobs and should have formal education and specific experience, and they have to take decisions in order to achieve organizational goals. Innovation is continuous and proactive, leadership is transformational, in order to foster organizational change.

The *managerial hotel* is managed as a business (no emotional relationship between manager and hotel), and decision-making processes are analytical and based on economic premises. Organizational rules are formalized into operational procedures. Jobs are specialized. Authority stems from a system of written rules that states the attributions of each job. The relationship with the customer is formal. The competitive strategy is demand-driven (it depends on the needs of the customers) and aimed at achieving differentiation. Workers should be able to perform specialized jobs and should have formal education and specific experience, and they have to take decisions in order to achieve organizational goals. Innovation is continuous and proactive, leadership is transformational, in order to foster organizational change.

These four ideal types do not actually represent any actual hotel: “first, the ideal types represent organizational forms that might exist rather than existing organizations. Thus, empirical examples of ideal type organizations are expected to be very rare or non-existent. Second, the ideal types are complex phenomena that must be described in terms of multiple dimensions. Third, ideal types are not categories of organizations. Instead, each ideal-type organization represents a unique combination of the dimensions used to describe the set of ideal types” (Dotty, Glick, 1994: 233).

In any case, it is possible to reflect on the characteristics of each hotel, trying to identify the type to which it is more similar (Figure 1 presents an example). In this way, the typology allowed to sort the complex array of organizational solutions adopted by hotels and, in case of longitudinal analysis, to represent the historical paths of organizational change for each hotel.

In fact, while none of the variables typically used to explain the variability of organizational solutions in hotels (size, category, seasonality, customer type, environmental characteristics) was able to bring order in such a

situation, the four ideal types generate clusters sufficiently homogeneous within themselves and adequately differentiated from each other.

5. Organizational history of Rimini hotels

By connecting hotels' history to the ideal typology, we can re-read the organizational history of Rimini hotels. The first entrepreneurial activities in the hospitality industry in Rimini date back to the early twentieth century, more precisely to 1908, when two large luxury hotels opened: the Grand Hotel (funded by international capitals) and the Hungaria Hotel (owned by a Russian landowner, Dimitri De Gravenhoff, and managed by an Hungarian hotel manager). These first hotels hosted elite international guests; hotel managers and their staff were very experienced and came from abroad or from the most important Italian hotels. The organization of these hotels reflected the configuration of the house of an aristocratic family: the key jobs (e.g., butler, kitchen chef, maître) were assigned to highly experienced men, while women worked in low-level jobs or managed less "noble" services (such as Housekeeping). Hence, despite their important role in developing the brand image of the city, luxury hotels did not foster the flourishing of local talents. The characteristics of these early hotels are very similar to those of the *managerial* type of hotel: hospitality in Rimini born with the *managerial* hotels.

A major turning point for Rimini hospitality industry took place in the period between the wars, when new entrepreneurs developed new accommodation services for middle-class tourists: these new hotels, usually very small, took advantage of the brand image developed by luxury hotels in order to attract Italian tourists. Their growth was consistent: from 14 hotels in 1913, to 36 in 1922, to 137 in 1938, while tourists (90% Italian) went from 18.750 in 1922 to 74.953 in 1934. These new hotels were usually family-run and some of them were managed by women: 57% of the holders of the first 137 hotels and guesthouses of Rimini were women, who previously worked as housewives (80%). Furthermore, unlike luxury hotels, these entrepreneurs were locals (68% of men and 43% of women came from the Province of Rimini) (Battilani, Fauri, 2009). The new entrepreneurship was an expression of the urban middle class: small traders, artisans, railway workers, public employees. This first generation of entrepreneurs matured a vision of the hotel which represented an extension of their home.

These small hotels could not adopt the organizational configurations of the luxury hotels (which were very hierarchical, with specialized jobs and formalized routines) and they had to find their own organizational arrangements. In general, hotel activities were roughly separated between different services, which were family-managed: dining room and kitchen (including purchases) were carried out by the wife, while front desk and the customer relations were managed by the husband (who often had also another work and was present in the structure only in the afternoon and evening). The housekeeping and laundry activities were carried out by seasonal workers under the direct supervision of the wife. External and seasonal staff was often linked to the hotel owners from relations of friendship or neighborhood. This organizational configuration, which reflected the organization of the house of a bourgeois family, became an alternative to the luxury-hotel configuration, finding its maximum development after World War II.

Hence, in the period between the two wars, the *traditional* hotel appeared, coexisting with the *managerial* type. Even if the war interrupted the steady growth of tourism in Rimini, the reawakening of the tourist industry since 1947 marked the beginning of a remarkable period of growth, due in part to a winning formula of average or low-cost services, which saw the rapid expansion and popularity of Italian tourism: in 1963 more than 1300 hotels housed 385,000 tourists (which corresponded to 5,700,000 overnight guests). Rimini was able to offer hospitality services able to fit the needs of international mass tourists: one-third of tourist presences during the 1950s were provided by flows of foreign tourists: in 1961, foreigners represented 32% of tourist presences, the majority of whom were Germans, followed by the English (17% of foreign tourists), the Swiss (5%) and the French (4%). In the 1950s and 1960s Rimini became one of the most famous European mass tourism resorts. In the two decades following the war, new entrepreneurs arrived in the Rimini hospitality industry. Part of them was coming from the urban middle class, as had happened in the twenties and thirties. However, in this period there were two additional entrepreneurial trajectories: one from the countryside, and one from the construction industry. These new generations of entrepreneurs adopted and consolidated the organizational configuration developed by small hotels in the years between the wars.

Hence, in the 1950s and 1960s, the traditional hotel became dominant in Rimini. During the 1970s, Rimini had to confront with the growing competition from foreign resorts, the economic crisis; in addition, the first-

generation shifts started to take place. Rimini reacted and changed to become the center of a leisure district: discotheques and amusement arcades became the new reference point for tourists. *Traditional* hotels remained the backbone of the hospitality industry, the first *renewed* hotels appeared, while the *managerial* hotel experienced an important crisis. Finally, after the crisis of algal blooms in the sea in 1989, the local administration and hoteliers largely invested in conference and trade fair tourism. In the 1990s and 2000s, a great part of *traditional* hotels shifted toward the *renewed* type, while some *bureaucratic* hotels were established, mainly to accommodate business travelers and foreign tourists. In the last few years, new hotels, similar to the *managerial* type, have been founded with the aim to provide tourists with memorable experiences. Nowadays, the four types of hotel coexist and succeed together.

6. Discussion

The research program described in this essay investigated organizational change processes by developing an organizational history of the hotels and by using it to understand and explain quantitative evidences and evolutionary trends. Preliminary results have important methodological and theoretical implications. From the methodological point of view, the adoption of an interdisciplinary and process-based perspective on organizational change allowed to reflect on the flows of decision-making processes instead of thinking in terms of ahistorical adaptations to the environment. From the theoretical point of view, empirical evidences depict a situation much more intricate and complex than that usually presented by mainstream literature. As a matter of fact, different organizational solutions coexist and succeed together. Furthermore, the theoretical framework developed by means of the ideal typology allows to understand and explain the evolutionary paths of organizational change in the hospitality industry. Beyond any difference in size and category, hotels tending towards the same ideal type show similar approaches to the business and adopt similar organizational solutions. As shown of Figure 1, this framework is also able to highlight the historical and foreseen (basing on the intentions stated by the interviewees) trajectories of organizational change.

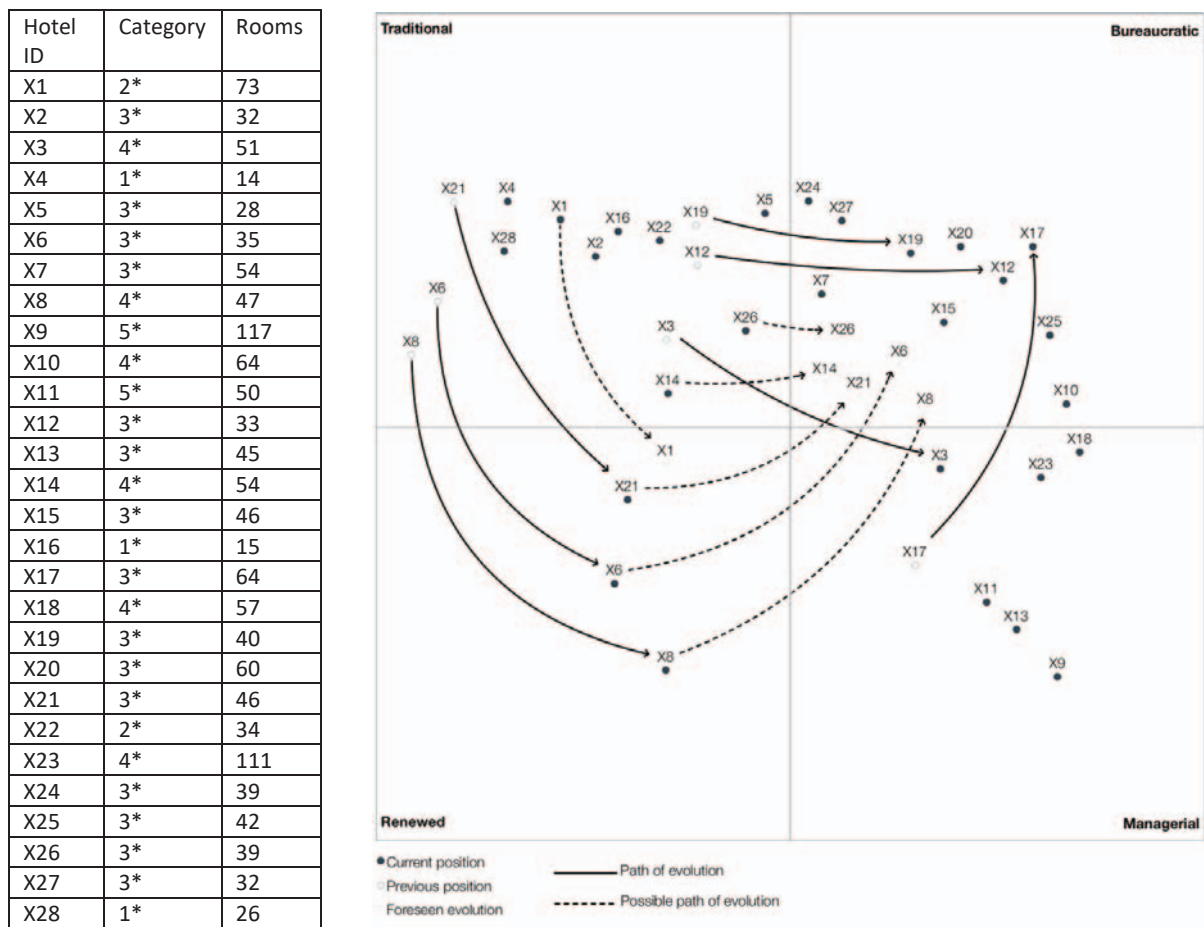


Figure 1: Rimini hotels grouped according to the ideal types toward which they tend. Arrows show the trajectories of organizational change. No arrow means that organizational change has not impacted on core organizational variables

The results of this investigation are based on a single tourism destination (albeit important and iconic), they are indeed in need of additional evidences and comparisons. Finally, longitudinal analysis relying on a sample surveyed in different moments of time would be very important in order to improve our understanding of dynamic processes (in particular with respect to intergenerational transmission).

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Exploring Deviant Elements in Qualitative Research

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Abstract: We argue that research methodologies in management sciences often neglect the negative impact businesses may have on societies. To mitigate this problem, we suggest a deliberate integration of adjacent effects in the data collection of any topics under study. We call this approach to data sampling and collection, deviant scrutiny methodology. Deviant scrutiny can be defined as research methodology that emphasizes an integrative data collection that actively incorporates a variety of externalities into the dataset. The methodology shares three characteristics with Thomas Kuhn's view: 1. an identified conception, metaphysics and values, viz., the approach includes externalities and issues often neglected by the dominant narrative (i.e., sense of purpose); 2. an historical consideration focusing on emerging topics, or social facts, that affects society and organizations (i.e., sense of context); and, 3. the compulsory, by protocol, integration of evidences that challenge taken for granted assumptions and theories, and confronts the biases affecting scientific communities-of-practice (i.e., sense of awareness). The approach suggests the integration of a second level of data collection that includes what we call 'inconvenient' qualitative and/or quantitative data. Inconvenient data is defined as data that may affect negatively, and thus change, positively reported business' performance. The approach provides new insights to the problematic assumption of the detached, rational, and objective researcher proposed by positivist approaches. The paper suggests a deviant scrutiny protocol (i.e., 1. Choose a research topic; 2. Review "conventional" literature; 3. Active seek for information in unconventional sources; 4. Compare conventional and unconventional data; and, 5. Choose consciously the epistemological and theoretical framework to interpret the findings and build new theory). As well, throughout the paper we apply the method to a contemporary business and society issue, that is, the role of management research in addressing social inequality.

Keywords: mixed methods, epistemology, deviant scrutiny, paradigm

1. Introduction

"If progress against poverty has been disappointing over the past half century, the reason is not the decline of the family but the rise of extreme inequality." [Paul Krugman, On Fighting the Last War: On Poverty, New York Times, (2014)]

The term deviant comes from the Latin words: *de* meaning "from" and *via* meaning "road", so deviant means "off-road or off-path". It has been used in several fields of study (e.g., Law, Medicine, Psychology, Pedagogy, Sociology) and has been transformed into an oxymoron when associated with the word "positive", that is, positive deviant, or positive deviance. In Psychology, the construct 'positive deviance' is defined normatively as intentional behaviours that depart from the norms of a referent group in honourable ways (Spreitzer and Sonenshein, 2004). In management sciences, in special under the field of positive organizational scholarship, positive deviant has been related to individuals or mechanisms that move beyond the normal and towards the extraordinary (Cameron and Dutton, 2003, Cameron and Caza, 2003). Freeman (1999) uses the term "divergent stakeholder theory" to postulate the necessity of bringing together theories and methods for understanding organizations that are divergent from the stockholder model and thus helping the creation of a convergent stakeholder theory. Arnold and Hartman suggest that 'positive deviance' may be instrumental for positive social change (2005). Parkin (2010) integrates the notion of sustainability and defines the term as a person who does the right thing for sustainability, despite being surrounded by the wrong institutional structures, processes, and uncooperative people. Such definitions and usage of the term poses one caveat, however. There are judgments *a priori* of the analyses and interpretations of the individual and social issues (i.e., "honourable"; "extraordinary"; "positive change"; "right thing"). In other words, the research assesses what the researcher had already preconceived as positive. Moreover, the attempt to consider successful deviation as a parameter for "positive deviation" (Sternin and Choo, 2000) falls short on controversial situations. While, for example, terminating child labour in developing countries seems a correct social change, much more controversy may be found in the debate for a universalization of the health care system.

In management science research, emergent debates are frequent. In the above-mentioned quotation, Paul Krugman, the recipient of the 2008 Nobel Prize in Economics, highlights an intriguing recent phenomenon: social inequality. What seemed to be a result of years of application of social science to orient governmental policies, at least on the majority of the Organization for Economic Co-operation and Development (OECD) countries, has

failed. In 2014, although in these countries stock markets have recovered to the same level they were before the 2008 financial crisis, the social recovery in terms of jobs, income, and social protections did not follow. According to the Canadian Centre for Policy Alternatives, CEO pay for Canadian public companies listed on the Toronto Stock Exchange has ballooned by 73 per cent between 1998 and 2012. In contrast, the average Canadian full-time worker's annual salary has only grown by six per cent during the same period. One may check the GINI Index to quickly verify these trends worldwide. Even in the European Union, where more Keynesian economics has always taken place, inequality growth and the disconnection between markets and wages is a fact. So, which are the reasons for the disconnect between stock markets and the rest of societies?

A possible explanation, and here is where the concept of positive deviance becomes ambiguous, is when another Nobel Prize in Economics (in 1976), Milton Friedman, argues that such disconnection is not worrisome, as poverty is an externality that eventually will be corrected by market forces of supply and demand, "the invisible-hand", and thus the stockholder is not responsible for the contemporary growing inequality. What seems central to the dominant narrative in business in the US is the reduction of the multiple claims of ownership to financial ownership. In other words, the non-financial investments made by other stakeholders are overlooked while capital investment is made central (Kempf, 2008, Klein, 2007, Freeland, 2012, Pilger, 2003).

The interests of the societies are equalized to what is interesting for their economies, which is represented by corporations as entities, and managers as decision-makers. The interests of other stakeholders like workers, suppliers or host communities are irrelevant because differently from the 'real' owner (i.e., the stockholder), they have no, or little, say in the decision-making process. The dominant model rationale is parsimonious: the free markets are more efficient and a greater efficiency would translate into more development (Stiglitz, 2002, Freeman, 2010). The typical narrative is: "The market did (or did not) react well to this decision..." and no coercion is needed in the process of manufacturing this consent (Herman and Chomsky 2008). In our view, among several instruments that are inadvertently, or strategically, used to produce consent are theory building and research methodology. This paper constructs its narrative from this controversial social fact (i.e., the social inequality) and the resultant difficulty in establishing an operational construct of "positive" deviance able to address the fact. Hence, the paper reflects on the purposes and procedures of management sciences and related research methodologies and research practice. It defines deviant scrutiny as a research methodology with a particular data collection protocol, then describes the process of sampling and data collection, and provides examples of its application.

2. The discovery of a research methodology

By mid-2016, political analysts who dared to suggest that Donald J. Trump had any chance to become the nominee of the Republican Party were laughed at. Those analysts were probably capturing, through intuition, perception, and/or interviews, neglected needs and desires of whom later became the focus of the presidential campaign, "the forgotten American middle class". In other words, the attention to social inequality in the US may have elected a disruptor. This mistake is extremely relevant as three days before the general election, institutes like the Princeton Election Consortium projected Hillary Clinton had 99 per cent chances of winning the election, the failed data analysis by probability statistic was found by the university's statistical Bayesian model (Wang, 2016).

In terms of science evolution, Thomas Kuhn (1996) on his sociology of science work "The Structure of Scientific Revolutions" described findings that invited the scientific community to rethink previous beliefs, especially the Vienna's Circle. While the fallibility hypothesis of Karl Popper (1972) addresses scientific changes within a micro historic viewpoint, considering instantaneous process of experimental rejection of a theory, the conception of the scientific revolutions of Kuhn demonstrates the complexity of these processes, considering a historical scale, and also, a micro sociological context opening the idea of historic epistemology. For Kuhn, the science is based on a paradigm acquired that provides conceptual elements, experimental applications, and some deeper scientific conceptions, metaphysics and values (i.e., purpose).

New conceptions and values will obligate the renovation of the paradigm eventually while maintaining the rigorous scientific practices. This process is the scientific revolution that permits re-establishing the loss of precision in the previous paradigm and the need for a new theoretical-experimental coherence. This epistemology, in confrontation to the logical positivism, presents a clear historical character (i.e., emergent and contextual) that could not be conceived without historical perspective. Interesting is the fact that the revolutions

do not come from ignorance of science, but the change takes place from a rigorous science to an even more rigorous one which is very close to Popper's concept of conjectures and refutations. However, it defers from Popper when it presents the science's social character as an essential part of science. It is a community of specialists who accepts the paradigm as the state of the art of the specific science, besides they are the ones who will accept the revolution or will fight against it.

The deviant scrutiny (henceforth DS) shares three characteristics with Kuhn's view: 1. an identified conception, metaphysics and values, viz., the approach includes externalities and issues often neglected by the dominant narrative (i.e., sense of purpose); 2. an historical consideration focusing on emerging topics, or social facts, that affects society and organizations (i.e., sense of context); and, 3. the compulsory, by protocol, integration of evidences that challenge taken for granted assumptions and theories, and confronts the biases affecting scientific communities-of-practice (i.e., sense of awareness).

The compulsory data collection of externalities suggested by the methodology permits the discovery of new facts that may impair the 'supreme' institutions, weakening their authority as these new facts remain unexplained. The crisis opens space for inventing an alternative theory. As Kuhn argues, the new paradigm may not be a continuum of the last one, it often defers conceptually. DS may disrupt the *status quo* as new information hardly fits mainstream explanation.

As an approach to sampling and data collection, there are criteria to be developed, a protocol. The paper builds on the considerations of Bazeley (2003), Brannen (2005), and Tashakkori and Teddlie (2010) who reviewed and treated issues, controversies and challenges research methods in general, and mixed methods in specific, encounter. Cameron (2011) summarizes and develops them into five Ps: paradigms, pragmatism, praxis, proficiency, and publishing. This paper introduces two new ones: Purpose and Presence.

The challenges of paradigm (i.e., Paradigm) relates to the influences epistemological and philosophical bases may bring to derivate research methodology. As DS inverts the process looking at emerging social facts first, it is a priori non-paradigmatic. Such aspect of the method must be interpreted in two ways. First, emergent means narratives that come out from the social context and imaginary, from curiosities and interests of the researcher, and yet from rediscoveries about longstanding issues.

Second, to avoid a fake detachment, in other words, the problematic belief that the scientist is neutral on his/her sampling and analysis, DS actively pursuit besides the conventional, unconventional sources of data and narratives from different societal stakeholders presented on unconventional media that are dealing with the topic under investigation and its surroundings (i.e., adjacent phenomenon). Such inclusive operation reignites the hope for a rational and reflective agent as Alvesson and Deetz (2006) understand it but who is now well-informed by the complementary sources of data. Also, the inclusiveness of this methodology avoids the epistemological relativism and short-sighted practicalism (i.e., Pragmatism) as unconventional information cannot be simply disregarded.

The methodology invites the researcher to take a conscious stance on the epistemological and philosophical approach to be chosen to analyse and interpret the data. The data may be explained by, for instance, empiric-analytical, historic-hermeneutical, or critical-emancipatory epistemological positions. Hopefully, the new data collected through the criterion of inclusiveness will reveal that main stream approaches may not explain the phenomenon under study with an ease and, therefore, new concepts, metaphysics and values may take place. As per the conjunction of theory and practice (i.e., Praxis), DS suffers the same challenges as most of the methodologies, that is, the researcher tries to determine how appropriate is the methodological tools utilized (e.g., data bases, interviews, surveys) to the epistemology and theories used to explain the phenomenon. Research practice shows that often researchers follow and enhance methods demonstrated on seminal works. DS may demonstrate that new tools are necessary.

As per the capacity of the researcher to perform and integrate different qualitative and quantitative methods (i.e., Proficiency), DS simply reminds the researcher that methods, and integration of methods, that may reduce dropping off existing information should be taken into consideration. For the probability of publishing (i.e., Publishing) research under the label of Deviant Scrutiny, it is expected that the methodology will be able to bring about more convincing narrative of findings and conclusions. DS is not better or worse than other methods, it just covers some methodological lacunas of inclusiveness as its starting point is the source of data. In that sense,

it introduces two new Ps, purpose and presence. Purpose means the methodology's endorsement for an active search for deviant information in breadth and depth.

Finally, presence meaning the being and existence of a researcher capable of assessing the social reality in depth and thus making recommendations to its improvement. Instead of what a postmodern approach would label the social scientist as another social actor influenced by his or her preferred group of interest, presence facilitates a core distinction between academic freedom and intellectual honesty. There is no academic freedom without a responsible exercise of intellectual honesty. In that sense, DS methodology's compulsory search for new data from unconventional sources may change the deepest beliefs of the scientist herself after profound analysis of a phenomenon.

3. Methodology definition and description

The deviant scrutiny is a research methodology that emphasizes an integrative kind of data collection, which actively incorporates a variety of externalities into the dataset. The dataset incorporates thus conventional and unconventional sources of information. By sources of information, we mean: 1. Theories from the mainstream and/or emerging from/conflicting with it; 2. Qualitative and quantitative methods both extensively used and/or new developments; 3. Data from traditional (or conventional) sources but also non-traditional (or unconventional). The approach transforms the researcher epistemologically into a discoverer of facts and an inventor/developer of theories. Like an investigative reporter, the researcher at first engages on an attitude of open-minded in search for deviant information. In that sense, the investigative researcher starts to find inconvenient, which may be defined as data that may affect negatively, and thus change, positively reported business' performance. Subsequently, the researcher becomes a data analyst confirming or adding new aspects for existent theory or proposing new theory.

Deviant Scrutiny starts with a problem (i.e., the phenomenon under study) but goes beyond. The methodology explores potential discourses, issues and data sources that are absent to the phenomenon under scrutiny. The purpose is to be deviant from the mainstream thinking (i.e., "think outside of the box") and, eventually, find neglected information. The methodology objective is to actively search and, in case of being found, include them, and then, chose a framework for explanation. In that sense, the sequence of events, or the DS protocol, suggested is:

- Choose a research topic;
- Review "conventional" literature (i.e., from an induced paradigm's publications);
- Active seek for information about the research topic chosen on unconventional sources;
- Compare conventional and unconventional data (i.e., are them similar, partially similar, with new nuances, in contradiction or deviant?); and,
- Choose consciously the epistemological, philosophical and theoretical framework to analyse or interpret the findings. Otherwise, build new theory.

Whereas, tradition literature review guarantees the legitimation and scientific accuracy of an article due to due processes like blind reviews. It seems clear that from the identification of an emerging topic to its appearance on a scientific journal there inevitably a delay. The delay often exists because researchers need time to investigate or because paradigm prison pushed way the symptomatic data. By actively searching for unconventional data, DS addresses both reasons of delay. To the former new evidences may be quickly incorporated to the researcher who is now amplifying the range of his/her radar and, to the later, as an attitude of open-minded is consequential paradigm becomes flexible by trying to assimilate new data.

4. Unconventional sources

The issue of searching information from unconventional sources is both an opportunity and a threat to DS methodology. Up to this point in the paper, it must be clear the DS forces the inclusion in the research sample of all the stakeholders who seem somehow relevant to the understanding of the phenomenon. For example, let us take an adjacent phenomenon of poverty in the United States of America: homelessness. After some interviews with homeless people, it does not take long for an interviewer to connect the effect homelessness with the plausible cause of personal bankruptcy after a personal illness or accident of an individual not covered, or thought of being covered, by a health insurance plan (Neumann, 2015). Yet, recent data in this same country

shows a great number of war veterans who had little or no support to transition to the civilian life, and thus ended up on the streets (Ijadi-Maghsoodi, 2017).

Now, the same interviewer with a more in-depth understanding about the phenomenon of homelessness may recommend, among other things, policies for more affordable healthcare and support for the vets. Nevertheless, we would like to highlight a more controversial source. Information present in the content of newspapers, business magazines, documentaries, music, and new social media (e.g., YouTube videos, Twitter messages, blogs, actions caught by smartphones' cameras, and so on) are deemed untrustworthy, non-factual based, for most of the scholars, despite of the fact that this content often shapes social beliefs, values and interests, that is, the social imaginary that becomes part of daily conversations. These new beliefs may help to elect politicians who are able to institutionalize laws, policies and create institutions. In other words, they were a covert source of information to the researcher discarded unnecessarily. We want to make clear the distinction between, "facts" and "social facts". In the same lines of Searle (1995, p.1) who postulates "...there are portions of the real world, objective facts in the world, which are only facts by human agreement", to us, social facts are facts with interpretation. DS may help reduce biases in this interpretation. Untreated unconventional information may create biases, positive or negative, in the mind of the social actors, researchers included, exactly because they are untreated. The problem lays with all the social facts and sources that are not investigated by a matter of prejudice originated from the present academic *modus operandi* in favour of the dominant model, on one hand, and conventional sources on the other. In our own experience, a PhD program 101 rule would: "In your papers, quote mainly top journals, if you want to publish it", as if these interpreted as "top" were the recipients of definitive truth. DS protocol may facilitate the differentiation between the fabrication of consent, as the above-mentioned Herman and Chomsky argue, and conversely the deeper exploration of an issue and the creation of a convincing scientific explanation. There are, however, several ways to deal with this issue, the following example will serve as an illustration.

In 2006, a documentary called "An Inconvenient Truth" directed by David Guggenheim and bringing the former Vice President of the United States Mr. Al Gore as the main character came out. The documentary became unusually a blockbuster, a "must see" movie. An Inconvenient Truth presents for the first time to the public evidences about the relationship between burning fossil fuels and global warming. Al Gore gives his own testimony on his attempt to take scientific data to the American Congress suggesting steady and considerable raise of emissions since first measured. The congress committee for the environment disregarded the information. The documentary becomes an Academy Award Winner, and subsequently, in the same year Al Gore receives the Nobel Peace Prize (joint award with environmental researchers of the Intergovernmental Panel on Climate Change from the United Nations). In September 2013, the Panel reinforced, with greater level of confidence, the fact that the Earth is warming at an accelerated rate and humans are responsible for more than half of that change. During the years since the success of the documentary, members of the society (politicians and citizens) started a heated conversation about the topic, while members of the business world started to invest heavily on sustainability. This world market is growing by "5% a year and is expected to triple by 2030" (Szabó, 2017, p.425). Following this trend represented in the documentary, research on the management of sustainability is booming. Conferences, journals, academic curriculum and programs, and research centres are evident institutionalizations of this new social fact.

It is known that An Inconvenient Truth was not the only source of information about the environment but its brutal impact (in society and academy) cannot be denied. The example shows a whole process of validation of the documentary. From an Aristotelian framework on rhetoric assessment (e.g., Demirdöğen 2010), both, the problem and the presenter, have ethos, or reputation, the argumentation that is based, partially, on scientific data but also on speculation still maintains its logos, or logic, and, the argument can awake emotions, or pathos, on the kind of audiences that attended Al Gore lectures or watched the movie.

Not all sources of deviant information are presented by known people. Besides, documentaries are on different stages of making their way towards social recognition. There is thus a mixed form of validation. The "Inconvenient Truth" is an example of mature validation, that is, the documentary per se brings scientific evidences regarding its main thesis and other sources of similar conclusions that are used in the process of triangulation of sources. In that sense, documentaries and other sources, may be classified in three different momentum:

- Early stage: source just launched; emerging topic with local interest;

- Developmental stage: source starts getting attention, and other sources and studies corroborate conclusions; and,
- Mature stage: source, and its additional triangulations, forces change in society including the scientific and business communities.

DS argues that management sciences would benefit with the integration of unconventional sources despite of their stage of validation. The strength of the narrative grows from stage 1 to 3, but it must be a researcher decision to courageously bring the information to front or simply abandon the deviant “noise”. The researcher is an early-adopter of information who understands the risk taking a lead to nowhere.

A stage 2 example would be the documentary *Sicko* by Michael Moore which added information to the public regarding the universalization, or not, of the health care system and the “lethal” behaviour of Health Insurance Companies in the United States. Likewise, the “*Inside Job*” by Charles H. Ferguson that brings awareness about the regulation of the financial market and executive compensation would be on stage 2. “*Inside Job*” won the 2010 Academy Award for Best Documentary Feature. “*Food, Inc.*” by Robert Kenner, and “*Hungry for Change*” by James Colquhoun and Laurentine Ten Bosch which examines corporate farming and concludes that agribusiness produces unhealthy food would be still on stage one.

As examples of other sources, concerning the frustration of younger generations presented on the “Occupy Movement”, we portrait any kind of music disclosing the life conditions of the less fortunate or minorities, like the 2014 top hit “*Royals*”, a song recorded by singer-songwriter Lorde that brings on its lyrics: “*And we’ll never be royals. It don’t run in our blood. That kind of luxe just ain’t for us.*” Such lyrics become sources of narratives that eventually may be taken into consideration by researchers, policy-makers and business people, who may take actions and solve or minimize the problem. Yet, content can be captured from new technology platforms such as YouTube videos or Twitter messages, which often go viral on such social networks and make known the voice of unsatisfied customers/citizens. Same sources in different idioms may be an interesting triangulation (of languages) as competitive explanatory views may be taking place on different social imaginaries.

The legitimation of a source built on its ethos, logos and pathos and the observation of its stages (and thus strength) are forms of validation focused on the source. In the following, the article discusses traditional forms of validation applied to the DS.

5. DS incorporating traditional criteria for research validation

Among the criteria traditionally used to validate research, sampling, triangulation, saturation, consistency, reliability and generalization is applied to this methodology.

Onwuegbuzie and Collins (2007, p.304) refer to four major crises to mixed methods research – representation, legitimation, integration, and politics – and indicate how each if these crises can inform considerations of sampling design. DS is an additional option to cope with these crises. One approach for sampling the unconventional sources is based on Pettigrew (1990). Pettigrew suggests that if the phenomena to be observed must be contained within a single or relatively small number of cases, extreme situations, critical incidents and social dramas may be considered. For example, management scientists dedicate sometimes their entire careers to explain why organizations as successful (e.g., profitability; stock value). They apply theory, define constructs and create models to be tested. Apple computers is often in focus as a successful case. Recently, however, a critical incident occurred. News on different media present the company as a “poor” taxpayer. “So, how much tax did Apple pay?” *Forbes Magazine* asks on January 11th, 2012. Such extreme incident led authorities in United States and Europe to consider taking actions against the company and, management scientists to consider tax evasion and/or loopholes as a possible explanation of the company’s success, even if partially. Another, approach to sampling called theoretical sampling is described by Glaser and Strauss (2009). In the case of DS, different sources may provide similar or different information about the topic. In other words, unconventional sources may provide: 1. similar information to the mainstream belief; 2. Different information from the mainstream; or, 3. The level of difference between then (i.e., new highlights vs. total disagreement). Cases 2 and 3 suggest discovery of new facts different from the mainstream.

We have highlighted the matter of data inclusion or compulsory triangulation of different sources of data. As legitimation is also a concern, we rely in the idea that triangulation is also defined as “the combination of

methodologies in the study of the same phenomenon” (Denzin, 1973, p.291), and, in that sense, DS welcomes quantitative and qualitative methodological tools and analyses.

In relation to sampling saturation, DS resembles Glaser and Strauss (2009) criterion, that is, the saturation of the data collection occurs when no new information is obtained from new collection and initial analysis. The findings become repetitive or saturated.

For research consistence, it is proposed the idea of “multiple operationism” developed by Campbell and Fiske (1959) to whom more than one method should be used in the validation process to ensure that the discrepancy reflected refers to the trait assessed and not to the methodology. Consistence criteria resemble the triangulation strategy, which in the case of DS, besides different methodological tools, different sources provide the additional effect. Thus, DS guarantees what Eisenhardt proposes, a “stronger substantiation of constructs and hypotheses” (1989, p.538) and “constant juxtaposition of conflicting realities [that] tends to ‘unfreeze’ thinking, and so the process has the potential to generate theory with less researcher bias than theory built from incremental studies or armchair, axiomatic deduction” (Eisenhardt 1989, p.546).

In terms of generalization, the paper refers to Churchill and Wertz (2001, p.254) who advocate that “the attainment of various levels of generality, as well as knowledge of what is unique in a particular case, requires qualitative comparisons of different individual cases, real and imagined, in which the researcher strives to intuit convergences and divergences and, thereby, gains essential insight into relative levels of generality” (i.e., a structural understanding of individual, typical, or universal features). Different and unconventional sources facilitate latter assessment of convergences and divergences.

Regarding research reliability, the article refers (Giorgi, 1985, p.96): “Thus, the chief point to be remembered with this type of [qualitative] research is not so much whether another position could be adopted (this point is granted beforehand) but (rather) whether a reader, adopting the same viewpoints as (those) articulated by the researcher, can also see what the researcher saw, whether or not he/she agrees with it.” In other words, from the initial inclusion of deviant data to the choice of epistemological position and methodological tools (e.g., interviews, surveys, statistical models), if the researcher is able to convince the reader about the accuracy and completeness of the data collected, the application of DS methodology will be considered reliable.

6. Discussion

The deviant scrutiny is a methodology anti-ideology as it abandons a priori choice of epistemological, philosophical and theoretical positions. The forced inclusion of unconventional sources of data and the suspension of concepts, metaphysics and values may allow the research findings and conclusions to represent virtually all those affected by the topic under investigation. For this reason, DS may address the challenge of finding collective explanations of social facts by stakeholders holding contested preferences initially. New information often benefits cooperative learning processes, which take place in the dimension of moral insight, practical knowledge, communicative action, and the consensual regulation of conflict (Habermas, 1972).

The researcher who dismisses critical information for the sake of maintaining harmony, and status quo, in a specific community of practice loses the opportunity of discovering facts and inventing new theory. It seems inevitable that deviant data starts to be integrated into the researcher radar. Take the example of the well established Sustainalytics data base from Thomson Reuters, besides the self-reported and transformed into numeric scores of specific areas such as environment, corporate social responsibility, and governance, the Sustainalytics is open to include, although still in a lesser amount, reports of controversies and incidents often from court decisions, ongoing lawsuits, and ethical scandals affecting companies present in the its base. Such reports add unconventional sources to conventional data, opening opportunities for discovery and for a better description of reality.

The deviant scrutiny methodology does not aim to discover positive deviances but its broader scope for data collection may facilitate such discovery. Metaphorically, the article concludes that the deviant scrutiny makes sure that “visible minorities” and their issues and conditions, like poverty, are incorporated into the mainstream research agenda in management sciences.

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Information Systems Research Methods: Exploring the Implications of Hannah Arendt's Analysis of the Human Condition

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Abstract: In 'The Human Condition' (1958) Hannah Arendt presents a picture of what it is to be human based on the activities that we humans undertake. She distinguishes three forms of activity fundamental to our lives – labor, work and action. In her view the western intellectual tradition has failed to take proper account of the distinctions between the three activities. She considers that this way of categorising human actions is important to understanding the way that modern life has developed and seeks to describe each one as fully as possible. Labor refers to the actions required to meet the unceasing need to satisfy our bodily needs. Work includes all those activities by which physical products are produced. It is through work that man (*homo faber*) transforms raw materials into tools and creates the human world we live in. However it is the third type of activity – action (*vita activa*) which promises to shine a different light on both the way organisations make use of Information and Communications Technology (ICT) and the role current research methods play in developing our understanding of the potential value to be obtained by organisations from this technology. This paper presents Arendt's analysis of these three human activities and then explores the implications for business research methods – in particular those applied within the Information Systems discipline (IS).

Keywords: Hannah Arendt, human activities, ICT artefact, IS discipline research methods, organisation's use of Information and communications technology

1. Introduction

The political events of the first three quarters of the 20th century – the period of Arendt's life, had a deep effect on her writing, in particular in developing the questions that she set herself. The extremes of political forms during her life time and the extra-ordinary developments of technology and science since the 17th century were central to her concerns for the management of human affairs. For her the conditions of human life had undergone profound change over this period with every sign that this would accelerate into the future. Her concern was that both our responses as communities and the ways of looking at the world expressed by philosophers, political philosophers, ruling elites and commentators of all types were failing to address issues emerging from these changes that she judged to be urgent. Her ideas have implications for the future development of science, the future use to which technology maybe put and the management of organisations.

This paper draws on one of her major publications – the book entitled 'The Human Condition' first published in 1958, (1998). In this book, Arendt formulates the fundamental conditions of human life in terms of our capacities for an active life (*vita activa*). She identifies and analyses three activities that form the basis of an active human life and labels them labor, work, action. Although not discussed in the same depth, the *vita contemplativa* (life of contemplation) emerges as a contrast.

A key theme winding through much of Arendt's writings is the importance for us as humans to try to understand what we are doing and perhaps why we are doing it. In the Human Condition she proposes 'a reconsideration of the human condition from the vantage point of our newest experiences and our most recent fears' (Arendt, 1998, p5). This paper has an aim similar in spirit to Arendt in that it seeks to clarify the assumptions underpinning IS research methods and the forces driving the way organisations make use of Information and Communications Technology (ICT).

The next section introduces the book by Arendt – The Human Condition. Section 3 describes the activity of work and outlines the impact of these on scientific and IS research. Section 4 describes the third activity – action and its role in human affairs. Section 5 assesses the implications of these ideas for business organisations use of ICT and Information Systems (IS) research methods.

2. The Human Condition

In 'The Human Condition', Arendt analyses each of the three activities – labor, work and action, the interaction between them and the impact of each on humans as individuals and communities. In her view the western intellectual tradition has failed to take proper account of the distinctions between the three activities. She

considers that this way of categorising human actions is important to understanding the way that modern life has developed and seems likely to continue developing in the future.

Labor refers to the actions required to meet the unceasing need to satisfy our bodily needs.

Work includes all those activities by which physical products and mental structures are produced. Contemplation is the activity most prized by the Greek philosophers. With this they turn their back on the *vita activa* (active human life of labor, work and action) to create the time, space and absolute quiet required for the search for truth. Action, the activity by which men interact with each other and work together, is the basis of political life.

According to Arendt (1998), western philosophy has for long put contemplation as the highest form of human activity. It was from this activity that the key truths of human existence were expected to emerge. In the hierarchy of human activities, Labor (not initially distinguished from work) was considered the lowest form of activity. Action – the life of the community (*polis* for the Greeks and the republic for the early Roman Empire) was recognised but ranked below contemplation. In later periods, after the Roman republic ceased, it seems to have disappeared as a recognised activity. We owe the identification of the concept of work to Arendt herself, but its steady rise in importance dates from the scientific and industrial revolution of the seventeenth century, (from which Arendt dates the beginning of the modern era). Labor, considered the lowest and least important activity for most of western history gained importance through the work of Marx in the nineteenth century. It is the activity of action that has struggled to gain recognition in modern times and a place in the hierarchy. Arendt views this development with concern. For her this bodes ill for human community life in general and western civilization in particular.

3. The activity of work

Arendt (1998) draws a sharp and unusual distinction between labor and work. Labor corresponds to the biological process of the body and is what we need to do in order to preserve our life. Work fabricates the ever increasing range of things that make life easier for us. The results are highly visible in the physical remains of one civilization after another. We have an immense and successful experience in this activity – we know how to do it. The following section describes the main characteristics of work and how scientific and IS research communities have embraced it.

3.1 Work

It is through work that man (*homo faber*) transforms raw materials into tools and creates the human world we live in. Work produces objects for use that are durable. Use may wear them out eventually but we do not consume them in the same way as we consume the products of labor. These objects can be considered objectively, as once created they have an independent existence from their owners and makers, men. Through work man creates his world and some degree of stability. But this comes at the price of destroying elements of the natural world in order to create the physical items that are use objects. In contrast, Labor leaves little trace, is repetitive with each person carrying out the same job again and again and the results are consumed immediately.

An important stage in the process of work is the thinking required for the creation of things. We are guided by mental models, blueprints of the final object before making them. Both model and object are durable remaining as a guide for other workers to make and remake and if appropriate change again and again. This essentially mechanistic world view offers us the potential for a feeling that we can control our lives. It gives us satisfaction and self-assurance and a feeling of stability. Labor, crucial to survival in the endless life process, has neither beginning nor end. Whereas the act of work, the fabrication of things, has a clear beginning and a clear end, marked by the existence of the new thing, with enough durability to remain in the world as an independent entity. The ultimate test of success is the existence of the final product.

3.2 The community of scientists

For the community of scientists, the concepts and attitudes engendered by work are embedded in the way it operates. Arendt (1998) dates the emergence of this community to the seminal action of Galileo in making a telescope and turning it to study the sky. The two actions – making a telescope and the approach to creating knowledge through empirical observations established the core of scientific method. From the start this

community knew no political boundaries (Wulf, 2015) and sought to focus exclusively on subjects of scientific interest (Gribbin, 2006).

The Cartesian world view proposed by Descartes was to have a major influence on this community. This starts with the fundamental dichotomy of subject/object (Foulds, 2013; Hubert Dreyfus on Husserl and Heidegger, 1978; Riemer and Johnston, 2014) and encourages the acceptance of an objective reality which we can come to know through perception, description and measurement. It places human reasoning and the power of the human mind to solve problems above most other activities. Men of science create models of the world and use experimentation and observation to test their accuracy in representing natural phenomena and acquiring knowledge. Because for them the process by which knowledge is acquired is more important than the final result, they prize the qualities of creativity within the limits of man created thought ideas, experimental success, industry and truthfulness.

The extra-ordinary success of scientific research especially in the 'hard' sciences has ensured that all other disciplines have sought to repeat their achievements by applying the same research methods. Their ideas now permeate research in all other disciplines including IS and the everyday life of practitioners and executives in charge of managing new ICT applications.

3.3 Information systems research

The IS research community was formed around the problems and questions raised by organizations' attempts to exploit the new Information and Communications Technology (ICT). This is a discipline that differs in a number of ways from that of the traditional sciences. The tools investigated - 'the IT artefact' (computing hardware, data storage facilities, systems software and most recently electronic communications) undergo constant development, so that the researcher faces an ever changing set of research questions around the potential of new applications and facilities. The organisations that implement new ICT, and their employees, are crucial factors in whether and how this potential is realised. Each new application installed represents an unprecedented opportunity or threat of change to the organisational structure and power relations within it (Orlikowski and Robey, 1991). Moreover the research community is also under constant pressure from the other stakeholder - the practitioners (consultants, business executives, government) to deliver practical and effective guidance on implementing new applications (Ramiller et al, 2008). It is an applied field with all the complexities that this implies. As Lee (2001) stated 'research in the information systems field examines more than just the technological system, or just the social system, or even the two side by side; in addition it investigates the phenomena that emerge when the two interact'.

The Cartesian worldview infuses the work of both sets of stakeholders – practitioners and researchers alike. Mainstream IS researchers believe in their ability to use the scientific method (positivism) to develop theories that can model ICT artefacts and their implementation well enough to describe and predict the outcomes of implementing each new wave of applications. Researchers develop guidelines on the major operations of design, adoption and implementation for managers and practitioners. Classical positivism emphasises the reliance on measurable evidence to support theories. Research methods include passive observation, measurement and statistical analysis, survey, questionnaire, instrument experiments, case study and simulation (Mingers, 2003). This is the dominant stream of research as measured by the proportion of empirical academic papers that fell into this category - over 75% for the latter period of the 1990s (Mingers, 2003). Work in this stream is critically assessed by academics for both the practical value of the results and the rigour of the research method applied. Researcher objectivity is a key criteria. The research results convince through their adherence to accepted standards of validity, reliability, replicability and generalisability. From the early 1990s, a new strand of research came into being applying interpretivist or social constructivist methods (Orlikowski and Baroudi, 1991). These methods are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham 1993). This approach sought to take account of the effects of ICT applications on the organizational culture into which it was being installed. The implication (implicit) with this approach was that the greater level of understanding would enable researchers to offer better guidelines on key practitioner problems. The research methods used include interviews, qualitative content analysis, ethnography, hermeneutics, grounded theory and participant observation (Mingers, 2003). These methods rely on the researcher judgements to a much greater extent than positivist methods. But criticism of these methods by mainstream IS researchers based on the positivist world view has driven the development of an extensive literature offering guidelines for good practice (Walsham,

1993, 1995, 2006; Klein and Myers, 1999). Researchers in this stream have sought to deal with criticisms largely by seeking to establish rules and guidelines that adhere to the standards of positivism and hence to the Cartesian worldview. IS researchers have also been quick to apply methods such as those based on phenomenology developed in other disciplines— notable social science. Essentially all these approaches are classical scientific approaches - testing existing theories and/or gathering empirical data to develop new theories combined with an intense debate on the quality of the research process and results obtained.

Despite success in for example quickly developing valuable knowledge on the potential and use of new IS applications, results achieved in terms of application by managers within organisations have been erratic. Planning the implementation of a new IS gives a flavour of typical experiences. The belief in the power of planning, good organization and rational analysis following the recommendations made in numerous manuals and text books has failed to deliver problem free installations. The widespread experience of managers, of project delays (Keil et al, 2000), user criticism, poor fit to business needs (Davenport, 1995) and unused systems (Markus, 1983; Markus and Keil, 1995) has led to a degree of pessimism and frustration with this process (Sauer and Cuthbertson, 2003; Ramiller et al, 2008; Riemer and Johnson, 2014). Another source of confusion is the numerous reports of conflicting research results as to the use made of similar IS. Barclay's (1986) work on the differing use made of CT scanners when introduced into two separate radiology departments, is an early example.

4. The activity of action

It is by the actions of men and women working and debating together that the political and social life of the community is kept alive. This is by far the most complex activity of which we are capable and the most difficult to make sense of. Our developing knowledge of our own history offers many examples of our relative lack of success in managing this activity – the lost cities unearthed by archeologists, the unending warfare, the political malaise of modern times. This for Arendt (1998) is the highest form of human endeavour, but has attracted the least attention in terms of scrutiny and analysis. This section describes the main characteristics of action and some of the problems it raises.

4.1 The individual human being

Heidegger (2010) and the existentialists see a wider world in which the experiences of the individual human life involve far more complexity. For Heidegger the traditional Cartesian ontology has a major gap in its description of how we humans relate to the world. It fails to include the practical day to day lived experience of all humans – of our experience of Being in the world. Each individual is catapulted into the world as it is and must deal with it from minute to minute throughout his or her life (Foulds (2012), Hubert Dreyfus on Husserl and Heidegger (1978), Barrett (1978) and Riemer and Johnson (2014)). We do so with great success - 'We are coping beings' (Hubert Dreyfus on Husserl and Heidegger, 1978). Heidegger is acutely aware of the complexity of individual experience of 'Being' in the world, and the myriad potential personal choices facing each person.

For Arendt (1998), it is the implications of the uniqueness of each new born on the life of the community that is most significant. 'Human plurality, the basic condition of both action and speech, has the twofold character of equality and distinction' (Arendt, 1998, page 175). By equality she means that men are similar enough to be able to deal with each other. The basic needs of life are known and understandable to all without additional explanation. But each individual born with the same biological structure is nonetheless a unique being as Heidegger describes so eloquently and has a life to live in conditions that no other person experiences. With these qualities together with speech, we each have the potential to take the initiative to create some new endeavour. This when taken in concert with others is the essence of action.

4.2 Action

The actions we take determine the way we live - our culture, our values, how we deal with others, the distribution of power and how it is used... A vibrant community with many people contributing to its political life through their actions, can generate many possible ways of living.

Action is the only activity that goes on directly between men and women without the intervention of humanly created artefacts or other naturally occurring things. For each of us to take part it makes great demands on us as individuals – on our willingness to get involved, the courage to use our intuition, to make and keep to our

judgements, to recognise our aloneness but trust in our dealings with others. It is through action and speech we reveal ourselves. It is our choice how far we reveal ourselves and we are dealing with others making the same choice so we can never fully know the character of our co-actors. Through action we can make a new beginning but the consequences are unpredictable. Not the least because Action depends on the actions of others as well as ourselves. And these other people will react to our action causing events to develop in unpredictable ways and this in turn will lead to further reactions. We can foresee a ripple effect of ever widening effects of a chain of reactions generated by one initial action. As a result the means-ends debate can have no relevance as Actions may have a beginning but can have no predictable end. It is in the performance of an action that the value lies not the end product/ event and by it's nature this process is irreversible.

Harari (2014) gives a wonderful illustration of an action. In his book, *Sapiens* (Harari, 2014), he charts the key events in the progress of the species homo sapiens over the last 70,000 years. His description of the agricultural revolution is salutary. The archaeological record shows that over a lengthy period of hundreds or possibly thousands of years groups of hunter- gatherers developed the technology of agriculture. The process seems to have been one of small steps, moving the species from a life of roaming a known geographical area at random to returning to one location for part of each year to finally settling permanently in one place. Each step would have offered immediate benefits in terms of the increased availability of food. With more food came population increase, arguably a success for the species. Many people and tribes will have acted together to forward this development. However as Harari points out - an unexpected result of this was to catch us, the species of homo sapiens, in a trap. The process was irreversible in that with more people to feed the only solution to avoiding famine was to continue farming more and more intensively. Moreover any hunter gatherers in the same locality would have been forced out. The two ways of life cannot co-exist in the same area. The farmers being more successful with ever greater numbers would have triumphed. But this came at a great price. For the population at large the conditions of living deteriorated markedly. Hunter gatherers tend to have a varied work load eating a varied diet (that seems to have been a healthy one) and lived longer lives than their descendants. Village life farming a nearby area creates demanding, hard, unpleasant jobs. The food may be plentiful but is greatly reduced in variety leading to an unhealthy diet and short lives. Ten thousand years later, the effects of this series of actions are still being felt. This is an early example of technology driven major change which has had far reaching and unimaginable consequences on the way we live.

4.3 The rejection of action

Philosophers and political elites alike, down the ages, have disliked the haphazardness brought about by the actions of multiple agents, and sought to reject, ignore or avoid it. Politicians and governing elites prize stability and control of community life. The three frustrations inherent in this activity of 'uncertainty of outcomes, irreversibility of the process and anonymity of it's authors' (Arendt, 1998, p220) led to the desire to escape the political world of human affairs completely through the elimination of the personal element. Early attempts of political philosophy, notably by Plato (Popper, 1966) thought to handle political matters in the mode of fabrication (work), reducing the complexity of human life to the certainty and solidity of models. These approaches also explored the possibility of designing an ideal governance structure opening the way to the more or less futile attempt to design and implement utopias. The recent elevation of the activity of labor in the hierarchy of human activities, has merely altered the form of rejection of action. After all labor rests on the concept of mass manufacture and the sameness of human beings (in terms of the jobs undertaken) and this is in direct opposition to the concept of the plurality of mankind embedded in action. It is notable that most attempts to create order in human affairs tends to reduce the potential of the plurality of man and hence turn human communities towards the mindless acceptance of the status quo.

Adam Curtis's (2016) review of the main political events of the western and middle-eastern civilizations since the death of Arendt in the mid nineteen seventies, bears out her analysis. Curtis has labelled this period of inexplicable political and economic shocks apparently happening at random and beyond control - HyperNormalisation. He attributes our arrival to this 'strange place' on our collective unwillingness or inability to deal with the complex and uncertain reality of human life. Those in control have projected a simplified picture of events which they subsequently failed to manage effectively. The increasingly disenchanting populations of the countries concerned have in response tended to retreat into individualism expressing this through rejection rather than the creation of workable alternatives and turning their back on public life. Contemporary surveys of levels of political trust in the western world support this judgement. They show an apparent long term global decline in trust in government (Edelman Trust Barometer, 2018; Standard Barometer 88 Autumn 2017).

4.4 Supporting the activity of action?

Despite the attempt to overlook our ability for action, it nonetheless continues to be a major feature of human life. Scientific endeavour may be carried out in the mode of work but the choices made as to what to investigate represent a series of actions. The problem is that by refusing to accept this reality we are unlikely to learn much about how to make the best use of this ability. The western political realm and its analysts have a great deal of experience of the phenomena but little apparent understanding of how to harness it well. The creation and maintenance of traditions has helped governing elites by setting boundaries on choices and simplifying options (Arendt, 2006). As numerous civilizations attest the form of tradition sets the priorities for a community, directs the use of surplus wealth and determines what questions and issues are considered of most importance. But this also reduces the freedom for action by the population at large. Moreover the design of the structures and institutions of western civilization are clearly based on the activity of work – an expression of our belief in the value of planning and control and rejection of action. As a species we seem unwilling to face the implications of human action – unpredictable outcomes that cannot be undone, only responded to. It is the perceived burden of acting rather than the enormous capacity to make enduring changes in our lives that dominates our thinking. The actor never quite knows what he is doing, ‘(becoming) “guilty” of consequences he never intended.’ (Arendt, 1998, p233). He never remains master of his acts and this seems to be the big stumbling block for us and our communities.

What would be involved in accepting action as an important aspect of human life? It is a process without end, so it is the process we need to address. If we cannot see the end then it is action itself that must be the basis on which we make our decisions. We should initiate action only because it seems good in itself without worrying about consequences. Implementation then involves the familiar factors of planning and work.

To explicitly accept and manage action within our lives would involve a fundamental change in individual and community attitudes. If we cannot master the process or control the outcomes (clearly our preference!), we can learn to live with them and make the results of them work for us. This puts a premium on being alert to the unexpected directions that the action takes and being ready to respond with agility and effectiveness (“going with the flow”). It means acceptance of living with change that is beyond our control. For the community as a whole this brings other values to the fore, with respect to the web of human personal relationships by which we all live. The creation of covenants and the rule of law enshrined in western civilization has long been recognised as a stabilising force making the uncertainty inherent in action more tolerable (Arendt, 1998, p243). To agree on actions means accepting our fellow men as equals in the decision. It means trusting our collaborators and the population at large. It means making promises and sticking to them. It means above all that we give up personal sovereignty so that we as a community have the freedom to act jointly. It means accepting that actions can lead to disastrous (as well as wonderful) results. Arendt (1998, p237) suggests that a willingness to forgive is key to living with irreversible consequences. The regular amnesties of the 20th century and creations of such formal structures as Truth and reconciliation commissions (for example The South African Truth and Reconciliation Commission (TRC), 1995) holds out some hope that western civilization is moving in this direction.

5. Business use of ICT and IS research methods

Business organisations of all types are generally designed around the concepts of work with a special emphasis on the requirement to obey orders (Nielsen, 1984). Such organisations are expected to control all aspects of their operations – the antithesis of Action. They have tended to assume that most problems can be solved now or in the future by use of organisational and business theory. The relatively stable conditions (in terms of business operations) of business over the first part of the 20th century led to a huge success in the development and application of business theory. The increasing volatility of the last quarter of the century may not have shaken the belief in the possibility of control but the existence of human action within organisations is becoming more apparent. Ciborra’s (1996) concept of ‘bricolage’ seems to capture the essence of human action. Bricolage was his word for the way he saw strategy being created at his case company, Olivetti – through tinkering and trial and error. As Fernandes (2005) comments this term ‘refers to the fact that organizations are complex and behave in an unpredictable manner’ – a good description of the results of widespread human activity of action. It seems that the pressure for action is linked to the degree of change experienced (from industry conditions, new technology, competition, size, growth..).

Organisations approach the installation and use of ICT with a similar attitude, in line with work characteristics. Ironically, ICT is itself a change agent within the host organisation but the core assumption for practitioners is

that it can be planned for and controlled in a similar way to other business operations, through the application of theory and experience from previous projects. The implementation and use of the ICT artefact involves people interacting with it and each other and hence involves the potential of the human community concerned, for action. The decision to implement a new IS itself constitutes an action which has generally proved to have unexpected, unplanned consequences in many companies.

IS research has produced many powerful results and theories, using a wide range of research methods, developed in the scientific tradition. But the focus on developing (and claiming) generalizable results has perhaps misdirected the use to which some of these theories have been put by companies. The fundamental assumption of both practitioners and IS researchers stemming from the approach dictated by a work environment, is that organisations will be able to use a new IS application in a similar way to another organisation. Practitioners want rules of best practice on how to manage the implementation of new information systems within their own unique organisational situation and IS researchers aim to develop this type of advice.

But IS research results are found in specific organisational situations – giving a snapshot in time ill designed to yield understanding of the dynamic process of real life usage. This may affect their general applicability elsewhere. The context for the research and its application is highly significant. Both organisational cultures and the changes wrought over time, within and without the company by human action will profoundly affect the potential and use of any IS. Organisations create their own traditions and culture. We need only contrast the publically acknowledged cultures of Google, IBM and a 'gig' economy new start up to see how different these can be. This may lead to situations in which best practice needs to be tailored for each organisation. Moreover organisations operate within dynamic situations of continuous change, not least from the ongoing series of actions initiated by their own managers – a unique group of people. The impact of another human action – an intervention (such as for example implementation of another IS application) may change the situation so far that theory no longer applies.

There is the potential for a gap between practice and theory, between practitioners and researchers. IS research theories require careful interpretation and modification for each organisational situation (for the context of both time and place).

6. Conclusion

The life of organisations is complex and can be fast moving. Although human action provides regular interventions that have the potential to set organisations onto major changes of pathway with unpredictable results for the organisation and its use of ICT, all participants in this life process – staff, managers, IS researchers and IS practitioner consultants behave as though it can be controlled with the methods generated by the activity of work. IS research and IS research methods have produced some impressive theories. But less attention has been given to how best to use these results in practice. The final value to organisations depends on the quality of management and users, and their ability address the implications of the regular and inevitable shifts in direction of the company wrought by the actions of all concerned.

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Law of Conservation of the Integrity of an Object: The Methodological Basis for the Strategic Management of Complex Social and Economic Systems

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Abstract. The strategic management of the region requires the formation of processes with predefined properties. However, models based on analysis are usually used for management. This requires solving a direct control problem. And its solution does not allow you to meet the fully formulated requirements. The article presents a management concept based on synthesis, which already allows more fully meeting these requirements. The new approach is based on the solution of the inverse control problem. The solution of the inverse control problem allows formulating the conditions for the application of methods and models of program-target control. The approach, in contrast to the known, allows guaranteeing the achievement of the goal of strategic management. A new result was obtained due to the application of the law of preservation of the integrity of the object.

Keywords: model, synthesis, inverse problem, control, law, conservation, integrity, strategic management

1. The basis of the problem of strategic management of the region

In the process of strategic management, it is necessary to have a guarantee of achieving the required result. If the results of the activities do not correspond to the decision of the manager - then this is a contradiction. Why did the contradiction arise? This is due to contradictory conclusions when making decisions. Correct conclusions are possible based on the axiomatic method

The basic components of the axiomatic method.

These components are presented in the two following levels: the “zero level” and the “first level”.

0 stands for the main assumptions formulated in the principles (the zero level).

The first level is considered as the main component of the method.

1.1. Basic concepts. Keywords. Axioms.

1.2. Rules of inference.

1.3. Theorems.

Logic of reasoning

The basic premise: the principles characterize the essence of the process.

What are we doing? We study and change the world around us. Who is involved in this process?

The following elements are involved in this process:

- A “human being”, and his consciousness.
- The surrounding world (object).
- The universal connection of phenomena.

The content of the approach is reflected in three principles:

The first principle. The principle of the three levels of cognition:

Level A mentions the abstract representation (Condition of existence of process of activity).

Level B highlights the abstract-concrete representation of the process of activity. (the Causal relationship of the process. (Methods))

Level C. underlines the specific representation of the process of activity. (Technologies, Algorithms).

The second principle (2). The principle of the integrity of the world.

It is based on the law of preserving the integrity of the object (LPIO). [Burlov, V. G. (2007a), Burlov, V. G. (2015)].

LPIO is a stable, objective, repetitive link between the properties of the object and the properties of the action for a fixed purpose.

The law manifests itself in the mutual transformation of the properties of the object and the properties of its action for a fixed purpose.). [Burlov, V. G. (2007a), Burlov, V. G. (2015)]. ("Object", "Destination", "Action".)

The third principle (3). Princip of cognition of the World.

It is implemented in three ways, such as the “Decomposition”, the “Abstraction”, and the “Aggregation”.

At present and at this stage, it is observed three elements that enable three actions, which can operate as follows: the cognition reduces to the establishment of regularities. Aggregation is consistent with the definition of law. The establishment of the law is possible only through the decomposition and the abstraction. After identifying the law, the reverse process is carried out. The aggregate (the law) enables the possibility of creating a concrete object through abstraction and decomposition.

Correctly constructed theory realizes cognition on three levels of cognition. A correctly constructed theory has three components:

- Methodology;
- Methods;
- Technology.

Researchers view methodology as a set of verbal models. With this approach, one cannot obtain a condition for the existence of the process. Therefore, the work uses a natural-scientific approach based on the system integration of properties:

- A human thinking;
- Objects of the surrounding world;
- The universal connection of the phenomena. [Burlov(2007a), Burlov (2015)].

This approach enables the possibility of obtaining a condition for the existence of the process. It is formed within the framework of a correctly constructed theory. The graphical diagram drawn below illustrates the correctly constructed theory:

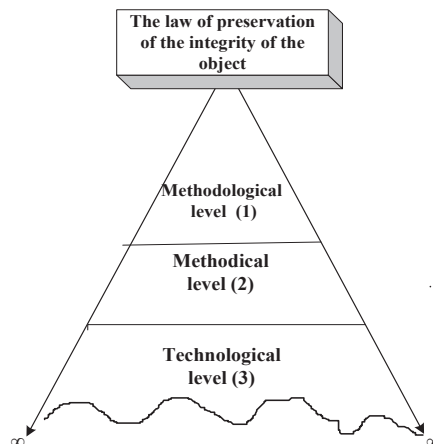


Figure 1: Graphical representation of a correctly constructed theory

The application of LPIS allowed solving several practical tasks of management. Management in the study of transport systems. [Burlov, V. G. Grachev M.I., (2017), Burlov, V. G. Lepeshkin O.M.,(2017)]. Management of social systems in construction. [Burlov, V. G. Grobitski A.M., Grobitskaya A.M. (2016)]. The obtained results are aimed at the guaranteeing achievement of the management objective.

2. Statement of the task of strategic management of the region based on solving the synthesis problem

Based on the proposed approach:

- At the first stage, the conditions for the existence of the management process are formulated;
- At the second stage, using the conditions for the existence of the management process, management mechanisms are formed;
- Technology of strategic management of the region is being formed at the third technological stage.

The technology of strategic management is the transformation of information resources and power resources of decision-makers in the interests of achieving the goal of management. At the same time, restrictions on the information resource, the resource of authority and the resource of the situation are considered.

In the present paper, the upper level (Methodology) is considered as a condition for the existence of a control process.

3. The main stages of the formation of the concept of strategic management of the region

Strategic management is carried out based on the results of modeling the processes of social and economic development within the framework of the chosen management concept. In engineering system there are only two approaches to the development system [Goode, H. H., Machol, R.E. (1957)]:

1. The development of the system based on analysis. (Development of a model based on analysis).
2. The development system based on synthesis. (Development of a model based on synthesis).

Historically, the management of social and economic systems uses models based on analysis. The use of such models does not guarantee the achievement of the goal of strategic management.

In the synthesized model, the developer can:

- To form processes with the given properties;
- To consider in a formalized form the characteristic patterns.

It is established that it is expedient to build based on the synthesized model for guaranteed management of sustainable social and economic development. To synthesize the model, it is necessary to use the law of conservation of integrity [Burlov(2007a), Burlov (2015)]. The law of preservation of integrity is an objective stable repeated connection of the properties of the object and the properties of its action for a fixed purpose. This relationship is manifested in the mutual transformation of the properties of the object and the properties of its action for a fixed purpose. The use of the law of preservation of integrity allows the manager to form processes with pre-defined properties. This reduces the level of risk in the strategic management of the region.

4. Basic stages of model formation.

1. In the model, the law of preserving the integrity of the object is concretized. This is done in the interests of achieving the goal of strategic management.
2. The system-forming indicators of the region's activity (IRA) are justified.
The indicators of the region's activity (IRA) are an integral ordered hierarchical set of indicators. It is formed based on the law of preservation of integrity.
3. The properties of IRA are identified with 3 basic interconnected properties "Objectivity", "Integrity", "Variability" (or "Object", "Purpose", "Action") [Burlov(2007a), Burlov (2015)].
4. Three main system-forming IRA corresponding to the third basic properties are determined.

IRA:

- Demographic indicator ("x" is the relative cumulative population index),

- Indicator of the development of the economy "y" (quantified by employment in the real sector of the economy, relative number of jobs in the real sector of the economy);
- Indicator of energy supply of the region "z"; Relative, reduced amount of conventional energy.

All indicators are presented in the form of relative, reduced, dimensionless quantities.

5. A hierarchical system of interrelated indicators of the region's activity is being built. Within the framework of the concept of applying the law of preserving the integrity of the object.

The system of differential equations is the system-forming basis of the dynamic model. The system of differential equations describes the changes in the three main indicators of the region's activity. Nine coefficients of the system of differential equations realize the mechanisms of strategic management of the region.

The derivation of the system of differential equations will be obtained based on the natural-scientific and socio-economic interpretation of the region's performance indicators.

4.1 The derivation of the first differential equation

We introduce the following notation.

x is a demographic indicator, which is defined as

$$x = \frac{x^*(t_0) + x^*(t)}{x^*(t_0)},$$

where - $x^*(t)$ the current value of the demographic indicator at the time t ;

$x^*(t_0)$ - the value of the demographic indicator of variability at the time point t_0 .

Derivative of the indicator « x » $\frac{dx}{dt}$ is the rate of change in the human population. The human population is associated with both the demographic index and with two system-forming indicators. This "y" is an indicator of economic development. "z" is the indicator of energy supply in the region. The rate of change of "x" is proportional to the quantitative composition of the region. That is, the more the population, the more it grows.

$$\frac{dx}{dt} = ax.$$

Where "a" is the coefficient of demographic activity.

We will determine the influence on the rate of change in the demographic index of the other two system-forming indicators.

"y" is the indicator of economic development (real sector of the economy). Quantitatively estimated by the number of jobs in the real sector of the economy.

Determined based on the minimum number of people in the enterprise, necessary to produce a certain range of goods and services.

For a given value of the demographic indicator "x", the number of "y" jobs, respectively, of working people, will reduce the rate of growth of the demographic indicator by an amount proportional to the value of "bxy".

The differential equation describing the change in the demographic indicator "x" will take the following form:

$$\frac{dx}{dt} = ax - bxy.$$

Where "b" is the coefficient of negative attitude to childbearing. (The interpretation is the following - "1-2 children - acceptable, and 3-5 - already a lot").

For a given value of the demographic index "x", the energy supply "z" index will increase the rate of growth of the human population, in proportion to the value of qxz . Therefore, the more energy enters the region, the faster the growth rate of the quantitative composition of the population of this region.

The differential equation is transformed to the following form:

$$\frac{dx}{dt} = ax - bxy + qxz;$$

Where "q" is the coefficient of the level of energy supply of the region.

4.2 The derivation of the second differential equation

"y" is an indicator of the level of the economic development, which is defined as:

$$y = \frac{y^*(t_0) + y^*(t)}{y^*(t_0)},$$

Where $y^*(t)$ is the value of the indicator of economic development at the period t ;

$y^*(t_0)$ is the value of the indicator of economic development at the period of time t_0 (Number of jobs in the real sector of the economy). Derivative of "y" $\frac{dy}{dt}$ - is the rate of change in the indicator of economic development. This indicator is associated with both the indicator of the development of the economy "y", and with the other two system-forming indicators. This "x" is a demographic indicator, and "z" is an indicator of the region's energy supply.

The rate of change in the indicator of economic development (the number of jobs in the real sector) is proportional to the number of jobs in the real sector of the economy with a minus sign. (The more jobs are created in the real sector of the economy, the more difficult it is to increase and increase the number of these places.)

$$\frac{dy}{dt} = -py.$$

Where "p" is the coefficient of development of the real sector of the economy.

Determine the impact on the rate of change in the economic development index of the other two system-forming indicators.

"y" is an indicator of the development of the economy. This is the number of jobs in the real sector of the economy, necessary.

Workplaces are determined based on the minimum number of people in the enterprise needed to produce a certain range of goods and services.

For a given indicator of the development of the economy "y", the demographic index "x" with the interest of people will increase the rate of change in the index of development of the real sector of the economy by an amount proportional to the value of $cx y$. The manifestation of such a property is objective, since it is justified by the self-preservation of society. The reverse manifestation of this property will lead to the self-destruction of society.

Where "c" is the coefficient of people's interest in the development of the economy.

The differential equation is transformed to the following form:

$$\frac{dy}{dt} = -py + cxy.$$

For a given indicator of the development of the economy "y", the number of "z" -energy units will contribute to an increase in the growth rate of the economic development indicator by an amount proportional to the value of "yyz". (The more energy is supplied for the development of the real sector of the economy, the higher the growth rate of the indicator of economic development.)

The differential equation has the following form:

$$\frac{dy}{dt} = py - cxy + \gamma yz.$$

Where "γ" is the energy supply coefficient of the real sector of the economy.

4.3 The derivation of the third differential equation

"z" is the energy supply indicator. It is defined as

$$z = \frac{z^*(t_0) - z^*(t)}{z^*(t_0)},$$

where $z^*(t_0)$ - value of the energy supply at the initial time (t_0);

$z^*(t)$ - The value of the energy supply indicator at the current time (t).

The derivative of this indicator is "z" $\frac{dz}{dt}$ - is the rate of change in the energy supply. This speed is related to the energy consumption index "z". Also, two backbone indicators. This "x" is a demographic indicator and "y" is an indicator of the development of the economy. The rate of change in the energy consumption index "z" is proportional to the amount of energy consumed. That is, the more the energy is consumed in society, the higher the rate of its increase.

$$\frac{dz}{dt} = \mu z;$$

Where «μ» is the coefficient of energy supply growth in the region.

Determine the impact on the rate of change in the energy consumption indicator of the region from the other two system-forming indicators.

"x" - the demographic indicator with increasing the quantitative composition of the region reduces the rate of increase in energy consumption.

"y" is an indicator of the development of the economy. Number of jobs in the real sector of the economy.

For a given energy consumption index "z" demographically, the "x" indicator will decrease the rate of change in the energy supply by an amount proportional to the value of τxz . (With the increase in the population, the rate of change in energy supply decreases). Where "τ" - is the ratio of the quantitative composition of the population to the level of energy supply in the region

The differential equation takes the following form:

$$\frac{dz}{dt} = \mu z - \tau xz.$$

For a fixed indicator of energy supply for the development of the real sector "z", an increase in the number of jobs in the real sector of the economy contributes to a decrease in the growth rate of the energy supply proportional to the value of δyz . That is, the more the real sector of the regional economy develops, the less energy "gets" to one workplace of the real sector of the economy.

And the differential equation takes the following form:

$$\frac{dz}{dt} = \mu z - \tau z - \delta yz;$$

Where " δ " is the coefficient of correspondence between the level of development of the real sector of the economy and the level of energy supply.

Model of management of social and economic development of the region.

$$\left. \begin{aligned} \frac{dx}{dt} &= ax - bxy + qxz; a, b, q > 0; \\ \frac{dy}{dt} &= -py + cxy + \gamma yz; c, p, \gamma > 0; \\ \frac{dz}{dt} &= \mu z - \tau z - \delta yz; \delta, \mu, \tau > 0. \end{aligned} \right\} 4.1.$$

Where "x" is the population indicator of the region;

"y" is an indicator of the region's economic development;

"z" is the indicator of energy supply in the region. (In a case, there may be a generalized index of the development of industrial production).

The three indicators are dimensionless relative quantities.

"a" is the coefficient of demographic activity;

"b" is the coefficient of negative attitude of people towards childbearing;

"q" is the energy supply of the region;

"c" is the coefficient of people's interest in the development of the economy;

"p" - coefficient of development of the real sector of the economy;

"γ" is the energy supply factor for jobs;

"μ" is the development factor of the region's energy supply;

"τ" is the ratio of the population's compliance with energy;

"δ" is the ratio of the development of the economy to the provision of energy.

5. Formalized concept of regional management

The nine coefficients involved in the system of differential equations are the essence of the components of the vector of strategic management.

The control vector for this model is $U(t) = [u_1(t), \dots, u_9(t)]^T$.

Where the components of the region's control vector are

$u_1(t) = a(t)$ is the coefficient of demographic activity;

$u_2(t) = b(t)$ - coefficient of negative attitude of people to childbearing;

$u_3(t) = q(t)$ is the coefficient of the region's energy supply;

$u_4(t) = c(t)$ is the coefficient of people's interest in the development of the economy;

$u_5(t) = p(t)$ - coefficient of development of the real sector of the economy;

$u_6(t) = \gamma(t)$ is the energy supply factor for jobs;

$u_7(t) = \mu(t)$ is the coefficient of development of the region's energy supply;

$u_8(t) = \tau(t)$ is the coefficient of the population's compliance with energy;

$u_9(t) = \delta(t)$ is the coefficient of correspondence between the development of the economy and the provision of energy.

The state vector of the Subject for the given model is $S(t) = [s_1(t), s_2(t), s_3(t)]^T$.

Where the components of the region's state vector are

$s_1(t) = x(t)$ is the population indicator of the region;
 $s_2(t) = y(t)$ - indicator of the region's economic development;
 $s_3(t) = z(t)$ is the indicator of the region's energy supply.

Such a description of the concept of state management of the region makes it possible to base the implementation of the concept on the formulation of the following problem of optimal control of the final state of the system under given terminal conditions. (The task of optimal, terminal management).

A task. Define the vector function of the state of the control object

$$U(t) \in U \subseteq L_2^9 [t_0, T], S(t) = [s_1(t), s_2(t), s_3(t)]^T \in S,$$

$$\text{Delivering } I(u(\bullet)) = F(s(T)) \Rightarrow \inf_{u(\bullet)}, \text{ (or } F(s(T)) \Rightarrow \sup_{u(\bullet)}, \text{)} \quad (5.1.)$$

$$\text{For differential equations } \frac{ds}{dt} = f(s(t), u(t)); \quad (5.2.)$$

$$\text{Terminal conditions } S(t_0) = S_0, S(T) = S_T. \quad (5.3.)$$

Where $F(\dots)$, $f(\dots)$ - and their partial derivatives are continuous in the set of variables;

t_0 - is the start time of the process;

T - is the final control moment.

Variant of the statement of the problem.

Such a concept of strategic management of the region allows us to consider various statements of the management problem:

Option one. 1. Is given - The remote-control system (4.1.);

- control vector $U(t) \in U \subseteq L_2^9 [t_0, T]$;
- state vector $S(t) = [s_1(t), s_2(t), s_3(t)]$;

Is the vector of initial states of the system $S(t_0) = S_0$;

- Vector of hospital states of the system:

$s_1(T) = x(T)$ - the population indicator of the region is not fixed;

$s_2(T) = y(T)$ - the indicator of economic development of the subject is fixed; (A fixed number of jobs in the real sector of the economy is specified);

$s_3(T) = z(T)$ - is the indicator providing energy to the region. (Alternatively, a generalized index for the development of industrial production).

The minimum, possible level of energy supply for the region at a fixed level of development of the real sector of the economy is determined.

2. It is required to define vector-functions $U(t) \in U \subseteq L_2^9 [t_0, T]$, $S(t) = [s_1(t), s_2(t), s_3(t)]^T \in S$, delivering

$$I(U(\bullet)) = [s_3(T) = z(T)] \Rightarrow \inf_{u(\bullet)} \quad (5.4)$$

for differential connections

$$\frac{ds}{dt} = f(s(t), u(t)); \quad (5.5)$$

and boundary conditions

$s_1(T) = x(T)$ - the population indicator of the region is not fixed;

$s_2(\mathbf{T}) = \mathbf{y}(\mathbf{T})$ - the indicator of the region's economic development is fixed. (A fixed number of jobs in the real sector of the economy is specified).

In solving this type of problem, there are known difficulties in considering terminal conditions that are repeatedly noted in the well-known literature. [Chernousko F.L., Banichuk N.V. (1972)].

We have considered the task of strategic management. This task is based on the selection of the control function.

Option Two. There is another option for setting the task of strategic management. This is a control problem, based on the choice of a control function on a set of numbers. That is, the formation of control as a function of parameters.

A task 2. Define vector functions $U(\mathbf{t}) = [u_1, u_2, u_3, u_4, u_5, u_6, u_7, u_8, u_9]^T \in U$,

$S(\mathbf{t}) = [s_1(\mathbf{t}), s_2(\mathbf{t}), s_3(\mathbf{t})]^T \in S$, extremum functions

$$I(u(\bullet)) = [s_3(\mathbf{T}) = z(\mathbf{T})] \Rightarrow \inf_u .$$

Where $u_1 = a = \text{const}$, $u_2 = b = \text{const}$, $u_3 = q = \text{const}$, $u_4 = c = \text{const}$, $u_5 = p = \text{const}$, $u_6 = y = \text{const}$, $u_7 = \mu = \text{const}$, $u_8 = \tau = \text{const}$, $u_9 = \delta = \text{const}$.

And the vector $S(\mathbf{t}) = [s_1(\mathbf{t}), s_2(\mathbf{t}), s_3(\mathbf{t})]^T$, there are solutions of the system of differential equations:

$$\frac{ds}{dt} = f(s(t), u(t)); \tag{5.6}$$

And boundary conditions $s_1(\mathbf{T}) = \mathbf{x}(\mathbf{T})$ the population indicator of the region is not fixed;

$s_2(\mathbf{T}) = \mathbf{y}(\mathbf{T})$ - The indicator of economic development of the region is fixed. (Given the required number of jobs in the real sector of the economy).

Our task of strategic management is the problem of non-linear programming [David M. Himmelblau (1972)].

The developed model allows achieving the goal of strategic management of the region, or the country.

The task of realizing the strategic management model is the task of forming the nine coefficients of the system of differential equations. Coefficients are formed according to specially developed methods. These coefficients guarantee the achievement of the management objective.

To demonstrate the potentialities of the proposed SM methodology, an analytic dynamic model of a SM was developed by the region of the country in the form of a system of three nonlinear differential equations. The developed methodology of SM allows us to put the task of the SM in a new way both as a separate region and the country. The model is based on the system integration of three dimensionless relative indicators: social, economic and technical-technological. Practical implementation of the model by the SM bodies is reduced to the formation of 9 coefficients by a method especially developed by the author to achieve the goal of SM. The results of the simulation in the interval 1992-2014, confirmed the main trends in the development of Russian regions.

6. Conclusion

The new concept of strategic management (SM) allows, in contrast to the known, to formulate conditions for sustainable development of the region based on the developed SM model. Usually for SM, models based on analysis are used. This approach does not fully guarantee the achievement of the goal. Therefore, the concept of synthesis of the SM process model has been developed, which already makes it possible to achieve the goal in a guaranteed way. Synthesis was made possible thanks to the author's development of the law of preservation of the integrity of the object (LPIO). The use of LPIO allows the person making the decision to form processes

with the given properties set in advance. This reduces the level of risk in achieving the goal of SM development of the region.

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Experimental Procedure in the Research on an Organizational Conflict

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Abstract: The research problem that is being resolved by means of the experiment is as follows: what methods of conducting mediation are more efficient depending on the characteristics of the conflict? The analysis shall be based on research relating to resolving conflicts at the workplace within the framework of the method of the third party intervention, or in precise terms, mediation. Such characteristics of the conflict have been taken into account as the level of the cooperative motive, as well as the level of antipathy between the parties to the conflict. In the research, attempts were made to find an answer to the question of what factors have an impact on the effectiveness of mediation from the perspective of actions undertaken by the mediator. The results of the research indicated among other things, the overwhelming level of efficiency of direct mediation as opposed to indirect mediation. The latter merely fulfilled its role in specified situations.

Keywords: experiment in social sciences, conflict management, collective bargaining, mediation

1. Introduction

Experiments in social research have been applied for years, particularly in the area of micro-sociology and social psychology. In the field of macro-sociology, the classic experiment is essentially not applied due to the great difficulty that is created by controlling and manipulating the variables. A natural experiment is applied in this area which involves the observation of the emerging processes and the measurement of their indicators that were not initiated by the researcher and run spontaneously. The herein paper shall concentrate on the quasi-experiment, namely such a version of the experimental method in which the researcher manipulates only some independent variables during which only the dependent variables are subject to control.

Conflicts are a phenomenon that is commonplace in contemporary societies and constitutes a significant element of social life. Such a viewpoint has been expressed by a multitude of outstanding theorists ranging from H. Spencer to K. Marx, G. Simml, L. and R. Dahrendorf, the contemporary researchers of conflict. Conflicts may be of a macro-social nature occurring in large social structures, namely states, social classes, nations, etc., as well as micro-social structures between individuals in social groups, institutions, organizations, etc. This dimension includes organizational conflict which is defined as a situation in which a specified change in the organization is perceived by one party as beneficial, whereas non-beneficial by another, while simultaneously both parties have the opportunity to carry out further changes in the organization via their own behaviour (Rumel-Syska 1990). This relates to the differences in terms of the awareness, disparity, divergent wishes or irreconcilable desires of both parties. (Mannix et al, 2002). Organizational conflict may take on the form of a conflict of tasks that is based on the dissonance associated with the tasks in a group of members or interpersonal conflict relating to the divergence between people who are different in terms of business interests, attitudes, values or behaviour (Souren et al, 2005). The effects of an interpersonal conflict for the functioning of employee groups is difficult to evaluate in an unequivocal manner. Jehn (1995) argues that when an interpersonal conflict may be damaging for interpersonal relations in an organization, this may be favourable in terms of the increased efficiency of the group. Another division of organizational conflicts was presented by Rahim (2011), who distinguished conflict as follows: intrapersonal, interpersonal, intragroup and intergroup. Intrapersonal conflict occurs when dissonance appears between knowledge, interested parties, aims and values, while also the commitment to execute the specified tasks and fulfilment of roles with regard to a member of the organization. Interpersonal conflict relates to the situation in which divergence, misunderstanding or significant differences occur between two or more members of the organization. In turn, an intragroup conflict takes place in the situation whereby differences in terms of aims, tasks and procedures occur between the members of the group or between two sub-groups or more within the group itself. However, an intergroup conflict refers to a conflict situation between at least two departments that was formed on the basis of differences in the realization of tasks, access to important resources, information, etc., as well as between trade unions or other associations of employees and the management of the enterprise.

Views on the issue of organizational conflict have altered over the past few decades. While some claim that the conflict is dysfunctional and should be avoided, others feel that a conflict is natural and inevitable and may help the efficiency of the group. The first group of researchers indicates that a conflict may hinder decision-making and disrupt the exchange of information, while simultaneously reducing the quality of the decision (Schweiger 1986). The second group assumes that a conflict is a normal phenomenon in that no cooperation of people takes place without mutual rivalry and emotional engagement on the principle of the unwavering balance of power and business interests of the particular employees and employee groups (Sztumski 2000). Hence, depending on the orientation of perceiving conflicts adopted in an organization, the price of the impact on the efficiency of the enterprise is varying.

In the modern-day approach, emphasis is placed on crisis management. One of the problems associated with crisis management in an organization is the choice of the style of resolving conflicts. In subject-related literature, various types of styles of resolving conflicts have been described (Blake and Mouton 1964), (Billingham and Sack 1987), (Kurdek 1994). An interesting typology was presented by Rahim (2011) who, by basing on the propositions of the network of styles of management by Blake and Mouton prepared five styles of resolving conflicts as follows: avoidance, accommodating, competitive, collaborative, and compromise. From the perspective of resolving intergroup conflicts in an organization, the integrative style would appear to be an effective style that is based on cooperation between parties that are ready to reach agreement whose solution is acceptable to the parties of the conflict. This is served by openness, exchange of information, the search for differences with the aim of finding a constructive solution that extends beyond personal issues and restricted vision. Despite the attractiveness of the theoretical assumptions, this style is rarely applied in terms of resolving intergroup conflicts. Most frequently the style of compromise is applied, which is based on engaging the parties to provide and adopt or share solutions with the aid of which both parties accept or yield on something which enables taking a decision that is acceptable to both parties.

The research presented shall relate to the effectiveness of the actions undertaken by the mediator in terms of resolving collective disputes, namely conflicts between trade unions and employers. Such mediation is obligatory in Polish legislation if the parties have been unable to reach agreement prior to this. Both the process of mediation itself and the procedure of collective disputes as methods of resolving conflicts known as “third party intervention” shall not be described in the herein paper as they are not significant from the perspective of the issue undertaken which concentrates on methodological issues.

2. Experimental procedure

Experimental research on conflicts is at a preliminary stage of development, particularly with regard to research on organizational conflict. This is the result of the difficulties associated with the application of the procedures of the experiment in conditions outside the laboratory. The majority of research on organizational conflict with the aid of an experiment is conducted in laboratory conditions. The experimental method may be applied for three purposes as follows: firstly, in order to test the theoretical models. In the laboratory it is possible to conduct rigorous behavioural tests on the basis of the model. Secondly, laboratory experiments may replace field research, which is frequently inaccessible during the course of analysing the conflict. Thirdly, laboratory data may be collected simultaneously with field research data (Abbink 2012).

The distinguishing feature of the experiment applied for research on organizational conflict is the application of a simulation that is perceived as an imitation of the course of the process or activity of the system in the real world. This simulation involves the creation of the artificial history of the system and its observation in order to draw conclusions on the subject of the characteristics existing in the real system (...).” (Banks 1998: 3). In subject-related literature it is possible to encounter the typology of the projects of simulation based on two criteria: range of applicability relating to the number of the model situation and the degree of complexity (extension), namely the number of elements and details included in the project of simulation (Druckman 2005). By applying the two criteria it is possible to distinguish two types of the projects of simulation:

- Featured by a high degree of complexity and a low range of applicability – the project of the game contains many elements, but refers to few real situations, e.g. simulation of international conflicts.
- Featured by a low degree of complexity and a high range of applicability - the project of the game contains few elements, but refers to multiple real situations, e.g. “Dilemma of a prisoner” and other simulations from the sphere of the game theory.

The projects of simulation availed of in the research presented may be enumerated among the first type as they contain many elements that usually consist of the causes of the formation of a collective dispute, whereas on the other hand these projects basically illustrate a model of only this type of conflict while having its own specifics that clearly distinguish it from others. Likewise, mediation also has its own specifics in this type of conflict.

The application of simulations in research on human behaviour implies a multitude of questions, among others, relating to the degree of reproducing simulations of real situations by the scenarios, as well as the degree of involvement of the participants in the simulated process, while also the impact of the variables that are not connected with the research process which the researcher has no influence on. This first and foremost relates to the awareness of the analysed subjects (above all the knowledge of the subject matter for research) of their decisions and behaviour constituting a dependent variable. The weakness of the simulation is that of the difficulty with the precise parameterization of the variables and indicators (Więcek-Janka 2003).

In laboratory research based on simulations, the project of the game is significant (its scenario) which constitutes the model of reality that represents the real processes and dependencies which are significant in terms of the research problem and become the subject matter for research in situations whereby this reality is inaccessible. This project of the game should represent such an analysed reality as it is described in theory. Thus, on the one hand it must operationalize in the language of the action of the analysed subjects by the assumptions of the theory, while on the other hand it must represent the significant features of reality – operationalized notions of the theories are therefore attributed with certain values that are taken from reality (Sułek 1979).

A significant issue in experimental procedure is the relation between the game and its results. In other words, this refers to whether even if the afore-mentioned condition of the appropriateness between the game and reality described and if the game and the theory have been fulfilled, the results of the research shall be similar to those that could have been received if actual processes had been subject to research and not their model? How much of a role will the people subject to research as specified in the scenario play out as in a real situation? How similar was their motivation to undertake specified decisions to how they would react in reality? Despite the problems outlined in these questions, the experimental method based on simulation is applied with great success in social sciences, which is exemplified by the experiments concentrating on the process of negotiations, such as for instance those relating to irrational involvement (Tokarz, Tyszka 2004). The scope of compliance of the results with the predications indicates the degree of confirming the theories (Sułek 1979). With relation to this, the relevance of the game project in terms of reality is important which represents both the theory describing and explaining it and the relevance of the motivation of the players in model situations in terms of their anticipated motivations in actual situations. In other words, this refers to whether, even if the conditions of the appropriateness between the game and reality, as well as the game and the theory have been fulfilled, the results shall be similar to those that could have been received if the research had been subject to real processes and not their model? How much of a role will the people subject to research as specified in the scenario play out as in a real situation? How similar was their motivation to undertake specified decisions to how they would react in reality? This is one of the most serious problems that laboratory research on the basis of simulations gives rise to, despite the fact that this method is widely applied in didactics, as well as in psychological and sociological research, while the rich history of this research certifies to its usefulness. Doubts relating to the last reservation are dismissed by the famous experiment of Zimbardo, in which the research participants identified with their roles they were given in the scenario so much that the experiment had to be interrupted with regard to the safety of the participants (Meredith, 2001). Of course a significant role was played here by the duration of the experiment. It is easier to accept the simulated conditions as real when it lasts for several days, but more difficult when it closes after several dozen minutes. Nevertheless, in spite of these reservations and imperfections of the simulations in the experiment, it is applied in social sciences with a great deal of success, which is exemplified by experiments concentrating on the process of negotiations, e.g. those relating to irrational involvement (Shubik 1971).

A separate problem is the selection of people for the research sample. Students relatively frequently participate in laboratory simulations (Raiffa 1994), which in spite of significant restrictions would seem to justify the choice of such a sample in the research presented.

By way of conclusion, the laboratory experiments in research on organizational conflict may fill in a gap in becoming familiar with the mechanisms of this conflict. It is possible to create a controlled and replicated conflict environment by changing one variable while maintaining all others at a constant level.

3. Subject matter of research

The subject matter of research is the dispute between the employer and trade unions, in which the parties conducted talks on the basis of a scenario prepared by the party conducting the research (the experimenter) by basing on the cases in which the researcher participated as a mediator. The aim of the experiment was to analyse the impact of the intervention of the mediator on the process of resolving the dispute whose effect was subject to gauging by the result of the mediation that was perceived to be the achievement of an agreement or lack of such (Hiltrop 1989). This result constituted a dependent variable in the research conducted.

The main research question of presented research is how the mediator may provide his intervention as a third party in order to help parties being in conflict to gain mutual agreement and to improve their relations as well and “to build a picture of mediation (or <collective> conciliation) process from views of those who conducted it”. (Hiltrop 1989: 243) and to examine some of the results of research provided by Hiltrop.

For this purpose an experimental design was chosen while using simulation based on scenarios. Extramural and stationary students of management were involved in the experiment who had been taught about the rules concerning the procedure of mediation under the Statute on Collective Disputes Resolution in Poland and 112 cases of simulated mediation were carried out. Half of them were direct mediation (the mediator meets both parties at the same time) and the other half were indirect mediation (private meetings). The dependent variable was an outcome of mediation (agreement or the lack of agreement). The independent variables were tactics of mediation (direct or indirect one) and twelve types of behaviour of the mediator. The statistical method used in the analysis of the data collected was the logistic regression applied in similar research focused on the effectiveness of the mediator’s behaviour (Mareschal 2005) and also in other management research (Amaro, Henriques and Duarte 2016).

As a research tool was used adapted for this research, Bales’s observation scheme consisted of twelve categories of the mediator’s behaviour directed to the parties (separately in the case of the unions and employers) in which the dependence of the outcome of mediation was examined (Gorse and Emmitt 2005).

Observation scheme – the mediator’s behaviour towards the parties:

- Giving the floor to the parties.
- Requests for evaluation and opinions.
- Requests for repetition or clarification.
- Calming down and reducing emotions (e.g. jokes).
- Expressing personal emotions.
- Interrupting statements when the parties are speaking simultaneously, excessively long or unclearly.
- Relaying the positions of the parties.
- Summing up the stages of mediation.
- Submitting personal propositions.
- Evaluation of solutions proposed by the parties.
- Rejecting the propositions of the parties.
- Drawing attention to the costs of the lack of agreement, exerting pressure.

4. Results

As mentioned already in this research, the dependent variable is the mediation output. If coefficient value has sign “+” this means that the independent variable positively influences the agreement, but if coefficient value has the sign “-” this means that the independent variable negatively influences the agreement. The value “P”

was established on a relatively low level – 0.15. In a small number of cases this level is a little lower. The mediator’s behaviour was examined with relation to the unions and employers separately.

The mediator’s behaviour in terms of the mediation outcome with relation to the unions was examined first.

Table 1: Mediator towards unions relation and outcome - direct mediation

Logistic estimation using the 56 observation 1-56				
Dependent variable: outcome				
Variable	Coefficient	Stand. error	T stat	P – value
const	1,11439	0,450288	2,475	0,01333 **
E	-1,93113	1,10629	-1,746	0,08088 *
J	0,350787	0,250241	1,402	0,16098
The number of correct prediction cases = 46 (82.1%)				

Source: own analysis

In the direct mediation the positive impact on output demonstrates variable - “evaluation of proposals given by parties” (J) but negative impact demonstrates variable - expressing his own emotions by the mediator (E). One may conclude that the mediator should not show the unions his own emotions probably because the unions expect him to control the emotions of the parties which are usually very high but interestingly, the unions expect the mediator’s evaluation of their proposals irrespective of whether the evaluation is positive or negative. The source of that expectation is probably derived from the relatively low level of knowledge concerning the complexity of the dispute.

The dependence of the mediator’s behaviour towards the unions is presented in a different way in indirect mediation.

Table 2: Mediator towards unions relation and outcome - indirect mediation

Logistic estimation using the 56 observation 1-56				
Dependent variable: outcome				
Variable	Coefficient	Stand. error	T Stat	P – value
const	0,449800	0,452241	0,995	0,31993
A	-0,864545	0,488984	-1,768	0,07705 *
B	-1,27189	0,608807	-2,089	0,03669 **
H	0,501606	0,251849	1,992	0,04640 **
The number of correct prediction cases = 44 (78,6%)				

Source: own analysis

In this relation behaviour A and B have a negative impact on the agreement but H has a positive impact. In other words, the mediator should not recognize the unions because in this kind of mediation there is simply a lack of time. He should also not ask unions for evaluation probably because they expect his independent analysis of the whole situation. On the other hand, unions expect the mediator to summarize the stages of mediation which is probably very helpful for workers because it makes the whole process clear and more understandable.

Different dependence was observed in relations between the mediator and the employer.

Table 3: Mediator towards employer relation and outcome - direct mediation

Logistic estimation using the 56 observation 1-56				
Dependent variable: outcome				
Variable	Coefficient	Stand. error	T Stat	P – value
const	0,692125	0,802684	0,862	0,38854
A	0,379903	0,265027	1,433	0,15173
B	-0,253478	0,142590	-1,778	0,07546 *
J	0,336017	0,228336	1,472	0,14113
The number of correct prediction cases = 46 (82,1%)				

Source: own analysis

A positive impact on the outcome is presented by variable A which means that recognition for employers is very important. One may assume that this mediator’s reaction is very helpful for employers because the high level of emotion presented by the union’s representatives does not allow normal dialogue to be conducted. Positive impacts on the outcome in this type of mediation while also evaluation of the proposals given by the party does mean that this kind of behaviour of the mediator is helpful for employers and they expect him to share this knowledge with them. It also means that they trust the mediator. Negative impacts on the outcome presents requests to express the employer’s evaluations or opinions. It is difficult to explain this dependence. One can assume that employers expect the mediator to present his own evaluation and this kind of behaviour reduces his credibility.

The last dependence which was examined concerning the mediator’s behaviour towards the employer is in indirect mediation.

Table 4: Mediator towards employer relation and outcome – indirect mediation

Logistic estimation using the 56 observation 1-56				
Dependent variable: outcome				
Variable	Coefficient	Stand. error	T-Stat	P – value
const	-7,72174	3,12128	-2,474	0,01336 **
C	0,787816	0,290959	2,708	0,00678 ***
D	0,544643	0,236419	2,304	0,02124 **
G	0,402554	0,186299	2,161	0,03071 **
J	0,713047	0,304440	2,342	0,01917 **
L	0,936135	0,417788	2,241	0,02505 **
The number of correct prediction cases = 40 (71,4%)				

Source: own analysis

In this relation one can observe the biggest number of variables presenting an impact on the outcome and in all of these cases this impact is positive. These are as follows: request parties to express their evaluations or opinion, moderating and deescalating of emotion (for example – jokes), evaluation of proposals given by parties, paying attention to the costs of a lack of agreement and exerting pressure on parties. The behaviour of the mediator towards the employer in indirect mediation illustrates a relatively strong influence on the mediation outcome.

5. In conclusions

Any attempt to create the model of an effective mediator’s behaviour should be stated as follows:

- The mediator’s choice concerning the most effective behaviour depends on the type of mediation and the party towards which this behaviour is addressed.
- In indirect mediation the mediator may have a bigger choice of behavioural traits which has a positive impact on the outcome than in direct mediation. This was observed with relation to both unions and employers.

- The most effective mediator's behaviour towards employers in both types of mediation are as follows: giving the floor to parties, a request to parties to provide an explanation or to repeat utterances, moderating and releasing of emotions (for example by jokes), conveying the positions of parties to each other, paying attention to the costs of the lack of an agreement and exerting pressure on parties.
- On the basis of the afore-mentioned deliberations, it is possible to state that experimental research based on simulations is suitable for the analysis of the behaviour of actors in conflict situations. Despite the initial feeling of superficiality, the participants of the experiment quickly engaged themselves in the situation defined in the scenario and acted in a manner that was close to actual mediation. The features of the experiment based on the simulation confirm the experience accumulated during previous research, such as for instance, in the well-known Stanford Prison Experiment conducted by Philip Zimbardo in 1971.
- Analysis of the data collected thanks to the research described facilitated the illustration of the behaviour of the mediator, which increased his efficiency. On the one hand, direct mediation leads to agreement much more frequently than indirect mediation, however increasing the level of control by the mediator over the process of communication between the parties to the dispute has an impact on enhancing the probability of achieving a compromise.
- These results coincide with the results acquired thanks to the qualitative tests conducted by means of the Case Study Analysis, which enabled the triangulation of the data acquired in the experimental tests. This kind of triangulation is typical for the mix-method research (Esterhuizen and Martins 2015). Nevertheless, a description of the results of the qualitative tests would exceed the boundaries of the herein paper.

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An Analysis of the Systematic Literature Review (SLR) Approach in the Field of IS Management

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Abstract: In defining the scope of a new research project, both early stage and experienced researchers can significantly benefit from identifying well-executed literature reviews that have been published in their chosen field of study. Such a review highlights the 'state of play' in the area of interest by bringing together disparate streams of research and presenting a synthesis of the accumulated body of knowledge. Thus, it establishes a foundation from which knowledge can be advanced. Because the literature review can also highlight emerging issues and key knowledge gaps in a specific field, it can identify opportunities for other researchers to make a novel contribution and thereby guide the direction of their research in extending current theories or developing new ones. However, in the field of IS management, the publication of literature review articles is low. This is because writing and publishing a literature review is challenging. Firstly, authors are faced with the difficulties in delineating the scope/boundaries of the literature review in a field which is in essence interdisciplinary, and systematically identifying, analysing, and synthesising the plethora of existing research in order to provide a relatively complete census of the existing body of knowledge. Structuring the review around the core concepts uncovered in the literature, presenting it in a coherent, logical, and engaging manner, and simultaneously ensuring the literature review highlights a clear contribution present further challenges. In addition, literature review authors will possibly undergo a more lengthy paper review and revision cycle, which may explain lower rates of publication. This paper outlines the adoption of a Systematic Literature Review (SLR) approach in the field of IS management. Based on the insights gained from this approach, the paper evaluates the benefits realised and challenges encountered, and further outlines guidance for researchers who adopt the SLR approach in future studies.

Keywords: literature review, systematic literature review, concept matrix, research methodology, IS management

1. Introduction

A literature review enables a 'current state' understanding of the existing body of knowledge and the evolution of ideas within a domain, and thereby serves as a conceptual background or solid theoretical foundation for new research projects (Levy and Ellis, 2006; Vom Brocke et al, 2015; Webster and Watson, 2002). It also serves to effectively substantiate the existence of a research problem and justify the reason for undertaking a proposed study (Pare et al, 2015). A rigorous literature review is more than a summary of a research topic; it involves describing and interpreting the main points within an article, classifying the article and explaining its importance, and analysing and evaluating its findings comparative to other articles in the body of knowledge (Levy and Ellis, 2006). Thus, it demands new insights and contributions to the knowledge base that require a degree of 'analytical criticism' based on the reviewer's own interpretations of prior studies (Okoli, 2015). This may include, for example, highlighting methodological or theoretical biases in existing research (Rowe, 2014) or highlighting where further investigation is required through additional studies (Brereton et al, 2007; Pare et al, 2015). Literature reviews have also been recognised for their role in informing theory development (Vom Brocke et al, 2015; Webster and Watson, 2002), and supporting practice (Okoli, 2015). An effective literature review provides insights into where a plethora of research already exists and where there are thematic knowledge gaps (Levy and Ellis, 2006; Rowe, 2014), and proposes new research problems and directions (Okoli, 2015; Pare et al, 2015), together with a justification for the relevance of addressing them (Vom Brocke et al, 2015).

A well-executed literature review can deliver considerable value to both the individual reviewers and the academic community as a whole. From an individual perspective, higher quality publication opportunities and increased citation potential are likely rewards. From an academic community perspective a high quality review can represent a benchmark for others conducting future research in the area (Webster and Watson, 2002), and may even be regarded as a 'paradigm shifter' (Pettigrew and Roberts, 2006) within a specific field.

Despite their potential value, however, in Rowe's (2012) new categorisation of Information Systems (IS) research genres, the literature review genre receives scant attention. During the period 1991 to 2013, only eight of the 700 papers published by the European Journal of Information Systems (EJIS) were literature reviews (Rowe,

2014). Certainly, undertaking literature reviews in the IS field is challenged by the field's thematic and methodological diversity (Okoli, 2015; Webster and Watson, 2002), as research themes often cross disciplinary boundaries. Consequently, the increasing volume of publications that are relevant to IS-related research – often more than one could read in a lifetime - means that comprehensive reviews are not possible in many topics today (Levy and Ellis, 2006; Vom Brocke et al, 2015). A further issue is that there are few common standards for conducting literature reviews in IS research (Okoli, 2015). These factors can make the process particularly overwhelming for novice and early stage researchers (Bandara et al, 2015; Vom Brocke et al, 2015). Due to their criticality in strengthening the IS field, however, several authors call for a greater volume of literature review publications to support new knowledge creation and dissemination (Rowe, 2014; Webster and Watson, 2002).

This paper investigates the value of adopting a Systematic Literature Review (SLR) approach in the domain of IS research. Section two discusses the SLR and its inherent concept of systematicity, along with a summary of current methodological guidance in systematically undertaking literature reviews. Section three presents the application of this guidance in an SLR in the field of IS management, while section four evaluates the benefits realised and challenges encountered in the process followed. Section five draws the paper to a conclusion and offers guidance to support other researchers undertaking a SLR in future studies.

2. The SLR and the concept of systematicity

There is a lack of consensus on what constitutes a SLR approach in research. For some authors, it refers to a particular subtype of a literature review (Pare et al, 2015); for others it refers to a characteristic of how a literature review is executed (Rowe, 2014; Vom Brocke et al, 2015). In this latter stream of thought, different interpretations are also evident – for some it involves adhering to a specific structured method that has its roots in medical disciplines, while for others it is regarded as a qualitative attribute that is evident in varying degrees across all literature reviews. In this paper, a SLR is regarded as any literature review that follows an explicit, structured method. This is similar to the position held by Tricco et al (2011) who state that '*systematic reviews consist of a clearly formulated question and use systematic and explicit methods to identify, select, critically appraise, and extract and analyse data from relevant research*'. In order for a literature review to be deemed systematic, some authors call for a comprehensive examination of all relevant, quality material on the topic of interest (Petticrew and Roberts, 2006). However, a softening in the requirement for comprehensiveness is evident in some recent thinking. Rowe (2014) suggests reasonable coverage is sufficient as opposed to aiming for '*an illusive complete picture*'. Hence '*coverage—not exhaustiveness—has become the relevant measure of saturation*' (Vom Brocke et al, 2015).

In order for a literature review to be classified as systematic, the reviewers need to explicitly describe the procedures by which the review was conducted in order to enable others to reproduce the study using the same reviewing approach (Okoli, 2015; Pare et al, 2015). Although presented in different phase categorisations, most previous research address similar issues of importance for executing a SLR (e.g. Brereton et al, 2017; Levy and Ellis, 2006; Vom Brocke et al, 2009). We summarise the key methodological guidance prescribed in the current literature below, structured according to the eight key SLR phases proposed by Okoli (2015) that he specifically tailored to the needs of the IS research discipline.

Identify the purpose – For a SLR, a clear and concise research question is required (Okoli, 2015). The purpose of the literature review, its research goals, its intended audience, and its dissemination strategy should be explicitly outlined (Okoli, 2015; Vom Brocke et al, 2015). Both the purpose and the research goals are key determinants of the type of literature review undertaken (Rowe, 2014). For example, the appropriateness of conducting a SLR is dependent on the current evolutionary state of the research field and may not be valuable early on when limited studies are available or when the research question is too broad, too vague, or too narrow (Okoli, 2015; Petticrew and Roberts, 2006).

Draft protocol and train the team – Conducting a SLR involves establishing a defined protocol during the planning stage in order to minimise bias. A protocol is a documented plan or roadmap that describes specific steps and procedures regarding how the SLR will be carried out. It specifies the scope of the review and its aims and objectives, search parameters and locations, exclusion and inclusion screening criteria, quality measures, data extraction guidelines, data storage and retrieval guidelines, software tool usage, and a detailed plan for the analysis (Pare et al, 2015; Vom Brocke et al, 2015; Whitemore et al, 2014). The protocol should be piloted and externally validated to ensure its rigour, and any changes to the protocol over time, based on new insights, need

to be documented to support the reproducibility of the work (Brereton et al, 2007; Okoli, 2015). Coordinating the literature review work across a team of people is difficult as search results can differ and people's interpretation of the literature can vary. All team members need to be trained in line with the protocol to ensure consistency in the approaches used to execute the review (Fink, 2005).

Search for literature – A successful search requires a researcher to have prior familiarity with the subject area under investigation. This may demand researchers new to a field to read other review papers, conference tracks, calls for papers, or textbooks in the field, and seek recommendations from colleagues prior to executing the SLR's literature search. The process of identifying and selecting the relevant literature has become more complex and involves a number of considerations. Firstly, the search scope should be defined in order to provide an orienting framework for the search, and define the structure and organisation of the search process. The reviewer should consider whether the search process will be sequential, conducted at the beginning of the review, or iterative, conducted in a continuous, repeated manner in tandem with synthesising and analysing the data (Vom Brocke et al, 2015).

Secondly, the publication sources to be consulted should be agreed – bibliographic databases, journals, citation indices, conference publications, library search portals, books, and so on. Electronic resources are now the predominant source of literature collections (Okoli, 2015), but selecting the appropriate search database is a difficult consideration as their coverage, search functionality, and available subscription models vary (Vom Brocke et al, 2015; Wolfswinkel et al, 2013). While some authors emphasise primarily the inclusion of 'A' quality journals (e.g. AIS Basket of 8), books, book chapters, and conference papers are also promising sources, particularly when a topic is new or highly technical (Rowe, 2014; Vom Brocke et al, 2015).

In addition, the search strategy or technique should be outlined. Developing such a strategy is challenging as search parameters often lead to unexpected results (Okoli, 2015). Keyword search strings, when either too narrow or too broad, may lead to either a limited or an overwhelming number of publications – in the words of Wolfswinkel et al (2013), '*a feast or a famine of outcomes*'. Relevant works can also be overlooked due to the existence of 'buzzword' synonyms that reflect the evolving phenomenon in the IS field (Rowe, 2014; Vom Brocke et al, 2015). Hence, keyword searches should be refined and iterated (Wolfswinkel et al, 2013) and be supplemented by backward searches (screening the reference list of the papers retrieved using the keyword search) and forward searches (identifying publications that cited these papers) in order to ensure the key seminal publications in a specific area are included in the review (Okoli, 2015; Vom Brocke et al, 2015). Further, experts in the field may be consulted to gauge the completeness of the list of compiled material (Pettigrew and Roberts, 2006).

Apply practice screen – Specific criteria need to be established for including and excluding the studies that will form part of the review (Okoli, 2015; Wolfswinkel et al, 2013). Criteria may focus on keywords specific to the research question, a specific publication language, a specific publication outlet, prominent authors in a field, specific industry contexts, specific research design and methodologies, specific publication date ranges, among others (Fink, 2005). These criteria may need to be reviewed, and relaxed or further limited based on the initial search findings (Wolfswinkel et al, 2013). Certainly, the practical screen is a subjective process - the screen must be practically manageable while at the same time be broad enough to include a sufficient number of studies to address the research question (Okoli, 2015; Rowe, 2014).

Appraise quality – Studies need to be rated according to the degree to which they meet quality standards in order to filter out papers deemed not relevant due to inferior quality (Okoli, 2015). Quality and relevance are quite arbitrary and often difficult to assess from reading an abstract alone (Brereton et al, 2007; Vom Brocke et al, 2015). The appraisal standards vary depending on whether the primary studies are quantitative or qualitative - quantitative studies are typically appraised based on the studies relative generalisability and validity, while qualitative studies are appraised based on an analysis of the paper's arguments and theories, and how they are supported by evidence (Okoli, 2015).

Extract data – The applicable information, based on the research question, needs to be extracted from each study included in the review as raw material for synthesis (Okoli, 2015). This data extraction process can be supported in a number of ways. Wolfswinkel et al (2013), for example, provide a useful discussion of their application of grounded theory and its open, axial, and selective coding procedures to identify relevant data. Bandara et al (2015) use qualitative data analysis software to support recording of the data extracted.

Synthesise studies – The data extracted needs to be combined, classified, and analysed in order to make sense of the findings (Okoli, 2015; Rowe, 2014). This involves summarising the key research findings, based for example on the use of thematic analytical categories, a conceptual framework, or other mechanisms of interpretation in order to deliver ‘a global representation of the literature as a whole’ (Okoli, 2015). Several authors advocate for the use of a conceptual framework (Rowe, 2014) and a coherent conceptual structuring of the topic underpinned by a guiding theory (Webster and Watson, 2002; Wolfswinkel et al, 2013), as an effective literature review is concept centric, as opposed to an author-centric or chronological account of literature findings (Levy and Ellis, 2006; Webster and Watson, 2002). Thus, concept maps or concept matrices (Webster and Watson, 2002; Wolfswinkel et al, 2013) are useful visual aids in logically organising, structuring, and making sense of information from different sources. Numerous software tools, including Computer Aided Qualitative Data Analysis Software (CAQDAS), can also aid in the analysis and synthesis process and add an extra layer of transparency through keeping a clear trail of evidence (Bandara et al, 2015).

Write the review – A well-written literature review needs to be both explanatory and creative (Webster and Watson, 2002). It articulates the motivations of the study, describes the key concepts, delineates the research boundaries, presents the review of prior literature, demonstrates a tangible contribution, and presents a model to guide future research (Webster and Watson, 2002). The review of prior literature should reflect a concise representation of the patterns uncovered in the literature (Webster and Watson, 2002; Wolfswinkel et al, 2013), underpinned by a reliable structure and proper argumentation (Levy and Ellis, 2006; Rowe, 2014). The key concepts uncovered, grouped and presented in a logical manner, should serve as the organising framework for the write up (Webster and Watson, 2002). The methodological process followed in the SLR also needs to be documented in sufficient detail to enable others to independently reproduce the review’s results (Okoli, 2015).

3. Applying SLR methodological guidance in the field of IS management

During 2016 - 2017 a SLR was undertaken to address the following research question: ‘what are the determinants that influence the adoption of Internet of Things (IoT) by organisations?’ Although IoT is anticipated to have a greater impact than the Internet itself, organisational adoption of IoT is far from universal. Thus, as part of a broader study, a SLR was initially undertaken to understand the key IoT adoption determinants currently reported in the literature, and to understand the applicability of the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al, 2003) in explaining the IoT adoption determinants uncovered. The methodology followed is now outlined according to the eight key SLR phases as discussed by Okoli (2015).

Identify the purpose – A clear research question and associated research goals were defined. These sought to a) understand the determinants of IoT adoption at the organisational level and b) categorise them according to the constructs of UTAUT to ascertain its applicability to the IoT adoption phenomenon. The publication output from the SLR process was targeted at a high quality journal in the IS discipline.

Draft protocol and train the team – A documented protocol, addressing all steps of the process, was developed prior to undertaking the SLR. This included the scope of the review, its aims and objectives, search parameters and locations, exclusion and inclusion screening criteria, quality measures, data extraction guidelines, and so on. The protocol was piloted with a number of academic colleagues prior to its use, and was updated in the early stages of the study to reflect new insights gained e.g. in terms of appropriate publication outlets and search parameters. All four team members tested this protocol and subsequently refined it to address any ambiguity of interpretation in the consistent execution of the SLR process.

Search for literature – A list of the applicable publication sources was compiled, and based on the research team’s experience of these sources (e.g. topic coverage, search functionality, accessible subscription models) and insights gained through discussion with colleagues, the sources to be consulted were agreed. The literature collection was focused on the high quality AIS ‘Basket of 8’ journals and the ‘Business Source Complete’ bibliographic database which provides a wide collection of peer reviewed journals that reflect the interdisciplinary nature of IoT. A search strategy was iterated and refined through testing in order to arrive at a manageable number of retrieved studies to address the research question. Cognisant of the many synonyms that exist for the word ‘determinants’, the search parameters focused on the presence of the following terms within the paper title, abstract, or keywords: ‘Internet of Things OR IoT’ AND ‘adoption OR drivers OR benefits OR barriers OR challenges’. The keyword search was supplemented by backward and forward searches to ensure

the key seminal publications were included. We also liaised with senior colleagues experienced in the stream of IoT and technology adoption literature to gauge their views on the completeness of the retrieved set of papers.

Apply practice screen – A number of inclusion and exclusion criteria for studies were also established. The specific criteria pertained to publication language (English), publication time horizon (between January 2010 and April 2017), and specific publication types (scholarly peer reviewed articles). Of 253 papers identified by the authors, a further screen of the title, abstract, and keywords resulted in the exclusion of 207 papers due, for example, to a focus on issues that did not illuminate specific adoption determinants at the organisational level. Consequently, 46 papers were systematically ordered and selected to achieve the SLR's objective, and read to verify their relevance.

Appraise quality – The 46 eligible papers were also evaluated in terms of quality. Given the search focus for scholarly peer reviewed articles and other prior screening criteria, no quality-related issues were found in the remaining paper selection.

Extract data – Within each of the shortlisted papers the relevant material to answer the review question was isolated. All determinants of IoT adoption were extracted with the support of NVivo software to code the key data items from the relevant studies. Hence, this step provided a list of all relevant concepts as raw material to synthesise the study.

Synthesise studies – The next step involved examining the data extracted from the 46 papers and analysing, classifying, and comparing it in order to address the research question and research goals. We focused on the conceptual structuring of topics through creation of a series of thematic analytical categories. A concept matrix was used to logically and visually organise the key determinant concepts from the literature sources – the matrix rows provided the paper references, while frequency of occurrence of a particular theme was indicated by the number of 'Xs' in the table columns. Through creation of an additional unit of analysis, the identified concepts were also categorised within the constructs of UTAUT to determine UTAUT's fit in explaining the IoT adoption phenomenon. As synthesis progressed, recurring themes were evident across the literature, which provided a degree of comfort in the completeness of the search executed.

Write the review – The final step involved a write up of the review. The write up sought to present a logical story of the IoT adoption phenomenon. It documented a clear motivation of the study - a need to understand the determinants of IoT adoption by organisations and the applicability of UTAUT in explaining adoption of this phenomenon. Working definitions of key concepts were provided, as well as a concise and logical synopsis of the determinant findings, structured according to the groupings of the concept matrix. A core theoretical contribution was also outlined regarding the applicability of UTAUT in explaining IoT adoption as well as a plan to guide future research in this space. Finally, a clear depiction of the methodological process followed was provided to support future reproducibility of the work.

4. Discussion - benefits and challenges of the SLR methodological approach

Following the SLR methodological approach in the above outlined IoT study proved beneficial and challenging. Although the study is framed in the context of Okoli's (2015) eight step process, the previous literature provides similar or complementary guidance. In this section, the three key benefits and challenges to adopting the SLR approach are outlined, based on the authors' experiences.

From an advantage perspective, it was found that, firstly, documentation of a detailed protocol, that was tested and refined by all members of the research team prior to undertaking the SLR, was invaluable in supporting reproducibility of the work. An explicit record of the required procedures across all of the key review steps served as a common platform for team members in executing a consistent process in searching for, screening, and appraising studies, and extracting and synthesising the relevant data. Secondly, incorporation of backward and forward searches to analyse the references and citations of the retrieved set of studies, and consultation with senior colleagues on the search completeness were invaluable tactics in ensuring no seminal publications were overlooked. Thirdly, a concept centric examination of the data extracted enabled it to be classified and analysed in a more logical manner, and enabled the research team to better interpret and synthesise the body of data. Through using the concept matrix as a visual aid, the write up phase was also less onerous as it could be organised around the themes categorised in the matrix.

In terms of the challenges of the SLR, it was found that, firstly, identifying upfront suitable publication sources was challenging. The AIS basket of eight journals did not provide adequate studies to address the research question and as the selected bibliographic database did not publish full texts of some key articles (e.g. relevant high standard conference papers), additional backward and forward searches were required to arrive at a body of studies that provided satisfactory coverage for synthesis. Secondly, agreeing suitable search parameters was a lengthy, experimental process. Initial search strings on IoT were too broad to be realistically manageable, and a more focused search for determinants of IoT adoption required refinement of the search string to ensure relevant synonyms were reflected. Thirdly, as the volume of extracted data for synthesis grew it became difficult to manage. Coding and categorisation of concepts from the data extracted was a time-consuming and iterative process that involved constant comparison of newly extracted data with previously coded concepts as well as comparative checks across the four researchers involved.

5. Conclusions

The SLR plays a critical role in advancing knowledge in a field of study. Based on the approach adopted in this research, this paper evaluated the benefits and challenges in undertaking a SLR in the field of IS management. Adopting the SLR methodological approach may be perceived by some as 'overkill' - several steps are required prior to embarking on the actual search which add both time and administrative burdens to the literature review process. However, through adopting the SLR approach, despite some challenges faced, overall the key finding was that following prescribed methodological guidance is invaluable. The upfront steps that involve establishing a clear understanding of the review's purpose, documenting an unambiguous protocol, and refining a search strategy all pave the way for a higher quality publication output. These steps ensure that an appropriate stream of publications to address the research question are available for analysis; hence there is no substitute for advanced planning and preparation for a specified purpose review.

The data extraction, synthesis, and write up processes can often seem the most daunting in terms of effectively mapping out the landscape of literature findings but also making a novel contribution to the body of knowledge. As we draw this paper to a conclusion, we offer practical guidance to assist in these processes.

Particularly where a large volume of studies are involved, use of CAQDAS should be considered as a tool to support the data extraction and synthesis processes. The literature can be treated as qualitative secondary evidence and the relevant data can be coded into concepts through the use of CAQDAS tools. In fact, some researchers may find the coding principles of Grounded Theory and its emphasis on constant data comparison a useful guide in this respect. The concepts can easily be refined, categorised, and re-categorised with CAQDAS as further insights are developed through coding. Hence, while CAQDAS does not do the analysis for you, it provides a structure for organising the data that enables the researcher to begin analysis and interpretation of the data early on. As part of the analysis process, the researcher should also record memos/notes on emerging ideas, for example, on the relationship between key concepts, applicability of underpinning theoretical frameworks, or patterns emerging from the review. Effective annotation is also invaluable when later needing to relocate and refer back to the articles from which the data emerged. Finally, the researcher should consider development of a concept matrix as a useful complement when synthesising the data. Through presenting a simple visual representation of 'the story' that has emerged from the literature it provides a logical structure to organise the data and enables a creative write up process.

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An Investigation of the Social Dynamics of Indigenous Mining in New Caledonia

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Abstract: Nickel mining commenced in New Caledonia in 1868 and continues to be the major business activity of that region. Traditionally the mining sector has polarized New Caledonian society via a complex mix of economic, cultural and environmental issues. In 1999 the New Caledonian and French governments initiated a future-focused program of “*rééquilibrage*” or rebalancing of opportunities for the New Caledonian indigenous Kanak people. “*Rééquilibrage*” aims to create a new identity for all New Caledonians – an identity that builds upon the multicultural mix of modern New Caledonia. A critical component of this rebalancing is the commencement of a major new world-class nickel mining venture at Koniambo (in the Kanak Northern Province) in 2014 and this venture is majority Kanak owned and operated. The literature confirms that no published review of this venture has been completed since its opening. Such a review is important because New Caledonians must vote by the end of 2018 on the issue of independence from France. This research into the social dynamics of the Koniambo project must ensure that all stake-holder voices are represented accurately and that the investigation is not simply a one-dimensional “cost/benefit analysis”. This research fits within sociology, and within this domain, the research uses the following empirical investigative approaches: social dynamics, actor-network theory, hagiography and critical discourse analysis (for core data analysis). Social dynamics and actor-network theory combine to facilitate the selection of stakeholder-groups within New Caledonian society that represent a maximised intersection of the Koniambo project across New Caledonian daily life. Hagiography provides the vital context that then allows critical discourse analysis to unpack the expressed opinions and policies that link stakeholders. In this manner the project results will be most representative of the current social dynamics concerning a flagship project of “*rééquilibrage*”.

Keywords: New Caledonia, nickel mining, critical discourse analysis

1. Introduction

New Caledonia (1200 kilometres east of Australia) is a *special collectivity* of France that was granted special status as a result of the Nouméa Accord in 1998. The Nouméa Accord provides for a New Caledonian citizenship (with existing French citizenship), a gradual transfer of power¹ to New Caledonia itself over the subsequent 15 to 20 year period, and finally a referendum on the issue of full independence from France to be held by the end of 2018. The population of 268, 767 comprises approximately 40% Kanak (the indigenous population), 28% European descendants and 32% Polynesian and Asian migrant inhabitants (ISEE, 2014). New Caledonia has three provinces: Northern Province (mostly Kanak of 60,000), Southern Province (the European and business hub centring on the capital Nouméa with 180,000 inhabitants) and Loyalty Islands (small Kanak tribal population of 30,000). The GDP of New Caledonia in 2014 was 9 billion US dollars, the fourth largest economy in Oceania after Australia, New Zealand and Hawaii. GDP per capita was \$ 36,376 in 2014, lower than that of Australia and Hawaii but higher than that of New Zealand (ISEE, 2014). However, New Caledonia is a highly assisted economy in that France's financial transfers into the country are its highest revenue stream (surpassing mining revenues) and the gap between imports and exports is growing every year.

In 1853 New Caledonia was proclaimed a French colony because firstly, France required a Pacific presence to accord with its 19th century geopolitical strategy, and secondly France needed a new penal colony. From the 1860s until the end of transportations in 1897 approximately 22,000 criminals and political prisoners were sent to the colony. In 1864 nickel was discovered in the colony and mining began, however the Kanak were excluded from all aspects of the French economy in the colony. The first Kanak uprising in 1878 cost many French and Kanak lives (Stanley, 1989). Economic and social deprivation for the Kanak was institutionalized in 1887 with the *Code de l'Indigénat*. This Code introduced state (not tribal) control within native reserve areas, forbade Kanak entry into the capital city of Nouméa, and facilitated nearly 90 percent of land in the colony to be transferred to colonists and the administration (Bensa et al, 1998). The *Code de l'Indigénat* was abolished in 1946 when France dropped the term “colony” and granted citizenship to the Kanak as part of a United Nations sponsored global decolonization plan. However, unlike in many African and Indochina French colonies, this did not lead to independence.

¹ France continues to control military issues, foreign policy, immigration, police, and currency matters.

The term “*Kanak*” emerged in the independence protests of the 1970s and was significantly defined by the leader of the independence movement, Jean-Marie Tjibaou (Fisher, 2014; Chappell, 2013). However, use of the term “*Kanak*” in a fully collective, unitary state sense implies a solid national framework and a common interest that overrides the diversity of chiefdoms, clans, territories and languages that make up the current reality (Bensa et al, 1998). Between 1976 and 1988, there occurred periods of serious violence (IEOM, 2010) between the Kanak separatists and the French authorities, culminating in April/May 1988 with significant loss of life on the tiny island of Ouvéa. Subsequently, the June 1988 Matignon Agreement introduced a decade of stability and dialogue leading to the signing of the Nouméa Accord on the 5th May 1998.

As part of the Nouméa Accord, in 1999 the New Caledonian and French governments initiated a future-focused program of “*rééquilibrage*” or rebalancing of economic and social opportunities for the Kanak. “*Rééquilibrage*” is a very ambitious program which aims to create a new identity of multiculturalism and inclusivity for all New Caledonians. A critical component is the commencement of a major new world-class nickel mining venture (a 7 billion US dollar investment) at Koniambo (in the Northern Province) in 2014 and this venture is majority Kanak owned (51%) and operated. The literature confirms that no published review of the societal impact of this venture has been completed since its opening. Such a review is even more important when it is noted that New Caledonians will vote by the end of 2018 in a referendum on the issue of independence from France. New Caledonia may now be considered as an *imagined political community* (Lassila, 2016), one visualized by those who may never meet each other but who are totally committed to the idea (Anderson, 1991). An important question for all stakeholders (internal and external) in New Caledonia is what influence Koniambo contributes to “*rééquilibrage*” and a multicultural, inclusive society for all citizens. This is the principal research goal for this paper: “What views and even ideologies shape the public discourse on Koniambo?” The principal research methodology used will be critical discourse analysis (CDA).

This paper will unfold in the following structure. Following this introduction, the paper will present a comprehensive discussion of the research methodological framework deployed within the research. Following that methodology, a context (of the New Caledonian mining sector) will be presented. The critical discourse analysis researcher must fully appreciate the context in which discourses are produced and then analysed (van Dijk, 1998). Finally, the paper will conclude with a very brief coverage of a small sample of the discourses that have been identified and analysed to date.

2. Research methodology

This research fits within sociology, and within this domain, the research uses the following investigative approaches: *social dynamics* (at the highest level of abstraction), *actor-network theory* (to scope the research project), *historiography* (to establish the overall context that frames the discourses), and finally *discourse analysis* (used at the lowest level of abstraction for data analysis). Social dynamics and actor-network theory combine to facilitate the selection of a specific groups of New Caledonian society that represents a maximised intersection across New Caledonian life. *Historiography* is used to most accurately describe the context in which the identified groups have forged their opinions, their ideologies and their discourses. This context is essentially the history of the mining sector in New Caledonia. Finally, *critical discourse analysis* facilitates the operational data analysis of the expressed views and ideologies that link to this sector and Koniambo in particular. In this manner the project results will be most representative of the current social dynamics of New Caledonia. This framework is represented in Figure 1.

2.1 Social dynamics

Social dynamics refers to the behaviour of groups that results from the interactions of individual group members as well as the study of group level behaviours (Durlauf et al, 2001). Social dynamics represents a relatively new multi-disciplinary field that comprises ideas from economics, sociology, and social psychology, and is a sub-field of *complex adaptive systems*² (Miller et al, 2007). The fundamental assumption of this field is that individuals are influenced by one another's behaviour. In social dynamics individual choices and interactions are typically viewed as the source of aggregate level behaviour, but of course in a recursive manner, and the source ultimately maps to a result. Therefore social dynamics blends the ideas of economists who have traditionally studied

² A *complex adaptive system* is a system in which a complete understanding of the individual parts does not automatically convey a perfect understanding of the whole system's behaviour. The field is highly interdisciplinary and uses theory and practices from the natural and social sciences to develop explanations that allow for heterogeneous agents and emergent behaviour.

aggregate behaviour as the outcome of individual decisions made interactively, and sociologists who have focused on the role of social influences on individual behaviour. Over the past decade, however, the barriers between the disciplines have broken down, resulting in the new area of social dynamics.

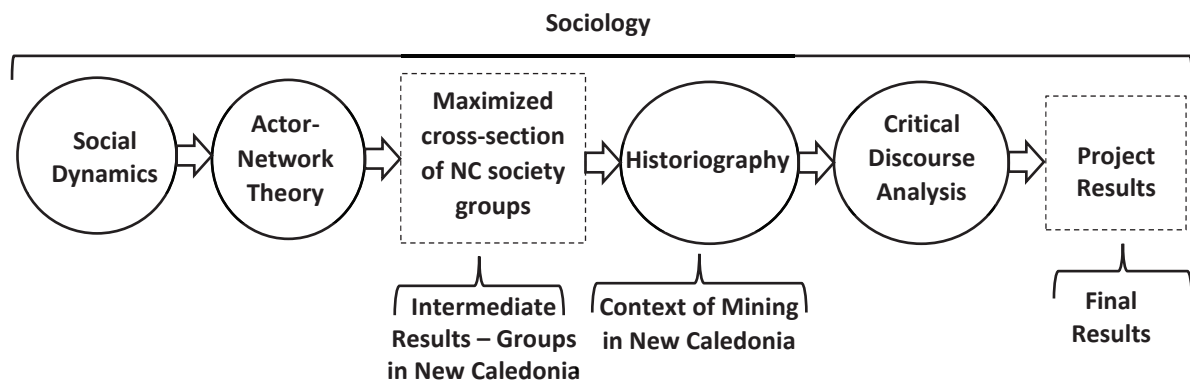


Figure 1: Overview of research methodology

2.2 Actor-network theory

Actor-network theory treats social relations, including power and organization, as network *effects*. The theory posits that networks are materially heterogeneous and that actors/agents, texts, devices and artifacts are all generated in, form part of, and are essential to, the networks of the social. All constituent components should be analyzed in the same terms and in full measure, to characterize the ways in which materials join together to produce institutional and organizational patterns in social dynamics (Law, 1999). At the heart of actor-network theory is the concept of the *heterogeneous network*. This concept is that the social is “nothing other than patterned network of heterogeneous materials ... people, machines, animals, texts, money, architectures”. (Law, 1999).

Operationalizing actor-network theory requires that a researcher must explore how actors and organizations *order* or *translate* within a network. *Translation* specifically describes how actors and organizations “mobilize, juxtapose, and hold together the bits and pieces out of which they are composed; how they are sometimes able to prevent those bits and pieces from following their own inclinations and making off” (Law, 1999). Operationalizing actor-network theory also requires actor-network research *explore* multiple forms of communications within a system, with a strongly longitudinal focus such as favored by the Annales³ School of History with its insistence on the “*longue duree*” (Braudel, 1975). Actor-network *exploration* in this research is via *critical discourse analysis* which firstly requires the construction of a detailed discourse *context* via *historiography*.

2.3 Historiography

Historiography is defined as “the study of the way history has been and is written — the history of historical writing... When you study ‘historiography’ you do not study the events of the past directly, but the changing interpretations of those events in the works of individual historians.” (Furay et al, 1988). Stone (1979) states: “More and more of the ‘new historians’ are now trying to discover what was going on inside people’s heads in the past, and what it was like to live in the past, questions which inevitably lead back to the narrative.” Consequently, in recent decades the traditional diplomatic, economic and political lens used by historians is being replaced by a social and cultural analysis. *Historiography* is used in this research project to describe the *context* in which discourses are produced, circulated and evolved. Context is defined as the mentally represented structure of those properties of the social situation that are relevant for the production or

³ The Annales School is a group of historians associated with a style of historiography developed by French historians in the 20th century to stress long-term social history. Fernand Braudel was the dominant leader of the Annales School in the 1950s and 1960s and has been considered one of the greatest of the modern historians who have emphasized the role of large-scale socioeconomic factors in the making and writing of history

comprehension of discourse (Duranti et al, 1992; van Dijk, 1998). Context must be fully understood for successful *critical discourse analysis* (van Dijk 1998).

2.4 Critical discourse analysis (CDA)

CDA can be described as the “close study of language in use” (Taylor, 2001). CDA is concerned with studying meaning, and it studies meaning where it occurs, that is, in language and in text. Consequently, the inter-relationships of *language, discourse, text* and *discourse analysis* must be understood.

Language can be regarded as a set of signs, which are part of the system for generating subjects, objects, and worlds (Shapiro, 1984; Silverstein, 2004). *Language* is social, a series of collective codes and conventions through which things (objects, subjects, material realities) are given meaning and endowed with particular identities. Language is not just a simple system of concepts referring to things and phenomena directly, but rather it is a social system that follows its own logic and this logic constitutes peoples’ reality. We say that *language* does not *explain* the world as much as language *produces* the world.

The concept of *discourse* captures how this production happens. The term *discourse* is used in a broad number of ways in the social sciences. *Discourse* “means anything from a historical monument, a lieu de mémoire, a policy, a political strategy, narratives in a restricted or broad sense of the term, text, talk, a speech, topic-related conversations, to language per se” (Wodak et al, 2009). *Discourse* is “language use in speech and writing – as a form of ‘social practice’...discourse is socially constitutive as well as socially conditioned – it constitutes situations, objects of knowledge, and the social identities of relationships between people and groups of people...discursive practices may have major ideological effects – that is, they can help produce and reproduce unequal power relations between (for instance) social classes, women and men, and ethnic/cultural majorities and minorities through the ways in which they represent things and position people” (Fairclough et al, 1997). Societies construct and attach meaning to the surrounding material world - this is the construction of discourses. A discourse is a system of producing a set of statements and practices that, by entering into institutions and appearing like normal, constructs the reality of its subjects and maintains a degree of regularity in a set of social relations. Discourses are both structured and relational. They are structured in the sense that they produce a field of intelligibility within the social realm. They are relational in the sense that this structure has no fixity, centre, or permanence. Discourses are open-ended and incomplete – that is, emergent. A discourse is always shifting, a given discourse is always arbitrary and contingent. There is always space for contestation, which provides further analytical opportunities for researchers. *Discourses* are systems of meaning-production that enable all of us to make sense of the world.

Text may be understood as anything that carries the discourse (e.g., images, performances). CDA uses text as a vehicle for understanding social, political and cultural phenomena. It is important to note that text itself is not the object of study. Discourse analysts tend to interrogate the ways in which specific systems of meaning-production (often called *representations*) have been generated, circulated, internalized, and/or resisted. These *representations* can be put forward repeatedly and become a set of statements and practices through which language becomes institutionalized and “normalized” over time. CDA involves showing the affinities and differences between representations in order to demonstrate whether they belong to the same discourse. In overview, CDA follows a simple structure: (1) identify the discourse, (2) delimit the discourse to a wide but manageable range of sources and timeframes, (3) identify the representations that comprise the discourse, and finally (4) explore change, uncover layering and reveal the most complete meaning within the discourse. *Critical discourse analysis* is predominantly qualitative NOT quantitative and significantly traces back to Michel Foucault who understood discourses as constituting the objects of which people speak. Indeed Foucault (1972) asserted that it is important that scholars analyze discourses by “no longer treating discourses as a group of signs but as practices that systematically form the objects of which they speak”. Consequently CDA scholars often reject the notion that knowledge is separate from the social realm and rather see knowledge as constitutive of reality.

Within this research project, the critical discourse analysis is conducted as described in the CDA Framework (Fairclough, 2003). The CDA Framework considers that all texts are written from a specific viewpoint and comprise two main discourse structures: *internal relations* and *external relations*.

- *Internal relations* are how the vocabulary and grammar are used in a text. This structure is further expanded into “three types of meaning” (Fairclough, 2003): the categories of *action, representation* and *identification*. *Action* describes the text format, such as interrogative, declarative, persuasive or implicative.

Representation involves the descriptions of people, places and actions. *Identification* relates to the representations used by the text authors to get the overall picture of the intent of the text. The interplay of *action, representation* and *identification* “brings a social perspective into the heart and fine detail of the text (Fairclough, 2003).

- *External relations* comprise the social effects and personal beliefs of the text authors. This is at the heart of CDA because “we can unlock the ideologies and recover the social meanings expressed in discourse” (Teo, 2000). Fairclough subsets the external relations into three categories: *social events, social practices* and *social structures*. *Social events* comprise actions that have been taken and are a function of social factors (the social events analyzed in this research are corporate announcements from Koniambo and group articles). *Social practices* are actions taken in social situations (examples are critical essays, historical reflections, community discussions). *Social structures* are described a “very abstract entities” (Fairclough, 2003) and can be understood to be the overall edifices in which the social practices take place (e.g., democratic political systems, tribal hierarchies, religious organizations).

3. Discourse context - mining in New Caledonia

The nickel mining sector in New Caledonia has been a defining economic, environmental, cultural and political issue in the country since French colonisation first occurred in 1853 and significantly touches all aspects of New Caledonian daily life (Le Meur, 2015a). Nickel⁴ is first discovered in New Caledonia in 1864. The fledgling mining industry needs a workforce but the French colonists are too few in number. The Kanaks are excluded from mining and also deplore the exploitation of the land which is culturally considered to be one of the abodes of the ancestors. In 1891 convicts from the prison camps are used to expand mining activities. From 1878 onwards, thousands⁵ of workers from Asia, Europe and Polynesia arrive on a contract basis in New Caledonia and in 1923 the colony numbers approximately 14535 Asian workers (three quarters of miners). This practice ends in 1946 but the influx will ultimately make the Kanak a minority in their own land. More settlers arrive and commence mining and some, for example John Higginson (1839-1905), Louis Ballande (1817-1882), Lucien Bernheim (1856-1917) and Henri Lafleur (1902-1974) will spectacularly succeed, creating immense personal wealth and powerful New Caledonian (*caldoche*) family dynasties with profound political implications for the territory.

From the start of the twentieth century, mining in New Caledonia experiences several major phases (Pelletier, 1990):

Until the 1920's, nickel mining is totally manual. The 1950s are marked by the mechanization of mining operations, the creation of an export stream, and the commencement of profound environmental damage.

Between 1963 and 1972, New Caledonia has exceptional prosperity due to the explosion of nickel demand triggered by the Vietnam War. The nickel boom also creates a second huge inflow of new arrivals with approximately 35,000 immigrants, mostly metropolitan French, joining the colony. The Kanak still do not benefit from the boom because of cultural obstacles and a lack of trade training. In 1972 nickel prices collapse and major environmental damage in New Caledonia becomes evident. The recession continues into the late 90s.

The market is normalized in 1999. The period after 2000 has seen an upsurge in nickel processing capacity with the establishment of two new plants, Goro in the Southern Province and Koniambo in the Northern Province. Goro is a Brazilian corporate investment (Vale, 2012) and provides very little direct local employment (2004/2006 some 4000 Filipino technicians arrive in the colony). Koniambo, however, has majority Kanak ownership (51%) and provides considerable Kanak employment and trade-training. Koniambo is a high-quality nickel deposit that will facilitate a long-term, low-cost operation (Risenborough, 2013).

Today, New Caledonia ranks fourth among the world's nickel producers and has approximately 15% of the world's nickel reserves and its economy remains heavily dependent upon nickel production.

⁴ Most of the world's nickel production (60%) occurs in the manufacture of stainless steels, used in many sectors of the economy such as home appliances, automobiles, building and aeronautics. New technologies also require nickel, for example electric cars are recharged using nickel-cadmium batteries. The metal is also used in certain coins, e.g., in the one and two Euro coins).

⁵ 1892 – Arrival of commercially contracted Japanese workers – these will number 5000 in 1919.

4. Discourses identified and analysed – a small sample

This research has identified and analyzed several discourses that relate to the “*rééquilibrage*” project of Koniambo. In this section we present a highly summarized discussion of a small sample of these discourses: *autochtonie* and *économie assistée*.

Autochtonie: The French word “*autochtonie*” means the identity of an indigenous person, that is, identity in the sense of “*self*” or “*identity*”. “*Autochtonie*” was initially a United Nations discourse in which indigenous populations were recognized as “*champions*” of biodiversity (Blaser et al, 2004). In New Caledonia, the principal Kanak political group FLNKS (*Front de Liberation Nationale et Socialiste*) used *autochtonie* to primarily publicize the Kanak struggle to the world. However, with the Noumea agreement (1998), the Kanak population was formally recognized and nickel became the new centre to the FLNKS's political strategy. – culminating in the Koniambo mine. However a new Kanak group (*le Comité autochtone de gestion des ressources naturelles* (CAUGERN) is challenging the FLNKS logic (and therefore Koniambo). CAUGERN asserts that there is no guarantee that Kanak mining ownership will be maintained because nickel has long benefited both France and the foreign multinationals and this situation is very unlikely to change. CAUGERN wants a direct taxation on all mining revenues, payable to the Kanaks alone and not forming part of general revenues for the country. It is clear that this is not simply a claim for revenue. It is a political strategy, on the grounds of *autochtonie*, to re-value and reconstruct Kanak identity even in a context where they are not sovereign (Harper, 2008).

Économie Assistée: This is a discourse that profoundly shapes modern public opinion in New Caledonia. The discourse, “*économie assistée*” (English: *assisted economy*), is very prominent in many of the public texts analysed in this research project and reflects widespread socio-economic and cultural beliefs in New Caledonia. The term “*économie assistée*” traces back to a seminal work titled “*Économie assistée et changement social en Nouvelle-Calédonie*” (Freyss, 1995). Le Meur (2015) states: “*This book became a mainspring of recent literature on the topic of mining in New Caledonia.*” Freyss used a socio-economic approach to analyse daily life in New Caledonia and also the process of social change within the Kanak community (both urban and provincial). Freyss maintained that this overall system of “*assisted economy*” is the result of a French political calculation that wanted to place New Caledonia in a state of dependency to end all calls for independence. The nickel boom of 69 – 72 created a massive need for labour, and the French government responded with a surge of immigration that caused the Kanaks to become a numerical minority in their own country. During the subsequent long recession period, the French government significantly increased public transfers into New Caledonia that served as a substitute for growth and made the territory even more dependent on France. In his work, Freyss also claims that Kanak social values do not map well to western capitalism. Freyss asserts that the Kanak place a high priority (in both time and energy) into the maintenance of their complex networks of family and tribal relationships, and this focus runs contrary to a conventional western focus on work and business interests. Secondly, Freyss states that Kanak culture does not prioritise the individual accumulation of wealth – it is the “*customary norms of good living*” (tribal needs) which define the average social level of needs for the Kanak.

5. Conclusion

This paper has described how a combination of social science research methodologies has been used to investigate the discourses relating to a billion-dollar business entity at the centre of a complex societal reconfiguration (*rééquilibrage*) in New Caledonia.

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Evaluation of a Focus Group Approach to Developing a Survey Instrument

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Abstract: The use of focus groups emerged in the 1940s when Merton and Fiske started using them to conduct audience studies (Merton and Kendall, 1946; Merton et al, 1956). Today focus groups are a form of qualitative research that is commonly used in product marketing, marketing research, and sociology, to provide insights into how people think and to provide a deeper understanding of the topic being studied. Focus groups are used extensively in the IS Management domain, to explore new research areas, to collect large amounts of information on a topic in a short time, to ensure that the information collected is directly relevant to the research topic, and to utilize the “group effect” to allow participants to explore, develop, and clarify their points of view. However, thus far, the use and effectiveness of focus groups for this purpose has received scant attention. Hence, this paper outlines the focus group approach and evaluates its effectiveness on a specific project i.e. the development of a survey instrument that forms part of a ‘cloud’ adoption framework. The cloud survey instrument was developed using a collaborative and engaged scholarship approach involving subject matter experts including; academic researchers, industry-based practitioners, and consultants. Using a process of knowledge co-production, learnings from feedback and exchange of views, and evaluation of the survey in contextually diverse organizations via field testing, this approach ensured that the principles underpinning the survey were informed by leading academic insights and industry best-known practices. Based on the insights gained from the cloud adoption framework project, the paper evaluates the advantages realised and the challenges faced in adopting a focus group approach, and presents practical guidance for researchers who may adopt this research methodology in future IS or related projects.

Keywords: focus group, IS management survey, qualitative research, research methodology

1. Introduction

The rapid developments and continuous change in information technology (IT) present a challenge for all organizations, large and small, public and private. While IT-enabled change and innovation are increasingly critical for their continued viability, many struggle to support and catalyse the changes that will contribute value across the organization. The rapid advances in IT have not been matched by developments in the management of information technology, and as a result many organizations fail to derive the full value from their investments – for example, over half of all large-scale technology deployments regularly fail to deliver the value and innovation expected of them (Agarwal, and Sambamurthy, 2002; Ahlemann et al 2012). With the International Data Corporation (IDC) estimating annual worldwide IT spending at around \$2 trillion, such failures represent a significant loss of value and innovation. Organizations must deploy and use IT effectively to remain relevant in an increasingly digital economy (Van Aken, 2005; Alavi and Leidner, 2001). They need to continually innovate and differentiate themselves to keep pace and gain competitive advantage (Alexander et al, 1977). Driven largely by digitization, new technologies, and rapidly increasing data volumes, modern CIOs face a growing set of challenges. Gone are the days of simply “keeping the lights on.” The modern CIO must deliver business value and drive innovation (Stangarone, 2017).

The IT Capability Maturity Framework (IT-CMF)[™] is a framework developed to address these issues. It uses an open and innovative ecosystem approach where collaboration between industry and academic subject matter experts was used to develop an integrated capability driven management framework, covering 35 key areas of IT management, that include tools for designing, deploying, and operating information systems, to deliver sustainable business value and innovation (Curley, 2004). Central to this approach are focus groups that are used extensively to explore and progress new research areas. In the fast-paced digital business environment, cloud computing has evolved to become one of these key research areas and is recognised as a key enabler and a top technology priority for organizations worldwide. As such this research focuses on the cloud element of the IT-CMF where it seeks to support the migration to, and the management of, a cloud environment. According to Computer Weekly in January 2017, cloud computing (otherwise known as ‘cloud’) topped the list of IT priorities. However, the adoption of cloud across an organization is a major undertaking, that requires the bringing together of technology, processes, and people in the development of a capability approach (Peppard and Ward,

2004), to ensure that it is successfully implemented and used to deliver value. Based on the insights gained from the cloud research, this paper evaluates the advantages realised and the challenges faced in adopting a focus group approach in this context, and presents practical guidance for researchers who intend to use this research methodology in similar studies.

The structure of the paper is as follows: section 1 introduces and gives the background on why a focus group study was undertaken; section 2 describes the approach and the methodology used; section 3 presents the findings and the results; section 4 discusses the findings; section 5 provides an overview of the key conclusions.

2. Methodology

The aim of the research was to develop a cloud adoption framework that would help organizations in the migration and management of their cloud environment. The research was comprised of the following phases:

2.1 Systematic Literature Review (SLR)

The SLR was used as a starting point, to get an understanding of the existing body of knowledge and the evolution of ideas within a domain, to serve as a conceptual background, and to provide a solid theoretical foundation for new research projects (Blaxter et al, 2006; Levy and Ellis, 2006; Pare et al, 2015; Vom Brocke et al, 2015; Webster and Watson, 2002). For the cloud research topic, the SLR was undertaken to understand and document the drivers, barriers, enablers and expected benefits of using cloud. This was used as input to the next phase. The composition and design of the focus group was intended to bring a diverse range of individuals from different backgrounds and experience together so that the subject matter being developed provides a good range of opinions. However, to maintain its focus the SLR was used to provide context and inform all participants of the key concepts and provide a theoretical background to ground the research and provide both a starting point, and a focal point if discussions need to be curtailed or brought back on track.

2.2 Focus group

Following on from the SLR, which grounded the discussion in key thinking and learnings in this area, the study used a qualitative research approach to develop a cloud survey instrument as part of a cloud adoption framework. The justification for the adoption of a focus group approach was based on the fact that focus groups are an effective method of gaining detailed information on a topic, in a relatively short space of time, that is cost effective in providing a broad range of information. A workgroup of industry experts and academic thought leaders in the area of cloud computing, collaboratively undertook the development process. This workgroup was comprised of members of a consortium of subject matter experts which include leading organizations from industry (including: Intel, The Boston Consulting Group, Ernst & Young, SQS, and Zilinx) and academia. The consortium used an open innovation model of collaboration that engaged with academia and industry in scholarly work to amalgamate leading academic theory with corporate thought leadership to advance practices for the migration to and the management of a cloud environment.

The focus group, comprising of eight subject matter experts, followed a development process with defined review stages and development activities that were based on the Design Science Research (DSR) guidelines (Hevner, 2004). The group met every week for two hours; there were six meetings in total. The overall aim of these meetings was to use the results from the SLR as input and for guidance to develop a cloud adoption framework that would utilize the body of knowledge contained in IT-CMF™. This required that members had expert knowledge in cloud computing and some knowledge of IT-CMF™. The primary objective of this phase was to produce a cloud adoption framework that would assess the maturity of an organization to migrate and manage a cloud environment. For example, to assess its maturity on: cloud strategy, cloud security, the ability to select and manage cloud service providers, and so on.

2.3 Semi-structured interviews

The next phase used semi-structured interviews as they can provide reliable, comparable qualitative data, they encourage two-way communication, and although they often confirm what is already known they provide the opportunity for learning and enhancement. Often the information obtained from semi-structured interviews will provide not just answers, but the reasons for the answers (Cohen 2006). Although the focus group approach generates the required detailed information in a cost effective and timely manner, it is important that this information is applicable to a broad set of requirements so semi-structured interviews were used to test and

validate the cloud adoption framework that was produced by the focus group, with the objective to produce an output that could be logically assumed to be representative of a broader population (Kallio, 2016).

Selected members of the consortium that were not involved in the focus groups were interviewed to solicit their feedback. Semi-structured interviews with cloud stakeholders across six organizations were conducted to capture the views of key domain experts and to understand current best practices in managing cloud projects. These included organizations that had both successfully delivered, and those who had failed to deliver, cloud-based projects. The interview approach enabled depth, nuance and complexity to be captured (Mason, 2002), and the insights gathered were used to inform and revise the development of the cloud adoption framework. The sample selected was predominantly CIOs and technical cloud experts from a balanced number of public/private organizations, large/small companies, covering a range of geographies and industries.

2.4 Pilot

The final phase was to pilot the cloud survey instrument with several selected partners, that used the complete end to end process, to test, validate, and make appropriate improvements, before a final release. The pilot consisted of an initial information meeting to explain the background and purpose. Then a number of key personnel from several organizations who had a specific interest in cloud, completed the cloud survey, the results were analysed, a report was provided, and suggested next steps were proposed based on the findings, with a view to developing an improvement program.

2.5 Utilisation of the focus group approach

Information technology has become a pervasive aspect of business in most organizations, across all sectors, and on a global scale. IT has also dramatically shifted roles, moving from automating back-office processes to becoming a strategic enabler of new offerings and new ways of doing business. Whereas this shift has resulted in many benefits—from a record rise in employee productivity to the creation of innovative new products and services that would have been impossible a decade ago—IT's coming of age has also brought new challenges (Voloudakis, 2015). Due to these challenges and the rapidly changing role of IT, it is imperative that a proactive approach is adopted in an effort to keep the content up-to-date. In order to fulfill these requirements a focus group methodology is used as follows:

- Initially, a moderator is identified and selected based on their knowledge of the subject matter area under investigation.
- Once the moderator is in place, a SLR is undertaken on the research topic. This forms the basis of any future discussions. Generally it serves to summarise the topic, highlighting strengths, weaknesses, and areas that need particular or further attention.
- The SLR is used as a starting point for the focus group and is typically used as a way of grounding the group, bringing them back to core topics, acting as a sanity check, and to validate any new ideas and concepts. This can be an iterative process, for example, when an idea or concept emerges within the focus group that is not covered by the SLR, further research or discussion may be undertaken.
- Once the SLR is complete, the moderator identifies potential candidates for the focus group. Fortunately this research engages with a large ecosystem and by using their communication channels (for example blogs, twitter) they can request that people who are interested in contributing and developing the research topic, to contact the moderator. The moderator then selects people based on their knowledge and background, the industry they represent, their geographic location and so on. The most important selection criteria is the level of domain-specific knowledge, followed by their availability.
- Once six to eight people are selected an initial meeting is convened to agree the rules, timetable, and the purpose of the focus group. Once this is in place regular meetings are conducted in person if possible; if not, then most people will meet face to face with the others joining via Skype/video links. Each meeting has a moderator who chairs and controls the meeting, a minute taker and in some cases a facilitator (to provide extra support). This sub-team will ensure that nothing is missed and that everyone is treated equally. This focus group methodology has been used over many years so when new topics need to be researched, it is very likely that members with previous experience will join the group. This greatly enhances the smooth running of the group and is a significant advantage in bringing new members up to speed.

3. Findings / results

During the focus group phase, data was collected, by a separate team of researchers who recorded, analysed and documented the approach, to determine if focus groups provided a suitable methodology for this particular type of research. The opportunity was also taken to gather any potential learnings on how the focus group methodology could be improved. The findings of this research versus the advantages and disadvantages of focus groups, as drawn from the literature is presented in Tables 1 and 2 below:

Table 1: Focus group advantages (adapted from Carey & Smith 1994; Barbour 2007; Stewart et al. 2014; Davidson et al. 2010)

Focus Group Advantages	Findings in respect of this cloud research
The interaction between participants stimulates new ideas and concepts; it adds richness to the data that may be missed in individual interviews, generally referred to as 'the group effect'.	This was the most significant advantage as initial thoughts were developed into ideas, concepts, and constructs that addressed the specific cloud requirements. The dynamic of the group often brought out new aspects or new information about the cloud subject matter.
The direct interaction between participants facilitates quick and easy clarification, for follow-up questions and the probing of responses. In addition, it is possible to observe non-verbal responses such as smiles, frowns and so forth, which can supplement the verbal responses.	This was a key advantage, as all participants could quickly get clarity on any relevant issue. The moderator could observe participants, and make the necessary adjustments to ensure a more successful outcome. For example, to intervene if one participant was dominating, or to observe peoples body language to detect when a participant needed to be encouraged to offer an opinion.
Relatively low cost, compared to other methods.	The cost to set up, run and produce results was minimal, compared to alternative methodologies. To facilitate participants, and to keep cost low, skype/video links were used to avoid all members needing to travel to the one location.
The focus group methodology is easy to use.	The focus group methodology was very easy to use, which was due in part to how the sessions were organised. Prior experience of running focus groups demonstrated that a good moderator, coupled with an agreed set of rules greatly increased the chances of a successful outcome.
The focus group approach allows the required information to be gathered very quickly, when compared to other methodologies.	A very large amount of in-depth information was gathered over a six-week period, which allowed the project to proceed more quickly than other methods.
Focus groups provide concentrated amounts of rich data, in participants' own words, on precisely the topic of interest.	The correct amount of relevant data was collected on the desired topic. However, at times it was a challenge to summarize the information without losing its depth and breath. This particular issue was catered for by agreeing to record the meetings.
All of the required information and data is easy to understand, interpret and analyse.	The focus group allowed all of the key information to be recorded and verified with the participants. It allowed all subsequent analyses to be validated, either at the next meeting or via e-mail.

Table 2: Focus group dis-advantages (adapted from Carey & Smith 1994; Barbour 2007; Stewart et al. 2014; Davidson et al. 2010)

Focus Group Dis-Advantages	Findings in respect of this cloud research
The approach demands a good moderator/facilitator.	An experienced moderator was used and was key to a successful outcome.
A moderator can introduce bias.	Either purposely or inadvertently the moderator can introduce a bias. The composition of the group, the agreed rules and the activities of the focus group helped to keep this to a minimum.
It can be difficult to generalize the outcome to apply to a larger context, due to the small size of the group.	The size of the group did not by itself make it difficult to apply to a larger context. However, to help maximize the applicability of the output, careful consideration was given to the composition of the group and the output was independently validated as described in section 2 – <i>Pilot</i> above.

Focus Group Dis-Advantages	Findings in respect of this cloud research
There can be less control over the output and the data generated, when compared to other methods.	The moderator facilitated discussion and encouraged interaction among the participants, that allowed for variation and for participants to go off-script, whilst still guiding the conversation to the overall objectives. This resulted in information and data that was directly relevant to the cloud requirements.
Group dynamics can be a challenge, particularly if the moderator is inexperienced.	This was handled by using an initial start-up meeting to agree the rules, the purpose, and overall agenda for the complete project.
It can be an effort to assemble the group.	To get the right mix of people and to have them available at the same time was a challenge and took longer than anticipated. One key learning was to avoid making up the participant numbers, just for the sake of it.
Members tend to act as a group, so are not truly independent of one another.	The group did have its own dynamic but its composition and the maturity of the participants maintained a reasonably independent stance, that catered for divergent opinions, that were subsequently validated by a wider audience.
Results can be biased towards dominant member(s).	There were dominant and more vocal members but the moderator and the agreed rules kept any bias to a minimum.
Focus groups tend to be open ended so summarization and interpretation can be difficult.	Each meeting had an agreed agenda with a set time for summation at the end. When there was not enough time to reach a conclusion or further research was needed, a sub group was used to propose a position, that was circulated for discussion for the next group meeting.

4. Discussion

It's not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change (Megginson, 1964)

In general terms the overall approach as described in this paper demonstrates the advantages of the focus group approach (as outlined in Table 1) including ease of use, effective stimulation of new ideas and concepts and the generation of rich data, the facilitation of quick and easy clarification of issues, the expedient gathering of data that is easy to understand, interpret and analyse.

There are disadvantages to using the focus group approach (as outlined in Table 2) but the study showed that they could be negated as follows:

- Using an experienced moderator. When one is not available, this can be compensated for, by using experienced participants that have attended previous focus groups.
- The issues with bias, either with the moderator, dominant members, and 'group think' is countered by a number of factors, starting with the input from the SLR which provides focus and an anchor point, followed by the way the meeting is structured, and lastly the previous experience of both the moderator and the other group members.
- Assembling a group for research is not a problem, as IVI's large membership is used to identify and recruit members for the focus group. The reality is that in most instances the focus groups are oversubscribed. In many cases the focus group is initiated by an individual or a group of members who require a solution to a particular problem, so assembling a focus group is rarely an issue.
- The potential problem with summarization and interpretation is dealt with by having a good meeting structure, and by using a minute taker and facilitator. The applicability to a broader IT audience is catered for by using a SLR, the careful selection of group members, and by using semi-structured interviews and a pilot after the focus group phase.

Experience has shown that there were very few instances where the focus group could not be effectively applied, and when it has occurred the learnings have been documented and used to improve to process.

This research was undertaken to primarily validate the use of a focus group methodology within a small number of organizations and although it has demonstrated that it delivers the intended requirements, the findings are limited by its applicability to these specific organizations. Great care should be taken in extrapolating the findings to cover a broader set of organizations and projects, however, the results can readily be used to contrast and compare findings from similar research projects.

5. Conclusion

This paper has examined the merits and limitations of using a focus group approach in the development of a survey instrument as a key component of a cloud adoption framework. Despite the existence of some challenges, the findings suggest that by adopting a focus group methodology as a part of a specific research study, fulfils the requirements for speed, cost, quality and so on. Furthermore, the study has highlighted the following key learnings that can be used to help improve the use of focus groups and to negate the possible disadvantages of bias, lack of applicability to a broader domain, and the difficulty in summarizing and interpreting the results. These learnings are as follows:

- A key requirement is the identification and use of an experienced moderator. If this is not possible, it can be compensated by the use of experienced participants and the use of a facilitator and minute taker.
- The best results were achieved by adopting the focus group to the specific needs of the research organization, in this instance IVI™, who adopted and used the method as follows:
- *A lot effort was taken to select the appropriate members for the focus group. Consideration was given to the expertise and availability of focus group members and their previous participation in similar groups.*
- *A SLR was conducted to provide input to the focus group which saved time and anchored the group throughout their meetings and discussions.*
- *Meetings were conducted using a combination of face-to-face, combined with on-line participation.*
- *Once the focus group was completed, further interviews and pilots were used to validate the output and ensure it was applicable to a broad IT audience.*

The obvious limitation of this study is that it is a single case study, so a cross examination of findings encountered across several research projects may lead to richer and more perceptive insights. Future research may also examine the application of a focus group methodology across a range of diverse and complex projects incorporating multiple academics and practitioners.

Focus group methodology is only as useful and as strong as its link to the underlying research question and the rigor with which it is applied (Bar-Din Kimel, 2003; Daneva, 2013)

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Grounded Theory Approach in Recent Engineering Management Studies

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Abstract: Engineering Management is a broad field whose concern is the application of engineering principles for effective planning and operations efficiency in managing manufacturing or industrial operations. Since the 1970's, qualitative studies are increasingly emerging in the engineering domain. Qualitative Grounded Theory emerged in the early 1960's and it has been developed and expanded since then. It is a qualitative approach and inductive methodology through which it is possible to develop a theory based on data which were collected and analyzed systematically. Methods in Grounded Theory consist of systematic and flexible protocols for collecting and analyzing qualitative data. This study aims to analyze Engineering Management studies that used Grounded Theory as a research approach. The purpose is also to identify how grounded theory has been dealt with in recent Engineering Management literature (peer-reviewed journals) by searching the New Technology and Engineering (ANTE), a ProQuest's database. Publications were refined to more recent articles. Twenty-nine articles were retrieved for further analysis. Collected data were firstly descriptively analyzed and then interpreted by content analysis. Forty-nine authors were identified, whose institutional affiliations are from 13 countries. Authors whose institutions are from the United States of America, the United Kingdom and the Netherlands are the most frequent in the collected sample. The keywords that could be most frequently observed are 'knowledge management', 'studies', and 'supply chain management'. The most used data-gathering technique was the interview, present in almost half of articles. Twenty-eight articles applied Grounded Theory in exploratory approaches and the remainders adopted it to develop new conceptual models – a framework to identify the patterns and drivers of food waste and a model on how business managers perceive employee's attitudes. Studies about grounded theory, in general, contribute to disseminating new methodological approaches. In the context of Engineering Management, these studies can yield new research areas and also enhance methodological possibilities for researchers. The outlets of this paper may contribute to the growing body of literature in Engineering Management associate with Grounded Theory domains.

Keywords: engineering management, grounded theory, qualitative research

1. Introduction

Engineering Management is a broad field whose concern is the application of engineering principles for effective planning and operations efficiency in managing manufacturing or industrial operations (Lannes, 2001). Qualitative analysis may be usually harder than quantitative and qualitative results are sometimes considered more "muddy" than quantitative, especially in technical communities (Barbosa, 2017). The predominance of the positivist approach has been discussed in the research's domain, where a functionalist view is understood as a main epistemological research (Charmaz, 2006). It is possible to verify since the 1970's, qualitative studies are increasingly emerging in scientific domain (Bryman, 1989). During the last few years, the amount of researchers who explore human and social aspects in engineering has increased through the application of qualitative approaches, including Grounded Theory (GT) (Hoda, Noble & Marshall, 2012).

GT emerged in the early 1960's and it has been developed and expanded since then. Petrini & Pozzebon (2009) state that those studies would be extremely advantageous with the adoption of more inductive research methods without, however, sacrificing the required methodological rigor to scientific research. Grounded theorists start with data constructed through observations, interactions, and materials about the subject or setting (Charmaz, 2006). Empirical events and experiences may be considered regarding the analytic ideas they may foster, with the additional advantage of containing explicit guidelines to carry out the research.

GT is a relatively new and adaptable qualitative research method, which is able to explain the studied processes with flexibility and accuracy (Charmaz, 2006). Gathering data is the first step which explains why it is crucial to operate the most suitable tools contemplating the research purpose. The quality and credibility of a study starts with the data, as well as the depth and scope of the data make all the difference. Data collection, ethnography, intensive interviewing, and textual analysis are some of the possible methods, which must be continuously reviewed during the entire research process. After being gathered, the data must be coded. In the first stage, the researcher thoroughly studies the data. In a second stage, it is fundamental selecting meaningful and relevant cores in order to categorize them. Categories may be created by observing the research goals.

Charmaz (2006) argues memo-writing is the next step, which consists in extensive memos that will form the core of the GT, providing a record of the research and analytic progress. By reviewing memos researchers are able to identify how accurate and reliable are the categories created. According to the previous author, this process is called theoretical sampling, and it is a movement back and forth between category and data in theoretical sampling fosters raising the conceptual level of categories elected and extending their reach. This stage must go on until the data saturates. Finally, the last stage is writing a draft of the theory. Thus, the final goal of GT is creating a theory as an interrelated set of hypotheses generated by constant comparison of data at increasing levels of abstraction (Barbosa, 2017).

Development in Science should be global and collaborative and peer reviewed journals are formal vehicles for communication in this field, configuring important tools to measure the development of a particular knowledge domain. They can be understood as an interconnected information system, which more than communicating research results to interested recipients, they are a mean to provide decision support to research administrations (Björk 2007).

A large part of this communication process takes place as a distributed peer production process. Thus, it is not a coincidence there is even an open access peer-reviewed journal, "The Grounded Theory Review", created in 1999 and published by Sociology Press to share results and demonstrate the interdisciplinary potential of the grounded theory method (Ulrichweb, 2018).

Within this context, this paper aims to analyze Engineering Management publications that adopted GT as a research approach. Thus, this paper identifies how grounded theory has been dealt through a sample of recent Engineering Management literature.

2. Methodological procedures

This is an exploratory study, which consists of a theoretical research through a literature review. In order to identify how grounded theory (GT) has been dealt with in recent engineering management literature, articles from peer-reviewed journals were retrieved by firstly searching the New Technology and Engineering (ANTE), a ProQuest's database. This database was chosen by considering indexed journals, focused in the field of engineering. Keywords and strings used in the search were: "Grounded Theory" (in abstracts) AND "management" (in article's titles), more recently published (2016 and 2017). The retrieving strategy applied is illustrated in the Figure 1.

The articles were retrieved and descriptively analyzed. Then, they were interpreted through content analysis considering specially their methodology sections.

As a research method, this approach is a systematic and objective mean of describing and quantifying phenomena, reducing findings to concepts that describe the researched topic by creating categories. Thus, content analysis was developed comprising the following main steps (Bardin, 2009):

- a) Pre-analysis, which consists of the selected body to be analyzed and its detailed reading;
- b) Encoding, transforming of raw data from body and distinguishing units (words and sentences) and to the rules for enumeration (presence or absence of GT approach);
- c) Categorization, organization phase and classification of the body on a set of significant number of units of record (the codes). This work categorized the applied GT approaches considering the four main categories of grounded theory based on Evans' study (2013).
- d) Interpretation, which consists of the inferential process.

Having outlined the research methods, attention is turned to the results, presented next.

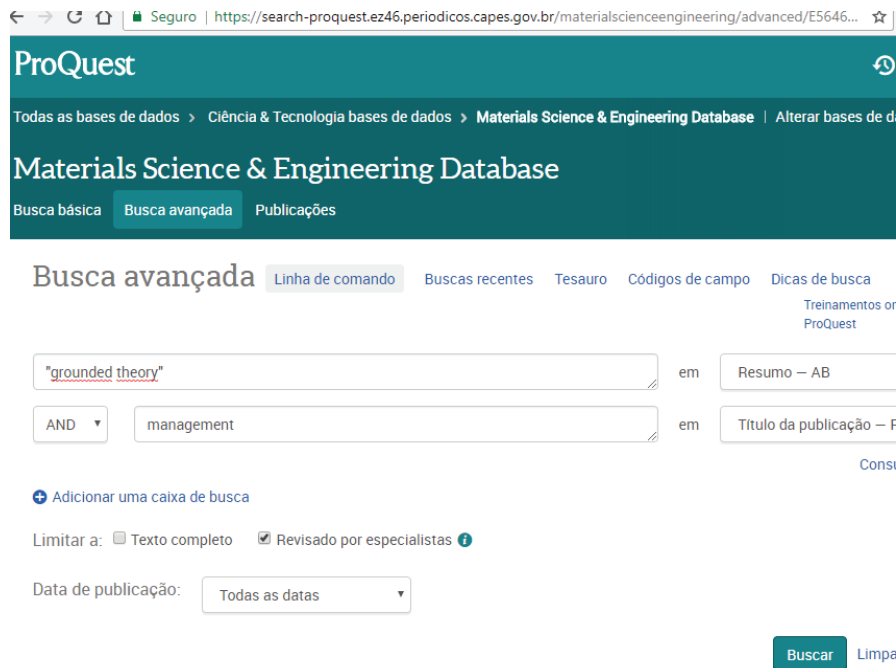


Figure 1: Retrieving strategy at ANTE’s Brazilian interface

3. Findings

The 29 articles retrieved consisted to 49 authors, whose institutional affiliations were from 13 countries (the United States of America, United Kingdom, Netherlands, Hong Kong, Canada, China, Island, Oman, Finland, Norway, South Africa, Australia, and Ireland). Most authors were from the United States of America (10), the United Kingdom (8), and the Netherlands (6). Table 1 shows the authors and the main focus of the papers in the sample under study. Appendix 1 shows the full references of these 29 publications.

Table 1: Authors and the main paper subject

N.	Author(s)	Main subject
1	Akhavan, Peyman; Nabizadeh, Masoumeh; Rajabion, Lila	Knowledge management pattern
2	Al Saifi, Said Abdullah; Dillon, Stuart; McQueen, Robert	Management Support and Knowledge Sharing
3	Banaeianjahromi, Negin; Smolander, Kari	Enterprise integration
4	Biemans, Wim G; Griffin, Abbie; Moenaert, Rudy K	New service development
5	Boyle, Frank; Thomson, Craig	Social housing
6	Bramwell, Donna; Sanders, Caroline; Rogers, Anne	Tightrope walking
7	Caro, Denis HJ	Transformational leadership
8	Chan, Albert PC; Wong, Francis KW; Hon, Carol KH; Ali Javed, Arshad; Lyu, Sainan	Construction safety and health problems
9	Elahi, Sha'ban; Norouzi, Naser; Hajihoseini, Hojat; Hasanzadeh, Alireza	Science and technology policy cycle
10	Fan, Ying; Niu, Run Hong	Service recovery strategies using social media
11	Gibson, Trish; Kerr, Donald; Fisher, Ron	Supply chain management learning
12	Hassan Amar; Haag, Markus	Virtual-Agile IT Projects
13	Ho, Paul H. K.	Construction industry
14	Jia, Andrea Yunyan; Rowlinson, Steve; Loosemore, Martin; Xu, Mengnan; Li, Baizhan; Gibb, Alistair	Construction safety management
15	Lager, Thomas; Samuelsson, Peter; Storm, Per	Generic production capabilities
16	Little, Todd A.; Deokar, Amit V.	Knowledge creation and knowledge-intensive business processes

N.	Author(s)	Main subject
17	Morrow, Susan; Hare, Billy; Cameron, Iain	Design engineers' perception of health and safety
18	Olafsdottir, Anna Hulda; Stefansson, Gunnar; Ingason, Helgi Thor	Group model building
19	Packirisamy, Premalatha; Meenakshy, Manju; Jagannathan, Srinath	Career Burnout
20	Papargyropoulou, Effie; Wright, Nigel; Lozano, Rodrigo; Steinberger, Julia; Padfield, Rory; Ujang, Zaini	Food waste
21	Rathi, Dinesh; Given, Lisa M.; Forcier, Eric	Knowledge needs in the non-profit sector
22	Raza, Douglas N; Kilbourn, Peter J	Clothing retail industry
23	Rivera, Liliana; Gligor, David; Sheffi, Yossi	Logistics clustering
24	Rose, William J; Mollenkopf, Diane A; Autry, Chad W.; Bell, John E.	Urban institutional pressures on logistics service providers
25	Seneviratne, Krisanthi; Amaratunga, Dilanthi; Haigh, Richard	Managing housing needs
26	Siddique, L; Hussein, B A	Agile Software Projects
27	Van den Heuvel, Sjoerd; Schalk, Rene; Freese, Charissa; Timmerman, Volken	Psychological contract on attitude towards change
28	Voordijk, Hans; Adriaanse, Arjen	Construction management research
29	Xu, Nana; Xu, Yusen	Reverse innovation

One hundred seven keywords were identified. Others most frequent than “Grounded Theory” (7) were: ‘Knowledge management’ (6), ‘studies’ (4), and ‘supply chain management’ (3). Table 2 shows the article’s objective and some aspects of GT application and categories.

Studies were categorized considering the four main categories of grounded theory registered by Evans’ study (2013): Classic Grounded Theory, Straussian Grounded Theory, Constructivist Grounded Theory, and Feminist Grounded Theory.

Classic Grounded Theory (CGT) has its grounding in the original work of Glaser and Strauss (1965, 1967). There are two types of coding in CGT: substantive coding and theoretical coding, with the former preceding the latter. Data must be compared on as many dimensions as possible. Induction is a key process with deduction, which occurs when questions and patterns emerge and allow a movement from generalization to theory. (Evans, 2013).

Constructivist Grounded Theory began in sociology field and its coding process three types of coding: open, focused, and theoretical. Constructivist methodology deals with the conflict of potential bias of the researcher and not a direct attack on the philosophy of grounded theory (Evans, 2013). The Straussian Grounded Theory used a three stage coding methodology of open coding, axial coding, and selective coding. The previous cited author also puts forward 11 procedures to follow their prescriptive method. A difference between Straussian theory and CGT is in the use of literature. Corbin and Strauss (1990) incorporated were to the coding structure adding more procedures on how to code and structure the data (Evans, 2013). Feminist Grounded Theory was developed considering a feminist perspective, initially at nursing field; it is not a method. Thus, there is no preference among Straussian, CGT, or constructivist grounded theory methodologies (Evans, 2013).

Evans (2013) states the discussions about process and methods have created the highest level of debate for users of grounded theory. Table 2 shows data from the 29 publications in engineering management.

Table 2: Publications’ purpose, grounded theory application and its categories

N.	Purpose	GT application	GT Category (Evans, 2013)
1	To deal with the gap of knowledge management pattern at national level based on real experiences.	Gathering and analyzing data. Data have been categorized and analyzed from case studies (at countries level) using the steps of this method.	Not identified
2	To explore the relationship between face-to-face social networks and knowledge sharing.	Analyzing the 25 semi-structured interviews data using Nvivo. Analyzed qualitative data gathered through semi-structured interviews supported by nvivo qualitative data analysis software.	Straussian

N.	Purpose	GT application	GT Category (Evans, 2013)
3	To survey and analyze the available literature on determining the role of EA in EI and also to identify gaps and state-of-the-art in research.	GT is not applied in this study. Through a systematic literature review, the paper identifies that GT is the least employed research method in the literature sample.	None
4	To analyze 230 empirical articles on NSD, published over a period of 30 years.	Creating initial understanding, many of the early researchers applied the concepts, frameworks, and methods used to understand NPD to the NSD domain.	Classic
5	To explore the adaptability of the existing social housing stock and how it relates to the requirements and preferences of the ageing population.	Following a constructivist grounded theory approach, key themes emerge through consultation with a working group	Constructivist
6	To explore employer and manager's perspectives of supporting those with LTCs as any successful workplace engagement will largely be influenced by their readiness to be supportive.	Semi-structured in-depth interviews were conducted with employers' and managers' from a range of organizations. Comparative analysis of the data was guided and informed by grounded theory principles.	Constructivist
7	To explore the process of conflicts in agile software projects.	Analyzing data and interview findings. The interview data suggested several possible sources of conflicts in agile software projects. It concludes that GT research is strongly context specific and, therefore, it cannot be generalized to a large population.	Straussian
8	To identify and rank according to severity the safety and health-related problems confronted by ethnic minority (EM) construction workers.	Constructing the main categories and subcategories of the construction safety and health problems of EM workers. Qualitative analysis software QSR NVivo 10 was used to aid the coding process.	Straussian
9	To propose a five-step procedure for the ex-ante science and technology policy assessment in the policy cycle.	Conducting interviews and document reviews.	Not identified
10	To explore influencing factors that affect the effectiveness of service recovery strategies using social network from operations management perspective.	Conducting qualitative analysis on data collection using NVivo 9. It investigates the service recovery process using social media from an operations-oriented perspective.	Straussian
11	To discuss an Australian university-industry collaboration aimed at accelerating SCM learning and to offer some insight into models for building a forward-looking SCM.	Developing exploratory case study of the industry-university collaboration, using grounded theory procedures.	Straussian
12	To explore some useful practices undertaken in IT industry to deal with such criticalities.	Generating emerging themes recognized as codes or concepts.	Straussian
13	To identify practicable strategies for resolving construction industry problems, assess the effectiveness of these identified strategies and finally develop a conceptual labour supply model.	Grounded theory approach was adopted to develop a labour supply theory.	Classic

N.	Purpose	GT application	GT Category (Evans, 2013)
14	To explore the gap between behavior safety and its unsatisfactory outcomes.	Focusing on conceptualization.	Not identified
15	To discuss manufacturing strategies within companies.	GT approach, with inspiration from configuration modelling, attempted to characterize the material transformation system as a set of variables.	Classic
16	To investigate knowledge creation in the context of knowledge-intensive business processes (KIBPs) and seeks to identify the challenges and opportunities associated with this phenomenon	Developing a framework based on 30 interviews across three different types of organizations.	Constructivist
17	To consider design engineers' perception of health and safety and its impact on their behavior during design activity.	Interviewing and categorization. GT method best served the purpose for exploring the issue of health and safety through design and to bring new understanding from the design engineer's perspective thus, discovering the problem area which exists for the participants and what is relevant for them.	Classic
18	To study how eight participants in group model-building (GMB) experienced the process and to increase understanding of the value of the method	Strategies were coded and analyzed and a theoretical model of the value of GMB was developed, evolved from Corbin's and Strauss' framework of generic relationships.	Classic
19	To explore the phenomenon of burnout during early career among knowledge workers in information technology services industry in a developing country (India).	GT analytical procedures - open, axial and selective coding - were used to analyze and interpret the interview narrative.	Classic
20	To propose a novel conceptual framework to identify and explain the patterns and drivers of food waste generation in the hospitality sector, with the aim of identifying food waste prevention measures.	Developing a conceptual framework which integrates data collection and analysis methods from ethnography and grounded theory.	Constructivist
21	To present findings from a study of non-profit organizations.	Qualitative data were analyzed using grounded theory approach, and identified five major categories and multiple sub-categories. GT supports the development and evaluation of categories and emergent theoretical models through the empirical analysis of qualitative data.	Straussian
22	To determine the extent to which South African clothing retailers use POS data in demand planning.	Data collected was analyzed following grounded theory analysis using codes that resulted in various categories which then developed into themes. Interviews were coded using a computer-assisted qualitative data analysis software (Atlas.ti).	Classic
23	To analyze the benefits of logistics clustering.	Employed a grounded theory approach and conducted 135 open and semi-structured interviews with logistics executives, government officials, academics, and chambers of commerce representatives.	Straussian
24	To identify the approaches used by urban logistics service providers to overcome the issues resulting from urban density and complexity.	Uncovering the approaches utilized by logistics service providers to adapt to urban environments.	Straussian

N.	Purpose	GT application	GT Category (Evans, 2013)
25	To explore how such housing needs can be effectively managed in post conflict housing reconstruction in Sri Lanka.	Data were analyzed using open, axial and selective coding to develop the theoretical framework.	Straussian
26	To explore the leadership challenges in emergency management systems in a developed country (Canada).	Positing a theory of transformational emergency systems leadership.	Constructivist
27	To develop a model on how business managers perceive that an employee's psychological contract influences his or her attitude toward an organizational change.	Data were collected from in-depth interviews. Development of a conceptual model based on detailed grounded theory-driven analyses of the qualitative data.	Straussian
28	To explore what engaged scholarship (ES) could mean for construction management research in facilitating interactions between practice and theory.	Developing a model to understand and explain why individuals and organizations are (not) using ICT in the intended way.	Straussian
29	To reveal the key success factors and the realization mechanism of reverse innovation of the latecomer engineering and technical services enterprise.	Analyzing the phenomenon, collating the results, mining through the systematic data and verifying the theory temporarily. Open coding, axial coding and selective coding.	Classic

Note: where indicated 'not identified', the full papers were not available

As can be seen in Table 2, GT was adopted in different topics of engineering management fields and with varied purposes. The most used data-gathering technique in those studies was the interview, present in about 40% of articles. Almost all publications applied Grounded Theory in exploratory approaches and only one adopted it to develop new conceptual models – a framework to identify the patterns and drivers of food waste and a model on how business managers perceive employee's attitudes. Four studies applied GT supported by the software Nvivo, a tool for qualitative analysis. The software Atlas.ti also supported one of the studies. For being a research method that yields much data, software may help researchers on organizing and registering data collection, concepts, and categories (Barbosa, 2017).

After categorization process, 12 papers designed their methodological procedures through a Straussian GT approach. In this case, hypotheses about relationships among categories were developed and verified during the research process. There is axial and selective coding (Evans, 2013). Eight studies applied a classic GT conception. This approach applies substantive and theoretical coding and the resulting theory needs to come from the data, although literature review could be viewed as another aspect of the data. Thus, difference between Straussian GT and Classic GT is in the use of literature (Evans, 2013). Five studies adopt constructivist GT. In this sub-sample, research begins with a review of the literature to determine what has been done before in the area of interest. In this kind of GT, there are three types of coding: open, focused, and theoretical (Evans, 2013).

Three articles were not categorized because they were not available in their full version. None of the sample's studies presented a gender perspective for a feminist grounded theory. In six articles within the sample, researchers explicitly reported executing the coding process. Because GT is a method that seeks a theory that emerges from the data, and due to the fact that there is no obligation to achieve such goal, it is understood that this is not a fault in its application. In addition, some authors are not very explicit about the development of the method.

4. Conclusion

This exploratory work presents a sample of Engineering Management studies that used Grounded Theory as a research approach. Studies about grounded theory, in general, contribute to disseminating new methodological approaches. Developing research supported by GT also may contribute to extend inferences in a variety of

domains. In the context of Engineering Management, these studies can yield new research areas and amplify methodological possibilities for researchers. The outcomes of this paper may contribute to the growing body of literature in Engineering Management and Grounded Theory field. For future work, this research will expand the retrieval strategy by including more databases in order to examine more precisely how GT have been applied in the Engineering Management discipline. Furthermore, it is effective exploring the different types of grounded theory methods in order to enhance understanding the one that best fits the research project.

Appendix 1: Full list of papers in the sample

- Akhavan, P. Nabizadeh, M. Rajabion, L. (2017) "Introducing knowledge management pattern at national level applying grounded theory method and fuzzy dematel", *VINE Journal of Information and Knowledge Management Systems*, vol. 47, no. 3, pp.372-394.
- Al Saifi, S. A. Dillon, S. McQueen, R. (2016) "The relationship between face to face social networks and knowledge sharing: an exploratory study of manufacturing firms", *Journal of Knowledge Management*, vol. 20, no. 2, pp.308-326.
- Banaeianjahromi, N. Smolander, K. (2016) "What do we know about the role of enterprise architecture in enterprise integration? A systematic mapping study", *Journal of Enterprise Information Management*, vol. 29 no. 1, pp.140-164.
- Biemans, W. G. Griffin, A. & Moenaert, R. K. (2016) "Perspective: New Service Development: How the Field Developed, Its Current Status and Recommendations for Moving the Field Forward", *Journal of Product Innovation Management*, vol. 33, no. 4, pp. 382–397.
- Boyle, Frank; Thomson, Craig (2016) "Establishing an evidence base for adapting social housing for an ageing population", *Journal of Financial Management of Property and Construction*, vol. 21, no. 2, pp.137-159.
- Bramwell, D. Sanders, C. & Rogers, A. (2016) "A case of tightrope walking: An exploration of the role of employers and managers in supporting people with long-term conditions in the workplace", *International Journal of Workplace Health Management*, vol. 9, no. 2, pp.238-250.
- Caro, D. I. (2016) "Towards transformational leadership: the nexus of emergency management systems in Canada", *International Journal Emergency Management*, vol. 12, no. 2.
- Chan, A. Wong, F. Hon, C. Ali Javed, A. & Lyu, S. (2017) "Construction safety and health problems of ethnic minority workers in Hong Kong", *Engineering, Construction and Architectural Management*, vol. 24, no. 6, pp.901-919.
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- Fan, Y. & Niu, R. H. (2016) "To tweet or not to tweet? Exploring the effectiveness of service recovery strategies using social media", *International Journal of Operations & Production Management*, vol. 36, no. 9, pp.1014-1036.
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- Hassan, A. Haag, M. (2017) "Exploring the Critical Success Factors of Virtual-Agile IT Projects: A Grounded Theory Study", *International Journal of Innovation, Management and Technology*, vol. 8, no. 6, pp. 427-434.
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- Lager, T. Samuelsson, P. Storm, P. (2017) "Modelling company generic production capabilities in process industries: A configuration approach", *International Journal of Operations & Production Management*, vol. 37, no. 2, pp.126-161.
- Little, T. A. Deokar, A. V. (2016) "Understanding knowledge creation in the context of knowledge-intensive business processes", *Journal of Knowledge Management*, vol. 20, no. 5, pp. 858-879.
- Morrow, S. Hare, B. Cameron, I. (2016) "Design engineers' perception of health and safety and its impact in the design process", *Engineering, Construction and Architectural Management*, vol. 23, no. 1, pp.40-59.
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Utilisation of a Sequential Mixed Methods Research Approach in Examining SME Digitization

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Abstract: This paper seeks to discuss and justify the sequential mixed methods approach adopted in a research project into SME digitization to be undertaken in the Republic of Ireland, Northern Ireland and England. The aim of the research is to determine the drivers, challenges, approach and the impact derived from digitization by small and medium sized enterprises (SMEs). The research design and methods chosen will ultimately be influenced by the need to effectively answer the study's objectives and questions (Woolley, 2008). Mixed methods research tends to follow a pattern of 'what' and 'how' or 'what' and 'why' and both qualitative and quantitative approaches are constructive in that they provide researchers with a means of considering structures and processes. It establishes relations between variables and examines the reasons behind those relationships and effectively provides a way of bridging macro-micro levels of social analysis (Bryman, 1988; Bryman, 1992). Thus, quantitative and qualitative approaches are utilised to address different elements of the research problem in order to develop a fuller picture, and in this sense, are complementary to each other (Woolley, 2008). The initial stage of the research design takes the form of a macro level exploratory phase utilising an online quantitative survey questionnaire. The data and subsequent analysis will assist in the identification of the key issues upon which the next phase of the study will be based. Thereafter, the second methodological phase will adopt a qualitative (in-depth interview) approach in order to expand on the questions raised in the first phase (Creswell, 2009). This paper will address the dearth of IS research that employs a mixed methods approach and will provide insight and guidance on the value of up-front consideration of the research context. Further, guidance on the applicability of the sequential mixed methods approach in the design and subsequent ethical considerations aspects of this research will support future mixed methods studies.

Keywords: sequential mixed methods, digitization, SMEs

1. Introduction

"For those who still believe that digitization is about creating social media sites or developing a responsive website, here is the truth: Digital technologies will disrupt value chains, organizational structures, operational processes and revenue models. And they will change every industry and every company. Managing digital transformation will decide which businesses will survive and which not" (Torben, 2016).

Digitization through leveraging digital tools and technologies is having a profound effect on how business is currently being conducted. It has already had a significant disruptive influence on many industries (i.e. music, print media etc.) and is threatening to disrupt many others. The stakes are clearly high and some industries are more vulnerable than others. However, there are steps that organizations can take to increase their rewards and to decrease their risks (Wade, 2014). Digital transformation is the journey an organization takes in order to 'digitize'. However, whilst there is a lot of hype about the term 'digital transformation', it is rarely defined. For the purpose of this research, our definition is as follows:

"Digital business transformation is organizational change through the use of digital technologies and business models to improve performance" (Wade, 2014, p.3).

Whilst most organizations will accept that they are not fully 'digitized', it is fairly safe to assume that most have already adopted *some* form of digital technology e.g. a website or social media tools (Doherty et al, 2015). In a 2013 study of senior executives and management, it was found that achieving digital transformation within two years was critical to their organization's survival (Capgemini, 2013). However, this transformation - from adopting a small number of digital applications to becoming a truly 'digital enterprise' - is a real challenge that most organizations are struggling with (Doherty et al, 2015).

1.1 The research problem

This research seeks to understand the digitization experience of SMEs in the Republic of Ireland, Northern Ireland and England through addressing the following research objectives. To:

- identify the main drivers that impact upon digitization;
- discern the main constraints that impact upon digitization;
- explore the approach taken to digitization; and
- clarify the impact of digitization on the firm.

1.2 Setting for the research

The study is SME-specific in that firms must comply with the European Commission's (2005) criteria for an SME, whereby the number of employees must not exceed 250. Secondly, the firms are required to be located on the island of Ireland (both Northern Ireland and the Republic of Ireland) or England. This study also has an equal sectoral focus as it is widely accepted that some degree of digitization by SMEs, irrespective of the sector in which they operate, has a positive impact on their business activities (Lopez, 2014).

1.3 Justification for the research

- Research focus on SMEs
- Current gaps in academic research

1.3.1 Research focus on SMEs

SMEs are deemed crucial to the Republic of Ireland (ROI) and UK (including Northern Ireland) economies. 99 per cent of all companies in ROI employ less than 50 people and constitute approximately 69 per cent of the overall workforce (Merrion Street, 2016). Similarly, in the UK, SMEs account for 99% of all private sector businesses at the start of 2016, representing 60% of all private sector employment (BEIS, 2016).

1.3.2 Current gaps in academic research

Previous studies into organizational digitization have examined it primarily from a large firm perspective (Lopez, 2014; Andersson, and Tuddenham, 2014; Wade, 2014). However, given the importance of SMEs to the economy, it is important that research is undertaken in the SME context. This view is echoed by Brune, (2017);

"SMEs tend to see "digitize or die" as a problem only for large companies. We need to make them aware of the fact that digitization is their business."

2. Research design

"The quality of any research study does not so much depend on whether it is qualitative or quantitative but rather it depends on the quality of its design and how well it is conducted" (Blumberg et al, 2008, p.194).

A number of mixed methods approaches have emerged over the last number of years' such as sequential, concurrent and transformative (Tashakkori and Teddlie, 2003). For the purpose of this research, the sequential mixed methods (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2007) approach is adopted which aims to expand on the findings from one method with the method of another (Creswell, 2009). In this sequential mixed-methods design, the research will begin with a quantitative online survey. This phase was conceptualised from a theoretical base in order to ensure that the quantitative instrument employed in this process had prior validity and reliability (Morse 1991, Ramsey, 2005). The research approach will subsequently move into the qualitative phase of in-depth interviews (Creswell and Tashakkori, 2007). Together these mixed methodological phases are deemed the most effective to address the research objectives of the study. The macro level issues of SME digitization will be explored through the quantitative online survey approach, and will inform qualitative phase to examine the micro issues of digital transformation. There is an equal emphasis in terms of weighting (Creswell and Plano Clark, 2007) on both quantitative and qualitative methods, bearing in mind the research objectives.

2.1 Questionnaire design

The online survey questionnaire was designed with particular attention paid to the design of the questions, the structure of the questionnaire itself and the rigour of the pilot testing. Together these steps serve to ensure that the instrument is a valid and reliable tool (Saunders et al, 2016). Essentially, the questionnaire split each broad research question into a series of related questions.

2.1.1 Identification of the type of information required

Questionnaires offer an objective means of collecting information about people’s knowledge, beliefs attitudes, and behaviours (Boynton and Greenhalgh, 2004, p.1312).

A further strength of the survey for the collection of primary data is its versatility; many different types of abstract information can be gathered by questioning others. It is useful for learning about opinions, attitudes, intentions, expectations and information on past events (Blumberg et al, 2008). However, while both qualitative and quantitative approaches may answer these questions, surveying is more efficient and economical than observation and can reach geographical areas outside of what would otherwise be feasible due to restraints of time and budget (Blumberg et al, 2008).

2.1.2 Conceptualisation and operational definitions

The relationship between theoretical concepts and the research instrument is mediated by a conceptual framework (Ramsey, 2005; Saris and Gallhofer, 2007; Harrigan, 2008). Consequently, five key areas evolved that necessitated investigation in order to address the aims and objectives of the research;

- Business information and demographics;
- Business environment (inclusive of drivers and constraints);
- IT strategy (inclusive of drivers and constraints);
- Approach to digitization;
- Business value/impacts.

Inquiry into each of these areas necessitated the constructs to have operational definitions attributed to them (Blumberg et al, 2008) or to be operationalised (Hair et al., 2000; Harrigan, 2008). An operational definition is one which outlines explicit testing or measurement criteria (Blumberg et al, 2008). These criteria must be able to be counted, measured or the information must be able to be somehow gathered via our senses (Blumberg et al, 2008). The criteria must be so comprehensible and clear that any person using them again would classify the objects in the same way (Blumberg et al, 2008). Additionally, all measures utilised in this research are most suited to the nature of the research and from a theoretical perspective were intrinsically embedded in the SME, digitization literature.

2.1.3 Measurement scales

A fundamental component of survey (questionnaire) design is the effective development of measurement scales which will return or generate responses which are relevant, valuable and quantifiable for the purpose of the research (Harrigan, 2008; Saris and Gallhofer 2007; Ramsey, 2005). Following distillation of the literature pertinent to the research problem, it was considered appropriate to draw influence from constructs previously used in other SME, technology or firm digitization studies. See Table 1 below.

Table 1: Sources in development of questionnaire scales

Construct / Scale items	Source
Business information and demographics	Adapted from Ramsey et al. (2003); Harrigan et al (2008); Doherty (2012).
Business environment	Adapted from Arvidsson et al. (2014); Aloulou and Fayolle (2005); Peppard et al (2014); Peppard and Ward (2004); Wade (2014).
IT strategy	Adapted from Arvidsson et al. (2014); Bharadwaj et al, (2013); Mithas et al, (2013).
Approach to digitization	Adapted from Bharadwaj et al, (2013); Wade (2014); Arvidsson et al. (2014); Banfi et al, (2014).
Business value/impacts	Adapted from Bharadwaj et al, (2013); Banfi et al, (2014); Wade (2014); Arvidsson et al. (2014).

The constructs for the online survey were adopted/adapted from previous studies (see Table 1), providing stronger validation that the measures are ‘fit for purpose’ and also saves on valuable time and resources (Boynton and Greenhalgh, 2004). The questionnaire was made up of a combination of open, closed (questions), but mostly 7 point Likert scales were employed to address rating questions; that is those statements that required expression of either a favourable or an unfavourable attitude towards the area of interest (Blumberg et al, 2008). In accordance with Saunders et al, (2016) both positive and negative statements were used to ensure respondents considered the statement from different perspectives, and to avoid respondent ‘halo’ effect.

2.1.4 Validity, reliability and practicality of the survey instrument

“A valid questionnaire will enable accurate data to be collected, and one that is reliable will mean that these data are collected consistently” (Saunders et al, 2007, p.364).

According to Foddy (1994), central to the idea of validity and reliability is that the questions posed in the survey must make sense to the respondent and the answer given by the respondent must be understood by the researcher in the way in which it was intended. In addition to this, Blumberg et al (2008), contend that the survey must be easy and efficient to use. As such, there are three central criteria required to evaluate a measurement tool. They are validity, reliability and practicality as outlined in Table 2 below.

Table 2: Assessing the validity, reliability and practicality of the questionnaire (adapted from Blumberg et al, 2008; Harrigan, 2008 and Ramsey, 2005)

Internal / External	Validity/ Reliability / Practicality	Type	Definition	Assessment Criteria
Internal	Validity	Face validity	Are the measurement scales accurate?	Rigour of scale development approach Expert opinion Pre-testing and analysis
		Content validity	Do measures cover the range of meanings included within a concept?	Previous employment experience Literature review Expert opinion Pre-testing
		Criterion validity	Do measures correlate with other measures of the same construct?	Literature review Pre-testing and analysis
		Construct validity	Do measures produce results relevant to theoretical constructs?	Literature reviewing Pre-testing and analysis
External	Reliability	Reliability	Correspondence between independent but comparable measures of the same construct	Confirmatory and complementary constructs in the questionnaire Multiple indicators in questionnaire
	Practicality	Economy	Trade off between ideal research project and budget	Number of measures in survey Length of interviews etc. Size of sample
		Convenience	Ease of administration of survey	Set of detailed instructions with examples Clever design and layout
		Interpretability	Interpretation (by persons other than test designer) of results	Statement of functions of survey and procedures by which it was developed Detailed instructions for administration

Validity is concerned with issues of quality and the extent to which differences found in research using a particular measurement tool reflect the true differences among participants (Blumberg et al, 2008). Regarding the issue of *face validity*; the approach to scale development is rigorous, expert opinions will be sought and a pre-testing phase is integral to the survey development process. *Content validity* of the survey instrument is strengthened by a number of factors; the research team have a wealth of experience through working on numerous research projects examining organizational digitization or related Internet related research. This pragmatic understanding is supplemented through a distillation of the relevant literature pertinent to the area under investigation. Additionally, through consultation with subject matter experts in this area surrounding the content and proposed design of the survey, their recommended revisions will be incorporated. The pre-test

phase is also fundamental to the validity of the content as it offers an opportunity for a smaller sample of respondents to give feedback on issues of design, layout and wording with a view to facilitating redesign and improvement of the final survey measurement tool.

Criterion validity or discernment of whether the measures correlate with other measures of the same construct (Doherty, 2012) is incorporated through an extensive review of the literature in the area and as above, enhanced through pre-testing of the survey instrument. *Construct validity* is where the researcher considers the theory and the measurement instrument being used with a view to ensuring that the implications from theory are in line with the resulting empirical evidence (Blumberg et al, 2008). This will be ensured through pretesting and subsequent extensive data analysis to ensure consistency with theoretical conceptualisations. Through this process, further streamlining of the questionnaire is enabled; duplicate constructs are integrated and those which contribute little to the research problem are removed. *Reliability* is synonymous with consistency (Saunders et al, 2007) and in particular is concerned with whether the instrument will produce consistent findings at different times and under different conditions (Saunders et al, 2007). The survey instrument contains constructs that endeavour to confirm and complement each other, consequently improving the reliability of the instrument. Additionally, and in accordance with Ramsey (2005) and Harrigan, (2008) and through utilising multiple construct indicators (as opposed to one indicator per construct), systematic error is made less likely, hence increasing reliability and subsequently improving the credibility and a greater level of consistency of the findings.

Practicality of the survey instrument is considered from an operational perspective and is concerned with issues pertaining to economics, convenience and the interpretability of the research findings (Blumberg et al, 2008). From an economic perspective, it is ensured that the length of the questionnaire is not compromised due to budgetary restrictions as can be the case in a large number of research projects. It is also ensured that the survey instrument is *convenient* to complete through rigorous pre-testing and any item/area deemed unclear or difficult to complete is revised and reworded and additional instructions added. Finally, with regard to *Interpretability*, of the results by other researchers, this is assured through a statement of the function that each test is designed to measure being included in the survey instrument and provision of detailed instructions for administration of the survey instrument by the respondent.

2.1.5 Pre-testing

Pre-testing is crucial in the design and development of any research instrument in order to;

“Refine and develop research instruments... assess degrees of observer bias...to frame questions, collect background information, and adapt research approach” (Sampson, 2004, pp.385-386).

Pre-testing of the survey instrument is planned using a sample of SME owner / managers, and academics with an expertise in this area. It is an important step in refining and streamlining the final questionnaire. The pilot questionnaire will be distributed online in February 2018. This serves to improve the overall layout, design and wording of the questionnaire. Necessary improvements / amendments will be made following distribution and analysis of the data returned from this pilot relating to for example issues of design and layout, wording clarifications and insufficient options to some closed questions.

2.1.6 Ethical considerations

“Questions about how we formulate and clarify our research topic, design our research and gain access, collect data, process and store data, analyse data and write up our research findings in a moral and responsible way” (Saunders et al, 2009, p.184)

This research is will be conducted by the researchers in accordance with guidance from (a) Saunders et al (2009) as well as (b) through strict compliance with the code of ethics as outlined by Maynooth University, Ulster University and Anglia Ruskin University, when research is conducted on their behalf. Consequentially, the interests of the researchers and the respondents are of paramount importance at all times during the research process. Issues of anonymity, confidentiality and security will be assured in how data is gathered and stored. The researchers will highlight the value attributed to respondents' participation in this research through careful attention to detail and personalisation (wherever possible) of all communications.

2.2 In-depth interview design

The in-depth interview approach offers researchers the opportunity to 'probe' or delve deeper, where they want the interviewees to explain, or expand upon their earlier responses (Saunders et al, 2007). The technique is appropriate for relatively unexplored subjects (Eisenhardt, 1989). Interviewees may use words, phrases or ideas in a particular way and in depth interviews offer researchers the opportunity to probe these meanings, adding significance and depth to the data obtained. It may also lead the discussion into areas not previously considered but significant to the understanding of the research problem and in addressing the research objectives (Saunders et al, 2007).

2.2.1 Interview structure

The semi-structured interview approach is adopted in this research where the interview protocol is sufficiently rigorous to ensure credibility whilst also ensuring sufficient flexibility and encouraging respondent interaction (Patton, 2002). Following analysis of the data and the subsequent findings from the quantitative phase, a number of themes / issues will be taken forward to interview stage and used as a (broad) guide. The objective of the interview guide is to discern the respondents' views on a number of phenomena relevant to the broader research problem (Blumberg et al, 2008) and to serve as a reminder to the researcher to ensure that the same broad issues are covered in each interview. It also increases the comparability of multiple interviews in ensuring that there is consistency in how the questions are asked (Blumberg et al, 2008). The course of the interview and the order of the questions will be left open and the interview will follow the lead of the interviewee (Harrigan, 2008). The interviewer will also be flexible in asking additional 'probing' questions if it is felt necessary depending on the direction the conversation takes.

2.2.2 Interview type

Convergent interviewing is an in-depth interviewing technique used to collect, analyse and interpret qualitative information concerning a person's knowledge, opinions, experiences, attitudes and beliefs on a particular topic through using a number of interviews which converge on important issues (Rao and Perry, 2003; Nair and Riege, 1995). In order to elicit information pertaining to both the exploratory and explanatory objectives of this phase of research, convergent interviewing will be adopted. The convergent method of interviewing can be used in a number of ways; 'within interviews' or 'across interviews'. Across interviews is where 'inductively' the issues raised in each interview contributes to the refinement of the subsequent interviews; with the broad issues increasingly gaining focus through the interview process with a range of interviewees (Patton, 2002). This research approach (within interviews) follows a different pattern, permitting modification and iteration as the interviews proceed, but not a generalisation or simplification of issues (Patton, 2002). At the outset, a divergent element will be incorporated into each interview, where the interviewer will use phrases such as 'tell me about' and 'describe to me' in order to facilitate capturing the perceptions of the interviewee as opposed to the interviewer (Perry, 1998). However, the interviews adhere predominantly to a convergent approach with the principal aim of verification and explanation of the findings from the quantitative first phase of this research.

2.2.3 Interview execution

A self-selecting sub-sample from survey respondents who indicate their willingness to participate in the follow up interviews will be identified. The 'willing' participants will be re-contacted via email and telephone with particular attention being paid to the pre-identified stratum (i.e. NI/ROI/England, sector and firm size) in an effort to acquire a reasonably representative within-population sample). In this communication, a suitable, date, time and medium (e.g. face-to-face, via internet technology (skype etc.)) will be agreed. Recording of the interviews will be proposed. However, if the interviewee is not comfortable with this proposal, detailed notes will be transcribed during the interview instead. Each interview is estimated to last between 30 minutes and 1 hour. A high degree of courtesy will be shown to each interviewee and exemplified through consideration of the range of ethical issues presented through qualitative research inquiry.

2.2.4 Ethical considerations in qualitative research

Through the course of the research process, the researchers needs to be sensitive to ethical considerations. These ethical concerns are particularly important as we negotiate entry to the field site of the research; involve participants in the study; gather potentially sensitive details and ask participants to devote considerable time to the project (Creswell, 2007). The avoidance of harm (non-maleficence) is essentially the origin of the ethical

issues confronting those who undertake research (Saunders et al, 2007). For example, the way in which consent is acquired, confidentiality is ensured, data is collected and the way in which this data is subsequently analysed and reported, all have the capacity to cause harm to participants (Saunders et al, 2007).

3. Conclusion

This paper set out to present the applicability of the sequential mixed methods approach to this research inquiry into SME digitization. In particular, each phase of the research has been explicated with particular focus on the research context, the applicability of the sequential mixed methods approach and subsequently the research design and ethical considerations for both the quantitative and qualitative phases. The researchers are confident that through the adoption of this sequential mixed methods approach, the research objectives will be competently addressed. Furthermore, this process has been specified clearly to enable replication, expansion or critique (Onwuegbuzie and Leech, 2005). The paper has also sought to address the dearth of studies that have adopted a mixed methods approach in the field of IS and serves to highlight the value of adopting this approach in developing novel theoretical perspectives and advancing the field (Venkatesh et al, 2013). It is hoped that this paper will contribute to the knowledge base of other IS researchers interested in mixed methods research; as well as those engaged in studies on digitization. It is however, limited in its scope in that this research is in its final planning stages and is yet to be conducted, and additional learnings will be captured when this phase has been completed. However, the importance of significant up-front consideration of the research design element of mixed methods research has been highlighted and hopefully shall provide insight into how such an approach should be conducted effectively in future studies.

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Comprehensive Experimental Technique of the Research on Forms of Personnel Reserve Stimulation

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Abstract: The study is aimed at developing a complex method of empirical research on the relationship between the three components: trends, needs of society (and labor market), and internal needs of local organizations. The research attempts to elaborate the authors' approach to the preparation and conducting of content analysis. The complex methodology of sociological research analyzed in the study includes traditional sociological methods such as substantive, systemic, comparative and logical analysis, as well as survey and special research methods. In particular, an experimental method based on the quantitative content analysis of electronic information sources and further processing of data by Excel tool is described in this paper. The words and their semantic combinations associated with the reflection in the public consciousness of the problems related to the formation of personnel reserve have been selected for the analysis. The techniques such as classification in selected groups, ranking and change in aggregate semantic units of different content are used by the authors for the semantic analysis. The proposed methodological approach involves the use of information taken from the Internet as the main data source. The paper presents the main results of the methodology testing based on collecting data on the interest of young specialists in the personnel reserve formation, as well as analyzes their proposals for implementing the stimulation technology in this regard. The theoretical implication of the study consists in the validation of effectiveness of the complex methodology proposed by the authors. The managerial implications lies in the elaboration of the recommendations on the allocation of priority directions of work for improving Human Resources Management (HRM). Using the methodology tested in the paper, modern employers will be able to take into account external trends and predict their impact on the changing needs of employees. In particular, thanks to the testing of the proposed methodology described in the paper, practitioners will have the opportunity to apply in practice the results of this study related to the effective talent management and to the formation of a personnel reserve (talent pool).

Keywords: talent management, research methods, experimental method, quantitative content analysis, integrated approach, content analysis

1. Introduction

Strategic development and "natural renewal" of the staff of an organization directly depends on the introduction of modern management technologies and methods applied by researches in the field of Human Resources Management (e.g. Rao, AGS, 2017; Beamond, MT, et al., 2016; Boudreau, JW, and Ramstad, PM, 2007). Talent management has become a solution to current and strategic human resource (SHR) issues by focusing on the effectiveness of organizations of various forms and in different sectors of activity (e.g. Bethke-Langenegger et al., 2011; Collings and Mellahi, 2009; Al Ariss, A., et al., 2014). There are a growing number of studies, which show how talent management methods affect not only hard performance indicators, but also soft performance measures, such as employees' attitudes and behavior (e.g., Krishnan, TN, and Scullion, H., 2017, Gelens, J., Hofmans, J. et al., 2014).

This paper is aimed at developing a complex method of empirical research on the relationship between the three components: trends, needs of society (and labor market), and internal needs of local organizations.

The methodology proposed by the authors has been tested in the framework of a Higher Education Institution, since the talent management and the personnel reserve management (as a career planning and management succession process, as a key part of retaining and attracting talents) is especially important in such organizations. With regard to the relevance of the topic, it is important to note that there is a large number of studies devoted to the assessment of personnel potential in higher education institutions and research organizations. Among the examples, we can list the following studies:

- Research conducted by the Institute of Socio-Economic Studies of Population of the Russian Academy of Sciences (Lokosof et al, 2017);

- Study based on the survey of employees and leaders of academic, sectoral and university science realized by the Center for Social Forecasting and Marketing (Sheregi et al, 2012);
- Survey of heads of state scientific organizations developed by the Institute for Problems of Development of Russian Science of the Russian Academy of Sciences (Zubova et al 2010);
- Study on the social security of the universities' and research laboratories' staff (Bently et al., 2013);
- Research related to the development of the university's human resources potential as the basis for its intellectual capital (Fedorova & Ponomareva, 2017).

Moreover, the significance of this paper can be confirmed by the data on aging of the faculties of the universities' departments and reduced inflow of young employees presented by Reznik & Vdovina (2017). According to these authors, "the average indicator of the experience of the scientific and pedagogical activity of teachers is 18 years".

In addition, it is worth noting that in several studies on the topics related to talent management effectiveness, career planning, and staff continuity, a wide range of methods based on the online questionnaires, and on the analysis of personal files of employees is used by the researchers (e.g., Gelens et al. , 2014, McDonnell et al., 2017).

In this paper, the interest of young specialists in the University's personnel reserve is assessed. The data obtained is used as a basis for identifying priority areas for improving work with the personnel reserve. Moreover, the possibility to apply the authors' approach to the preparation and conducting content analysis is described. In particular, in addition to traditional sociological methods, the authors suggest using the experimental method of quantitative content analysis conducted on the basis of electronic information sources. Modern researchers have successfully used this method for the evaluation of individual learning technologies. The content analysis matrix presented in the Farmer's research (2014) is one of particular interest for our study.

2. Description of the method

The peculiarity of the presented authors' method is the use of the external and internal research contours for building hypotheses.

The method includes several phases (**Figure 1**):



Figure 1: The main phases of the research method proposed by the authors

The first one is preliminary phase. It consists in determining the purpose and objectives; selecting the methods and tools for the study; defining the sample; formulating hypotheses; assessing the reliability of the results obtained.

The second phase is traditional one. It assumes conducting of a sociological analysis using statistical analysis tools and quantitative sociology. The analysis may include the following activities: analysis of trends in the study field, design of questionnaires and/or interview questions, conducting of questionnaire survey, including the use of online resources (for example, Google-form), interviews with specialists, round tables on the results of the

study. This type of research is conducted at the micro-level (enterprise, organization). The objective of the study is to analyze internal environment (employees, management), main trends and critical points of the studied phenomenon. The research practice described below could be an example of this phase of the analysis.

In order to identify key technologies for the retention and attraction of talents in the Higher Education and research institutions, we have collected data on the personnel reserve management at the Ural State University of Economics (Russia, Yekaterinburg) by means of a survey and secondary data (documents) analysis. As an experimental group, we have selected the average level of high-potential employees - young specialists, which age does not exceed 40 years. An expert study conducted in 2017 included a sample of 134 people, which was 23.3% of university professors. Among the respondents, 35.7% of men and 64.3% of women, which reflected the overall distribution of the university staff by gender. Among survey participants, 66.2% of respondents have a PhD title. Therefore, the sample can be considered representative. The data provided by the University's HR department and the self-report data allowed us to analyze information about the age, education and experience of young employees, as well as about their motivation for career growth. As an additional research method, the observation has been applied. The observation has been performed during the strategic session of young scientists on the university's development. The indicators that have been assessed during the observation are as follows: attendance of strategic session, activity in the process of group work, initiative, interest in the university's development, proactivity. The results obtained have been discussed with the university's government during an interview.

The collected analytical material has become the primary source of information used for the next phase of the study. This is the difference between the proposed authors' method and the classical approach to the preparation of content analysis. In the classical approach of content analysis, different types of documents are used as traditional sources of information: magazines, newspapers, fiction literature, official documents, protocols of work meetings, radio and television programs, etc. The peculiarity of the authors' approach is using the results of traditional analysis of the company's internal environment to formulate hypotheses for the study of external sources of information (conducting of content analysis). For this purpose, answers to questionnaire questions, transcripts of interviews are analyzed in order to identify trends, key features and critical points of the studied phenomenon. Hence, the source of information is not documents, but the people themselves, employees and managers, who form the "agenda" of the company.

When preparing a sociological questionnaire, we have formulated open-ended questions. The answers to these questions have allowed us to subsequently determine the semantic units for conducting content analysis. For example, the most popular answers to the question "what are your plans for professional and personal development?" were as follows:

- Professional development - 44.6%;
- self-education - 30.4%;
- professional retraining courses - 23.2%;
- professional internships - 12.5%;
- study of a foreign language - 7.1%.

Consequently, the received answers have allowed us to allocate semantic units "professional development", "self-education", "professional + training", that became the basis of content analysis.

The third phase of the analysis is conducting quantitative content analysis of electronic media. The essence of the method consists in translating verbal information into a statistical non-verbal form, it assumes a systematic fixation of the semantic units of some set of textual array with subsequent quantification of the received data. We will dwell on this stage in more detail and show the features of the author's approach when applying it.

Methods of Internet research are widely used by specialists to study commodity markets. At the same time, they are underestimated when studying the processes taking place in society. In this connection, one should agree with the opinion of researchers that "Internet Studies is an interdisciplinary and multidisciplinary field of the fundamental and applied research that integrates different research disciplines with a common object, that is, the Internet" (Rykov, Yuri and Nagornyy, Oleg, 2017). These scientists consider three main methods by which it is possible to study the data reflected in electronic media. The method of analysis of social networks (Social

Network Analysis) is a traditional method of sociology, whose roots go to Moreno's sociometry. Such an analysis is an extension of the mathematical theory of graphs to sociological data (Garton, L., et al., 1997). The following method is a network of hyperlinks, communication, commenting, mentions, recommendations, and grading. This method is suitable for studying the structure of online communities and the structure of public discussions (Smith, M., et al., 2014), social influence and identifying opinion leaders, testing information dissemination models, rumors, news diffusion. The application of network algorithms to the relationships of individuals, social groups and other types of objects allows us to find new customers for companies, to strengthen the personification of advertising, to increase sales. The Internet is not only a source of data about the links between various information objects, pages, users, but also a repository of huge arrays of textual information. To analyze large amounts of text data, special methods of analyzing printed texts are used. The purpose of such an analysis is to isolate the meaning, to cluster information, to receive a semantic and emotional assessment, to prioritize public inquiries (Prabowo, R. and Thelwall, M., 2009).

After the hypotheses are formulated, the text of the hypotheses is coded through the modeling of indicators - individual semantic units. This stage of work assumes a high level of competence of the researcher. The coding capabilities are wide and, unlike simple methods of statistical analysis of the media, it is possible to lay a grouping in the content-emotional orientation into a model of semantic units. Thus, the feature of the method is the simultaneous use of both quantitative and qualitative content analysis.

The result of the selection and analysis of the data for the study will be the overall picture of the distribution of the semantic units for the selected groupings, which will then be interpreted. Also, when selecting generalizing content analysis, it is possible to collect data for a certain period and the possibility of studying their changes in dynamics.

The use of a special method of content analysis is due to the need to assess the reliability obtained in the local data study. Their assessment at the level of public consciousness, the importance for the society. The data obtained during the application of the experimental method of content analysis make it possible to confirm or challenge the hypotheses of the study, to evaluate the specificity of the sociocultural differences of local, ethnic and professional communities. Investigating first the internal environment of the research object (employees, company management), which allows us to formulate hypotheses for further investigation of the external (public) outline of the problem, we have the opportunity to assess the reliability of the research results.

Mass media and in particular print media inform, create images, suggest words for verbalization and assessment of problems and phenomena, form discourses. Thus, they have a great influence on modern society. Public opinion is largely formed not in the process of direct communication, but as a result of the introduction of judgments and attitudes created with the help of media images (Lai, Linda S. L. and To, W. M., 2015).

The use of modern methods of studying the development of human capital through the Internet search systems can detect and fix the logical patterns of the problem under study. For example, as an information source in the process of comprehensive research of the forms of stimulating the personnel reserve, the Yandex search network was chosen as the most popular in the Russian Internet space for the period from January 2016 to December 2017.

The main purpose of applying the method of content analysis is to confirm or deny the results of the preparatory phase of the study.

Let's consider in more detail the essence of the 3 stage of applying the methodology on the example of the study of the issues of formation and development of the university's reserve reserve, which was mentioned above.

The unit of research is words and their combinations. The calculation was made based on the number of mentions of the semantic unit for the analyzed period and the proportion of these mentions in the total set of available web sources. Empirical indicators were key concepts that characterize the professional and scientific career development plans of the university staff, as reflected in Internet publications.

The main semantic unit in the work was the word "personnel reserve". Earlier, we described the approach to identifying the semantic units, which resulted in the allocation of 3 of their clusters:

- 1) the importance of the problem posed: "personnel + reserve", "staffing + reserve of the university";
- 2) plans for professional and personal development: "increase + qualification", "self-education", "professional + retraining", "internship", "learning + language";
- 3) plans for scientific development: "publication + articles", "doctoral + thesis", "conference + participation", "monograph + publication", "textbook + write", "grant + application".

As a test approbation of the experimental methodology, the results of a survey and observations of the potential staff reserve of the University, according to the sample presented above, and the study of public opinion using the content analysis method were combined.

The need to join the university's personnel reserve according to the results of the survey was noted by 43%, the possibility of joining the personnel reserve 38% of respondents. The content analysis of electronic information resources for the period 01/01/2016 - 01/01/2017 showed an increase in interest in the problem of the personnel reserve by 29.2%. The specification of the request within the framework of the objectives of the research of stimulating the personnel reserve in higher educational institutions has shown an even greater growth of interest - 2.5 times as a whole in Russia. Correlations on the issues of career development planning for teachers using the author's methodology of analysis are considered below.

Counting similar semantic units by the authors' method and comparing the results allowed defining a model (Figure 2)

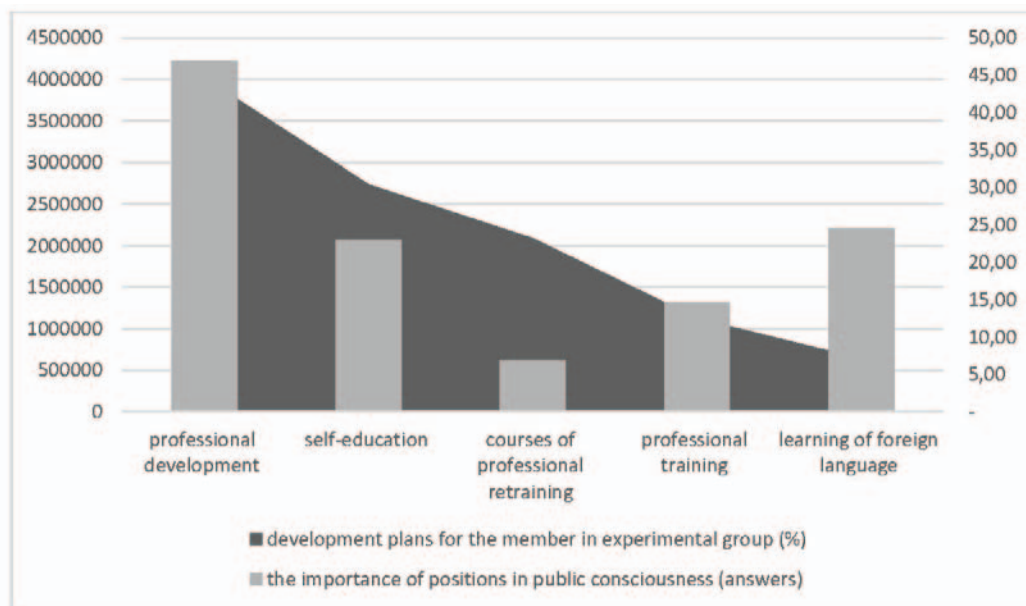


Figure 2: Results of a local research of narrow professional community and the importance of the received positions in public consciousness about a professional development

The model combines the results of a local study of a narrow professional community and the significance of the positions obtained in the public consciousness. As a result, the main position became common for the various stages of the study. "Professional development" likewise ranks first in the rating of content analysis of electronic media. Then comes the semantic unit "study + language". Here the wider problem of the study of a foreign language in the public consciousness can be covered. Perhaps here there is an interest in learning a foreign language, not related to career growth. Semantic units "self-education" and "internship" occupy similar positions. Similar results were obtained when answering the question "What are the plans of your scientific activity?" (Figure 3).

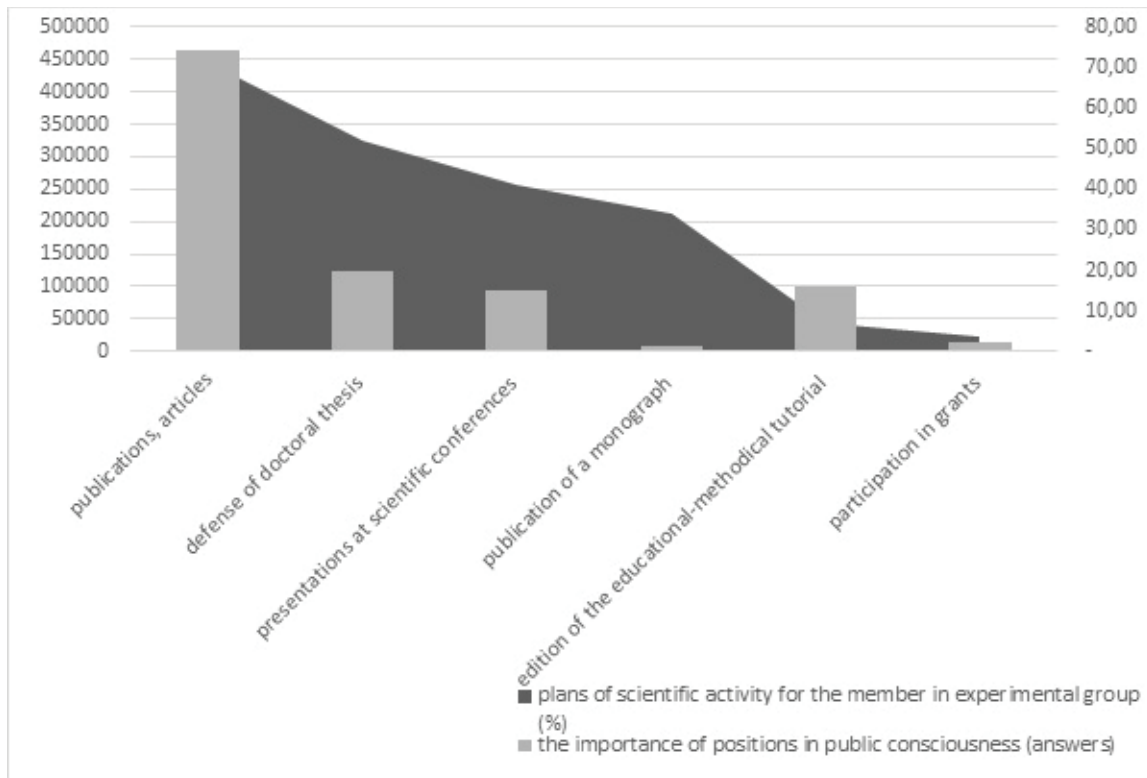


Figure 3: Results of a local research of narrow professional community and the importance of the received positions in public consciousness about plans of scientific activity

The sociological survey showed the following distribution:

- publications, articles - 71.4%;
- defense of doctoral thesis - 51.8%;
- presentations at scientific conferences - 41.1%;
- publication of a monograph - 33.9%;
- edition of the educational-methodical tutorial - 7,1%;
- participation in grants - 3.6%.

The first positions of the content analysis "publication + articles", "doctoral + thesis" by rating completely coincide with the results of the sociological survey. Less important seems to be the problem of publishing a monograph. Perhaps this fact may be associated with the narrow specialization of scientific activity in professional communities. Greater importance, in comparison with the survey, is given to grants.

Hence, the validation of the complex methodology proposed by the authors in order to study prospects for the formation and development of the personnel reserve in higher education institutions has shown the soundness of its use. The research mechanism has given a system result. The main hypotheses of local microeconomic research have been confirmed at the macro-level of public opinion's study. The differences obtained in the results of the analysis performed in different phases enable us to critically analyze and study in depth the phenomenon.

3. Study results and implications

Thanks to multidirectional empirical research of labor market trends and changes in social needs, modern employers are able to take into account external trends and predict their impact on the changing needs of employees of an organization. In particular, some issues concerning effective talent management and formation of personnel reserve have been discovered, as shown in the example of the methodology application.

The application of content analysis in the authors' variation allows researchers to expand the list of primary information sources necessary for the formulation of semantic units, for the possibilities of research errors, as well as increases the reliability and accuracy of the content analysis results.

The proposed complex methodology has wide application possibilities in various fields of social sciences. In particular, the methodology has already been tested in the study of toxic management (Fedorova et al., 2017), as well as for the assessment of the impact of labor migration on the host territory (Melnikova, 2016)

Further studies on this topic can be related to the refinement of the toolkit of the proposed comprehensive methodology, as well as to its applications in different areas of the human potential study.

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Methodological Approaches for Research on Intangible Resources and Competitive Success in Software Companies

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Abstract: In software companies, intangible resources are the most important resources. Therefore, intangibles are crucial for the competitive success especially in software companies. Because of the importance of intangibles for the competitive success, investigation in intangibles is an appreciable field for research in software companies. But what is the right methodology to investigate in these important intangibles in software companies and the impact on the competitive success? There are numerous quantitative studies dealing with the interdependencies between intangible resources and competitive success in companies. At least as much the limitations of the research design and the resulting conclusions of such studies were discussed. The main criticism is the operationalization of the variables. As an alternative to quantitative research design, qualitative approaches such as case study analyses are often cited. This paper discusses the methodological approach of case study analysis opposed to purely quantitative approaches. The aim is to work out whether quantitative or rather qualitative approaches lead to more useful results regarding the investigation of multi-causal relationships between intangible resources and the impact on competitive success. In the paper, it will be shown that case studies can be used to comprehend multi-causal relationships between intangible resources and competitive success of software companies. Furthermore, it will be shown that the advantage of case studies in contrast to purely quantitative approaches is not only in their practical applicability and the maximally flexible choice of data acquisition. The advantages of case studies are also the included opportunities to analyse and interpret the underlying mechanisms of selected cases in their overall complexity. The pronounced strength of a case study in comparison to quantitative approaches is accordingly the more comprehensive and superior depicting of the social reality of the company.

Keywords: intangible resources, competitive success, case studies, software companies, multi-causal relationships

1. Background

Today, software companies perceive an increased competition caused by an oversupply of products and services. Felix, Huerta and Leyva (2016) stressed accordingly that the software industry is a very dynamic industry where software companies need to constantly offer new products and services at ever lower prices. This adaptive behaviour of software companies corresponds to a market-oriented view of strategic business management, the latter known as market-based view (MBV). According to Papula and Volna (2013) traditional models of strategy development like the MBV would focus primarily on the external environment. The specific resource circumstances in a company as well as special abilities of a company are not recognized as a source of sustainable competitive advantages.

Success and failure of software companies strongly depend on the according conditions of the industrial sector. However, the competitive success of software companies is unthinkable without the specific skills, the know-how and the experiences of the software developers. Joshi, Ubha and Sidhu (2010) emphasize that the software industry “entirely depends on human resources particularly their skills, training and knowledge.” In the software industry, it is therefore not enough to formulate the corporate strategy from a market-oriented perspective. That is the reason why the management in software companies tries to achieve competitive advantages not only through optimal adaptation of the company to the given industry structure, but also to exploit opportunities for competitive advantages in the company’s resources. The corporate strategy also takes into account the specifics of company’s resources and uses them as a basis for generating long-term and sustainable competitive advantages. This view corresponds to a resource-based view (RBV) in strategic management.

Because of the importance of intangible resources for the competitive success of software companies, investigation in intangibles is an appreciable field for research in software companies. But what is the right methodology to do research to investigate these important intangibles in software companies and the impact on the competitive success? Should interdependencies between intangible resources and the impact on competitive success be examined more with quantitative approaches, or rather qualitative approaches lead to useful results? In the following the methodological approach of case study analysis opposed to purely quantitative approaches will be discussed.

2. Quantitative approaches

2.1 Empirical confirmation of the RBV

The RBV assumes that there are systematic and empirically observable differences in the resource equipment of companies and that these influence the competitive success of a company. Numerous tests of the basic hypotheses of RBV in the empirical literature have been carried out for decades. However, the first review of the results of this research did not take place until 2001. Barney and Arikan (2001) evaluated 166 studies in which the RBV was tested in one or more ways. The authors concluded that only four studies could not be reconciled with the RBV logic. Although the results of Barney and Arikan (2001) give the impression that the RBV can be confirmed as a valid theory. Newbert (2007) considers this premature for two reasons: First, Barney and Arikan (2001) merely concluded that an article was consistent with RBV's logic as long as the results reported in the article were not inconsistent with resource-based logic. Second, according to Newbert (2007), Barney and Arikan's (2001) sample was influenced by their own knowledge of the empirical literature on RBV.

To ensure heightened objectivity in investigating the current state of empirical research on RBV, Newbert's (2007) approach follows the method of David and Han (2004). David and Han (2004) used the method to evaluate an empirical confirmation of Transaction Cost Economics (TCE). Essentially, this approach is about choosing a representative sample of studies that met a specific set of criteria. According to Newbert (2007), his study is the first systematic evaluation of empirical results from studies on RBV with the result that 53% of the tests confirm RBV. Far more important is that the degree of confirmation depends significantly on the independent variable. The results suggest that it is less the static resources that are responsible for a company's competitive position than the organizational context and specific skills and core competencies.

Another meta-study comes from Arend (2006). Arend (2006) has examined more than 1700 scientific journals in the Business Source Premier (BSP) database. For the investigation, he has defined four main criteria that must be met to test the RBV theory. His result: "My assessment of the RBV leads me to the same conclusion as others who did not evaluate specific papers against well-defined criteria: empirical support for the RBV is fragile at best and non-existent at worst." (Arend, 2006). Looking at the studies of Newbert (2007) and Arend (2006), it can be concluded that, despite countless quantitative studies, a long-term empirical confirmation of the RBV based on quantitative research does not yet exist.

2.2 Problems with the operationalization of variables

According to Hieke (2009) a quantitative study leads to the question, how the independent variable intangible resource and the dependent variable competitive success can be operationalized. Hieke (2009) points out that the operationalization of an independent but explanatory resource provides a sizeable challenge within the scope of empirical validation. If the key attribute of a resource is its inimitability, which is intangible and difficult to observe by definition, the operationalization thereof causes problems. Hieke (2009) moves on that the rather abstract term of sustainable competitive advantages can be illustrated with the help of above-average profits of a business. However, companies frequently operate in several industrial sectors and allow different sections of their business activities to participate in their company resources. This leads to the risk of confusion and a diffuse presentation of influencing factors in the overall picture.

Armstrong and Shimizu (2007) identified 125 empirical studies on RBV over the period 1991 to 2005. Their research focused on studies, which explicitly examined the relationship between corporate resources and performance-related business results. Armstrong and Shimizu (2007) argue that the key conceptual contribution of the RBV is the relationship between resources and sustainable competitive advantage. According to Armstrong and Shimizu (2007) a problem in the studies is the selection of observable proxies. Because of the difficulty to measure enterprise resources directly, some researchers have used proxy variables in the studies. In the panel Armstrong and Shimizu (2007) observed as proxies among others the research and development intensity, the number of alliances and/or years of experience for knowledge development. According to Armstrong and Shimizu (2007), such simple proxies for knowledge require a homogeneous distribution of learning skills among companies: an assumption that fundamentally contradicts the explanatory logic of RBV. Especially the heterogeneity in learning skills plays an important role in creating heterogeneity in the resources between companies.

As an alternative to such proxies, which rather describe input for skill development, Armstrong and Shimizu (2007) call proxies for the company's outputs. Armstrong and Shimizu (2007) give as an example a study by Miller and Shamsie (1996). Miller and Shamsie (1996) used the number of Academy Awards to measure the knowledge-based resources of Hollywood film studios. However, Armstrong and Shimizu (2007) emphasize, the use of output variables does not deprive researchers of the criticism that they have not decrypted the "black box" of companies. This issue has not received enough attention in articles. Armstrong and Shimizu (2007) doubt to find a proxy that reflects hard-to-maintain resources alone. Armstrong and Shimizu (2007) recommend, to work with multiple variables that together represent hidden resource structures. However, many studies rely on individual indicators of resources. In this panel, this applies to a total of 43 of the 57 studies.

2.3 Limitations of quantitative studies for investigation in process phenomena

Al-Laham (2003, p. 198) underlies the proxy problem in quantitative studies. He critically assesses that knowledge is operationalized in most trials by proxy variables. Most of the studies indicate a positive correlation between knowledge and competitive success. Both the absolute knowledge base of a company and the ability to coordinate this knowledge within the company and to build it externally, led to success. On the other hand, these important findings face considerable conceptual and methodological problems. Divergent baseline relationships, heterogeneous, partially problematic operationalizations and different methodological designs made it difficult to interpret and compare the findings (Al-Laham 2003, p. 198).

From a conceptual point of view, Al-Laham (2003, p. 197 f.) identifies three central problem areas: Hardly any process study showed that examined changes in the organizational knowledge are based on learning processes. The fundamental problem area of RBV research would be on the one hand in the conceptual starting point of reference. Secondly, the empirical design of the studies is problematic. In the majority of cases knowledge is conceptualized as a content variable and not as a process variable. This leaves the view of the strategically important process phenomena locked. Furthermore, there are hardly any studies that make a situational relativization of the observed correlations. For example, work that relativizes the relationship between knowledge intensity and competitive advantage as a function of corporate strategy seemed important. Regarding the causal chain of knowledge as independent and success as dependent variable, it is also noticeable that mostly linear or progressive contexts are assumed: the greater the knowledge intensity of the company, the higher the presumed success. However, such frames of reference deny multicausal connections between success potentials and corporate success (Al-Laham 2003, p. 197 f.).

3. Qualitative approaches

3.1 Open character of theoretical concepts

Erzberger and Kelle (2008) emphasize that there is, especially in Germany, a strong tendency to assign quantitative and qualitative research methods to two different philosophical roots. Bortz and Döring (2009, p. 298) state that there are far-reaching discrepancies in the conception of science. According to Dasgupta (2015) choosing a method is very much influenced by a researcher's personal prejudices and philosophies. Lamnek (2005, p. 86) emphasizes that quantitative researchers are less interested in reality than in reviewing the theories and hypotheses previously formulated.

The formulation of hypotheses at the beginning of a study is an indispensable tool for quantitatively oriented researchers. Quantitative researchers thus subject all perception to systematic control. The established theory is subject to a restrictive selectivity (Meinefeld, 2008). The hypotheses and the subsequent operationalization of the quantitative approach determine what is relevant to the investigation and how it is captured. It will only be measured what the researcher considered as useful and necessary in the knowledge of the subject of the investigation. However, the perspective and relevance systems of the subjects of interest could be quite different (Lamnek 2005, p. 15 f.).

In contrast to the quantitative conception, the development of hypothesis in qualitative research is a constitutive element of the research process. Characteristically is the open character of the theoretical concepts, the constant exchange between collected data and the still vague theoretical preconception, so that there is a constant clarification, modification and revision of theories and hypotheses. The descriptive information obtained in the exploration should make theoretical connections recognizable. In addition, the greater

adaptability of qualitative methods implies a higher validity of the results. The expectation was thus more fulfilled than in the standardized approach of quantitative research (Lamnek 2005, p. 89 ff.).

3.2 Comprehensive and improved reproduction of social reality in qualitative studies

To develop a better understanding of resources that are difficult to access empirically, Hieke (2009) believes that qualitative approaches, including case studies, can provide relief. Dumay (2009) also sees advantages in the use of case studies. He emphasizes that the benefit of case studies is that they can be used to explore and understand a phenomenon in a specific context. In addition, there would be flexible in terms of the limits within which the study will be moved. Another advantage is that different methods of data collection can be used (Dumay, 2009). Dumay (2009) mentions interviews, focus groups, internal and external documents, observation of participants and direct observations. Seleim, Ashour and Bontis (2004) find as well that different data collection methods are common in the study of intangible resources in enterprises. They call interviews, polls and focus groups. According to Seleim et al. (2004) the most popular method, however, are case studies.

According to Armstrong and Shimizu (2007), McEvily and Chakravarthy (2002) provided a useful example of using qualitative methods. In their study of companies in the adhesives industry, they spent months interviewing scientists and manufacturers to gain insight into the production of adhesives. They then validated their interview data with the help of trade journals and two adhesives technology experts. Therefore, these qualitative approaches led to the development of quantitative measurements that could test the impact of certain resources on the lifetime of performance benefits. Borchardt and Göthlich (2009, p. 34) arrange case studies accordingly in the center of a matrix displaying a continuum ranging from deductive and theory-guided methods to empirical-inductive procedures and a continuum between objective, functional approaches and interpretative paradigms. Here, case studies are originating from interpretative paradigms, aim to achieve a theoretical approach and do not exclude quantitative methods.

Borchardt and Göthlich (2009, p. 34) point out that case studies deliver generic answers to explorative, descriptive and/or explanatory questions, an output which cannot be delivered by all methods. Case studies could help researchers with quantitative orientation to generate hypotheses or validate previous constructs (Borchardt & Göthlich 2009, p. 34). In addition to this, case studies could also support a qualitative approach to elucidate new or other perspectives on a research field – even or maybe especially when the project is already in an advanced state. Following the authors, the specific advantages of case studies in comparison to quantitative investigations could be found in their more comprehensive and therefore improved reproduction of social reality. Case studies would not remain restricted to static snapshots at a given point of time, but allow the comprehension of developments, process cycles and cause-effect relationships as well as the formulation of statements which are practical, relevant and based on the gained data (Borchardt & Göthlich 2009, p. 34).

3.3 Methodological approaches for case study research

It remains unclear how to properly apply the case study methodology (Ridder 2017). Borchardt and Göthlich (2009) highlight that data collection in case studies is not bound to any method. The selection of survey methods should be geared to the objective of the study and should be commensurate with the subject of research to be used to collect relevant data to answer the research questions. However, Borchardt and Göthlich (2009) cite observation, content analysis, and interviewing as the main methods commonly used in case study work. According to Swanborn (2010, p. 74), observation is an important element in case study research. As one of the main methods, however, it is a time-consuming and costly approach to data collection. Unlike questionnaire surveys, Borchardt and Göthlich (2009) suggest that observing offers not only the possibility of recording data at a discrete time, but also the continuous perception of individual events or chains of events over a period. In addition to the observation, collecting data in a case study offers the collection of documents relating to the case under investigation. As documents to be considered, the most diverse documents can be used.

In addition to the interviews with experts, Hieke (2009) also considers survey methods such as guided interviews as a means of directly and in-depth querying of in-house skills and resources. However, it should be noted here that the RBV assesses the value of a resource from the point of view of the competition, which it does not own and cannot imitate. Therefore, a meaningful survey should also include competitors or outsiders. Finally, the construct resource can also be replaced by observable representatives or objective proxies. For example, Hieke (2009) mentions consequences that arise from a non-observable resource or are likely to result. Company-specific knowledge can be measured by many factors such as R & D expenditure, the number of company

alliances and experience in years. Consequently, the representatives would have to consist of different variables, since the demand for construct validity in the examination of basic assumptions of a theory is particularly dominant. According to Swanborn (2010) interviews would not only provide information in an efficient way, but also provide access to key persons and area experts. Swanborn (2010) explains that mostly well-informed individuals are interviewed, who take a leadership role in the organization or occupy other relevant positions. These individuals call Swanborn (2010) "informants". They provide information about the phenomenon and the social processes in which they are involved. In addition, they can also report on their own experiences, social relationships, perspectives, attitudes and behaviours. With this information, the researcher can construct a detailed picture of the processes.

For Swanborn (2010, p. 73), an effective way to tackle a case study is to study every available and relevant document. As possible documents for a case study Swanborn (2010) calls "agendas and minutes of meetings, self-evaluations, earlier research reports, letters, memoranda, newspaper clippings, programme proposals". According to Swanborn (2010) archives are also worthwhile sources, for example "the number of clients per period, geographical characteristics, inventories of members, service records, electoral results, and many other statistics." Borchardt and Göthlich (2009) name as possible documents for a case study letters, memoranda, protocols, contracts, insolvency plans, annual reports, presentations, speeches, newspaper articles or websites. Primary and secondary sources are equally permissible (Borchardt & Göthlich, 2009).

4. Results of case studies in software companies

Seleim et al. (2004) were one of the first who examined the intangible resources of a software company in a case study. They emphasize that software companies do not need tangible values. To understand the characteristics of a knowledge-based economy, Seleim et al. (2004) conclude, software companies are therefore an excellent setting. However, the research on intangible resources in software companies as well as whose interdependencies with competitive success are "in its infancy" (Seleim et al., 2004). A broader study comes from Barney, Aurum and Wohlin (2009). Barney et al. (2009) examined intangible resources in 38 software companies in Egypt. For Barney et al. (2009), intangible resources in software companies are both the input and output of the performance process. Joshi et al. (2010) reviewed the annual reports of 20 software and IT companies in Australia to describe organizations' knowledge-based resources. Joshi et al. (2010) concluded, that intangible resources in software companies have advantages over tangible values. Joshi et al. (2010) highlight that the importance of intangible values is significant in software companies. Kukko (2013) used a case study in a software company to investigate knowledge sharing barriers in organic growth. Her aim was to "ensure an in-depth and holistic understanding of the research phenomenon" (Kukko, 2013). The empirical data was gathered in seven semi-structured and themed interviews (Kukko, 2013). To understand the process of managing innovation and technology within software companies, Felix et al. (2016) used a mixed methods approach. The quantitative part was based on information from a survey to managers of software companies. As part of the qualitative analysis, Felix et al. (2016) interviewed software developers. They found out, that generating innovation considering employees skills, ongoing employee training and open communication between employees and executive managers (Felix et al., 2016). Interesting as the results of the mentioned case studies may be, interdependencies between intangible resources and the impact on the competitive success of software companies were not the subject of the studies.

The first and only intensive investigation of the interrelationships between intangible resources and the competitive success of software companies was carried out by Döring and Papula (2015). Döring and Papula (2015) used a case study to comprehend multi-causal relationships between intangible resources and the competitive success in a software company. As methods of data acquisition observation, content analysis and interviews were applied in the case study. Numerous different documents were used for the analysis of the case, i.e. company registrations, trade register excerpts, contracts, trademark certificates, business data, internal planning documents, business plans and figures, presentations, internal and external meeting protocols, and business correspondence in form of letters and emails. Structured interviews with employees of the software company and expert interviews were also applied during the case study. The interviews with the employees mainly served as data acquisition purposes, whereas the expert interviews aimed at a communicative validation of the research method and the interpretation of the results.

For evaluating and interpreting the gathered data Döring and Papula (2015) used a multi-level indicator system which separates indicators for stock values of the knowledge base, interventions, transmission effects and

results of the operational business activities. The multi-level indicator system did not only make process phenomena visible and comprehensible, the model also offers an approach to analyse and assess cause-effect chains within the company context and from a strategic perspective. Using the acquired data, the case study managed to gain insights into the intangible resources as well as the cause-effect relationships between the intangible resources and the competitive success of the investigated software company. The case study helped to gain findings regarding dynamic aspects of intangible resources, being considerably responsible for the value of intangible resources in software companies. Döring and Papula (2015) stated that the stock of intangible resources is not the decisive element for the competitive success of a software company, as this stock solely provides a fundamental prerequisite for a company to operate in a competitive market or context.

5. Conclusions

The focus of this paper was on the right methodology to investigate in the intangible resources of software companies and their impact on the competitive success. According to Döring and Papula (2015) it could be stated that the study of relationships between intangible resources and competitive success in software companies is relatively new. Not least because of that, a central question in the paper was, whether interdependencies between intangible resources and the impact on competitive success should be examined more with quantitative approaches, or rather quantitative approaches lead to useful results.

Looking back on numerous quantitative studies on RBV the limitations of the research design and the resulting conclusions of such studies were discussed. According to Al-Laham (2003), Armstrong and Shimizu (2007) and Hieke (2009) the main criticism is the operationalization of the variables. Researchers use in quantitative studies proxy variables that are too simple to describe intangible resources sufficiently. In addition, the view on strategically important process phenomena is prevented because the studies do not work with process variables. Quantitative studies also assume linear or progressive correlations. However, such frames of reference deny multi-causal connections between success potentials and corporate success.

Döring and Papula (2015) showed that a case study allows to comprehend multi-causal relationships between intangible resources and competitive success of software companies from a strategic perspective. A multi-level indicator system used for case study analysis provided insights into process phenomena that would not have been possible with a quantitative study. Particularly interesting here are dynamic aspects of intangible resources, which are related to core competences and learning processes. This did not only contribute to a better understanding for the management of intangible resources in software companies, but also for further scientific work with intangible resources and their impact on competitive success.

According to Lamnek (2005) and Meinefeld (2008) the formulation of hypotheses for quantitatively oriented researchers is at the beginning of a study. In qualitative research the development of hypothesis is a constitutive element of the research process. Hypotheses generated in case studies should increasingly be used as a starting point for quantitative studies in the future. This may lead to more useful results of quantitative studies on the mentioned causal relationships. Furthermore, the findings from case studies should be used to define multiple variables in quantitative studies that together represent hidden resource structures.

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Indicator of Unemployment Gender Inequality

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Abstract: Analyses of gender inequality in unemployment have only recently appeared in the literature, and hence deserves the attention of researchers. The most widespread way of its measurement, among researchers, has been a measurement of gender inequality in unemployment, as a difference between the unemployment rate of women and men or a ratio between them. From difference or ratio indicator there are issues with high and low unemployment rates because of their incomparability. Issues that resulted from the difference indicator were the nominal differences that could not be considered as a relevant measure of gender inequality. Issues from the ratio indicator originated from inconsistency in ratio intervals between the rates. Another issue of the ratio indicator was that in case of low unemployment rates, gender inequality could increase to very high levels. Both described indicators do not provide an appropriate scale of measurement of gender inequality. The approach that we introduce in this paper measures unemployment gender inequality by proposing measurement intervals of the gender inequality. The intervals do not depend on the unemployment levels, but they are set by permitting some fluctuations around the unemployment rate for both sides. Unemployment gender inequality is calculated by introducing a scale that varies between minus one and plus one. Zero value represents gender inequality, minus one represents unemployment gender inequality to the disadvantage of women and plus one means unemployment gender inequality to the disadvantage of men. By this way, the interval is the same regardless of which gender unemployment rate is higher. By multiplying gender inequality, calculated as ratio of the lower gender unemployment rate to the higher gender unemployment rate, and for measurement purposes subtracted by one, with the unemployment rate, we obtain unemployment gender inequality rate. The main aim of our approach is to measure gender inequality in a way that is free of the influence of the unemployment rate behaviour and could be used as an indicator of the gender inequality for the labour market. Once the inequality is measured using our proposed approach, it is possible to propose a suitable policy for it decrease or sustain it low level.

Keywords: unemployment, gender, inequality, inequality scale, inequality intervals

1. Introduction

Gender inequality remains an issue on the labour market, even though many policies have been implemented to decrease it (Zachorowska-Mazurkiewicz, 2009). Many indicators were developed to measure gender inequality (Ferrant, 2014), but there is still a need for measurement of gender inequality during unemployment. Gender inequality in the unemployment was usually analysed by comparing the female and male unemployment rates, or by extracting one from another unemployment rate, or creating the ratios of them. These methods do not consider the gender inequality in labour force participation rates, which could lead to misinterpreted results that enhance or diminish the gender inequality. Based on these findings, we propose an indicator that would consider the gender inequality resulting from changes in participation rates by gender and unemployment rates by gender. The need for improvement of the measurement of the unemployment gaps as ratios of female to male unemployment rates or as difference between men and women unemployment rates, lies in lack of their capability of unified calculation and interpretation of the same unemployment gender inequality. Moreover, structural changes of the labour force participation by gender were not included in these indicators. Therefore, we propose a universal scale of the gender inequality that could be used, regardless of the levels of the unemployment rates or labour force participation rates. This scale is based on the fluctuations from means of total unemployment rates from the total gender equality, which is zero. The scale provides clear polarization of the gender inequality and is bounded from -50 to 50. Number -50 means all women were unemployed, and all men were employed, zero means men and women were equally unemployed/employed and 50 means that all men were unemployed while all women were employed, together 100% of the workforce.

A question arises why measuring gender inequality during unemployment is needed, and what could be obtained by measuring it. According to many authors, decrease in gender inequality of the labour market would lead to an increase of productivity and therefore would lead to increase of growth and wealth (Kennedy, Rae, Scheridan, & Valadkhani, 2017). However, the increase in workforce participation of women could lead to an increase in gender inequality (Elveren, 2014). Therefore is important to incorporate it to the indicator of the unemployment gender inequality. By its incorporation, the impact of the European Union policy of the increase of the woman participation in the labour market on unemployment (European Commission, 2017) could be

measured, and appropriate modifications of the policy could be proposed. The importance of measuring the gender inequality in unemployment is closely linked with this policy. Increase of the participation of women on the labour market could, indeed, decrease gender inequality in the labour force participation, but if new jobs were not created or if the unemployment rate is already high, women entering the labour market would stay unemployed, which increases unemployment gender inequality. By measuring unemployment gender inequality, policy makers could detect when they should implement policies supporting gender that is worse off during unemployment, and by its support to switch from unemployment to employment or decrease gender inequality in employment. Since if there are more women unemployed than men, this would mean that there are more men employed than women, suggesting inequality in employment, which could be decreased if more unemployed women get employed.

The paper is structured as follows. Firstly, we describe the results from the studies of gender during the last years, in respect of unemployment, participation rate and labour market. Subsequently, calculus of the proposed method is described, followed by measurement scale of the gender inequality. Afterwards, the proposed method of the gender inequality calculation is compared with the methods of Queneau and Sen (2007). Finally, we give our conclusions.

2. Literature review

Through history, men were considered breadwinners while women were more oriented on family. This perception of women has remained so far, which keeps women away from participation on the labour market (Krajska, 2016). Socio-cultural habits of employers still influence their management of the human capital in the private sector. Unchanged discriminatory behaviour concerning staff issues is the most concerning issue that keeps gender inequality present in the labour market (Spielmann, 2006).

Since the 1970's (Spielmann, 2006) until today, gender inequality has been investigated through many spheres of the labour market. This issue has concerned academics, governments and organizations from all over the world. Relation of gender inequality and foreign direct investment and deregulation of the labour market was researched by Mukhopadhyay (2015). Gender inequality has been most widely researched by comparing the wages of women and men. Differences between the wages of women and men were explained by being employed in specific economic sectors (Seshan, 2013; He & Wu, 2017), qualifications (Popli & Yilmaz, 2017), professional orientation (Mihàilà, 2016), educational attainment (Gokulsing & Tandrayen-Ragoobur, 2014) and many other factors. The relation between labour market activity of married women and the labour market activity of their husbands and worsening general economic situation was investigated by Karaoglan and Okten (2015) and Peiro et al. (2012). Duration in unemployment by gender was related to worsening economic situation (Bachmann & Sinning, 2016) as well as to participation in trainings (Pašic, et al., 2011).

Even today, when policies are oriented toward achieving gender equality, gender inequality remains persistent (Zachorowska-Mazurkiewicz, 2009). Problem with gender inequality could also be neglected, due to wrong orientation when solving this issue. Instead of increasing the participation rate of women in labour market, policies could focus more on ensuring the same working conditions and rights for both genders (Klugman, et al., 2014). Decrease of the gender inequality in the labour market, could be related to increase in productivity (Kennedy, et al., 2017) and economic growth in the long run (Klasen & Minasyan, 2017).

Unemployment gender inequality indicator that was used in many published papers, was the one of those used by Queneau and Sen (2007). Gender inequality was analysed by calculating the gender gap using two different ways. At first, the gender gap was calculated as the difference between the unemployment rate of women and men, at second gender gap was calculated as the ratio of unemployment rate of women to men (Queneau & Sen, 2007). The gender gap was also analysed by comparison of constructed steady state gender gap, with gender gaps constructed from finding and separate rates (Koutentakis, 2015).

The contribution of this paper to literature consists in enhancing constraining intervals and incorporating the gender inequality of the labour force participation for the method proposed by Queneau and Sen (2007). Unemployment gender inequality proposed in this paper captures the quantitative gender inequality measure of the unemployed workforce in respect of labour force participation. Measurement scale of gender inequality was also proposed, which would help to estimate the gravity of the unemployment gender inequality more accurately. Finally, the proposed approach was compared with Queneau and Sen (2007) methods.

3. Proposed indicator of unemployment gender inequality

The indicator that we propose considers gender inequality in participation rates as well as the findings from the established methods of the unemployment gender inequality calculations. To provide more accurate measurement of the gender inequality during the unemployment, we compute unemployment gender inequality rate from unemployment rates disaggregated by gender and labour force participation rates disaggregated by gender. The indicator that we propose could be implemented for the analysis of the unemployment gender inequality of any country, regardless of the country level of the unemployment rate or labour force participation rate.

Let denote the female unemployment rate in time t as u_t^f and the male unemployment rate in time t as u_t^m . Gender inequality, denoted as u_t^i , would be subsequently calculated as

$$u_t^m = u_t^f \Rightarrow u_t^i = 0; \tag{1}$$

$$u_t^m > 0 \wedge u_t^f = 0 \Rightarrow u_t^i = 1; \tag{2}$$

$$u_t^f > 0 \wedge u_t^m = 0 \Rightarrow u_t^i = -1; \tag{3}$$

$$u_t^m > u_t^f \Rightarrow u_t^i = \left(\frac{u_t^f}{u_t^m} - 1 \right) \times (-1); \tag{4}$$

$$u_t^f > u_t^m \Rightarrow u_t^i = \left(u_t^m / u_t^f \right) - 1. \tag{5}$$

By computing the gender inequality as listed above, we have achieved the same measure of gender inequality regardless of the gender in disadvantage. This provided us with more accurate and unified measure of gender inequality. To prove this statement, we compare it with unemployment gender gap calculated as ratio of female to male unemployment rate, proposed by Queneau and Sen (2007). In the next example, we would reference to the gender inequality indicator of Queneau and Sen as *Ratio indicator* (u_t^R) and to the indicator proposed above as *GI indicator* (u_t^i). Unemployment gender equality of *Ratio indicator* is set to one, and of *GI indicator* to zero. If the unemployment rate of women is higher than the unemployment rate of men, *GI indicator* would report a value from the interval -1 to zero, while *Ratio indicator* would report a value from the interval one to infinity. If the unemployment rate of men is higher than the unemployment rate of women, *GI indicator* would report a value from the interval zero to one, while *Ratio indicator* would report a value from the interval zero to one. Unequal intervals for *Ratio indicator* represent one of the issues of this method, which could be solved by replacing it with *GI indicator*. An example of the same gender inequality and distinct reported values when calculating with *Ratio indicator* was provided next. Let us suppose that the unemployment rate of one gender is 20%, while unemployment rate of the other gender is 17%, then let us suppose that gender inequality in participation rates does not exist. Results are presented in Table 1.

Table 1: Comparison of GI indicator and ratio indicator

	Ratio indicator	GI indicator	Equality gap	
			Ratio indicator	GI indicator
$u_t^f > u_t^m$	$u_t^R = \frac{u_t^f}{u_t^m} = 1.176$	$u_t^i = \left(\frac{u_t^m}{u_t^f} - 1 \right) = -0.15$	0.175	0.15
$u_t^f < u_t^m$	$u_t^R = \frac{u_t^f}{u_t^m} = 0.85$	$u_t^i = \left(\frac{u_t^f}{u_t^m} - 1 \right) \times (-1) = 0.15$	0.15	0.15

Source: Own calculations

While *GI indicator* reports the same gender inequality, independently from which gender had a higher unemployment rate, *Ratio indicator* reports distinct gender inequality for the same absolute difference between gender unemployment rates. This is the reason why *GI indicator* was proposed as a replacement of the *Ratio indicator*.

When we multiplied unemployment rate, denoted as u_t , with gender inequality calculated as described above, we obtained weighted gender inequality, denoted as

$$u_t^{wi} = u_t^i \times \frac{u_t}{100} . \quad (6)$$

Now we have obtained gender inequality indicator that considers the level of the unemployment rates and does not permit high levels of the gender inequality when the average unemployment rate is low, or low gender inequality when the average unemployment rate is high. We have not considered a nominal gender inequality, but rather gender inequality calculated as the ratio of the higher unemployment rate to the lower unemployment rate that is universal for all unemployment rates and provides more suitable measurement of the gender inequality. By multiplying *GI indicator* with the unemployment rate, we have also solved the issue with absolute differences of unemployment rates by gender. Multiplied *GI indicator* with unemployment rates would be further addressed as *WGI indicator*. By differences between unemployment rates by gender we consider the indicator obtained when the unemployment rate of men was extracted from an unemployment rate of women, to which we would further reference as to *Difference indicator*. Gender equality, using this indicator, was set to zero, and gender inequality could be retrieved from the interval -100 to zero, if the unemployment rate of men was higher than the unemployment rate of women, and from zero to 100 otherwise. Issue with *Difference indicator* lies in fact it does not accurately measure gender inequality, but only returns absolute difference between the two rates. To better explain the mentioned issue, we introduce an example, in which we compare it with *WGI indicator*. Let us assume *Difference indicator* is 10 and it was obtained by differencing, from unemployment rates 5% and 15%, and in the second case from unemployment rates of 40% and 30%. When referencing to *Difference indicator* we only have information that gender inequality is 10 in absolute value, but we do not know if it was obtained from the first or the second example. This issue could be solved with *WGI indicator*. Results are presented in Table 2.

Table 2: Comparison of WGI indicator and Difference indicator

	<i>Difference indicator</i>	<i>WGI indicator</i>	Ratio	Average unemployment
$u_t^f = 15; u_t^m = 5$	$u_t^R = u_t^f - u_t^m = 10$	$u_t^i = \left(\frac{u_t^m}{u_t^f} - 1 \right) \times \frac{u_t}{100} = -0.0667$	3	10
$u_t^f = 40; u_t^m = 30$	$u_t^R = u_t^f - u_t^m = 10$	$u_t^i = \left(\frac{u_t^m}{u_t^f} - 1 \right) \times \frac{u_t}{100} = -0.0875$	1.33	35

Source: Own calculations

While *Difference indicator* indicates the same gender inequality, *WGI indicator* reports higher inequality in the second case. This result may be controversial, since unemployment rate of women in the first case is three times higher than unemployment rate of men, but if we look at the average unemployment rate, it is lower in the first case. *WGI indicator* is basically obtained by merging the *Difference indicator* and *Ratio indicator* enhanced with weighting unemployment rates. *WGI indicator* does not permit gender inequality higher than the average unemployment rate. This limitation is incorporated to avoid reporting high unemployment gender inequality, when unemployment rates are low. The labour market is not perfect, some gender inequality will always exist, but it is easier to decrease it when unemployment rates are low. When unemployment rates are high and gender inequality is high, policies should focus first on decreasing the unemployment rates, and only then on decreasing gender inequality. Since it is hard to parallelly focus on two very serious issues, gender inequality during high unemployment rates is considered being more complicated for solving than during low unemployment rates. This is the reason of weighting with unemployment rates, and indicates higher gender inequality even the ratio indicates otherwise.

To provide more elaborate unemployment gender inequality measurement, we include gender inequality in labour force participation in our method. We calculate it using the same methodology described above.

Let denote female labour force participation rate in time t as LF_t^f and male labour force participation rate in time t as LF_t^m . Then the labour force participation rate gender inequality, denoted as LF_t^i , would be calculated as

$$LF_t^m = LF_t^f \Rightarrow LF_t^i = 0; \quad (7)$$

$$LF_t^m > 0 \wedge LF_t^f = 0 \Rightarrow LF_t^i = -1; \quad (8)$$

$$LF_t^f > 0 \wedge LF_t^m = 0 \Rightarrow LF_t^i = 1; \quad (9)$$

$$LF_t^f > LF_t^m \Rightarrow LF_t^i = \left(\left(\frac{LF_t^m}{LF_t^f} \right) - 1 \right) \times (-1); \quad (10)$$

$$LF_t^m > LF_t^f \Rightarrow LF_t^i = \left(\frac{LF_t^f}{LF_t^m} \right) - 1. \quad (11)$$

Now, we denote average labour force participation rate as LF_t , and we calculate the weighted labour force participation rate gender inequality as

$$LF_t^{wi} = LF_t^i \times \frac{LF_t}{100}. \quad (12)$$

Using this step, the same issues were solved by weighted unemployment gender inequality. To calculate the accurate unemployment gender inequality, we combine two weighted indicators from above, and we get the unemployment gender inequality rate denoted as

$$ugir_t = \frac{u_t^{wi} + LF_t^{wi}}{2} \times 100. \quad (13)$$

The unemployment gender inequality, to which we in the further text address as to *UGIR indicator*, provides a complex indicator of the gender inequality with respect of the actual situation on the labour market. Labour force participation of women was increasing during the last two decades, which is the phenomenon that was not incorporated in the previous indicators of the gender inequality. By increasing the participation of women on the labour market, there is a possibility that the actual gender inequality is lower than the previous methods exhibited. For this reason, we include gender inequality in labour force participation.

4. Construction of measurement scale

To construct the measurement scale of the unemployment gender inequality rate, we would combine the scale of the weighted unemployment gender inequality with the scale of the weighted labour force participation rate gender inequality. Both scales were set to fit the interval from -1 to 1, where 0 was set as gender equality, -1 means total gender inequality disadvantaging women, and 1 means total gender inequality disadvantaging men. Values from interval from -1 to 0, represent measurement of the gender inequality disadvantaging women, while values from interval 0 to 1 represent measurement of the gender inequality disadvantaging men. After averaging weighted unemployment gender inequality rate by weighted labour force participation rate gender inequality and multiplying the result by 50, measurement scale of the unemployment gender inequality rate was then set to intervals from -50 to 50.

To construct the gender inequality measurement scale, we suppose the perfect conditions on the labour market. Let us suppose that everyone on the labour market is unemployed ($ULF_t = 100$), which represents 100% of the labour market. To procure the gender equality, half of them should be women ($ULF_w = 50$), and half of them should be men ($ULF_M = 50$). Measurement intervals were set by permitting 1.25%, 2.5%, 5% and more than 5% fluctuation around the gender equality. The right gender inequality interval border when $ULF_M < ULF_w$ (right) was calculated as

$$right_t = \left(\frac{ULF_M + (ULF_M \times fluctuation)}{ULF_w - (ULF_w \times fluctuation)} - 1 \right) \times (ULF_t - (2 \times fluctuation \times 100)), \quad (14)$$

and left gender inequality interval border (left) was calculated as

$$left_t = \left(\frac{ULF_w + (ULF_w \times fluctuation)}{ULF_M - (ULF_M \times fluctuation)} - 1 \right) \times (-1) \times (ULF_t - (2 \times fluctuation \times 100)). \quad (15)$$

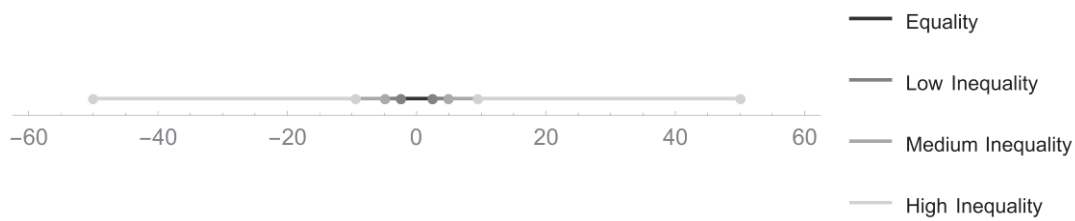
Gender inequality intervals were consequently calculated for each fluctuation level and next unemployment gender inequality intervals were set by which gender inequality was classified (Table 3).

Table 3: Unemployment gender inequality intervals

Fluctuation	Unemployment gender inequality intervals	Category
$\pm 1.25\%$	$ugir_t \in (-2.468; 2.468)$	Equality
$\pm 2.5\%$	$ugir_t \in (-4.878; -2.468) \cup (2.468; 4.878)$	Low inequality
$\pm 5\%$	$ugir_t \in (-9.524; -4.878) \cup (4.878; 9.524)$	Medium inequality
$> \pm 5\%$	$ugir_t \in (-50; -9.524) \cup (9.524; 50)$	High inequality

Source: Own calculations

Fluctuation could be also explained as a variation from the unemployment gender equality. According to the first fluctuation range, if the unemployment rate of one gender is by 2.5% higher than the unemployment rate of another gender, unemployment gender equality would be considered. Proposed indicator ensures that regardless of the average level of the unemployment rates, if the unemployment rate of one gender is by 2.5% higher than the unemployment rate of the other gender, it would be the value from the first interval (Table 3). Intervals are centred arounds the gender equality. The proposed intervals do not overlap as we can see in Figure 1.

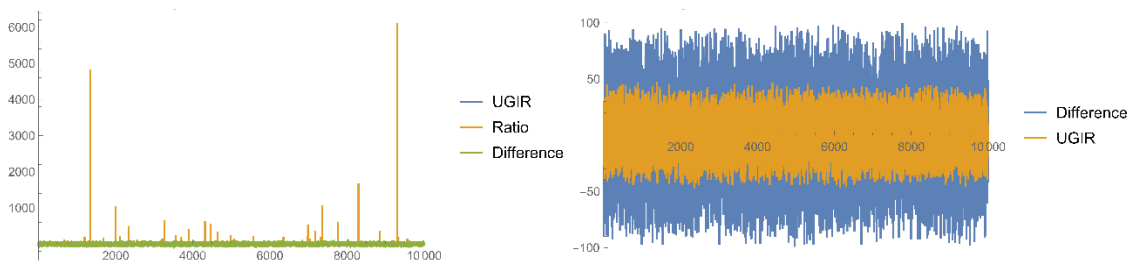


Source: Own illustration

Figure 1: Measurement scale of Indicator of unemployment gender inequality

5. Comparison of the unemployment gender inequality indicators

The chapter provides a comparison of distinct methods of gender inequality in unemployment calculation. For this purpose, we have generated the unemployment rates by gender and labour force participation rates by gender, from unified distribution (0,100), with Monte Carlo simulation. Generated were 1000, 5000 and 10000 observations, and the process was repeated 100 times.



Source: Own illustration

Figure 2: Comparison of Indicators of unemployment gender inequality (all indicators left, two indicators right)

Ratio indicator returns very high and incomparable values of gender inequality, therefore for better comparison of the *Difference indicator* and *UGIR indicator*, we depict them in the right picture (Figure 2). *Difference indicator* is bounded by two times higher gender inequality interval than *UGIR indicator*, but it does not return two times higher values when compared with *UGIR indicator* at time t . This is due to *UGIR indicator* being weighted with unemployment rates, and *Difference indicator* only returns the nominal difference between two unemployment rates, regardless of the level of unemployment rates (the same difference is obtained when calculated for 5%

and 15% or 30% and 40% unemployment rates, nominal difference is always 10, and therefore is hard to compare them).

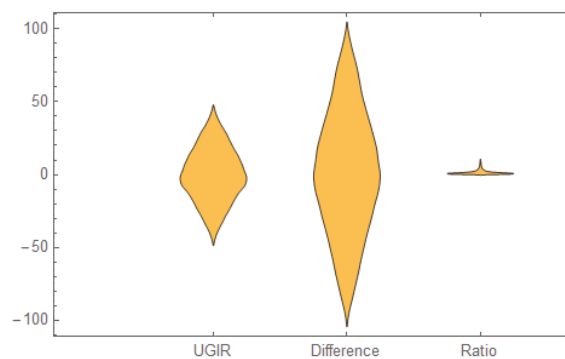
Table 4: Descriptive statistics

n	Ratio indicator			Difference indicator			UGIR indicator		
	1000	5000	10000	1000	5000	10000	1000	5000	10000
Min	0.00106	0.00055	0.000031	-94.72	-98.36	-99.24	-47.42	-47.05	-47.19
Max	1967.96	2353.79	6110.62	97.72	97.18	99.56	46.41	49.05	47.75
Median	1.033	0.999	0.993	2.21	-0.04	-0.31	1.004	-0.237	0.164
Mean	5.79	4.35	4.91	0.755	-0.31	-0.53	0.321	-0.237	0.028
Q 25%	0.507	0.499	0.493	-29.75	-29.00	-29.46	-12.48	-13.24	-13.29
Q 75%	1.978	1.986	1.957	30.87	28.19	28.41	13.32	12.87	13.22
StD	65.225	49.014	83.385	41.93	40.37	40.72	18.28	18.05	18.43

Source: Own calculations

When compared, *Ratio indicator* was rated as the least suitable indicator from all three. Its standard deviations were increasing with increase in the number of observations, achieved maximum gender inequality also increased. However, in all three replications, in 50% of the cases unemployment of women was higher than the unemployment rate of men, and in 50% the opposite was true. Regardless of the number of replications, 25th and 75th quantile reported the same gender inequality. When the 25th quantile gender inequality disadvantaging men was reported, due to unemployment rate of women was 0.5 higher than the unemployment rate of men, and in the 75th quantile, the unemployment rate of men was two times higher than the unemployment rate of women, then we obtain the same gender inequality. Since, *Ratio indicator* permits open upper interval, mean gender inequality was distorted, and with the presence of very high reported values of gender inequality, increased to around five. It is hard to compare gender inequality of women and men since intervals disadvantaging each gender in unemployment are unequal (Table 4).

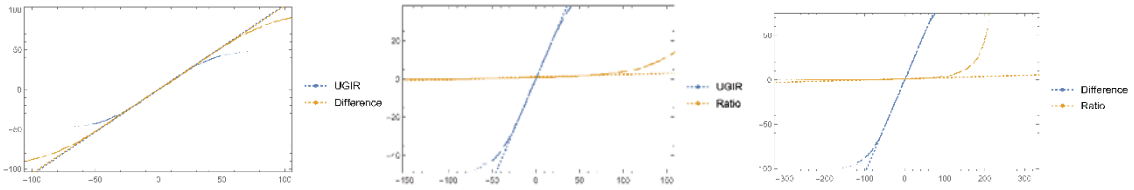
Both *Difference indicator* and *UGIR indicator* are constrained within the some fixed interval, therefore minimum and maximum retrieved values of gender inequality depend on these intervals. With the increase of the number of replications, obtained means are closer to zero, which represent gender equality, which is also true for medians. Half of the values represented gender inequality disadvantaging men, and half disadvantaging women. 25th and 75th quantile of both indicators, also exhibited similar behaviour. Variance occurs when the standard deviation of two indicators is compared. If we consider interval of *Difference indicator* being two times higher than interval of *UGIR indicator*, the standard deviations should also be two times higher to declare them equal. However, standard deviation of the *Difference indicator* is more than two times higher than the standard deviation of the *UGIR indicator*.



Source: Own illustration

Figure 3: Comparison of Indicators of unemployment gender inequality distributions

To compare the distributions of the indicators of the unemployment gender inequality, distribution of the *Ratio indicator* was constrained, to fit the interval of *Difference indicator*. Very high values of *Ratio indicator* would enable us to compare the analysed indicators. The lower interval is bounded by 0, equality is 1, and upper interval is open, and therefore this interval was constrained. By comparison of *Difference indicator* and *UGIR indicator*, we observe similar behaviour in average, with only intervals being distinct (Figure 3). Therefore, we compare them using Quantile plots (Figure 4).



Source: Own illustration

Figure 4: Comparison of quantile plots of Indicators of unemployment gender inequality

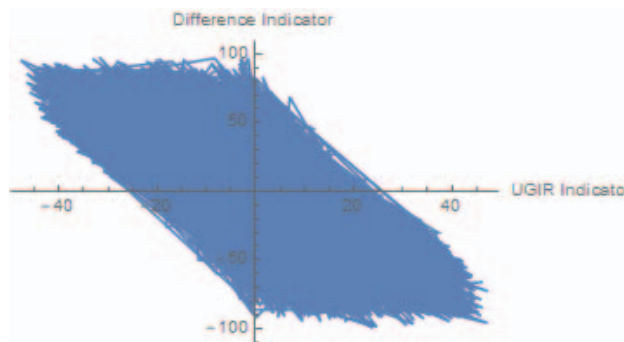
When we compare *indicator UGIR* with *Difference indicator*, we see S-shape of both indicators, but *Difference indicator* distribution shows heavy-tailed and over-dispersed data. Comparing *Ratio indicator* with *UGIR* or *Difference indicator*, *Ratio indicator* exhibits right skewed heavy-tailed distribution.



Source: Own illustration

Figure 5: Difference and UGIR indicator of gender inequality compared with unemployment rate

Figure 5 shows independence of UGIR indicator of unemployment gender inequality from unemployment rate, while Difference indicator of unemployment gender inequality is highly dependent on it. Considering UGIR indicator measures unemployment gender inequality independently from current unemployment rate and therefore, more accurately, we argue that should be used instead of the Difference indicator of unemployment gender inequality. Finally, Difference indicator and UGIR indicator of unemployment gender inequality were compared (Figure 6), to prove that at time t indicators are not comparable, since they exhibit different gender inequality. This is due to Difference indicator of unemployment gender inequality lack of consideration to distinct unemployment rates and labour force participation rates (same difference when the unemployment rate is 5% and 15% or 30% and 40%, difference is always 10).



Source: Own illustration

Figure 6: Comparison of Difference and UGIR indicator

Based on the evidence provided, we argue that UGIR (unemployment gender inequality rate) indicator provides more accurate measurement of gender inequality than Difference or Ratio indicator. This is due to its ability to report unemployment gender inequality as a percentage from the mean unemployment rate, rather than ratio or difference between the two unemployment rates.

6. Conclusion

The paper provides calculus of unemployment gender inequality building on methods that consider the nominal difference and ratio between unemployment rates by gender, enhancing them by incorporating gender inequality in labour force participation rates and constraining it to a fixed interval. Further, measurement scale of unemployment gender inequality was set by permitting certain level of fluctuation around the average value

of unemployment rate and labour force participation rate. Further, the indicators were compared by implementing them on examples that illustrated the issue inflicted. It was demonstrated that by neglecting gender inequality in labour force participation rates, gender inequality indicators could be distorted. Further, it was proven that by not weighting gender inequality ratios by unemployment rates, gender inequality could exhibit higher values than they are. Moreover, issue with high gender inequality ratios when unemployment rates are low could be solved this way. By constraining gender inequality rates within the proposed interval, level of gender inequality would remain the same, regardless which unemployment rate by gender is higher. This issue was not solved by existing methods that have unequal intervals. Methods that consider the differences and ratios between unemployment rates by gender, exhibit distinct levels of gender inequality when compared, while the method that we propose is unified. Nominal differences could be the same for distinct levels of unemployment rates, while the ratios between them is different and vice versa. The indicator that we propose, besides gender inequality ratios, considers also levels of unemployment rates and gender inequality in labour force participation rates, and therefore, provides more accurate unemployment gender inequality indicator.

Acknowledgements

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Before and After Treatment Analysis Based on a Quali-Quantitative Approach: Coaching Intervention

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Abstract: The paper focuses on the use of quali-quantitative approach to analyse the role and effectiveness of a treatment initiative in the field of Human Resource Management (HRM). Each employee in their professional development has to overcome a number of critical stages, when their labour behaviour, work motivation, attitude to work, and emotional state are changing. In such periods, the employee, who is under the influence of a professional development crisis, not only reduces the effectiveness of their own work, but can also cause a crisis situation in the company due to professional mistakes they make. Consequently, companies need efficient management tools to intervene in the HRM system and to impact on the staff labour behaviour. In this study, through multiple qualitative methods, we attempt to analyse the coaching intervention as a tool for overcoming the crisis of employees' development, as well as toxic behaviour in the workplace. In order to identify the individual peculiarities and general patterns of employee professional development crises, we used a quali-quantitative method that includes narrative inquiry, narrative interview, and visual narrative analysis, supported by expert assessment of the data collected before and after the treatment initiative. In particular, in this study we try to verify if this methodology allows us to analyse the change of employee self-perception due to coaching intervention aimed at working with professional crisis situations. To obtain objectified verbal and non-verbal material of each coaching participant's manifestations, the authors collected data, including by means of video recording. To increase the objectivity of our estimates we used expert assessment with the assistance of competent professionals with the necessary experience who participated in our study as informants. To ensure the reliability of the results, the evaluation process by a group of experts did not involve their interaction with each other. Calculations made using Fisher's formula, allowed us to ensure the reliability of the differences between the categories identified in the data collected before and after coaching treatment.

Keywords: quali-quantitative method, before-after treatment analysis, professional development crisis, toxic behaviour at work, coaching intervention

1. Introduction

Modern organisational environment is characterised by constantly growing requirements for employees' professional competence, as well as by an increase in the overall labour intensity that contributes to the emergence of professional crises. Each employee in their professional development has to overcome a number of critical stages, when their labour behaviour, work motivation, attitude to work, and emotional state are changing. It should also be taken into account that the development pace of modern society imposes constantly increasing demands on the level of employees' professional development, which causes professional crises, related to the increased overall work intensity. Dissatisfaction with job position or/and working conditions in the company, psycho-physiological and age-related changes, excessive absorption in professional activity, as well as changes in the life situation may be the origin of toxic behaviour at work. During such periods, the employee, who is under the influence of a professional development crisis, not only reduces the effectiveness of his/her work, but can also cause a crisis situation in the company due to professional mistakes they make. Moreover, a toxic employee, consciously or not, can inflict damage to the company, for example, by destroying the work of the team, by misusing official powers, etc.

The problem of crises in human development has long been the subject of interdisciplinary research in psychology, pedagogy, and management. Researchers distinguish crises of mental development, age, life and professional crises (Bodrov, 1991, Erickson, 2006). Akhmerov (1994) described three major biographical crises: the crisis of lack of self-realisation, the crisis of devastation, the crisis of lack of prospects (of hopelessness). Zeer (2003) points out that what plays a decisive role in the development of crises in an adult is the change and restructuring of their leading activity, and identifies crises of professional development in individuals. Of particular concern for professional advisors are abnormal crises of stochastic nature that are difficult to forecast. Such crises that have arisen due to an unfavourable confluence of circumstances are accompanied by severe

suffering: very often individuals cannot cope on their own and need help and support of relatives and psychologists. To effectively overcome a crisis, a person must first of all understand the underlying reasons. Often, the crisis cause is associated with the difficulties of adaptation in the event of a drastic change of any life circumstances (social, family, professional). In this case, a person, as a rule, has trouble orienting in the new environment, and starts fearing an uncertain future.

Professional development crisis is obviously one of the causes of various forms of destructive behaviour in the workplace. Professional deformation and the development of professionally undesirable qualities undermine the employee's personality integrity, reduce their adaptability, stability, and adversely affect their performance. As noted above, employees in professional crisis may create risks and threats to the company economic efficiency. Such employees can be referred to as toxic personnel who inflict damage to the company by their actions or inaction (Frost, 2004, Lubit, 2008, Fedorova, 2016). First of all, the level of their involvement in work diminishes (Dolzhenko, Ginieva, 2016), as well as the level of job satisfaction decreases, causing reduction of employee loyalty to the company (Tokareva, Tokarev, 2016, 2017); the instability of their emotional state leads to conflicting interpersonal relations destabilising the work of the whole team, which requires taking certain measures on the part of management to prevent and counteract the toxic staff destructive behaviour (Sue, 2007).

In addition to friends' support and participation, and orientation to universal values, the most effective way to overcome crises of professional development is working together with a professional advisor. The best method of dealing with professional development crises is coaching. Traditionally, coaching is viewed as a professional partnership with a client, aimed at creating and implementing special, meaningful changes in personal and professional life (Erickson, 2006). Rybkin and Padar (2009) introduced the concept of systemic-integrative coaching as a system for unlocking the mutual integrative and professional potential of a person to ensure the ultimate effectiveness.

The article presents the results of our study into the effectiveness of coaching intervention as a way of overcoming professional crises in employees. In this study we used a multi-method qualitative approach, including the methods of narrative analysis and expert assessment.

2. Methods

The purpose of the study is to analyse the effectiveness of coaching intervention as a method of dealing with personnel crises and decreasing toxic behaviour. The study was conducted from March 2016 to December 2017 and involved 65 people aged from 23 to 42, 47 women and 18 men. The respondents worked in coaching groups: they were divided into 5 groups of 13. The participation in the experimental method approbation was voluntary, all the participants responded to an advertisement inviting those in a situation of a professional crisis to gain experience of overcoming it through coaching. It is essential to point out that the respondents were aware of their professional crisis and declared their willingness to cope with it. For six weeks, the participants took a coaching course under the guidance of a professional coach; group meetings were held once a week.

To work with the participants' requests for overcoming the crises of professional development, we used a six-stage model of systemic-integrative coaching. At the first stage, a client specifies the requirements to the results of coaching, the purpose of the work is determined, and the client's expectations are discussed. At the second stage, the client, using special questions, carries out a self-assessment of their personal and professional competencies, and also considers their professional situation from different angles, identifying its positive and negative aspects. At the third stage, internal and external resources for constructive resolution of the professional crisis are searched for. Resource maps are compiled together with the client, and opportunities for finding them are discussed. At the fourth stage, the client's values are worked on. A person needs to have a sufficient level of motivation for further professional development. Working with the client's values allows building an individual hierarchy of values, identifying priority areas in personal and professional life. At the fifth stage, the client, with a greater degree of awareness, identifies personal and career goals, and builds new career plans. It is essential at this stage to discuss with the client the specific further actions, to indicate the timing for the implementation of the goals. At the sixth stage it is important to get feedback from the client and outline the prospects. An important point is the client's accepting responsibility for their past, present and future actions. The desirable results of coaching and indicators of its success can be as follows: the client's increased

awareness, acceptance and rethinking of the crisis situation, enhanced motivation for work, formulation of new career goals, improved psychological state, reduced anxiety, improved mood and performance.

To achieve the objectives of our study, we developed a multi-component qualitative approach, which can also be used in the practice of human resources management. This approach includes the following research methods: narrative interview, narrative inquiry and visual descriptive analysis supported by expert assessment.

Narrative interviews were used as a qualitative research method in anthropology, sociology, psychology, education, psychotherapy and history. A narrative interview was first used as a biographical method in the study of personal oral and written accounts of the lives of certain social groups' representatives, conducted by American, Polish and Austrian sociologists and psychologists in the early twentieth century (White, 2003).

Narrative interviews were conducted individually, one-to-one with the interviewees, for 30-60 minutes. The purpose of the interview was to immerse the person in the events directly related to their professional crisis, to identify its causes and symptoms, which provides important information for further work. Narrative interviews began with a request: "Please tell us what caused your professional crisis and how it manifests itself." In the course of the narrative interview, the researcher's influence is minimised to prevent undermining its validity, so a strictly limited number of questions were asked, the questions belonged to one of the three types: 1) when the professional crisis started; 2) what happened before and after this; 3) when and how you realised that you are in a professional crisis. Other questions were not asked, because according to the rules of a narrative interview, the interviewer should avoid any pressure or leading questions. Questions were asked when the respondent made a long pause in the narrative. Narrative accounts were recorded on a voice recorder with the respondent's permission.

The narrative inquiry was conducted to identify individual peculiarities and general patterns of professional development crisis for each participant. We used the method of a short narrative inquiry for express-diagnostics of the participants' verbal statements before and after coaching. A narrative inquiry provides an opportunity for a differentiated analysis of a person's self-perception under the influence of a professional crisis. Each coaching participant was given the following instruction: "Whenever you decide to do it (there is no particular order or turns), stand in front of the group and tell them "What I am like at work now". We recorded positive, negative and neutral states of consciousness depending on the direct content of the utterance, and conducted a qualitative analysis of the narratives. The narrative inquiry was recorded on video. To establish reliable differences at the level of the respondents' verbal statements between the indicators of the first and second data slices, we used Fisher's criterion (φ), intended to compare two series of sample values on the frequency of occurrence of a feature. This criterion can be used to estimate the differences in any two samples: dependent or independent. It allows comparing the indicators of the same sample, measured in different conditions. This study used dependent samples; the measurements were carried out before and after the coaching intervention. The criterion evaluates the reliability of the differences between the percentages of recorded effects under consideration in two samples. The essence of Fisher's angular transformation is the translation of percentages into the values of the central angle measured in radians. A larger angle φ will correspond to a larger percentage, and a smaller angle will correspond to a smaller percentage, but the correlations here are not linear. As the discrepancy between angles φ_1 and φ_2 , and the number of samples increase, the criterion value increases. The higher the value of the φ_{emp} value, the higher the probability of the difference reliability. The φ angles for each of the compared percentages are determined using calculation tables (Ermolaev, 2002).

The empirical value of φ_{emp} is determined by means of the following formula:

$$\varphi_{emp} = (\varphi_1 - \varphi_2) \sqrt{\frac{n_1 \cdot n_2}{n_1 + n_2}}$$

where φ_1 is the angle corresponding to a higher percentage, φ_2 is the angle corresponding to a lower percentage, n_1 is the number of observations in sample 1, n_2 is the number of observations in sample 2. The resulting value of φ_{emp} is compared with the critical values of φ_{cr} . The critical values for the 5% and 1% significance levels have a fixed value and are $\varphi_{cr} = 1.64$ for 5% ($P \leq 0.05$), and $\varphi_{cr} = 2.28$ for 1% ($P \leq 0.01$); in the common form of recording it looks as follows:

$$\varphi_{cr} = \begin{cases} 1.64 & \text{for } P \leq 0.05 \\ 2.28 & \text{for } P \leq 0.01 \end{cases}$$

The hypotheses we studied to verify the statistical significance of the first and second data slices using Fisher's criterion, include:

H₀: The share of individuals with manifestations of the effect under consideration in sample 1 is not larger than in sample 2.

H₁: The share of individuals with manifestations of the effect under consideration in sample 1 is larger than in sample 2.

If $\varphi_{emp} \geq \varphi_{cr}$, then H₀ is rejected.

The video recorded during the narrative inquiry was subjected to a visual descriptive analysis supported by expert evaluation. Visual descriptive analysis is essential in terms of increasing the reliability of the study: it was especially important for us to monitor not only what a person was saying, but also how they were doing it, what nonverbal reactions accompanied the narrative. Visual analysis of the video recordings was carried out to obtain objectified verbal and non-verbal material of each coaching participant's manifestations. To increase the objectivity of the evaluation, we used expert assessment as an additional tool: competent persons with special experience in analysing non-verbal manifestations who participated in the study as a source of direct information. The experts' objective was to express their opinion on the quality of the visual descriptive analysis on a specific scale in accordance with the related rules. The method of expert assessment is classified as subjective, since its results largely depend on the characteristics of the experts themselves. However, the subjectivity of the method does not lead to its ineffectiveness: with the right selection of specialists and properly organised work, the information obtained is reliable.

We followed the stages of expert assessment: 1) preparation for the analysis (studying the procedure and rules for assessment, familiarisation with the methods of recording opinions and statements, actualisation of the knowledge in this particular area); 2) examination of the study object; 3) implicit assessment, in case the subjective impression, weakly differentiated and unstable, has not yet received expression through inner speech, symbols or words; 4) the explication of the assessment, that is, its formulation in the mind, and subsequently, in verbal or symbolic form; 5) checking the accuracy of the results; 6) substantiating the assessment with appropriate arguments. To prevent undermining the reliability of the results during the expert evaluation, we chose the evaluation by a group of experts (seven people) not interacting with each other. Specific parameters were developed for the experts, according to which they made their individual judgments. "Congruence" was chosen as one such criterion, which we understood as the agreement between the verbal content of the respondent's answer and their non-verbal manifestations. This choice was due to the fact that congruence is the quality of a mature personality, it indicates a pronounced potential for personal and professional development. It is, undoubtedly, also a positive resource for overcoming professional crises. Congruence can be viewed both as a characteristic of communication and a special mode of any facilitator's effective work, or developmental intervention (in this study – coaching).

After expert assessment, we carried out the following standard operations:

- checking individual judgments for the consistency of the components;
- analysing the experts' opinions to establish the degree of their coherence;
- identifying the causes of discrepancies between individual opinions.

The main features of our analysis organisation include:

- cyclic nature of the procedure, repetition of its stages. At the beginning, each expert gave their assessment and justified it. Then a summary was compiled, reflecting all the participants' opinions;
- absence of interaction between the experts, which ensured the minimisation of inter-subjective influence of communication on the quality of the results;
- using not only quantitative evaluation, but also substantiating it with arguments, which contributed to more careful reasoning when making individual judgments.

Expert assessment was conducted in one round. As mentioned above, we used Fisher's criterion, which allows verifying the statistical reliability of two measurements of an indicator before and after the intervention, to establish reliable statistically significant differences between the results of the first and second expert assessment.

3. Results

The narrative interview in our study directly preceded the coaching intervention and was carried out to clarify the specifics of professional crisis for each participant. Moreover, narrative interviews allowed us to identify the causes of the professional crisis and its manifestations at the external and internal level. In addition to its diagnostic potential, the narrative interview allowed the participant to understand more deeply the causes of their professional crisis. The analysis of the answers to the question "What do you think caused the professional crisis?" made it possible to single out the subjective reasons listed below (Table 1).

Table 1: Rating of the reasons for professional crisis mentioned by the coaching participants in narrative interviews, % of the respondents

No	Reasons for professional crisis	%
1	Poor workplace conditions	69.2
2	Toxic leadership (the manager's destructive personality traits)	58.5
3	Absence of career prospects	41.5
4	Low pay	41.5
5	Negative socio-psychological climate in the team	36.9
6	Failing health due to heavy workload	29.2
7	Unofficial employment	23.1
8	Insufficient recognition of merits	21.5
9	Feeling of own unprofessionalism	12.3
10	Unsatisfied expectations from work	7.7
11	Other	4.6

*The total is over 100%, since one respondent could choose several factors.

The table shows that poor working conditions are the reason that was ranked the first. Toxic leadership, primarily associated with destructive personality traits of the manager, with their low managerial culture and emotional intelligence, was mentioned in the narratives by two-thirds of the coaching participants. Lack of career prospects and low pay were identified as a possible cause of professional crisis by slightly less than a half of the participants. In addition, a variety of individual reasons (for example, boredom, difficulties in personal life, etc.), were subjectively noted by individual participants, which, of course, were taken into account in coaching, but were not statistically significant, as they were not mentioned by other participants in the experiment. It is noteworthy that the majority of the participants, aware of the existence of a professional crisis, associated it only with external circumstances and the behaviour of other participants in their professional activities, but did not connect it with their own behaviour. One in eight participants noted the sense of their own unprofessionalism as the reason for professional crisis, and every thirteenth participant mentioned unjustified, often overestimated, idealistic expectations from work. For most of the participants, the starting point for the development of a professional crisis was a negative situation after which they realised they were not satisfied with their professional activities, job, duties and position in the career hierarchy of the organisation.

The analysis of the narratives made it possible to identify the manifestations (consequences) of the professional crisis among the participants, which were recorded at physical (physical state), psychological (emotional state), professional (feeling as a professional) and communicative level (communication with colleagues, clients and management). 72.3% of the participants noted changes at physical level, manifested in health issues, exacerbation of chronic diseases, decreased immunity, sleep disorders, impaired appetite, problems with digestion system, intensified addiction to sweet food, increased fatigue and tiredness, frequent headaches. Manifestations at psychological level were noted by all the participants: various emotional reactions and states

were mentioned: stress, unreasonable anxiety, worsening mood, depression, and distress. At professional level, two opposite tendencies were observed in the narrative interviews: approximately 60% of the interviewees considered themselves to be high-level professionals who could not fully realise their potential in their workplace due to a number of reasons described in Table 1. At the same time, 23.1% of the participants spoke of their dissatisfaction with their own professionalism, showed a low professional and personal self-esteem, etc. A small number of the participants, mostly under the age of 30 (6.1%), said they doubted their choice of profession. At communicative level, 66.1% of the coaching participants referred to conflicts with their superiors and colleagues that occurred, in their opinion, as a result of a professional crisis. Some respondents experienced negative emotions towards their managers, and less often to clients and colleagues: anger, resentment, aggression, rejection. 4.6% of the participants experienced negative emotions in relation to themselves.

A qualitative analysis of the interviewees' statements obtained through a narrative inquiry showed their stereotyped character, a fear of standing out, of openness. The following characteristics and expressions were the most frequent: "insecure", "there are problems", "worried", "alarmed", "bad mood", "tense", "uncomfortable", "sad", "shy", "upset". When describing their physical condition, the respondents mentioned fatigue, headaches, and drowsiness. The coaching participants mostly talked about how they would like to see their professional activities in the future, what their goals, plans, dreams were. Their current professional achievements were mentioned less often. Having summarised the data obtained during the second inquiry, we can state that qualitative changes were observed. A qualitative analysis of narratives showed that the statements became more detailed, the interviewees tried to convey their condition to others, and the number of stereotyped, defensive statements diminished. Most of the participants were able to come up with a constructive vision of the components of the problematic situation; many of them became less defensive. The number of situational statements significantly decreased, but they did not disappear completely. After coaching, the following statements were the most typical: "feeling of lightness, flying, feeling of inspiration, intimacy with colleagues, warmth and soulfulness, delight, joy, hope." As an illustration of the changes in the situation, let us consider the most typical statements before (first data slice) and after (second data slice) coaching intervention. Participants, the narratives of which are listed below as examples, were assigned literal indexes in alphabetical order.

A, 23, a recruiter. First inquiry: "Currently, I'm not quite confident in myself and in my career opportunities, tense. I hope that in the future, with the help of coaching, I will overcome my shortcomings and complexes in order to fit my profession." Second inquiry: "I am calm and confident. I am fine".

B, 41, a nurse. First inquiry: "I have now achieved very little in life and in my career. It seems to me that a lot of important and new things are happening in my life. And I'm changing a lot." Second inquiry: "I'm very interested right now in what people around me think about me, my colleagues, and patients. I try to realise myself as fully as possible, both at work and in life. I feel a great interest in myself as a person on the part of my superior. Thanks for this!"

C, 50, a mining engineer. First inquiry: "I'm the biggest, the smartest and the most handsome, and I don't have megalomania". Second inquiry: "I know I've become a better professional and I feel the attitude to me has changed on the part of my colleagues, superiors and even my wife".

D, 40, a university lecturer. First inquiry: "I haven't slept well, but I'm in an excellent mood because of coaching". Second inquiry: "Finally, it's my turn. I'll try to say something meaningful. Now I like the people that surround me, my team of colleagues. Everyone is looking at me, probably expecting me to say something special. I know, you all love me very much, and I love you, too. You are all wonderful."

E, 31, an economist. First inquiry; "I'm really tired and I want to go home". Second inquiry: "I'm quite calm and satisfied with the state of my life. I work where I've wanted to. I love the people that surround me, my team is nice. Everything is good".

Thus, we have identified positive, negative and neutral states of consciousness depending on the content of the utterance. In general, at the time of the first inquiry positive comments predominated, the subjects evaluated themselves as clever, good specialists, confident professionals, balanced, ready to help colleagues, charming, likeable, sociable, and so on. As it can be seen from Table 2, positive self-characteristics were revealed in 62% of the interviewees. In 23% of the participants, neutral self-characteristics were identified: "an ordinary

employee", "a simple worker", "normal, like everybody", "average". At the same time, some participants (15%) spoke of themselves as unconfident, tense, anxious. It is characteristic that this category was the most sincere in describing themselves and their state, since you need to have a sufficient degree of courage to confess your shortcomings to people you do not know well. After the coaching intervention, the number of negative, self-accusing statements and self-characteristics decreased by a half: these were recorded for only 8% of the participants. 75% of the participants had positive statements, and 17% – neutral statements.

Table 2: The distribution of coaching participants with different states of consciousness according to the results of the narrative inquiry, % of the total number of interviewees

Inquiry №	Positive	Negative	Neutral
1st	62	15	23
2nd	75	8	17

Fisher’s criterion was used to identify reliable differences at the level of verbal manifestations between the indicators of the first and second analysis. Based on the data shown in Table 3, we can state that there are statistically significant differences between the results of the first and the second analysis. At 5% level of significance, we can speak about the differences between the indicators of the first and second data slices that characterise positive states of consciousness. At 1% level of significance, differences between the indicators of negative and neutral states of consciousness were revealed.

Table 3: Results of mathematical-statistical analysis using Fisher’s method (indicators of verbalisation)

Statistical values	Positive statements	Negative statements	Neutral statements
φ_1	1.813	0.795	1
φ_2	2.094	0.574	0.85
Φ_{emp}	1.601976472	1.259893845	0.855132
P	0.05	0.01	0.01

Thus, it can be concluded that the respondents demonstrated considerable changes on all verbalisation parameters.

But not only the quantitative indicators are important: the qualitative characteristics of the participants’ utterances changed as well. After the coaching intervention the participants tried to demonstrate their characteristics, both positive and negative, more objectively. Even statements that were negative in their direct content were the result of the person’s internal work on the issues that initially led to their professional crisis.

In the videos of the participants’ answers during the first interview, it is especially noticeable that the direct content of the statements does not correspond to the participants’ actual state of mind. The test situation itself is stressful enough, but the subjects tried to demonstrate self-confidence, not always successfully. At the same time, the phrase "I am calm" or "I am self-confident" often sounded like the participants’ trying to convince themselves. The participants tried to "save their face," not to show their weakness to others. The visual descriptive analysis of video recordings was accompanied by expert evaluation to increase the objectivity of the conclusions about the effectiveness of coaching for overcoming professional crises. When analysing the video recordings the experts divided the participants into two groups according to the set criteria: "congruent" and "incongruent". Congruence here refers to the authenticity and openness in expressing one’s feelings. Congruence, as the quality of a mature personality, is an indicator of the individual’s potential, including their professional potential. When analysing the video recordings of the first narrative inquiry, the experts demonstrated a wide range of opinions in the definition of congruent and incongruent interviewees. Table 4 shows that the number of congruent interviewees, according to the experts, was from 15.3% to 30.7% of the total number of participants.

Table 4: Number of congruent participants according to expert analysis of the video, % of the total number of interviewees

Expert’s №	1	2	3	4	5	6	7
1st data slice	15.3	30.7	27.6	21.5	18.4	26.1	26.1
2nd data slice	83.0	84.0	83.0	81.5	81.5	89.2	90.7

Thus, the generalised average number of congruent participants was 15.4%. On the contrary, when assessing the videos of the second inquiry, the experts independently showed more similar results in identifying congruent participants. They found from 81.5% to 90.7% of the participants congruent, the generalised percentage is

84.6%. All the experts, without exception, noted the fact that during the first interview the participants tried to make a more favourable impression, to demonstrate adequate self-esteem and self-confidence. However, non-verbal manifestations revealed the insincerity of these answers. After the coaching intervention, the same participants assessed themselves more adequately, their non-verbal manifestations agreed with the direct content of their utterances, they were much easier to classify as congruent or incongruent. Using Fisher's criterion, the reliability of the differences in the number of congruent respondents at the time of the first and second interview was confirmed; statistical significance $P=0.01$.

Thus, reliable qualitative and quantitative changes in the respondents' condition allow us to conclude that coaching intervention is an effective method of dealing with personnel professional development crises.

4. Conclusion

Our study contributes to the research of evidence-based methods for coaching intervention in HRM, aimed at overcoming employees' professional crisis, as well as their toxic behaviour in the workplace. The choice of the quali-quantitative approach is due to the specificity of the subject and the object of our study. The results of this study confirm the reliability of the evaluation of the effectiveness of using coaching intervention as a tool for overcoming employee professional crisis obtained through narrative inquiry, narrative interview and visual narrative analysis, supported by expert assessment. The qualitative and quantitative changes in the condition of the experiment participants experiencing professional crisis, measured before and after the coaching intervention, allowed us to obtain convincing evidence of the positive impact of coaching on overcoming professional crisis.

We affirm that the importance of overcoming employee professional crises is due to the fact that employees in crisis can demonstrate various forms of toxic behaviour, become a source of conflicts, as well as risks and threats to the social well-being of the workforce and the economic performance of the company. The experiment we conducted involved employees of various companies in a random way and showed the effectiveness of our coaching intervention method as one of the tools for addressing this issue. The methodology for coaching intervention was developed based on the concept of systemic-integrative coaching and includes six stages from the formation of participants' requests and expectations to the construction of new prospects for their professional development. The methodology for evaluating the effectiveness of coaching intervention, developed on the basis of a multi-component qualitative approach, serves two purposes simultaneously: 1) a transformative influence on the experiment participants' condition aimed at overcoming negative manifestations of professional crises; and 2) obtaining reliable results on the effectiveness of coaching intervention. Thus, the multi-component qualitative approach applied in our research is unique in its ability to address several issues simultaneously.

In addition to the multi-component qualitative approach, a quantitative method was applied: using the Fisher's criterion, statistically significant differences between the results of the first and second data slices were identified. The quantitative method allowed us to confirm the reliability of the results obtained by means of qualitative study.

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Reflecting on Cyber Governance for a new World Order: An Ontological Approach

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Abstract: Who controls cyberspace is a question that remains unresolved by cyber stakeholders around the globe. Since its invention half a century ago, the Internet has been largely owned and operated by the private sector and its experts, architects, and engineers. Recent world events have created a sense of urgency concerning the new world order and what that means for cyber governance and the emerging global domains of cyberspace. With the devastating global ransomware attacks on universities, hospitals and businesses we are reminded that cyber-attacks can result in serious losses for the victims and tremendous financial gains for the perpetrators. Cyberattacks can also have serious political implications as demonstrated by the cyber-attacks targeting the American political system, and the cyber systems operated by the Ukrainian government. These attacks create concern about the stability of global connectedness and the potential for diminution of global boundaries. Though there are some who would like to tame the cyber world with more laws and regulation, there are many who would like to maintain a free cyberspace open to all with an opportunity for greater technological advancement. This research responds to the question: How can ontological research methodologies contribute to the understanding of cyber governance at the global level? There is considerable scholarly research around the topic of cyber security ontologies, but far less research on the use of ontological development to understand the coordination and interconnectedness of cyber governance at the international level. This paper explores the concept of the governance of cyberspace from its early phases to the present environment and analyses governance through an ontological approach to provide a deeper understanding of the entities, attributes and processes of these evolving domains. The paper begins by providing an overview of ontological approaches to research generally and more specifically in the cyber realm. To enable new thinking the paper progresses to provide an overview of cyber governance as presented in the literature and through interviews conducted with cyber professionals and policy experts. The paper then explores some of the challenges and opportunities to ontological development of the cyber governance domains and where future research should be focused.

Keywords: ontology, cyber research methodologies, cyber governance, national cyber strategies

1. Introduction

Cyber research is at a critical point of development based on the needs of our networked world. We must continue to defend our critical infrastructure, while preparing for the future use of cyber as a weapon for warfare and as a tool for political, economic, and social disruption. Governance is a critical aspect of any cyber system. Determining the state of security, designating the resource(s) to be secured, and applying lessons learned are critical governance functions that must be considered in the design of resilient cyber systems.

In an attempt to formally define and represent cyber governance domains, an ontological approach is proposed in this paper. Through such an approach, the aim is to better understand the development of cyber governance, from the national and global level to provide a broader perspective on how cyber governance might be enhanced through a more harmonized or interconnected global approach. To better understand the challenges of developing a unified system of cyber governance, and the appropriate role of nation-states in Internet governance, an analysis of governance models has been undertaken as conceptualized by legal scholars and Internet experts and private, national, and international organizations. These models vary widely and range from self-regulated market based models to more highly regulated national and transnational governance models critical to national security. The various meanings of governance are explored in the cyber context, and governance is examined as a core element of national and international cyber security strategies.

The move from globalization to stronger national security particularly in the cyber realm will continue to impact our perceptions and control of cyberspace. How will this trend effect how we approach cyber security, cyber warfare and cyber power? Will NATO continue to play the significant role it has played in the past, or will more distributive approaches dominate cyberspace? Defending cyberspace in a changing world must be understood, in its domestic and international dimensions in order to prepare ourselves for an evolving landscape of cyber threats. The use of cyber power is evolving, but is the governance structure that will oversee this change prepared to adapt to an evolving cyberspace? Will strategies, policies and procedures keep up with these changes? One of the leading impacts on globalization today is the ability to interact in cyberspace whenever and

wherever one chooses. Though cyberspace has created many opportunities for social and economic interaction, globalization has also created more vulnerability for national security and economic interests.

2. Cyber governance

To understand cyber governance we must first understand the meaning of cyberspace as commonly defined in the literature. The research uses interchangeable terms including cyber, Internet, information technology, and cyberspace. In current practice, cyberspace includes, but is not coextensive with, the Internet (Goldsmith & Wu, 2006). The U.S. government has defined cyberspace as “the interdependent network of information technology infrastructures,” which “includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries” (WH, 2009). The Oxford English Dictionary defines cyberspace similarly as “[t]he space of virtual reality; the notional environment within which electronic communication, especially via the Internet occurs” (Oxford, 2017).

While there is a common understanding of the Internet, there is not yet a shared view of Internet governance. The term ‘Internet governance’ has been defined in various ways to reflect differing cultures and political, legal and economic interests. In the United States Internet or cyber governance as it is commonly known, has been defined differently within the federal government, the private sector, and military operations to protect the respective interests of each sector.

The rise of the Internet centered in the United States has been described by scholars as “a disruptive event in the system of international relations formed around communication and information policy” (Mueller, 2010, p. 55). During the ten years in which the Internet evolved from a research and academic facility into “a global facility available to the public,” very different points of view emerged about the scope and mechanisms of Internet governance (de Bossey, 2005). In 2005, the UN-sponsored World Summit on the Information Society (WSIS) defined Internet governance as “the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programs that shape the evolution and use of the Internet” reaffirming that “[Internet] governance should constitute a core issue of the Information Society Agenda” (WSIS, 2005).

Based on emerging concepts, principles and strategies for cyberspace, various models have developed for cyber governance promulgated by governments, the private sector, non-profits, academics, and inter-governmental organizations (NATO, 2016; Rustad, 2016; NIST, 2014; OECD, 2014; Maurer, 2011; Solum, 2008; WSIS, 2005). The characteristics of cyberspace reduce some of the power differentials among actors, and thus provide a good example of the diffusion of power that typifies global politics (Nye, 2010). But cyberspace also illustrates the point that diffusion of power does not mean equality of power or the replacement of governments as the most powerful actors in world politics (Nye, 2010). Researchers have helped to clarify the mechanisms that shape cyber power and demonstrate how mobile technologies create pressures on state control, and how the state responds to such pressures (Goldsmith and Wu, 2006).

3. Ontology development

In 1995, Gruber defined the notion of ontology as an “explicit specification of a conceptualization” (Gruber, 1995). In 1997, Borst introduced an ontology as a “formal specification of a shared conceptualization” (Borst, 1997). Without a shared understanding acting as a unifying framework, the problems and misapplication that arise from misunderstanding the meaning and application of cyber terms will continue, and exaggerate conceptual and terminological confusion. While ontology is a way of describing information through conceptualization, sharing mechanisms structure the way the information is encoded. For example, Ontology as defined by the European Union Agency for Network and Information Security (ENISA) entails or embodies a set of concepts (e.g. entities, attributes, and processes), their definitions and their inter-relationships with respect to a given domain (ENISA, 2011). Ontologies can also assist in standards development. However, it is not suggested that ontologies replace the existing approaches to developing standards, but rather that ontologies can be used to augment existing best practices (p. 36).

Ontology development is not new to cyber research and has been used for artificial intelligence (AI) to obtain intelligence across disciplines; for knowledge modelling and decision support in cyber-physical systems (Petnga and Austin, 2016); to define a national cybersecurity culture (Gcaza et al. 2015); to develop a cybersecurity domain, (Obrst, et al., 2014); and as a model for the implementation of the national cybersecurity policy

framework for South Africa (van Vuuren, et al., 2014). The most important attribute of the ontologies studied was the construction of a common language and a set of basic concepts about which the cyber governance community can develop a shared understanding. In reviewing the different ontological models presented in the literature, it was important to reflect upon the purpose and goals of each of the models and the different groupings and classifications to make better sense of the different possibilities for ontological development (Remenyi, 2014).

Ontology development at the outset of the research process provides a framework for formulating the research design. The ontological method was chosen in this case to clarify the confusion in governance concepts and domains in the cyber space including how governance perspectives vary depending on the objectives of the individual(s), groups, organizations, and national, regional, and transnational interests. It was also chosen so the frameworks in the cyber governance domain could be understood from the bottom-up including the benefits and limitations of cyber architecture, cyber strategies, policy making, cyber standards, and laws and norms among other attributes. Each of the frameworks were studied through a review of the cyber governance literature, analysis of various governance case studies, and semi-structured interviews with cyber professionals, government officials and corporate management on their perceptions on the meaning and structure of governance within their own environment. A goal of this research is to develop a high level ontology of the domains of cyber governance and to provide an understanding of the core attributes of our global cyber governance system. The literature reflects a serious gap in the understanding of national and international cyber governance as most cyber ontologies focus on cyber-attack patterns; while only a few ontologies were found that focus on the coordination and interconnectedness of cyber governance at the international level.

A review of the literature, government reports and organizational documents, and key responses from the semi-structured interviews conducted with experts in the cyber field revealed a focus on four major domains of governance. These governance domains derive from various cyber powers that interact and overlap and encompass (1) distributive; (2) transnational; (3) state-centric; and (4) polycentric governance. Each governance domain has developed frameworks that are used to carry out the primary purposes or goals of the domain. Each domain can be further explained by its attributes including its activities, relationships, processes, and rules. Figure 1 presents the proposed high-level ontology model for cyber governance that at this stage only presents the descriptive components of the domains. The development of the proposed ontology including the phases below was adapted from Noy and McGuinness (2001) with the addition of phases for the evolution and the evaluation of the ontology.

Ontology Development Phases:

- Develop a top ontology for cyber governance to which the domains refer
- Develop an ontology for each of the domains
- *Describe the scope of each domain*
- *Establish the frameworks for each domain and the entities that will comprise it*
- *Identify the key actors and stakeholders in each domain - sponsors, owners, participants*
- *Identify the relationships among the domains – purpose, interface, roles*
- *Determine the commonalities among the domains and areas for coordination and collaboration*
- Describe the evolution of the ontology
- Evaluate the ontology

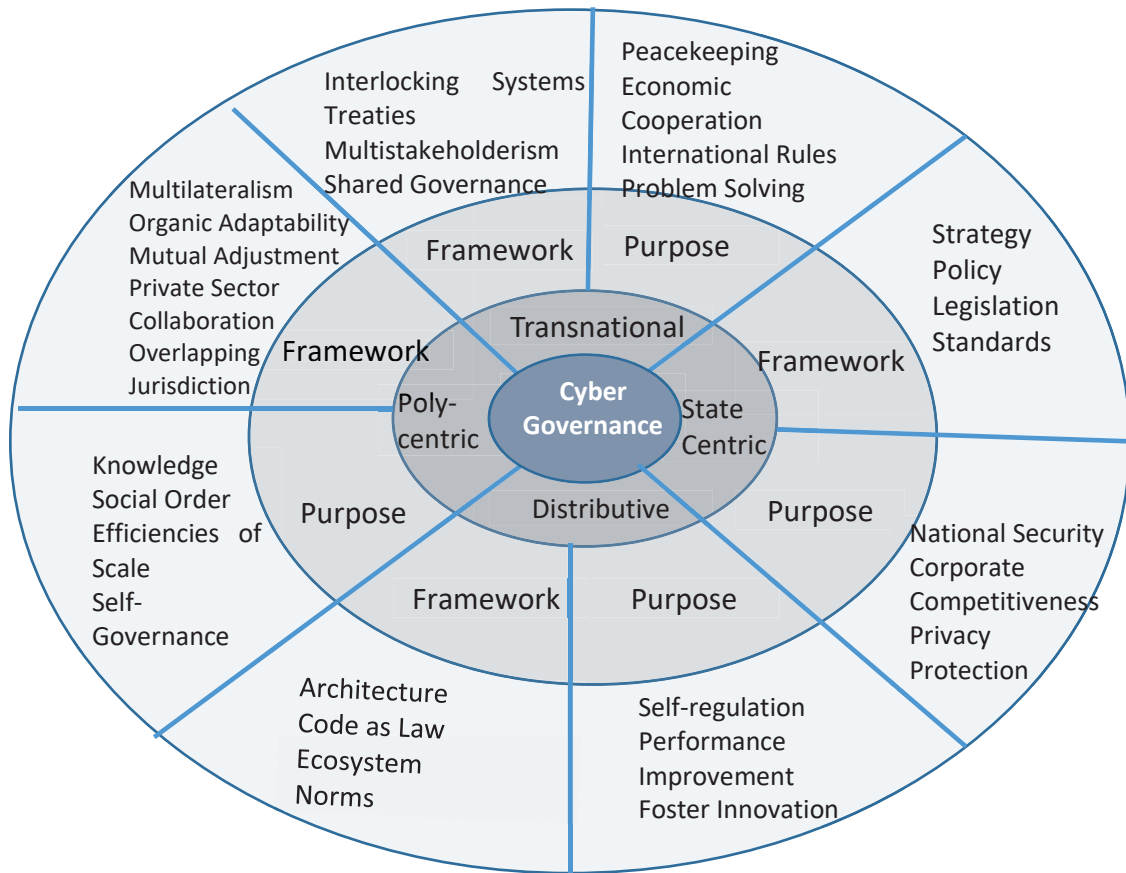


Figure 1: Cyber governance ontology

4. Ontological development of the domains of cyber governance

Distributive governance

The discussion of cyber governance domains begins with the ontological development for distributed governance. Distributed governance grew out of the open system and deregulation movement where the architecture of the Internet was the regulator and the Code was law (Lessig, 2006). Its focus has been on problem solving and issue identification, rather than stakeholder responsibility. Distributed governance exists in many forms on the Internet and has drawn its inspiration from the theory and practice of the open governance movement (Barlow, 1996). Scholars have called for distributed frameworks that could increase “interoperability in terms of identifying and describing issues and approaches for resolution throughout the ecosystem (i.e., creating a common Internet governance ontology” (Verhulst et al., 2014). Distributive governance facilitates cooperation between actors and organizations, moving away from a top-down, bureaucratic system in which a single authority sets agendas, enabling more flexibility, fluidity and creativity in decision making. A distributed, yet coordinated framework of governance can accommodate a plurality of existing and emerging decision-making approaches (p. 5). Importantly, distributive governance does not need to operate in isolation, but can co-exist and contribute to other governance domains. As explained by two Internet scholars, “[t]he architect of the Internet, can shape the path of the law, but the architecture can also be disrupted and controlled by the interests of powerful nations and the conflicts within and between them” (Goldsmith and Wu, 2006).

Harvard Professor Lawrence Lessig contends that the regulator of cyberspace is Code--the software and hardware that make cyberspace as it is and that any governance framework must draw from the Internet’s architecture (Lessig, 2006, p. 5). This Code, or architecture, sets limits or constraints on how cyberspace is experienced. For example, Code can provide access to knowledge, limit your privacy, or it can be used to censor speech (p., 7). One of the most vivid debates currently is about the transfer of some human decisions to machines. Modern society will have to identify and deal with the borderline between machines replacing humans in daily activities, and machines moving into the realm of making decisions concerning the political and

legal organisation of our society (Kurbalija, 2016). Ontological development of the distributive domain affords the opportunity to connect the actors with the issues, and thus “mediates between the ‘purely multi-stakeholder’ and ‘purely multilateral’ approaches” (p.13).

The Council of Europe also promotes the concept of an open Internet that should serve the interests of the user and encourage inter-state and international cooperation and people-centered public policy including respect for human rights (EC, 2016). It is a view commonly held within the Internet community that certain social values, such as free communication, are facilitated by the way in which the Internet is technologically designed. For instance, the principle of net neutrality, which says that the network should merely transmit data between two end points without any discrimination of traffic, is often acclaimed as one of the technical safeguards of the freedom of communication on the Internet (Sylvain, 2016). Some other solutions, such as the use of firewall technologies for restricting the flow of information, prove that technology can be used in many, seemingly contradictory, ways. Importantly, the distributive form of governance creates an opportunity for coordination and collaboration on the issues that arise, and makes it easier to develop a mutually understood ontology of Internet-related issues and responses (Kurbalija, 2016).

Transnational governance

Transnational governance has become critical to global security and has emerged in various forms. The significance of global transnational governance is evidenced through the enactment of multinational and regional agreements and treaties that can impact cyberspace in a profound way. For example, the role of NATO, as described by Alexander Klimburg in the National Cyber Security Framework Manual, is designed to be a political-military alliance, with its interests coalescing around counter-crime, intelligence and counter-intelligence, critical infrastructure protection and national crisis management, and diplomacy and internet governance among its 29 member nations (Klimburg, 2012). NATO is increasingly portrayed as if it were simply the armed wing of the European Union, committed not only to the welfare of North Atlantic populations, but also to the populations of neighboring territories. This ignores the fact that NATO boldly uses force in the service of protecting the economic and national security of the Alliance (Schmitt and Vihul, 2017).

In recent years a growing body of transnational governance is represented by the evolution of multistakeholderism. The concept of multistakeholderism and the flexible Internet governance vision it embraces has evolved from its original structure as nations have expressed concern over a U.S. Centric governance structure. Models for ontological development of this domain can be found in the transfer of some of ICANN’s technical functions by the U.S. Department of Commerce to the “multistakeholder community” in October 2016.

The Council of Europe (CoE) in its Internet Governance Strategy (2016-2019) is firmly committed to, multistakeholder governance with leading actors in the field of Internet governance, including relevant international organizations, the private sector, and civil society. “Generally, non-governmental stakeholders agree that multistakeholder collaboration and cooperation are the best means to develop effective cybersecurity policies that respect the fundamentally global, open and interoperable nature of the Internet” (OECD 2012, p. 18).

Regionalism, another form of transnational governance, would offer various benefits and drawbacks that are in inherent tension, and would offer a means of balancing the benefits and dangers of both supranational and national enforcement (Burke-White, 2003, p. 730). One of the most advanced areas in regionalization as it relates to cyber security is the enforcement of international criminal law. There is a wide range of cyber threats, including war, espionage, sabotage, and disruption, and international law is ambiguous about their status as a crime, an act of war, or act of espionage (Rid, 2013). Ontological development of this domain requires identification of the key actors and stakeholders in each domain and distinguishing among the role of sponsors, owners and other stakeholders.

National system governance

The move towards national system governance, commonly called state-centric governance, can be seen in the British vote for Brexit, the closing of borders in some European countries, and America’s move towards restraints on immigration and free trade. The clash of values between the push for national sovereignty against the

transnational movement for globalism are creating much uncertainty and governments are clearly recognizing the need to adapt to the will of the people. In the cyber world, the trend is shown by a clash between the United States advocating for an open cyberspace, while other nations including China and Russia push for greater control and regulation (Chin and Dou, 2016; Russia, 2016). It can also be seen in the European Commission's implementation of the European Regulation on Data Protection (GDPR, 2016) which strengthens citizens' fundamental rights in the digital age and facilitates business by simplifying rules for companies in the Digital Single Market. The role of nation-states in Internet governance has been the subject of much debate by the international community. National governments continue to focus on the development of risk strategies, policies and standards to protect critical infrastructure; while national cyber security strategies aim to foster better relationships between the public and private sector and among nation-states.

As shown in Figure 1, the ontology for national system cyber governance is reflected in national and international cyber strategies, policy statements, legislative frameworks, and the development of standards and best practices to enhance cybersecurity capabilities (NIST, 2014). Each state will need to develop its own rules for ontological development of the national system including the specific frameworks that encompass that system.

Polycentric governance

Scholars that have explored the evolution of best practices for developing international cybersecurity legal frameworks and governance structures have recommended an on-going process and a dynamic "bottom up" approach (Satola and Judy, 2011). Others have recommended a more polycentric regime that includes private sector engagement and multilateral collaboration (McGinnis, 2016; Shackelford, et al., 2016; Ostrom 2008). Polycentricity has been defined as (1) multiple centers of decision-making authority with overlapping jurisdictions, (2) which interact through a process of mutual adjustment during which they frequently establish new formal collaborations or informal commitments, and (3) their interactions generate a regularized pattern of overarching social order which captures efficiencies of scale at all levels of aggregation, including providing a secure foundation for democratic self-governance (McGinnis, 2016).

"Polycentric initiatives applied to the cyber world recognizes both the common but differentiated responsibilities of public and private sector stakeholders as well as the potential for best practices to be identified and spread organically" (Shackelford, et al., 2016). Thus, polycentric governance involves notions of mutual adjustment, and organic adaptability. For example, best practices could be shared through initiatives such as the NIST Framework or public private collaboration at the local, national and regional levels. Multilateralism appears in more recent discussions of polycentric approaches to governance that focus on knowledge sharing, overlapping jurisdiction and public private sector collaborations. Since polycentric governance is an evolving domain, ontological development will require analyzing the models of multilateralism versus the models of multistakeholderism more commonly used in the transnational domain.

5. Challenges and opportunities in developing an ontological model

Global cyber governance is increasingly shaped by factors beyond state-based ontology. Global governance depends on capacities and national purpose, and how countries envisage their national interest. If national interests focus on national security and economic competitiveness, then shared broad democratic and capitalist interests can favor multilateralism as a form of cyber governance. In order to build frameworks that address the challenges in cyber governance, the frameworks need to be backed by ontologies that have well-defined semantics. Each domain must be formally defined and described by a reusable basic ontology that captures its core concepts and properties. Then, it must be extended with application oriented concepts and properties.

The Ontological model in figure 1 was developed to assess the purpose and current frameworks of the key governance domains in cyberspace as reflected in the literature, national and international strategies, policies, laws, standards and practice. Though each domain overlaps in some respects to the other domains as discussed in this article they also have distinguishing features. For example, an analysis of the national system domain for the United States, Russia, China and the UK involved reviewing the national and international cyber strategies, the cyber policies, and the legislative frameworks in these countries. That review reflected that there was divergence in the countries on the priorities of national security v. individual rights, with some countries like the UK and the EU countries having a high priority for data protection, and other countries, including China and

Russia placing more emphasis on national sovereignty through censorship and other means, while the United States places a high priority on national security through its Federal Intelligence Surveillance Act (FISA).

In developing an ontology for cyber governance it is critical that users agree on the usage of the ontology beforehand to avoid confusion in its purpose and value. Also, development of the domains at the conceptual level may result in different interpretations. Moreover, users are expected to add new domains and frameworks for those domains into the ontology depending on the situation of each community of users. This requires that they build their own rules for ontology development in advance.

6. Conclusion

The cyberspace ecosystem is global and complex, and regulating it is a challenge. There is no single set of rules, and no single definition of what governance structure serves the best interests of all participants. Essentially, governance is a value system and the emerging area of cyber human rights including privacy and freedom of expression must be integrated into cyber governance structures and continually evaluated for effectiveness and sustainability and alignment with global norms of behavior. In defending cyberspace, governance models should be evaluated for performance, adaptable to the changing needs of its ecosystem, and transformative to address not only the evolving technology, but also the evolving practices that are developed through the infusion of a broader perspective of ideas from multiple stakeholders. In order to provide depth to the high level ontological concepts discussed here, further data on cyber governance will be gathered in the future to expand upon and explain the domains presented in this paper through ontological development of each domain's entities, attributes, and frameworks. Future research will also help to understand not only the overlap in cyber domains, but the various opportunities for building more resilient cyber governance frameworks through coordination, harmonization, and more open participation in the governance of cyberspace.

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A Kaupapa Māori Research Methodology: Phases for Conducting Quantitative Research

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Abstract: Māori are the indigenous people of New Zealand, and kaupapa Māori research (KMR) methodology refers to a Māori way of doing research. We illustrate how this approach can enhance indigenous research. KMR methodology grew out of a history of Māori being 'researched' by non-Māori, largely for the self-interest of the researcher. An important approach of KMR is it encourages Māori researchers to engage indigenous communities/stakeholders to ground and embed the research being undertaken. Consequently, a study's research question might be driven by stakeholders, while still handing the research task to the researcher. Another focus of KMR is embracing Te Ao Māori (the Māori worldview). Using this KMR methodology, ten Maori stakeholders were engaged as they sought insights into Māori employee careers. Thematic analysis drew two Te Ao Māori factors potentially influencing career satisfaction: (1) whānau support, which referred to support from family and extended family, and (2) kaiārahi, which is when someone serves as a role model. This was then explored quantitatively on a sample of 414 Māori employees, across a broad range of occupations in New Zealand organisations. Findings showed whānau support and role model were significantly related to work-life balance, cultural wellbeing and career satisfaction. A two mediator model was supported (with bootstrapping), with whanau support influence being fully mediated by work-life balance, and role model partially mediated by cultural wellbeing. Both mediators predicted career satisfaction. The model accounts for a solid amount of variance (38%). The findings support the new additions towards understanding Māori career satisfaction.

Keywords: Kaupapa Māori research, indigenous, career satisfaction, extended family, role models, mediation

1. Introduction

Māori are the indigenous people of Aotearoa/New Zealand(NZ) and have a long history of being the 'targets' of research, with much of this research being of a negative focus, such as exploring the poor health outcomes of Māori (Smith, 1999). Durie (2005, p. 301) stated a new approach has focus on the interface between indigenous knowledge and other knowledge systems, such as science, to generate new insights, built from two systems". This third way by Durie (2005) builds on a body of Māori and indigenous research methodology that seeks to map a way between solely western or indigenous towards a merged research approach. The historical detrimental focus on Māori research subjects – as well as the exclusion of indigenous worldviews - lead Māori academic leaders to call for new approaches to researching Māori (Bishop, 1999; Smith, 1999). This lead to the development of KMR, which Smith (1999, p. 2) defines as "Māori research for Māori, and that meets the goals of increasing returns for Māori Academics and the people they effect with their research. Hence, Kaupapa Māori is a methodological approach to research based on "Māori philosophy and principles" (Bishop & Glynn, 2003, p.61). This aligns well with calls for unique cultural-based research, such as in the Indian context (Kao & Sinha, 1997; Tripathi, 2013).

Within the wider research field, there is an understanding that Western knowledge and approaches to science are not 'all knowing' and perfect. The present paper suggests that KMR provides a similar analogy. It does not suggest that existing research is flawed or incorrect. Instead, it suggests that KMR can provide a useful 'counter-point' to existing scientific research, whereby an indigenous approach can be utilized *in conjunction* with existing research methods, to achieve research that is more accurately captures the voices of Indigenous peoples, due to stronger alignment with Indigenous worldviews. Thus, KMR moves beyond research that is simply 'culturally sensitive' to support research that is 'culturally safe' (Smith, 1999). Importantly, conducting culturally safe research is also valuable for the researcher. Thus, in alignment with *tikanga Māori* (Māori traditions) there becomes a holistic and embryonic relationship to the research process: researcher/s-research groups/-research topic informed by *tikanga Māori*. Thus, this meets Smith (1999) assertion around "for, by, and with, Māori" (p. 2). Mahuika (2008) reminds us that "unlike the dominant Western paradigms, Kaupapa Māori does not make claims to universal truth or to superiority over other existing paradigms" (p. 4). Smith (2007) asserts that KMR is an "approach developed for and by Māori for the purposes of marrying Māori and Western theories of research" (p. 2).

Finally, while the present study uses the terminology of KMR and Māori people specifically, the lessons, namely [culturally safe and relevant research] are not exclusive. Indeed, respect for participants as equals, cultural values and worldviews and relational interactions have been articulated in other countries and settings with indigenous people, for example, Australia and India (Kao & Sinha, 1997; Tripathi, 2013). Here we use an empirical study to provide insights into a KMR *process in action*, it is our hope the paper will encourage indigenous researchers and those who engage with such groups to be aware there may be more culturally appropriate ways to conduct research.

2. Kaupapa Māori research

Smith (1999) argues that when researching Māori communities, modifications are needed to the traditional research model, to ensure that the research is 'culturally safe'. For example, this might include the involvement of a kaumatua (Māori elder) as a mentor or guide. In this regard, the inclusion of a kaumatua reflects the Māori tradition of respect given to elders. It might be the role of a kaumatua to represent not only the traditions and historical linkages around Maori traditions, but to also provide a voice for the 'people' i.e., Māori, at the centre of the research. Importantly, KMR is not just for researching Māori subjects, and can be (should be) extended to include other indigenous research settings, peoples, and their issues. While a KMR methodology is focuses on culturally safe research, this is not seen as being at the cost of scientific quality of the research. Indeed, Smith (1999) notes the importance of conducting KMR which maintains scientific rigour. It could be argued that KMR simply seeks solid scientific methods to be *inclusive* of an indigenous voice – and importantly, to embrace Māori traditions and worldview, and seek to represent a positive focus where possible. General guidelines offered by Smith (1999; G. Smith, 1992), stated that KMR (1) is related to 'being Māori'; (2) is connected to Māori philosophy; (3) takes for granted the validity and legitimacy of Māori; and (4) is concerned with 'the struggle for autonomy. The present paper seeks to present KMR in a coherent model for conducting quantitative research via three phases (detailed below).

3. Kaupapa Māori research phases

We seek to focus the guidelines for KMR with the above questions to provide a useful framework for conducting quantitative research with, by and for Māori. We focus specifically on quantitative research, which has to date been limited in scope. Although Kaupapa Māori embraces both qualitative and quantitative approaches, this relates to the typical inability of quantitative research to negotiate power (Bishop, 1996). We offer the following guidelines specifically for quantitative researchers seeking to work with and engage Māori communities, as a way to better align such research with the quantitative methodology. Our quantitative KMR guidelines are: (1) *The Start* (setting the research topic); (2) *The Middle* (conducting the research), and (3) *The End* (dissemination).

The Start

Fundamentally, a KMR approach needs to conduct research that is valuable to Māori, and not specifically the researcher. This aligns with *tinu rangatiratanga* (self-determination), which corresponds to calls for research 'by Māori for Māori' (Bishop, 1999; Smith, 1999). This approach ensures that at least some of the research topic being undertaken caters for the need of the Māori community. Graham Smith (2012) stated that KMR "transforming purpose must continue to be driven by Māori community and iwi interests from which it has evolved. Its wider application should reflect Māori and iwi interests and accountabilities" (p. 20). This approach of engaging the Māori community – via stakeholders, kaumatua etc. as guides - ensures the research is centrally located for Māori. We suggest that conducting research that is of interest to the Māori stakeholders does not in and of itself, guarantee this will generate a useful solution. For example, factor/s raised by the Māori stakeholder were not significant predictors of the outcome/s explored. However, by participating in the research process – perhaps seeing the potential for insights, perhaps in more future research - that may provide value for all participants in the research. So, how do quantitative researchers engage Māori community/stakeholders?

Bramley et al. (2004) state they have engaged a specific advisory board to provide Māori input into their research, stating "The Maori Cardiovascular Advisory Group supports research that prioritises Maori concerns and that use a Maori defined analytical framework to address them" (p. 5). This Advisory group in effect signals greater engagement with Māori stakeholders, which is in alignment with KMR principles. We suggest an Advisory Group may not be sufficient in and of itself. To be sufficient, the advisory group would need to voice specific research ideas from within the groups they represent, that is, they are the voice of key Māori stakeholders. One proposed approach is what Graham Smith (1992) calls a *whangai model*, where researchers are adopted by a

whānau (extended family) or Māori community. However, such approaches are rare due to the time commitment required. At a minimum, a KMR methodology should engage Māori to provide not only insights into the topic of research but also provide research direction (e.g., Research Questions) around what they are interested in or would like answers too. Smith (1992) calls this a *Tiaki* model (mentor model), where a Māori individual - who is an authority in the research context - mentors the researcher/s (or at least their focus). It is likely this *Kaitiaki* (guardian) would be a *kaumatua* (elder). This approach does not necessarily expect the researcher (topic/method expert) to disengage their expertise. This also suggests that Māori engagement may also give insights into a Māori worldview, that might otherwise be missed.

Furthermore, given recent methodological recommendations around greater disclosure and transparency in research (Aguinis, Ramani, & Alabduljader, 2018) we think it is imperative for researchers to provide some details of what steps under a KMR approach were undertaken. For example, (1) detail *who* the Māori stakeholders are, and/or (2) what questions were raised *by* Māori stakeholders. We contend this is a transparency issue that will improve KMR.

The Middle

This relates to conducting the quantitative research that is truly engaging in a KMR method. Thus, the researchers have realised that by engaging with relevant Māori stakeholders at the start of the research process, is likely to mean changes in what can be explored. A KMR approach means the researcher is encouraged to engage the stakeholders' suggestions to understanding a broader context of influence. A different voice, and typically, a missing voice from most literatures. But a voice that needs to be heard and indeed, could be supported from a *whangai* or *Tiaki* model, this might likely bring insights that accurately capture the group of Māori being researched with. A researcher – wishing to engage in genuine KMR – should acknowledge this as a *fundamental* step in their project. If this means they may need to drop factors in favour of Māori stakeholder suggestions, although we suggest this is really like any typical research process. The present study example is on career satisfaction – a topic developed under the *Tiaki* model, where elders provided direction. A meta-analysis on career success by Ng, Eby, Sorensen, and Feldman (2005) identified 27 factors, grouped under four main headings. A researcher on this topic is likely to focus on some but not all these factors, ultimately ignoring the majority of other potential factors. In a KMR approach, if a Māori stakeholder wishes other factors included, this might reduce the original number of factors (say in a typical quantitative model) by including these new (potentially unique) factors.

These cultural factors *might* align with a meta-analysis (or not, perhaps because they are culturally unique e.g., cultural wellbeing, Haar & Brougham, 2013), but we reiterate: this approach is not dissimilar to a typical quantitative research process. It is the *generation* of ideas from the Māori stakeholder that is important, not whether they exist within a literature or not. That said, this engagement might generate *new* ideas that extend a literature or bring in traditional Māori worldviews that provide a unique contribution to research. The research should include not only aspects of Māori culture and worldview where applicable and appropriate – as influenced by Māori stakeholders, but might also be conducted in *te reo Māori*. Thus, this recognises the importance of Māori language and culture. Note that the majority of Māori are likely to be unable to converse in *te reo Māori*, but it is the opportunity for those who can to do so that is important. Indeed, it may be unlikely that the majority would do a quantitative survey in *te reo Māori* but supporting the language, is viewed as a vital element and important factor for Māori. Beyond the design and delivery of a survey, it is important that the team conducting the research has a strong Māori makeup. A KMR methodology is about research by Māori, although Smith (1999) acknowledges that the inclusion of non-indigenous researchers is a complex question to answer. She acknowledges that some will see the exclusion of non-Māori as a certainty, and Smith (1999) reiterates the need of KMR to shift Māori from the subjects of research to the researchers themselves. Consequently, there is a need for Māori researchers to include and teach other Māori researchers. Related to research team composition, is the theme of empowerment in a KMR approach. This might include empowering a Māori community by including a question (or all questions) from them, but it can also include empowering indigenous researchers. Thus, projects engaging a KMR methodology should include experienced and less experienced researchers. Ideally, as the research progresses so should the mentoring of junior colleagues or researchers on the project. In KMR projects with a *whangai* approach, this might also include the researcher/s training community member/s who are interested in the project.

The End It is timely to remind those conducting KMR that the experiences of indigenous research subjects have been largely negative, such as examining causes of diabetes (prevalent amongst Māori). Thus, there is an imperative for the research and researchers to ensure the completed work is handled properly. On one hand, the focus on publishing (conferences, journal articles etc.) is a given for academic researchers. But it is worth considering the role of Māori stakeholders as co-authors in some of the research outputs, especially if they have played an important role in shaping the direction of research. Alternatively, co-authorship when presenting an overview of the project might be sufficient. Aligned with this, is the dissemination of research findings – this is an important component of KMR. Presenting the research back to Māori stakeholders might be one step, but for studies that have surveyed a broad range of Māori participants, providing an opportunity for them to view or hear the results is important. This might be via a specific *hui* (meeting) – perhaps organised in conjunction with the Māori stakeholder - where important findings are reported back and opportunities to engage and ask questions and clarifications is provided. Smith (1999) noted that when disseminating research findings, researchers should *manaaki ki te tangata* (share and host people, and be generous). Hence, Māori researchers when giving back to their Māori subjects are encouraged to hold *hui* to disseminate results, but also remember that the costs associated with such *hui* should lie with the researcher not the subjects.

Dissemination *kanohi ki te kanohi* (face-to-face) is a culturally appropriate technique and provides a form of credibility check on the KMRer/s (Smith, 1999). However, since not all participants are likely to be able to engage this way (especially for large scale, broad survey studies), we also encourage researchers to provide more mainstream options, such as an online presence (report, website, youtube videos etc.) to enrich the dissemination process. Again, true to KMR, having some or all of these resources also in *te reo Māori* would be desirable. It is also worth noting that depending on the community and their expertise, many academic outputs are not likely appropriate. For example, long literature reviews, complex theories, advanced statistical modelling might be desirable academically, but are likely to mean very little to most people. Thus, interpreting and disseminating the research into lay-language is key. Finally, the presentation of research findings can also be used to signal the ‘giving back’ of the research. In this regard, Te Awekotuku (1991) asserts that when Māori are the subject (partners) of research, they should have as much right as the researcher to ownership and control of the research. Smith (1999) argues that with a KMR approach, the research should seek to empower communities and prioritise Māori communities and this might also be achieved by sharing the knowledge – the essence – of the research. For example, a Māori researcher might present their findings and return the transcripts of the research (or surveys) as a symbolic gesture to acknowledge the participants and their role in the project. Physically handing back the data – transcripts, surveys, a data stick - highlights the commitment of the researchers to those who have shared of themselves (or their representatives). The returning of data, the dissemination, and subsequent additional resources, all play an important role in maintaining the integrity of a KMR approach. It is important that researchers conducting a KMR methodology understand the additional commitment (time and resources) that are required. Finally, it is important to know this also builds a pathway (e.g., reputation) both for the Māori researcher/s, but also for others who seek to research with that Māori community. Thus, doing a good job in the research – beginning, middle, and end, is imperative.

4. Application

We now illustrate our phases (*the start, middle and end*) in the context of an actual study, albeit briefly. Our context is that we were interested in a broad study of working Māori, and while as employee researchers we came with expertise and understanding of a range of factors (e.g. HR), we sought discussion with Māori communities to determine research direction. We engaging a number of Maori stakeholders including two major Māori urban organizations that represent regional Māori people within their communities to broadly discuss the project and seek their interest, support and direction. From interviews with ten Māori, a consistent direction emerged around seeking insights into Māori employee careers. From these interactions, we conducted a brief thematic analysis (Braun & Clarke, 2006) and drew two factors: (1) *whānau support*, which referred to support from family and extended family, and (2) *kaiārahi*, which is when someone serves as a guide or role model. Furthermore, they were especially interested in the location of Māori respondents in our survey were from, so they might receive findings tailored specifically for their region. Consequently, our first stage was complete, and while no stakeholder wanted to engage in the research process, we did highlight our intention to disseminate the findings with them via *hui*. In our next stage, *the middle*, less experienced Māori researchers were added to the project to aid their development. Based on the literature (meta-analysis) and feedback from our mentors, we hypothesized that Māori employees who have stronger support from their whanau unit around work and careers will have been steered into a more suitable career and thus report greater career satisfaction. Similarly,

those who had a stronger role model will also report higher career satisfaction. Given the strong links between work-life balance and job outcomes (Haar, 2013) we also expect those with higher work-life balance will report higher career satisfaction. Finally, Haar & Brougham, 2013

Hypothesis 1. Whānau support will be related to career satisfaction.

Hypothesis 2. Kaiārahi (role model) will be related to career satisfaction.

Hypothesis 3: Work-life balance will be related to career satisfaction.

Hypothesis 4: Cultural wellbeing will (a) be related to career satisfaction and (b) mediate the influence of other factors.

5. Method

Participants were recruited in 2017 from a Qualtrics panel specifically targeting Māori in paid employment of a minimum 20 hours/week. Participant are confidential but they are compensated for their time, although the pricing strategy of Qualtrics is proprietary. Participation is voluntary, and the Qualtrics software ensures there are no multiple responses. This approach to data collection has become more common (e.g., Morrison & Macky, 2017) and can be particularly useful for target specific populations, such as Māori. Our survey instrument was only in English, although we plan a *te reo Māori* version one as we continue on. Data on 414 Māori employees was collected. The majority were women (71%), had average aged of 35-40, with 3.7 years' average tenure, with 48% from the private sector and 36% public sector.

We used measures well established in the literature. For example, Career Satisfaction was measured using five items by Greenhaus, Parasuraman, and Wormley (1990), coded 1 = strongly disagree, 5 = strongly agree. A sample item is "I am satisfied with the success I have achieved in my career" ($\alpha = .90$). This measure has been validated on Māori employee samples (e.g., Haar & Brougham, 2013; Haar & Staniland, 2016). For our two unique items, one was established in the literature - *whānau support* – which we based on Haar, Roche and Taylor (2012) and tailored it to focus on support towards one's career. The item on role model was a unique item created for the study. All other constructs were robust ($\alpha > .70$) and were analysed using PROCESS (version 3) in SPSS (v. 24). Our initial analysis showed the four predictors (whānau support, kaiārahi, work-life balance and cultural wellbeing) were all significantly correlated with career satisfaction ($.55 < r > .30$, all $p < .01$). In our regression analysis, we controlled for established factors: age, number of jobs, job tenure and hours worked.

The results showed that towards work-life balance, whānau support ($\beta = .16$, $p = .0005$) and kaiārahi/role model ($\beta = .26$, $p = .0000$) were both significantly related, accounting for 22% of the variance towards work-life balance. Towards cultural wellbeing, whānau support ($\beta = .13$, $p = .0028$), kaiārahi/role model ($\beta = .22$, $p = .0000$) and work-life balance ($\beta = .38$, $p = .0000$) were all significantly related, accounting for 36% of the variance. Finally, towards career satisfaction, whānau support ($\beta = .17$, $p = .0027$), kaiārahi/role model ($\beta = .30$, $p = .0000$) and when work-life balance and cultural wellbeing are included in the model, they are both significantly related to career satisfaction: work-life balance ($\beta = .44$, $p = .0000$) and cultural wellbeing ($\beta = .24$, $p = .0000$), while the influence of whanau support is fully mediated ($\beta = .05$, $p = .3346$) while kaiārahi/role model is partially mediated only ($\beta = .11$, $p = .0266$). These factors accounted for 38% of the variance for career satisfaction, and the model was strengthened by 18% by including work-life balance and cultural wellbeing as mediators. Finally, these mediation effects were confirmed by bootstrapping.

6. Discussion

Our findings support previous research that has demonstrated the importance of cultural wellbeing for career satisfaction of Māori employees (Haar & Brougham, 2013) and also highlighted the importance of work-life balance (Haar, 2013) which while well established to job outcomes like satisfaction, has not been well explored in the careers literature. However, the most fundamental aspect of the present study was the significance of the two unique factors identified by our *Tiaki* model (mentor model), where *Kaitiaki* (guardians) provided input and ideas into the research process, highlighted the usefulness of this approach within a KMR methodology. These factors or close alternatives are not seen in the literature (Ng et al., 2005) and highlight the potential useful contribution the KMR approach might make to research. This supports the concept of engagement and consultation with Iwi to give voice to Māori knowledge and values (Henry & Pene, 2001; Smith, 1999).

Our findings also provide some insight into the path through which indigenous employees assess their career satisfaction. The role of whanau is central to Māori and the role of whanau support for Māori employees has

been established on other factors (e.g., Haar et al., 2012). However, the potential influence of role models has not been explored before. The consultation groups (i.e., iwi) suggested that role models along with whānau support might play important roles in shaping career satisfaction for Māori, particularly because of the higher rate of unemployment that Māori have in New Zealand – often greater than twice that of the New Zealand European group (Haar & Brougham, 2013). Thus, long-term high unemployment rates might shape employee practices, but having role models and wide family support for working and a career is likely to help shape satisfaction with an employee's career, at least within the Māori employee context of the present study. The process/mediated model shows that these factors also help shape work-life balance, which in turn predicts cultural wellbeing (along with whānau support and kaiārahi/role model), and ultimately these last factors – work-life balance and cultural wellbeing – influence career satisfaction. This provides new factors – including culturally based ones – that aid and shape our understanding of Māori employee career satisfaction. The KMR approach shows that such engagement can provide unique insights beyond an established literature (e.g., Ng et al., 2005) because the stakeholders are likely to have greater insights into nuanced and unique cultural factors. This might support the notion that the expression and validation of cultural beliefs and values in the workplace can be an important contributor to career satisfaction, irrespective of the content of those beliefs and values.

Because the project is being extended into more data collection, we do not currently have any aspect of *te mutunga* completed, but our plans include two hui/meetings with the two main Māori stakeholders – in which we intend to present the data and implications, and provide hospitality to ensure our completion of the project is done with good hospitality. We also intend to provide these main Māori stakeholders with layperson reports as well as any academic presentation and papers (journal articles etc.) that are generated. Our aim is to have an accompanying document in 'everyday language' (English) and *te reo Māori*, which interprets the academic findings into words that can be better utilised and disseminated by our stakeholders.

7. Conclusion

This study sought to explain KMR and then detail some of the principles related to it. KMR provides indigenous researchers with the tools to undertake and ultimately promote culturally safe research, providing an important tool for conducting research with/within potentially vulnerable populations. In addition, we offered three broad phases towards conducting quantitative KMR and illustrated how quantitative researchers can utilize and conduct indigenous research. Importantly, we encourage researchers to provide more detail around our three principles when conducting quantitative KMR in an endeavour to provide greater disclosure and transparency in indigenous research (Aguinis et al., 2018).

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Mind the gap: But Does the gap Matter in Social Science Research?

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Abstract: This paper explores the issue of the ‘gap’ between research and practice in the social sciences with specific focus upon business and management domains. This is important and timely given the current interest by funding bodies in the impactful nature of research. However, it is also problematic since such research is frequently viewed as irrelevant by the practitioners it is intended to impact. On the one hand, there is a need to advance knowledge which is abstract and conceptual, though, not uncommonly, whilst empirically grounded, this is construed as being that which is interesting by the scholarly community, where the emphasis is upon developing the field. This is compounded by the need to consistently publish in ‘quality’ journals. On the other hand, are the requirements of practitioners which are driven by a solution provision and immediate relevance orientation, with scant regard for rigour. This emphasis upon results is to the detriment of theory and the needs of researchers for quality empirical data. This invites the question of how to bridge this gap in terms of what is construed by both academics and practitioner as relevant. In response, attention is drawn to such approaches that attempt to bridge this gap, such as Pragmatism, Action Research, Constructive Research and Interventionist Research. Each claims to have their own orientation, with associated advantages - disadvantages. However, these, questionably fail to resolve complex situations characterised by multiple views as to what the problem is. This invites attention to Problem Structuring Methodologies (PSMs), in particular, the Cybernetic Methodology, which offer an approach to deal with such multi-perspective complex situations, and with the aim to effect change in the situation. This paper evaluates these different approaches and offers a reflective and collective auto-ethnographic view to surface the pragmatic challenges of this pressing ‘value gap’ and with the intent to stimulate dialogue as to what this means for advancing business and management research and what ‘impact’ should actually mean.

Keywords: research gap, research, reflection, research methods

1. Introduction

The distinctive warning to be heard at UK train stations is to ‘mind the gap’ (Figure 1). The aim is to ensure the passengers’ successful bridging between platform and train. However, unlike this gap, there appears to be a common perception of an unbridgeable gap between the ‘ivory tower’ worlds of academics and the reality of everyone else (THES, 2017). However, is this necessarily the case. There is no doubting that there is abstract work which has likeminded scholars as the intended audience – this being the mode 1 research espoused by Gibbons et al (1994). However, there is research which does interface between the world of ideas and that of practice. Indeed, some disciplines may be viewed as more applied than others (e.g. science versus humanities) and pure research may be required before applications can be considered. Indeed, what is the precise nature of this gap. It is proposed that the gap is that between theory and practice rather than a gap between academic and practitioner. It is a gap in how knowledge is used.



Figure 1: The familiar ‘mind the gap’ warning to be heard and seen at UK railway stations

Within the social sciences, particularly within the business – management domain, this issue of gap is equally if not more applicable. For example, there is need to publish in top quality peer reviewed journals which might be read by only a few with a deep interest in the specialism. However, this work may be totally inaccessible to a practitioner. Nevertheless, there is an academic desire to encourage more impactful research, as evidenced with the UK’s Research Excellence Framework which has ‘impact beyond academia’ as one of three assessment

criteria (REF, 2018). This draws attention to two issues. First is the relevance of theory to practice – how does theory inform (describe, explain) about practice? Second is the effect of research upon practice – how can theory change (prescribe, predict) practice. There has been much discussion about this (e.g. Tranfield & Starkey, 1998; Grey, 2001; Kilduff & Kelemen, 2001; Kieser & Leiner, 2009; Birkinshaw, et al., 2016; Tkachenko et al., 2017). Moreover, this has can be elevated to questions about the role of Universities and specifically Business Schools and the purpose of research (e.g. Starkey & Maden, 2001; Starkey & Tempest, 2008; Wilson & Thomas, 2012). However, this perhaps detracts from the fundamental issues of how can researchers bridge the ‘gap’ and create a meaningful interplay between theory and practice.

The aim of this paper is to briefly examine how the gap can be methodologically bridged in the context of management research. It examines four different representative approaches: Pragmatism, Action Research, Interventionist Research and Constructive Research. These four approaches have emerged over the last century and illustrate different emphasises. Then an alternative approach is presented which is from drawn from the family of approaches referred to Problem Structuring Methods (PSMs). The approach selected (The Cybernetic Methodology) provides a systemic approach to bridging the gap.

2. Various approaches to closing the ‘gap’

The desire for interplay between theory and practice manifests in approaches whereby the researcher attempts to either generate theory from engagement with practice or uses theory to change practice

2.1 Pragmatism

Pragmatism has its roots in the work of Charles Peirce and is enunciated in the statement “Consider what effects that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object” [Peirce, 1878; 5:402; also Peirce, 1905; 5:422]. This is later more clearly expressed: “Now quite the most striking feature of the new theory was its recognition of an inseparable connection between rational cognition and rational purpose; and that consideration it was which determined the preference for the name pragmatism” [Peirce, 1905; 5:412]. Simply put: “it is merely a method of ascertaining the meanings of hard words and of abstract concepts” [Peirce, 1903-07; 5: 464]. “There are two functions... that Pragmatism should perform;. in the first place, to give us an expeditious riddance of all ideas essentially unclear.. In the second... help to render distinct, ideas essentially clear” [Peirce, 1903; 5:205]. This is underpinned by the view that “all that we can anyway know relates to experience” [Peirce, 1908; 6:492], which Peirce clarifies includes “the entire mental product”. For Peirce, pragmatism concerns the establishing of meaning of concepts by evaluating the practical nature of the implications of our reasoning.

However, commenting about the ‘merciless way’ that the word was being ‘abused’, “he begs to announce the birth of the word ‘pragmaticism’ which is ugly enough to be safe from kidnappers” [Peirce, 1905; 5:414]. Nevertheless, its meaning is unchanged: Pragmaticism “is a theory of logical analysis or true definition” [Peirce, 1908; 6: 490]; is a method which places emphasis upon a mode of reasoning whereby the practical consequences (“practical conduct” [Peirce, 1908; 6:490]) of this reasoning are evaluated.

Aside from this merciless abuse, both John Dewey and William James had embraced and written about ‘pragmatism’. For John Dewey, perhaps the clearest insight into his view of pragmatism is provided in his preface to ‘*Logic: the theory of inquiry*’ (1938). This views inquiry as the “determination of an indeterminate situation” (Dewey, 1938: iii) in which a coherent account can be made between observation and conceptualisation, invoking a pragmatic approach. However, in explaining this method Dewey explains:

The word ‘Pragmatism’ does not, I think, occur in the text. Perhaps the word lends itself to misconception. At all events, so much misunderstanding and relatively futile controversy have gathered about the word that it seemed advisable to avoid its use. But in the proper interpretation of “pragmatic,” namely the function of consequences as necessary test of the validity of propositions, provided these consequences are operationally instituted and are such as to resolve the specific problem evoking the operations, the text that follows is thoroughly pragmatic (ibid: iv).

Further, Dewey suggests that for readers for whom his discussion is too technical, that they:

Interpret what is said by calling to mind what they themselves do, and the way they proceed in doing it, when they are confronted with some question or difficulty which they attempt to cope with in an intellectual way (ibid: iv).

Dewey’s view of pragmatism is more concerned with how concepts give rise to operationised consequences, thereby dealing with problems.

However, William James was explicit in his account of pragmatism, though he did not like the name ‘pragmatic’ (James, 1907: vii). In a series of lectures published in 1907, which Dewey reviewed (Dewey, 1908), James explains that “The pragmatic method... is to try to interpret each notion by tracing its respective practical consequences” (James, 1907: 45). Moreover, theories have utility:

Theories thus become instruments, not answers to enigmas, in which we can rest... Pragmatism unstiffens all our theories, limbers them up and sets each one at work (James, 1907: 53).

James shifts attention to how theories are instrumental in dealing with problems.

From an applied perspective, this has been picked up more recently as implying outcomes (solutions) are practical. The account provided by Saunders et al. (2016) highlights this practical orientation whereby the problem is clearly defined, permits mixed or multiple methods and converts into a practical outcome which can inform future practices. Knowledge has practical value / relevance.

In conclusion, pragmatism has evolved to become a vague concept, but is concerned with how concepts have application to problem situations.

2.2 Action research

‘Action Research’ is attributed to Lewin (Adelman, 1993). Adelman presents a brief biography of Lewin’s research approach, describing him as a ‘scientific pragmatist’ who was influenced by Charles Peirce. Lewin (1946) considered action research within the context of ‘research for social practice’, which he stated “can best be characterised as research for social management or social engineering... [this being] a type of action research,” (ibid: 35) where action research is “research which will help the practitioner” (ibid: 34). However, it requires inclusion of “mathematical and conceptual problems of theoretical analysis... descriptive fact-finding... Above all it will have to include laboratory and field experiments in social change” (ibid: 36). In a subsequent paper, Lewin (1947) reveals that experiments allows assessment of how a change is brought about. However, Dash (1999) credits the Tavistock Institute for developing action research in the 1950s and 1960s.

Clark’s (1972) seminal book “Action Research and Organisational Change” positions ‘action research’ as one of five types of research (Table 1). Their differences can be established based upon three critical dimensions: its orientation (theoretical question of practical problem) the dominant channel for diffusing research results (e.g. learned journals or reports) and the audience (single or multiple). Clark draws upon Rapoport’s (1970) characterisation of action research, which:

aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework (Rapoport, 1970: 499).

Implicit is the generation of new knowledge for the social science community (Clark, 1972), however, this may create dual agendas in terms of servicing both sponsor and scholarly needs (Rapoport, 1970), since how knowledge is perceived by a practitioner and a behavioural scientist differs, as illustrated in the comparison of Table 2. For the scientist, knowledge is generated either by testing a theory about organisational change or by evaluating the nature of organisational change. Irrespective, there is a need for a ‘infrastructure’ to permit findings to be communicated and acted upon (Clark, 1972).

Table 1: Adapted from Clark (1972: table 2.1)

Research type	Problem orientation	Dominant diffusion channel	Single or mixed audience
pure basic	Address a theoretical question / problem related to discipline	Learned journals	Scientists (single)

Research type	Problem orientation	Dominant diffusion channel	Single or mixed audience
basic objective	Explain a general practical problem that can arise in different contexts (non-prescriptive)	Learned and professional journals	Scientists and practicing scientists ('practitioners')
evaluation	Assess a situation of a practical nature (e.g. organisational performance)	Mainly the sponsoring enterprise	Sponsor (and practitioners) (mixed)
applied	Solve a practical problem within a sponsoring system (does not add new knowledge)	Only the sponsoring enterprise	Sponsor (single)
action	Practical problem with theoretical relevance	Reports to sponsor AND Learned and professional journals	Sponsors AND Scientists and practitioners (mixed)

Table 2: The underlying nature of a practitioner's and a behavioural scientist's knowledge (adapted from Clark, 1972)

Practitioner knowledge	Behavioural scientist knowledge
An artist with knowledge through acquaintance	Emphasis is 'knowledge about' – 'theoretical explanation'
Diagnostic - Instrumental	Explorative
Happy with incomplete predictions and uninterested in knowledge sources and methodological rigour	Concerned with knowledge sources, prediction, hypothesis and verification
Manipulation and control of variables	Theoretical relevance of variables
Is an involved participant	Is a detached observer
Concerned with 'how' to solve problems in a timely manner	Concerned with explaining and understanding 'why' with rigour

Shani & Pasmore's (1985: 439) definition offers a perhaps clearer insight:

Action research may be defined as an emergent inquiry process in which applied behavioral science knowledge is integrated with existing organizational knowledge and applied to solve real organizational problems. It is simultaneously concerned with bringing about change in organizations, in developing self-help competencies in organizational members and in adding to scientific knowledge. Finally it is an evolving process that is undertaken in a spirit of collaboration and co-inquiry.

It is an evolving, emergent collaborative process that integrates practitioner and scholarly knowledge with view to effecting change that deals with real problems.

Moreover, 'action research' has evolved into many variants as revealed by Dash (1999): action learning (emphasis upon the conceptualisation of everyday problems as a form of group management development), action science (to create novel responses, breaking from the routine), action inquiry (emphasis upon 'observing participants'), participatory action research (researcher facilitates practitioner problem solving, drawing upon their 'local knowledge' and emphasising emancipation or liberation) and co-operative enquiry ('professionals' engaged in improving practices). Underpinning these approaches is the bonding between research and action. Nevertheless, the form of engagement draws attention to the ethical distinction between 'imposition' and 'facilitation' (Dash, 1999).

Further, action research is distinct from its close rival – consultancy. Unlike action research, consultancy does not aim to produce new theory, fails to explore failed projects, shares with the 'clients' goals, tends to be vague about approach, though these are likely to be established techniques, and works explicitly to a budget and time-scale (Westbrook, 1995).

A more recent evaluation of action research is exemplified by Zhang et al. (2015) Their definition of action research emphasises organisational change as an outcome of research activity, though is unclear about the contribution to knowledge:

a research process that collaboratively involves the subjects under study with an objective of using the research results to influence organizational outcomes (ibid: 152)

Moreover, the authors highlight the 'what's in it for me' view of potential participant practitioners, for a collaboration to happen. The appeal to practitioners may be the rigour of the study as well as the ability to contextualise findings within a bigger picture.

In conclusion, action research is not a to-be-taken-for-granted approach. That it has evolved into different forms highlights that there are many issues.

2.3 Interventionist research

Bracci (2017), in his review of the 'interventionist' approach, attributes it to Argyris (1970). Argyris defines an intervention as "to enter into an ongoing system of relationships, to come between or among persons, groups or objects for the purpose of helping them" (Argyris, 1970: 15). However, there is a stipulation that the client system is independent of the intervenor, with the client maintaining its autonomy in the form of '*free, informed choice*' based on valid information, and commitment to the choice. This implies awareness of all the options. The intervenor is concerned with the system as a whole, though may only act through a few people. Moreover, the intervenor does not make recommendations or instructs what should be done.

This approach has evolved over time as revealed in the reviews by Baard (2010) and Bracci (2017). However, Baard (2010) reveals that research using an intervention approach was rare. Bracci (2017) reveals examples of application and draws attention to the contribution to both theory and practice through what is insinuated to be an 'abductive' approach, though the authors do not use this term. A five step approach is presented, which includes problem definition, collaboration potential, comprehensive understanding of the situation and a feasible innovative solution with its more general application. It is an ongoing learning process.

In conclusion, this is an approach where the researcher facilitates but attempts to avoid influencing decisions within the practitioner arena.

2.4 Constructive research

Kasanen's (1993: 244) notion of a 'constructive' approach is a problem solving approach within management accounting. It is defined as a "research process for producing constructions" where constructions are "entities which produce solutions to explicit problems", whereby these entities take forms such as theories, models, and frameworks. It emphasises practical relevance and theoretical contribution. It invokes a learning process that includes problem definition, comprehensive understanding of the situation and a feasible innovative solution that is both 'relevant, simple and easy to use' and can have more general application (i.e. is generalizable).

A more recent evaluation of the 'constructive' approach is presented by Labro & Tuomela (2003). They demonstrate, using Kasanen's (1993) seven step approach for two contrasting case studies, how there can be implementation as well as a theoretical development, the former able to inform the latter.

In conclusion, this offers a similar approach to the 'interventionist' approach, but the emphasis is upon the conceptualisation of both the problems and solutions and is more immersive.

3. PSMs: The cybernetic methodology

The preceding approaches to research have focused upon engagement with view to some aspect of learning and change. However, one of the characteristics of social science research is that it deals with people. Thus, social phenomena, due to the multiplicity of viewpoints, are characterised by uncertainty and ambiguity and can be construed as 'messes' (Ackoff, 1974). This invites approaches such as PSMs, which aim to guide the handling of the problematic aspects of such complexity. This 'handling' is a non-linear and iterative process, with attention given to developing a deep understanding of the situation in terms of issues and stakeholders. Its aim, through careful definition of what is problematic within the situation, is to bring closure to the situation. Since social science research can be viewed as a form of complex problem solving, then a PSM is an appropriate approach to deal with the messiness of social science research.

The most prominent PSM is the 'Soft Systems Methodology' (Checkland, 1972, 1981, 1999). This is an empirically grounded methodology, with emphasis upon the learning process. An alternative methodology is offered which is conceptually grounded and is systemic in its approach, i.e. it embraces a systems thinking perspective to how to address a situation which is perceived as problematic. This is concerned not only with the learning process associated with making sense of the situation, establishing what is the problem and how to deal with it, but also with the process for creating conditions conducive for this to take place. This methodology, the 'Cybernetic Methodology' (Figure 2), was developed by Raul Espejo (1988), with subsequent accounts in Espejo, (1990, 1992,

2015a, 2015b), Bowling & Espejo (1992, 2000), Espejo et al. (1997) and Espejo & Reyes (2011). It was renamed the VIPLAN Methodology in Bowling & Espejo (2000). Applications have included facilitating operational change in a manufacturing context (Harwood, 2012) and the design of a research methods course (Harwood, 2016). It has been proposed as a systemic approach to deal with water-energy-food nexus issues, particularly at a community level (Harwood, 2018).

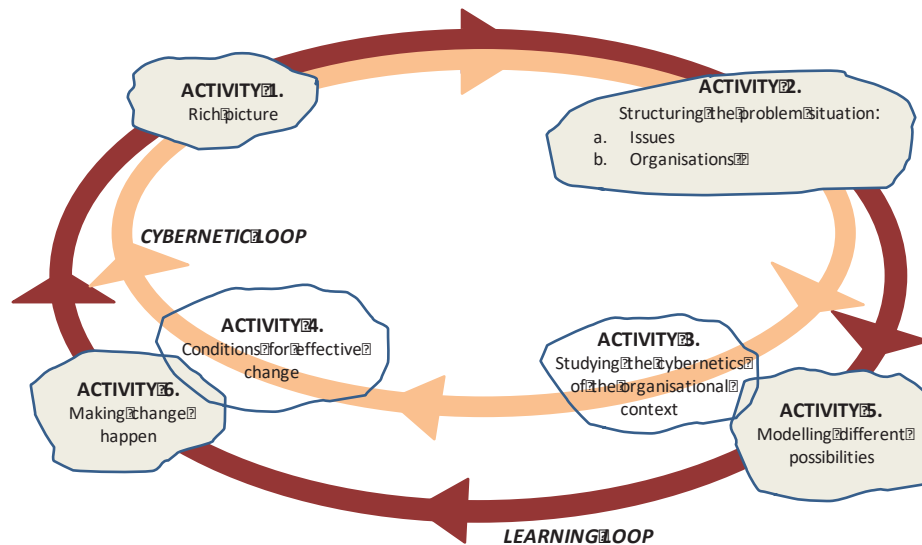


Figure 2: The cybernetic methodology [adapted from Harwood (2012) which is based on Espejo (1992)]

What distinguishes this methodology from others is its attention to the contextual aspects of a situation (i.e. its cybernetics). Moreover, it is systemic. It is conceptually grounded in the field of Cybernetics (Ashby, 1963; Beer, 1979, 1981, 1984) and specifically Second Order Cybernetics (von Foerster, 1979). It views a complex situation such as a mode of research inquiry as a problem system. This system comprises a learning element (the learning loop), which takes place in the information domain (Espejo, 1992) and relates to the content of conversations. This is perhaps not dissimilar to Dewey's (1933, 1938) discourse on the nature of inquiry. However, learning takes place in a context and it is the interplay between learning and context that establishes the boundaries of the system. This context is denoted by the stakeholders that enable learning to take place, each being observers of the reality that constitutes the inquiring system (hence, 2nd order cybernetics). This contextual domain is the operational domain which is concerned with how stakeholders are organised to enable learning, this constituting the cybernetic loop of the methodology.

The methodology comprises six activities. The first activity (#1) is concerned with developing a rich understanding of the situation that is of interest, so that its multi-faceted composition is revealed. From this, there is the challenge of establishing the focus of the study which leads to definitional statements about what the problem is (issues) and the pertinent stakeholders (organisations) (#3). This leads to a detailed evaluation of how stakeholders are to be organised (#3) in such a way that when implemented (#4), this organisation will be conducive for both establishing how to handle the situation (#5) and the actions that provide closure (#6). It offers an approach that is inclusive in terms of recognising the rights of those with a vested interest to be participatory. It is also iterative as illustrated with a reflective application to the PhD research experience (**Error! Reference source not found.**). This reveals the multifaceted nature of the research process in which stakeholders and their fit (relationship) within the research process is a shaping feature of whatever outcomes are achieved. Moreover, it renders the notion of gap irrelevant as the degree to which intervention happens is an outcome of what constitutes the research questions (#2).

4. Conclusion

This paper has presented a review, albeit cursory on basis of word-count limitations, of four approaches towards interventionist research. Each contributes towards an engaged intervention in the research domain. However, each has limitations. This suggests a systemic perspective towards research. Another approach is proposed that views research as a problem system – the Cybernetic Methodology. This systemic view is inclusive and offers a more critical approach to dealing with inquiry though its explicit distinctions, not privileging one over the other. Irrespective, as is critical in any interventionist research, any methodology is only as good as the quality of its

collaboration with stakeholders. A synthesis of the five approaches is presented in Table 4. What can be concluded is that the Cybernetic Methodology offers a more powerful approach to interventionist research allowing the researcher to take control over the degree of intervention, but nevertheless facilitate change.

Table 3: One possible unpacking of a PhD research experience using the cybernetic methodology

STAGE	CYBERNETIC LOOP				LEARNING LOOP		
	1 RICH PICTURE	2a NAMING ISSUES	2b NAMING ORGANISATION	3 ORGANISATIONAL IMPLICATIONS	4 CREATING ORGANISATIONAL CONDITIONS	5 MODELLING POSSIBLE ISSUES	6 ACTION
Awareness of desire to pursue PhD	Find out about topics of interest	Formulate possible research questions	Identify relevant institutions to host the study	Evaluate potential research participant to support the study (e.g. expertise, respondents, audience)	Contact the potential supervisor (also sound out potential respondents about participation)	Conceptualize the research - create research proposal	Discuss the proposal and enrolment
Initial study	Develop deeper understanding of topic (literature review, relevant courses, pilot, secondary data)	Refine research questions	Identify the system with an interest in the topic	Get to know who has interest in the domain of the topic. Examine methodological implications (research design)	Make contact with those who can inform about topic	Clarify the theoretical position of research - produce end of first year report	Defend end of first year report
Data collection		Refine research questions		Develop appropriate methods	Contact respondents, acquire database	Establish the content of - conversations with respondents or - interrogation of database	Collect data, interrogate database, make change with participant organization
Data analysis				Identify analytical support (e.g. NVivo or SPSS)	Enroll analytical support	Make sense of data using appropriate theories	Discuss findings with - participant organization - peers or feedback (e.g. conferences)
Closure				Identify relevant examiners	Enroll examiners	Draft argument of thesis	Defend thesis
External impact	Develop an understanding of possible participatory situations	Identify possible problem situations	Identify relevant stakeholders	Identify specific people	Enroll stakeholders	Establish possible content of conversations, discuss 'solutions'	Make change happen

Table 4: A synthesis of the five different approaches to conducting impactful research

Approach	Emphasis
Pragmatism	To engage in practice and thereby establish conceptual understanding
Action Research	To make sense of organizational change in the problem situation, through collaboration and integration of scholarly and practitioner knowledge
Interventionist Research.	To facilitate and learn from the change that takes place (distant)
Constructive Research	To deal with a practitioner problem situation and create conceptual knowledge (immersive)
PSMs: The Cybernetic Methodology	To systemically engage in problem situations in order to bring about closure to the situation (inclusive).

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An Engineering Reasoning-Based Course on Research Methodologies for Systems Engineers

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Abstract: This paper presents engineering reasoning as the basis of a new research framework for system design. While scientists necessarily focus on examining natural phenomena to explain our surroundings, engineers center their efforts on applying scientific knowledge, life experience, and their own creativity to build useful things. However, engineers are seldom exposed to the range of research methods that could enable them to formulate better engineering solutions. Quantitative means to generate data, develop statistical evidence, and support design decisions dominate engineering research. Departures from traditional methods of inquiry are rare and not readily apparent in engineering courses. Inevitably, exploratory approaches in engineering hinge on numerical techniques, which align neatly with the educational journey that most engineers experience. The conventional approach incrementally converges on a solution. However, this way of driving towards a design can often overlook the value of divergent thinking and alternative logic. Engineering reasoning consists of abductive thought, as well as deductive and inductive rationale, each pointing to different research approaches. Retroduction iteratively employs these classes of reasoning throughout the design process. The linkages between engineering reasoning and methods of inquiry are foundational for developing a robust course on research methods for systems engineers. The engineering design process motivates lines of thinking to specify the design components of the engineering solution. Each class of reasoning has a distinct purpose for defining the grounds (design variables), warrants (design knowledge), and conclusions (design specifications) that are involved in the engineering problem. The method of inquiry is bound by the design component that has been given, and that which must be derived. Deductive reasoning seeks design specifications when the design variables and knowledge are known. When the design variables and specifications are given, then inductive thinking is applied to develop knowledge about the engineering problem. Lastly, abductive logic unearths design variables that are important to the design problem. To obtain the missing information, systems engineers must adjust their thinking and apply appropriate research techniques. This new research framework offers a mixed method approach to improve solutions development.

Keywords: engineering reasoning, system design process, retroduction

1. An overview of engineering research

Engineering research is infused with the scientific method, which proposes a hypothesis for which the scientist collects evidence. The means of acquiring information to support or negate the hypothesis is decidedly quantitative. Experimentation, numerical modeling, curve fitting, and other empirical means are among the most used techniques. Similarly, engineering research is immersed in these standard practices. Not surprisingly, scientific endeavors most often apply common methods of inquiry to converge on a provable “truth” that adds to the body of knowledge. Engineering research parallels this goal with a significant distinction; discovery of new knowledge serves the primary purpose of developing functional design solutions to an engineering problem.

As long as systems remain relatively one-dimensional, it is acceptable to continue with convergent thinking and iterative processes that employ customary research methods. However, systems continue to grow in their complexity. The surge in technological advancements, greater depth of interactions between operators and the system of interest, as well as the exponential necessity for developing systems of systems to address increasingly complex issues demand novel approaches to augment conventional practices.

A need to think about engineering problems differently emerges from recognizing that simplistic systems are no longer the norm. In academia, engineering research is often linear, consisting of 1) Introduction, 2) Specification, 3) Experimentation, 4) Verification, and 5) Conclusion (Nagabhushan, 2016). Bates (2008) focuses on data and decision-making and presents the steps as 1) Problem Definition, 2) Data Identification, 3) Data Gathering, 4) Data Analysis, 5) Data Presentation, 6) Information, and 7) Decision Making. Generally, a research plan will combine one or more of these elements and center on numeric techniques (Thiel, 2014). Regardless of the research model, each reinforces the idea that a new way of reasoning is missing in the education of many engineers. This paper describes how engineering logic and retroductive thinking apply to the design process in ways that guide engineers to consider other methods of inquiry. The overall framework results in an innovative research methodology that can be developed into a more comprehensive course in research methods for a new generation of systems engineers.

2. Systems engineering

The International Council on Systems Engineering (INCOSE, 2018) defines systems engineering as the “interdisciplinary approach and means to enable the realization of successful systems.” In this spirit, engineers conduct research to develop physical solutions to problems. Moreover, engineering reasoning maintains that the quality of engineering research is primarily based on its fundamental purpose and an identifiable problem or issue (Paul, Niewoehner, and Linder, 2013). Engineering methodology insists on a clear problem definition as a result of detailed discussion and study among the triad of client, designer, and user (Blanchard and Fabrycky, 2011; Clym and Little, 2000). Figure 1 presents the Vee model for the systems engineering process. We focus on the left side of the Vee, which results in a design solution that in turn, initiates the right side of the diagram, culminating with a product that delivers a desired capability (Defense Acquisition University, 2018).

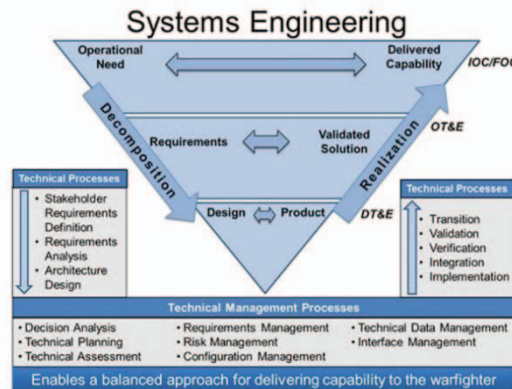


Figure 1: Systems engineering is a process to address the engineering problem with a concrete solution. The Vee model is just one approach (Defense Acquisition University, 2018)

To introduce engineering reasoning in the following sections, we begin with Figure 2, a conceptual model for the engineering design process (Dym and Little, 2000). While other models for the design process exist, they share many activities such as the articulation of a problem from an established stakeholder need, followed by stages that sketch a rough design and progressively refines it into a final design solution.

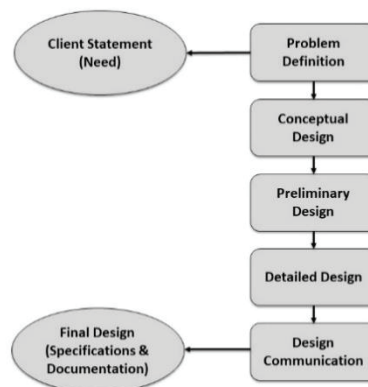


Figure 2: This basic engineering design flow provides a common understanding of the activities that system designers undertake (Dym and Little, 2000). It is a start point for refinements in the process

The design process begins, as it does in the engineering model, with a bona fide need from a customer. Through inquiry the engineer develops a problem statement that drives design activities and establishes objectives. The conceptual phase focuses on specifications and schemes for design alternatives. During preliminary design the lead engineer or committee selects a design after analysis of the alternatives. Prior to communicating the design, the engineering team refines and optimizes the chosen design. This step includes a final review of the design and proposed fabrication specifications. The design process ends in the last two blocks of Figure 2 with documentation of the final specifications for system development and the corresponding justification for them.

Design incorporates strategic thinking and requires all aspects of engineering reasoning. It is within this process of the systems engineering model that convergent and divergent thinking co-exist. Through these differing views for arriving at a solution is where the value of engineering logic comes to light. The connection between engineering reasoning and steps in the design process are the subject of the following sections.

3. Engineering reasoning and the design process

Engineers use language based on rational thinking (Paul, Niewoehner, and Elder, 2013). It follows that design is meant to be an organized and “thoughtful” exercise toward a real solution to the engineering problem. The American philosopher Charles Peirce distinguished three classes of reasoning: deductive, inductive, and abductive (Nozawa, 2008). They underpin the design process and are distinct in the design elements that are present or absent when the reasoning is applied.

As Wasson (2016), Blanchard and Fabrycky (2011), Buede (2009), and other engineering practitioners describe, the system design environment often begins with an understanding of important factors to the engineering problem, the current experience of the design team, as well as their knowledge about the system. We define the engineering problem in terms of design elements. They consist of grounds (design variables – V), warrants (design knowledge – K), and conclusions (design specifications – S). Table 1 summarizes each type of logic in terms of V, K, and S (Whitcomb and Hernandez, 2017).

Table 1: The types of engineering reasoning are distinguished by the design elements that are given and that which must be derived (Summers, 2005)

	Given	Derived
Deductive	V, K	S
Inductive	V, S	K
Abductive	K, S	V

As Table 1 indicates, the objective for applying a specific type of engineering logic is to obtain the missing design element in the relevant stage of the design process. For instance, deductive thinking focuses on the study of design variables and the design team’s current knowledge to develop design specifications. Similarly, inductive and abductive reasoning surface in other phases of engineering design.

Summer (2005) further refines the application of engineering reasoning to the design process by introducing reductive thinking. Figure 3 shows retroduction as an iterative implementation of different classes of logic that can parallel the design process. This cycle leads to innovations for examining the engineering problem.

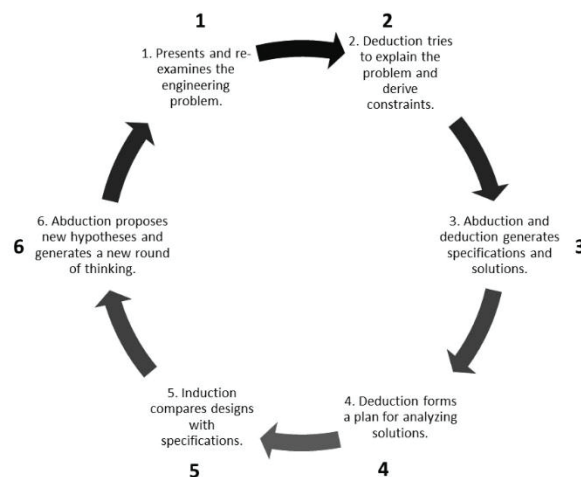


Figure 3: Retroductive thinking or retroduction model

Retroduction guides discovery of new design variables, greater understanding of the operational concept for the system or context for its use, and development of new system specifications. It promotes careful, iterative study of the design elements that leads to new solutions that manifest into a physical system. For clarity, we list the major activity of each step in Figure 3.

- 1. Present and/or re-examine the engineering problem.
- 2. Deduction tries to explain the problem and derive constraints.
- 3. Abduction and deduction generates specifications and solutions.
- 4. Deduction forms a plan for analyzing solutions.
- 5. Induction compares designs with specifications.
- 6. Abduction proposes new hypotheses and generates a new round of thinking that includes new variables, knowledge, and/or specifications.

The logic involved in each step of this process greatly influences the choice of research techniques, and consequently, shapes the engineer's overall research methodology.

4. Applicable methods of inquiry based on engineering logic

The design process produces the design artifact (solution) that addresses the engineering problem (Summers, 2005). When engineers require more information about the design elements, they apply different research techniques to fill the gaps in the known data. These techniques directly link to engineering reasoning.

4.1 A discussion of deductive, inductive, and deductive thinking

Each class of Peircean logic springs from inferential science and introduces the Peircean Science of Inquiry (Nozawa, 2008). This approach eventually evolves into the scientific method and subsequently helps frame engineering research. Therefore, it is practical to have a lengthier discussion about each class of reasoning.

Deductive reasoning is when the design variables and design knowledge about the engineering problem are known. This is usually the case at the beginning of the design process. As a simple engineering example, consider a need for a beverage container. Design variables can include the amount of liquid that the container holds, weight of the container itself, or the frequency that it will be used during a given time period. Knowledge about the problem consists of the density of liquids and the properties of potential material for the container. Other information about the engineering problem includes rules about the relationship between the strength of the material and its ability to hold the weight and density of a particular liquid. Given these design elements, deductive reasoning analytically determines the specifications of the container. The designer would make conclusions (specifications) about the maximum size of the container, the minimum amount of liquid it should hold, its durability, or the amount of fatigue (weakening of material) incurred for a given applied load. An evaluation of these conclusions can measure the suitability of the design.

Inductive reasoning is a process to derive design knowledge. Knowledge is a set of facts about the system or similar systems, and the system designer's level of experience and study about the system. During the design process, it may happen that the accumulated knowledge about the system is insufficient to continue with its design. This situation prompts the design team to obtain additional information through inductive thinking. At this point, the engineer would have a set of design variables and design specifications. However, the information about causal relationships between variables or even the concept of operations for the system may be vague. Experimentation is a natural technique in inductive thinking. Test runs keep certain design variables constant while varying other variables, and measuring the impact on the design specifications. Analysis develops a mathematical expression for the relationship. Take the beverage container example. The engineer would hold the amount of fluid constant, vary the container material, and subsequently measure the fatigue that the container sustains during the experiment. Another approach would be to evaluate the amount of fatigue that each type of material shows as the amount of liquid is increased. The resulting relationship between material properties and fatigue informs the engineering problem.

When design knowledge and specifications are given, abductive thinking aims to discover new design variables, or to re-examine design variables that the engineer had previously considered as unimportant to the problem. Continuing with the beverage container example suggests how abductive thinking could take place. We have identified that fatigue related to the material properties of the container is an important measure of the design. However, it is not certain that only the material properties contribute to the fatigue that the container may exhibit. For instance, the conditions of the experiment may involve other factors such as the temperature of the liquid, the air temperature surrounding the container, or the speed at which the liquid enters. Examination of

these new factors in an experiment may prove them significant to the level of fatigue that occurs. In this example, not only does this approach identify new design variables (temperature, speed), but it also alters the context for using the container—system knowledge.

4.2 The retroductive design process

Retroduction is not a class of logic. It is a process that applies the different classes of engineering reasoning. As presented in Figure 3, the retroductive process is cyclic. In Table 2, we linearize it to associate it with the engineering design process (Summers, 2005). The comparison shows a clear connection between retroduction and design. We focus on the last column of Table 2 to identify applicable research techniques.

Table 2: Implementing the retroductive process into the engineering design process (Summers, 2005)

Step	Retroductive Thinking	Retroductive Design Process
1	An unexplained fact is observed	Design specifications are provided
2	An exploration of the relationships with the fact(s) is made	Assimilation of the design specifications, including trying to determine secondary constraints and the relationships (explicit and implicit) between requirements, constraints, and goals
3	Abductive reasoning is applied to make a guess to explain the fact (either through selective or creative hypothesis formation)	Abductive reasoning is used to generate possible design solutions. These solutions may be generated either through routine or novel strategies.
4	Deductive reasoning is applied to ready the explanation for testing	Deductive reasoning is used to formulate an analysis of the posed solution(s)—this may include identifying additional design variables that are part of concern and the known relationships between them and the specifications
5	Inductive reasoning is applied to test and evaluate the guess	Induction is used to compare the original design specifications against the values for the specifications based upon the analysis of the design solution. Induction is used to determine possible correlations of the deficiencies between the desired and calculated. These correlations are accepted into the design knowledge as new knowledge—temporary
6	Abduction or deduction is used to interpret the evaluation and the cycle begins	Abduction may be used to propose new hypotheses for why the deficiencies exist or deduction may use known knowledge for reasoning about the deficiencies. Based upon the hypotheses (abduction) or the conclusions (deduction) changes are made to the original hypotheses (design solutions) through abduction. The cycle repeats.

4.3 Motivating methods of inquiry in the design process

The desire to discover new information or clarify an ill-defined design element in the engineering problem drives the application of a specific class of reasoning in the design process. It motivates the associated research techniques. We map the tasks in engineering design that are correlated with retroduction. Figure 4 is an example of how these engineering concepts, logic, tasks are linked with different methods of inquiry. It is not an exhaustive list of research methods, but it is representative of how an engineer may develop a useful research methodology to support the design process. Note that we do not include the communication and documentation steps from Figure 2.

Many of the research methods in Figure 4 have detailed discussion in many texts for research design such as Creswell and Poth (2018), Thiel (2016), Creswell (2014), along with Dym and Little (2000). As Figure 4 suggests, combining the engineering tasks with the way that the engineer thinks about the task leads to more than just numerical approaches. For instance, abductive thinking would include crowd sourcing to develop new ways to think about the problem and solutions for it. During preliminary design, inductive thinking tests and determines significant correlations between variables that are present in the system. Blueprinting is a business management approach to testing new processes, but for an engineer it may be an unconventional means to gain a better understanding of interactions among system variables (Millson and Wilemon, 2008). As an example, introducing a new electric car in a maintenance shop forces the shop owner to understand if the current test equipment in

the service bays is technologically advanced enough to evaluate the car. The owner may also review if the shop's capacity can handle the electrical load the car demands. Blueprinting is a non-numeric approach to consider other important factors in the problem. While this paper introduces some different research methods to address tasks in the design process, it is the creativity and intellectual agility of the engineer to develop a research methodology that fits the engineering problem.

Design and Logic			Engineering Design Tasks			
Engineering Design	Retroductive Thinking	Retroductive Design Process	Establish objectives, requirements, constraints, functions	Establish design specs; Generate alternatives	Model, analyze, test, and evaluate conceptual designs; Select a design	Refine, optimize chosen design; Propose fabrication specs
Client Statement (Need) and Problem Definition	An unexplained fact is observed	Design specifications are provided	surveys, interviews, literature reviews, phenomenology			
	An exploration of the relationships with the fact(s) is made	Assimilation of the design specifications, including trying to determine secondary constraints and the relationships (explicit and implicit) between requirements, constraints, and goals	system dynamics, wargames, value-focused thinking, brainstorming and systems thinking, diagramming			
Conceptual Design	Abductive reasoning is applied to make a guess to explain the fact (either through selective or creative hypothesis formation)	Abductive reasoning is used to generate possible design solutions. These solutions may be generated either through routine or novel strategies.		case study, experimentation, statistical analysis, literature reviews and morphological boxes, brainstorming		
Preliminary Design	Deductive reasoning is applied to ready the explanation for testing	Deductive reasoning is used to formulate an analysis of the posed solution(s)—this may include identifying additional design variables that are part of concern and the known relationships between them and the specifications			literature review, physical experiments, one and multi-dimensional statistical analysis	
	Inductive reasoning is applied to test and evaluate the guess	Induction is used to compare the original design specifications against the values for the specifications based upon the analysis of the design solution. Induction is used to determine possible correlations of the deficiencies between the desired and calculated. These correlations are accepted into the design knowledge as new knowledge—temporary			systems thinking, and system dynamics, blueprinting, computer experimentation, mathematical modeling and optimization, curve-fitting, scenario based learning	
Detailed Design	Abduction or deduction is used to interpret the evaluation and the cycle begins	Abduction may be used to propose new hypotheses for why the deficiencies exist or deduction may use known knowledge for reasoning about the deficiencies. Based upon the hypotheses (abduction) or the conclusions (deduction) changes are made to the original hypotheses (design solutions) through abduction. The cycle repeats.				grounded theory, literature reviews, brainstorming, experimentation, multi-parameter optimization, scenario methodologies to include wargames

Figure 4: Mapping research techniques with engineering logic and the design process provides an idea for how engineering reasoning can help develop a more comprehensive structure for engineering research

5. A framework for a course in engineering research based on engineering logic

All previous discussion in this paper establishes the foundation for developing a new course in research methodologies for engineers. Such a course centers on engineering reasoning as an innovative way to prepare a new generation of engineers on how to handle research challenges in a world of complex systems.

The course is an eleven-week program of instruction that consists of three major sections and approximately thirty contact hours. Part I is a basic introduction to engineering research and the design process. Part II involves

the different classes of logic and retroductive thinking. Part III is a set of modules that explores potential research techniques that are appropriate for the required tasks in the engineering design process. A number of methods to assess student achievement of course objectives is administered at appropriate junctures in the program.

5.1 Course textbook and study material

Appropriate textbooks for the course include *Research Methods for Engineers* (Thiel, 2016) and *Research Design* (Creswell, 2014). Pamphlets such as *The Thinker's Guide to Engineering Reasoning* (Paul, Niewohner, and Elder, 2013) are a staple for the class. Additionally, the instructor selects articles that are relevant to course objectives. Presentation slides are the basis for dialogue during lecture hours. In-class lab material is instructor provided.

5.2 Course introduction and research basics

Part I of the course identifies course objectives and learning outcomes. It involves a thorough discussion of engineering research terminology. It reviews the design process that has been discussed in previous courses in the Systems Engineering curriculum. A study of traditional research methods provides the student a working knowledge. This section of the course ends with an introduction to research design and planning activities.

5.3 Modules for engineering reasoning

A short history on reason and logic begins this section of the program. Study modules for abductive, inductive, and deductive thinking are the primary focus in this part of the course. The instructor or course coordinator invites guest lecturers who are subject matter experts on each of the specific class of logic to complement class material. A discussion of the retroductive process shows the iterative application of the major classes of engineering logic. It initiates the discussion between design and engineering reasoning.

5.4 Modules for linking research techniques, engineering logic, and the design process

The program of instruction calls for detailed discussion of quantitative and qualitative research techniques that were not presented in the first part of the course. Instruction centers on linking steps in the design process, corresponding tasks or objectives of design step, and the class of engineering reasoning that governs how to address the tasks. Potential research techniques are studied for their suitability to achieve the design objectives. This set of study modules is essentially an examination and explanation of Figure 4.

5.5 Evaluating student achievement of course objectives

Periodic quizzes after the first week of class reinforce key concepts that correspond to course learning objectives and outcomes. The student is required to read several advanced papers on relevant topics throughout the course. The student provides a short paper and a 20-minute presentation about each article to discuss its significant points. On the eleventh week of the program, the student develops a research design for a given system as a capstone for the course. Evaluation centers on the degree that the student applies course concepts and tools. Accompanying the research plan is an argumentative paper that should justify the resultant design. The course has no midterm or final exam. In keeping with theme of the course, final grades are awarded in accordance with thresholds described in *The Thinker's Guide to Engineering Reasoning* (Paul, Niewohner, and Elder, 2013).

6. Conclusions

Traditional practices regarding engineering research rarely address a wide range of research techniques. Education for engineers frequently limit research methods to numeric approaches. Additionally, the engineer mind set is seldom aware of different ways to think about a problem, thereby narrowing the choice of research techniques that are used in the design process.

Fashioning a research methodology that centers on engineering logic opens opportunities for applying new research designs that may improve engineering solutions. Linking the design process and tasks with engineering reasoning lead to a greater variety of research techniques. The application of different research methods has potential for discovering more information about the design elements, which prompts closer examination of the final design. Increased scrutiny of the design and corresponding justifications for it leads to a set of more robust solutions to the engineering problem.

Capturing the retroductive design process in a new course on research methodologies for engineers is a reasonable step to improve engineering research and eventual engineering solutions. This paper develops the basis for such a course and introduces a template for a program of instruction. It offers the opportunity for other engineering research practitioners to enhance the preparation of a new generation of engineers.

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Ice Hockey Player Characteristics: Qualitative Research

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Abstract: There are many quantitative statistics employed to evaluate the performance of ice hockey players. But, these measures are not always sufficient. This paper describes two unique perspectives involving qualitative research. One perspective involves the use of a qualitative research method to investigate the performance characteristics of ice hockey players and their contribution to team success. The other perspective demonstrates the use of an on-line survey to conduct qualitative research from a Critical Incident Technique perspective. The data gathering technique involved group responses to an online survey. The ice hockey players were asked to identify situations which were meaningful to them. Qualitative themes were identified which contribute to team success. A profile may be developed which represents ice hockey players' interpretation of desirable characteristics beyond the quantitative statistics. The profile may be employed to assess current ice hockey players or to identify potential team members who will contribute to team success.

Keywords: ice hockey, qualitative research, grounded theory, critical incident technique

1. Introduction

The project described in this document has identified qualitative performance aspects related to the contribution of an ice hockey player to overall team success. While there are many quantitative performance measures, there does not seem to be many qualitative considerations. These types of considerations relate to an ice hockey player's contribution during a stoppage in play, off the ice, on the bench, or in the dressing room. These players are usually referred to as "character players". Various traditional quantitative performance measures exist such as shots on goal, save percentage, and plus/minus. There also exist advanced statistics such as Corsi and Fenwick (Herman, 2014). All of these measures are relatively easy to determine and provide information about individual players and overall team performance. What is missing is a measure of attitude and character. These qualitative aspects may be used to assess individuals on the team or before they join the team whether through the draft or a trade. Identifying these aspects will contribute to the development or extension of team chemistry.

This report contains the following sub-sections. First, both traditional and advanced quantitative measures are briefly described. Then, the consideration for qualitative measures is introduced followed by an overview of the approach taken to conduct this investigation. A description of the investigation serves to introduce the data acquired and how it was analyzed to identify emerging themes. A framework was developed which outlines the relative importance of the themes. The report concludes with suggestions relating to the use of the themes and the proposed framework, and potential future investigations.

2. Background

Traditionally quantitative statistics have been used in the evaluation of ice hockey players and teams. These statistics include shots on goal, save percentage, goals and assists by individual players, and team wins and losses. Skaters have been evaluated by total goals and assists. Each league presents an award each season to the skater who amasses the most points. Also, skaters may be evaluated by the number of shots on goal. Save percentage is the major evaluation for goalies. It is generally expected that a goalie will save nine out of ten shots. Thus, a save percentage of 90% is expected. Overall wins and losses by the team results in the relative standing in the league. More wins and fewer losses result in higher standings.

More advanced statistics have been employed relatively recently. The most used statistics relate to Corsi and Fenwick (Herman, 2014).

The Corsi statistic has been employed in several different ways. It not only represents a measure of goalie work load, it also is a measure of puck possession. The Corsi statistic is calculated as follows:

$$\text{Corsi} = \text{Shots on goal} + \text{Missed shots} + \text{Blocked shots}$$

In each case the goalie must react in some way. Thus, it represents goalie work load. Corsi has also been used to evaluate team performance. A net Corsi is employed in this situation. Thus, a positive net Corsi number

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indicates time spent in the offensive zone. A negative net Corsi indicates time spent in the defensive zone. Unfortunately, there are some issues regarding the use of Corsi. It does not account for a player's assigned role on the team. There is no consideration for an individual who plays defense. Also, a player may be assigned a checking role and the resulting Corsi number may be low or negative. Further, a player may be good at advancing the puck into the offense zone and setting up plays. The Corsi statistic does not account for these types of contributions to team success.

The Fenwick statistic is like Corsi except for removing blocked shots.

$$\text{Fenwick} = \text{Shots on goal} + \text{Missed shots}$$

A modification of Fenwick is FenClose. This statistic relates the calculation of Fenwick to time in the game and the score. Specifically, when the game is tied or with a difference of one goal. When the score is beyond a one goal lead and it is late in the game then teams alter their approach. Teams that are leading in the score will adopt a defensive attitude. While teams that are behind in the score late in the game may adopt an aggressive approach.

The Corsi and Fenwick percentage statistics may be employed for performance comparisons for both teams and players. Both the Corsi and Fenwick statistics represent an indication of puck possession. Herman (2014) suggests, "Corsi and Fenwick are meant to be indicators of "possession", or how much a team controls the puck in the offensive zone during a game." In discussing the Corsi and Fenwick statistics, Herman (2014) states,

"The theory is that better teams possess the puck more in the offensive zone (...which...) lead to more shot attempts, more shot attempts lead to more goals, and more goals leads to winning. Plus, when your team has the puck in the offensive zone, by definition, the other team doesn't. It makes sense." (Herman, 2014)

The Corsi and Fenwick statistics miss the context of the game. Are the teammates great players? Is the opposition weak? In which zone do the shifts start? What is the score of the game? Further, some suggest, "... there is a lot more to hockey than simply being on the ice when a goal is scored." (JenLC, Part 1, 2013:2).

Lewis (2003) wrote the highly acclaimed investigation into baseball statistics titled "Money Ball". Mason and Foster (2007) present the possibility of applying the statistical concepts outlined in Money Ball (Lewis, 2003) to ice hockey. They describe ice hockey as a "complex organization" because, "... the players are dependent on their teammates' actions for their inputs so they can produce outputs." (Mason and Foster, 2007:210). Alternatively, baseball players act relatively independently to produce their outputs. Thus, Mason and Foster (2007) conclude that traditional statistics do not identify the contributions made by each ice hockey player to overall team performance.

"As a result, existing statistics do not necessarily measure the true contributions that players make to teams, and because hockey is a fluid and dynamic game, events that occur are more difficult to measure in order to develop data analysis techniques." (Ryder, 2006:53)

So, the conceptual ideas presented in the book Money Ball are interesting. But, they do not seem to fit into the evaluation of a complex sport such as ice hockey. Tingling et al (2011) investigated whether the selection order in the annual National Hockey League (NHL) amateur entry draft represents a reflection of performance for players who eventually play in the NHL. Draft order was generalized by picks in the various selection rounds. While a few aspects were considered for the authors' definition of "success", the eventual focus was placed in the number of games played. The first threshold was at least 1 NHL games. The second was at least 160 NHL games. This second threshold reflected the requirement of participating in 160 games to qualify for a full NHL pension. Statistics were determined for many draft years and the success criteria of 1 or 160 games. In general, the results are as follows:

Percentage Attaining the Threshold

	1 GAME PLAYED	160 GAMES PLAYED
FIRST ROUND	90.6%	64.1%
SECOND ROUND	65.1%	28.6%
THIRD ROUND	51.4%	23.5%

Source: Tingling et al, 2011:161

Both threshold numbers continue to decline in subsequent draft rounds. Thus, the drafted players in rounds after the first round show a marked decrease in success relative to 1 and 160 games played. Tingling et al (2011) coined the term, “draft round effect”. The authors suggest,

“... early round players receive greater and disproportionate opportunities to play in the NHL.”
(Tingling et al, 2011:164)

However, the later draft round statistics, while the numbers are low, suggests there are still some successes. The question then arises, how can the potential successful players in these subsequent rounds be identified? As Tingling et al (2011) suggest,

The “... evaluation and selection processes ... have substantial room for improvement”
(Tingling et al, 2011:167)

3. Qualitative performance evaluation

In 1980 the United States Olympic hockey team won the Gold Medal. Fischler describes this team as follows:

“More than anything, the American win underlined the possibilities of an underdog team that plays like a team, in contrast to a considerably more powerful foe loaded with individual stars. Emotion can do wonders for a hockey club if properly channeled, and nobody refined the rah-rah spirit to proper advantage more than Brooks and his boys. They weren’t the best team to play in the Olympics, but they certainly could go down as the most spirited of the underdog gold medalists.”
(Fischler, 1990:265)

Developing aspects of performance evaluations relates to the idea that, as above, “... there is a lot more to hockey than just being on the ice when a goal is scored.” (JenLC, Part 1, 2013:2). Qualitative analysis helps add depth to this idea.

4. Qualitative research

Qualitative research supports the investigation of personal experiences in the participants’ natural surroundings (Myers, 2009). Participants are urged to tell about their own experiences. It is important that the participants possess direct experience relating to the topic under investigation. Thus, as described below in the Project section of this document, ice hockey players were asked to describe their personal experience with an ice hockey related meaningful event.

5. Grounded theory

Grounded Theory is,

“... a general methodology of analysis linked with data collection that uses a systematically applied set of methods to generate an inductive theory about a substantive area.”
(Glaser, 1992:16)

The flexibility inherent in Grounded Theory (Glaser, 1992) allows it to be combined with the Critical Incident Technique which permits the examination of events from the participant’s perspective. Participants can convey their own interpretations of personally experienced events. Giroux (2009) employed Grounded Theory (Glaser, 1992) and the Critical Incident Technique (Flanagan, 1954) to investigate the problem-solving processes of small business in British Columbia, Canada. It was determined the processes were intuitive, improvised, and non-linear.

6. The critical incident technique

The Critical Incident Technique emerged as a method to accomplish the above objectives (Flanagan, 1954) and included five steps.

- Develop a statement describing the issue to be investigated along with specific research objectives.
- Determine how specific incidents will be gathered which relate to the above issue including plans and specifications.
- Gather the data via interview or observation.
- Analyze the data to develop a framework.

- Interpret and report the results relative to the identified issue.

It should be noted that both positive and negative incidents may be documented (Flanagan, 1954). Indeed, this provides further elucidation to the issue being described in this paper.

A review of the Critical Incident Technique was conducted by Gremler (2004). The focus of the review was on service marketing research. The review supported the use of the Critical Incident Technique for qualitative research to determine emerging themes for a topic of investigation.

The Critical Incident Technique has also been defined as,

“... a qualitative interview procedure which facilitates the investigation of significant occurrences ... identified by the respondent... The objective is to gain an understanding of the incident from the perspective of the individual.”

(Chell, 1999:56)

Some investigations into sport have employed the Critical Incident Technique. Rühley and Greenwell (2012) determined the positive (interpersonal and social factors) and negative (organizational issues) attributes of sport participation experience in bowling. Hardin et al (2013) employed the Critical Incident Technique to investigate service quality from the fan’s perspective at a college football game. They conducted content analysis (Paisley, 1969) on 2,450 valid responses. The coding of the data followed the Open, Axial, and Selective approach (Creswell, 2007). Categories are identified, supported by themes, all of which may be employed to validate relationships (Strauss and Corbin, 1990). Another investigation (Greenwell et al, 2007) which employed the Critical Incident Technique evaluated the customer experience at sporting events, specifically, minor league baseball and arena football. Overall, positive comments were received relating to sport appreciation, facility, and atmosphere. Negative comments were about parking, weather, food prices, and comfort.

7. The project

The investigation reported here has gone beyond the traditional and advanced statistics currently used to evaluate ice hockey player performance. An in-depth analysis of qualitative aspects of ice hockey player evaluation is presented. The project has identified qualitative performance aspects related to the contribution of an ice hockey player to overall team success. While there are many quantitative performance measures, there are not many qualitative considerations. These types of considerations relate to an ice hockey player’s contribution during a stoppage in play, off the ice, on the bench, or in the dressing room.

For this investigation ice hockey players were asked to document what they considered to be a meaningful event. They were asked to document what was said or communicated non-verbally and what that meant to them. The responses were analyzed to identify common qualitative themes. These themes may be employed to develop profiles of the players’ interpretation of the aspects which contribute to team success. Further, the themes may be used to develop a generic profile for a player’s contribution. These profiles may be used to assess current players and/or to assess a player who may potentially be acquired (through draft or trade) by the team.

On November 13, 2017 two groups of players gathered in a classroom at the Bonnyville and District Centennial Centre (known as the C2 Centre) in Bonnyville, Alberta, Canada. To begin each player signed an Informed Consent letter (Appendix A) which, in effect, committed to the confidentiality of the projects process. Then, the players individually accessed an on-line survey and responded confidentially to the questions. The survey is included here as Appendix B. The average age of the participants was eighteen. For the majority (70%) this was their first year with the team and in the Alberta Junior Hockey League (AJHL).

To begin the survey the players were asked to think of a meaningful event. The first two questions asked what was the communication and what it meant to the player completing the survey. The content of the answers to these two questions were qualitatively analyzed to identify themes which emerged from the responses. Twenty-three players completed the survey generating six themes along with forty-six supporting comments. Two further questions provided detail about the communication in the meaningful event. These responses provided support for the emerging themes. The relative importance of each theme (based on the number of mentions) is shown in Table 1.

Table 1: Themes count framework

THEME	COUNT	%	OVERVIEW DESCRIPTION
Team	15	33%	Close as a team; Teammates care
Improve Myself	12	26%	Try to get better; Put in the extra work
Improve Others	8	17%	Make other players better
Protect Others	4	9%	Have each other's back
Confidence	4	9%	Extra confidence
Communicate	3	6%	Communicate well
TOTAL	46	100%	

The themes may be employed to identify those characteristics possessed by an ice hockey player which will contribute to team performance and potential success. To begin, the initial evaluation of quantitative performance measures should continue to be employed. These performance measures relate to the technical skills possessed by each player. Given acceptable technical skills, differentiating aspects may be identified by asking the following questions and interpreting the player's responses in relation to the identified themes.

Potential Questions

- What do you need to do to become a better player?
- What are your strengths?
- How can you contribute to the success of the team?
- What do you want to accomplish?
- *This year?*
- *After your junior career?*

Potential Answers

- Answers of a quantitative nature will support the necessary technical skills.
- Qualitative answers may be employed to assess the player's character.
- *These responses should be related to the themes in the above Framework.*
- *Players who comment about Themes higher in the table should be considered as those with the type of characteristics which will contribute more than other players to team performance and eventual success.*

8. Conclusion

Overall, the results of this investigation and further survey administrations will serve to identify those characteristics of ice hockey players who contribute in a qualitative way to team success. Indeed, the research approach may apply to other sports beyond ice hockey.

The objective of this investigation was to determine the personal characteristics of ice hockey players and how they contribute to the success of the team. The Critical Incident Technique encompasses an approach to gather data which addresses this objective. The technique provides a method to investigate how individuals attempt to document their experiences. The technique is a proven qualitative research method which facilitates the documentation of personal experiences. Respondents describe their experiences relating to the topic of the investigation. For this investigation ice hockey players were asked to document a meaningful event. As above, these events may have occurred during a stoppage of play, off the ice, on the bench, or in the dressing room.

One question in the survey asked the respondent to list the contributing player's number. It is interesting to note that two specific players' numbers were entered most often. It was further noted that these players are not the leaders of the team in terms of goals and assists. A more detailed investigation of these two players would provide further support to the identified themes.

Subsequent investigations will pursue completing more of the surveys. Further survey administrations will be conducted with different age groups and cultures. Also, a very important variable could be provided by survey responses from women ice hockey players.

Appendix A: Informed consent letter

Research Project Title: Hockey Player Contribution to Team Performance

Investigator: M. Gordon Hunter, Professor Emeritus

This consent letter, a copy of which has been given to you, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something that is included here, or information not included here, please ask. Please take the time to read this form carefully, and to understand any accompanying information.

You have agreed to participate in a research project that I am conducting. The purpose of this research is to investigate the qualitative aspects related to the contribution of a hockey player to overall team performance leading to success. Your participation is very important, as it will provide valuable information about your experience. The most valuable information for this research is your personal opinions.

The data that will be obtained from you will be gathered in a small group of players, which will be about one hour in length. Please respond to the questions individually and anonymously on your electronic device, openly and honestly in full detail. Your participation is completely voluntary. Should you decide to withdraw from the study there is no penalty and the data you provide will be destroyed. Subsequent publications will not identify you in any way based upon the data gathered via the interviews. Your name will not appear on any publications. Your Coach and General Manager, and anyone else associated with the team will not know your personal responses and will not know who did or did not participate. Because of the anonymity and confidentiality considerations there are no risks associated with your participation. Benefits may accrue to you in the form of understanding in more detail those characteristics which contribute to team success.

In terms of protecting your anonymity, your identity as a participant in the research will be revealed only to the extent that I must ask you to sign a copy of this letter, acknowledging that you understand the conditions of participation. This will be the only record of your identity as a participant. Your confidentiality and the confidentiality of the data will be protected because there will be no means of connecting the data you provide with your individual identity. Data will be stored in password-protected electronic form. Data from this study will be disposed of after three years, when electronic files will be erased. It is anticipated that the results of this study will be shared with others in the form of journal articles and presentations at scholarly meetings with all participants remaining anonymous. You will have an opportunity to review these documents before they are shared.

Your signature on this letter indicates that you understand to your satisfaction the information regarding your participation in our research project and agree to participate. You are free to withdraw from the study at any time with no consequences. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

Signature of Participant

Date (Day/Month/Year)

My signature on this letter represents my commitment to you regarding confidentiality.

Signature of M. Gordon Hunter

Date (Day/Month/Year)

Thank you for your participation. Please do not hesitate to contact me if you have questions:

M. Gordon Hunter
Professor Emeritus
(587) 220-6360
E-Mail: ghunter@uleth.ca

Appendix B: Hockey player contribution to team performance

The purpose of this research is to investigate the qualitative aspects related to the contribution of a hockey player to overall team performance leading to success. Your participation is very important, as it will provide valuable information about your experience. The most valuable information for this research is your personal opinions. As part of a hockey team, team mates encourage each other in lots of different ways. In this research I am examining specific events where another player said or did something positive toward you that was memorable. Please think of a specific event that was meaningful to you. It may seem big or small to others—what matters is that it was meaningful for you. The following questions ask you about the communication or action, which could have been verbal or non-verbal.

What was the communication made to you?

- Box for text

What did the communication mean to you?

- Box for text

Is there anything else you remember about this communication you would like to share?

- Box for text

What three words best describe the player making the communication?

- One
- Two
- Three

In your opinion what positive characteristics does the player making the communication possess?

- Box for text

The following questions ask about some background to the communication. If you do not remember all the details feel free to leave the answers blank.

When was the communication made?

- Before the game
- First period
- Between first and second period
- Second period
- Between second and third period
- Third period
- Overtime
- After the game

Was it a home or away game?

- Home game
- Away game

If the communication was made during the game, who was winning the game?

- Us
- Them
- Not sure

What was the jersey number of the player making the communication?

- Box for text

The following questions are about you and your background

What is your age?

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- 15
- 16
- 17
- 18
- 19
- 20

What position do you play?

- Left Wing
- Centre
- Right Wing
- Left Defense
- Right Defense
- Goal

How many seasons have you played in the league?

- First Year
- Second Year
- Third Year
- Fourth Year
- Fifth Year

How many seasons have you played with the team?

- First Year
- Second Year
- Third Year
- Fourth Year
- Fifth Year

Thank you for your participation

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Helping as the Topoi for Interventionist Research From a Pragmatic Constructivist Point of View

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Abstract: This paper addresses the question: what criteria must we apply for a topoi that will support interventionist research from a pragmatic constructivist point of view. Interventionist research is about academics and practitioners together changing practice while developing theory. Thereby it is about constructing a reality for practice and a reality for academia. Interventionist research may take many forms ranging from strong to weak interventions. No matter what form, the driver of interventionist research is here found to be helping. So helping is the topoi of interventionist research. Such claim requires a discussion of the concept of helping. This discussion will be guided by the thoughts of Søren Kierkegaard concerning the art of helping. The discussion in this paper will show that not only the academic must seek to find the practitioner, and understand what the practitioner may not know in order to help him. Also the practitioner must seek an understanding of what the academic do not know. The paper will argue that helping based on humbleness and mutual respect is the driver of successful interventionist research. The paper concludes that helping each other into the construction of functioning realities may lead to successful interventionist research projects. However, success is dependent upon that both parties are aware that their own success goes via success of the other.

Keywords: pragmatic constructivism, interventionist research, helping, topoi

1. Introduction

Within the field of management accounting there is a tradition for interventionist research (e.g. Jönsson & Lukka, 2006; Suomala, Lyly-Yrjänäinen, & Lukka, 2014). Interventionist research is a form of qualitative research where the researcher directly interacts with practice. The interaction and practical involvement must lead to theoretical contributions in order to qualify as research instead of consulting. The working process of interventionist research involves that both academics and practitioners have the ambition to change a current situation or solve a problem. As such, interventionist research requires an emic viewpoint (Suomala et al., 2014). Interventionist research does not involve experimental methods, where the researcher exposes some kind of treatment to a respondent and the researcher observes the outcome, an approach that would involve an etic perspective (Suomala et al., 2014). Experiments do not see the practitioner as an actor. Experiments presumes that the test person is a re-actor that will respond in a certain way to certain stimuli. Instead, interventionist research implies an active engagement with reasoning according to local rationale and practice. Interventionist research recognises the practitioner as an actor that is capable of contributing to the common ends of the interventionist research project. Recognising the practitioner as a capable actor does not exempt the academic from any ethical obligations that ought to be associated with traditional social experiments. An interventionist researcher must be fully aware of the authoritative role that she or he is playing in the common problem solving process of interventionist research.

The working process of interventionist research has similarities to a central concept of pragmatic constructivism - co-authorship (Nørreklit, 2017). Co-authorship involves professional knowledge and insight of the local practice that situates the reality construction. Co-authorship happens when two or more actors all contribute to the construction of a common reality. Interventionist research is only successful when both parties benefit. This will only happen as long as both parties contribute to the common problem solving process. This means that both parties must contribute to the reality construction of each other's reality. Taking part of an interventionist research process implies that you interacts and take responsibility not only for solving your own problem, but also the other's problem. This means that all parties have to be given room for participation, and all different positions has to be acknowledged and discussed respectfully. Basically this is about how actors work together, and how they start putting words on the problems they face and share ideas of how to solve these problems. Within pragmatic constructivism this process is labelled topoi, and is defined as ways of conceptualizing the actor-world-relations (e.g. Nørreklit, 2017).

The objective of this paper is to discuss criteria for a topoi that will support interventionist research from a pragmatic constructivist point of view.

Interventionist research involves two parties, the academic and the practitioner. These parties are equal but they also have different objectives of the cooperation. The practitioner have a practical problem to be solved, the academic is searching for a research problem that can contribute to a relevant theoretical field. These two kinds of problem are often not the same (e.g. Booth, Colomb, & Williams, 2003). However, the problems can co-exist, and the problems are co-solvable, this is the whole idea behind interventionist research and what must drive the cooperation. Given these different objectives of entering an interventionist research project it is probably necessary that the two parties adjust their expectations to each other so that both parties can help each other in solving their problems. In that sense, helping becomes the driver of interventionist research.

In order to guide the following discussion, two research questions will be raised:

- What does it mean to help?
- How can helping foster co-authoring of realities.

The ambition of the paper is not to create a new methodology for conducting interventionist research. Instead, the ambition is to point at guidelines for both academics and practitioners when they join forces and move into the co-authoring of interventionist research.

The paper proceeds as follows. The following section will discuss the concept of helping. The discussion will be guided by the thoughts of Søren Kierkegaard concerning the art of helping. In his authorship, helping is about finding the other where he is, and begin from thereon. The discussion in this paper will show that not only the academic must seek to find the practitioner, and understand what the practitioner may not know, also the practitioner must seek an understanding of what the academic do not know. The paper will argue that helping based on humbleness and mutual respect is the driver of successful interventionist research. The paper concludes that making helping the topoi and driver of interventionist research may lead to better interventionist research projects, if the condition is made explicit and form the adjustments of expectations to each other.

2. The art of helping

The common understanding of help or helping another person can be illustrated by a man who is waiting at a bus stop together with a young woman with a baby carriage. When the bus arrives, the man asks the young woman if he can help her carry the baby carriage into the bus. What characterises such an event is that both parties can see the problem, and they also know how to solve the problem. All it takes is a kind request from the man asking: "Can I help you carry the baby carriage into the bus". The young woman would probably answer: "yes please". Then they will grab the baby carriage and lift it into the bus. When the baby carriage is safely inside the bus, the young woman will probably thank the man, and he will gently reply with a "You are welcome". What characterises such a situation is that both parties are able to identify the same problem, and they also know how to solve the problem. From a pragmatic constructivist point of view you can say that they share perceptions of reality and are thereby able to co-author the solution of this simple problem.

Helping in relation to interventionist research is different compared to the everyday situation explained above. First, in the example above both the young woman and the man face the same problem – a baby carriage including a baby needs to get safely on board the bus. It will have different consequences for the two people if the problem is not solved, but motives for both the man and the woman can be found for not leaving the baby carriage at the bus stop. When we look at an interventionist research project the academic and the practitioner are not facing the same problems. The academic are looking for and have to solve research problems, because this is her or his motive for entering the research project. The practitioner face a practical problem that needs to be fixed in order to make her or his reality work. Hence what is needed is that the two parties must construct common means in order to reach each their ends. Second, carrying a baby carriage into a bus is a well-known problem that we have a known solution for. You can say that the facts and the possibility around such a problem are well defined; what it takes is two people that shares values, and communication to begin the action. Interventionist research problems are per definition not fully defined, this is part of a project, and for sure, there is not an obvious solution, because then there would not be a research project in the first place. The situation of the academic and the practitioner is that they have to work together and the success of each of them is dependent on the success of the other. Such a situation can only be solved if they find a form of helping each other that mobilises the advantages each of them may possess and reduces the weaknesses they may carry.

Going through the sociological and philosophical literature that discusses the concept help often point at motives for helping. When it comes to principles of how to help the help from existing literature is not that obvious. However, help from the Danish philosopher Søren Kierkegaard can be used. In his book "The Point of view for my work as an author" he writes: *"If One Is Truly to Succeed in Leading a person to a Specific Place, One must First and Foremost Take Care to Find Him Where He Is and Begin There. This is the secret in the entire art of helping. Anyone who cannot do this is himself is under a delusion if he thinks he is able to help someone else. In order truly to help someone else, I must understand more than he-but certainly first and foremost understand what he understands. If I do not do that, then my greater understanding does not help him at all. If I nevertheless want to assert my greater understanding, then it is because I am vain or proud, then basically instead of benefiting him I really want to be admired by him. But all true helping begins with a humbling. The helper must first humble himself under the person he wants to help and thereby understand that to help is not to dominate but to serve, that to help is not to be the most dominating but the most patient, that to help is a willingness for the time being to put up with being in the wrong and not understanding what the other understands."* (Quote from Hong & Hong, 1998). Most of Kierkegaard's writings were written in a sarcastic and ironic tone. This means that his texts has to be read and understood with caution. Often the real message is the opposite of what the text says. However the quote is taken from one of the last books that Kierkegaard wrote and is published as a kind of postscript where he accounts for his authorship. As such we dare take the words at face value.

Before we continue a few words about the applicability of philosophy of Søren Kierkegaard regarding pragmatic constructivism might be appropriate. Kierkegaard explicitly subscribes to Cristian values, and his authorship revolves around developing a Cristian existence as human being (Kierkegaard, 1859). He is interested in humans, and he is interested in how to make people reflect upon their existence. Pragmatic constructivism does not specifically subscribe to Christianity. However, pragmatic constructivism includes values, values that might have roots in Christianity but not necessarily. Hence, some kind of recognition of values as guidance for people's action seem to be shared between Kierkegaard and pragmatic constructivism. Kierkegaard say that people develop through reflection. Pragmatic constructivism would say that people seek integration of their reality through searching for (communication) and walking on paths that are factually possible and in consistence with the values of the actor, and that the integration process requires conscious reflection by the actor. Søren Kierkegaard's existentialistic philosophy is not identical to pragmatic constructivism. Nevertheless, the two philosophies have similarities in their approach to how to recognise and meet humans as reflective actors. Thereby it is found reasonable to use Søren Kierkegaard as inspiration for developing the ideas of this paper.

In order to address if the quote from Kierkegaard can provide us with an answer to the question concerning help as a topoi for interventionist research within pragmatic constructivism some passages of the quote needs to be discussed. The first passage in the quote that will be discussed is: *"... take care to find him and begin there..."*. From the perspective of the academic such an approach has the implication that in order to help the practitioner solve his or her practical problem, then the academic must understand the situation of the practitioner. At first sight, one might argue that this is not an issue for a trained academic. Most research methods based on interpretive or qualitative principles typically has such an inherent approach. One example is Arbnor and Bjerke (2008) and their actor based method. Of cause, the academic may happen to forget the situation of the practitioner, but since an awareness of this pitfall is made explicit in most research methods, a trained researcher will probably make an effort to understand the situation of the practitioner. However, research methods are written and followed in order to solve research problems in a way that can justify research criteria. Often the methods are also designed to support describing a case, and to analyse the case through a more or less predetermined theoretical lens. Under such circumstances the practitioner and practice becomes objects for research. In itself such an approach is an act of proudness and vain. However, more important such an approach exclude the researcher from learning from practice and thereby create knowledge instead of doing research.

When doing interventionist research, solving research problems goes via solving practical problems. These problems may be trivial for the academic. The academic may thereby have a tendency towards suggesting standard solutions to the practitioner's problem. It may be the case that this standard solution can actually solve the practical problem. Nevertheless, this is not the point. The point is, that by proposing standard solutions, the academic disregards that the practitioner is an actor on equal terms as the academic. The academic ignore to find the practitioner where he is. Thereby the academic can easily end up being perceived as proud or vein, and thereby unable to help the practitioner. This is of cause a violation of the co-authorship relation that in itself may harm the relationship. But what might be even worse is that the academic will exclude himself from gaining

knowledge that could actually enrich the solution to the research problem. If the academic is perceived as being arrogant and unapproachable, it is unlikely that the practitioner will invite the academic into his reality and share it with the researcher. Thereby the whole reason for entering research in an interventionist way has collapsed.

What about the practitioner? He or she may not have an academic training and probably not research experience. Thereby the urge for finding the other may not be inherent in the way that the practitioner approaches the interventionist research project. However, finding the academic is just as important for a successful interventionist research project as that the academic wants to find the practitioner. At least if we take the quote from Kierkegaard as guideline for a topoi for interventionist research. Doing so assumes that the practitioner has accepted to help the academic in solving his research problem. This acceptance includes an obligation to find the academic where he is. It also means that the practitioner must put the academic first and acquire some patience. This may be a challenge, especially if the practitioner has an expectation of a quick fix solution to his practical problem. A harsh reply to such an expectation could be that the practitioner under such circumstances should have bought a consultant. For sure such a remark would be a sign of arrogance. Instead attention should be pointed towards that attempts to find the academic where he is not only helping the academic to solve his problem. Finding the academic may also be a chance for the practitioner to qualify the solution to his own practical problem. This qualification contains not only the answer, but also the reasons for why the solution is right. Thereby the practitioner may have improved his possibilities for building pro-active truth around future challenges he may find.

3. Discussion and concluding remarks

The paper has been arguing that interventionist research is a matter of co-authoring, and the topoi that should be the leading idea of practice is helping. The definition of helping has been to seek to find the other where he is, and from thereon support the other into constructing a functioning reality. Co-authoring involves the common creation of not one reality, but two side-lined realities. The practitioner is interested in solving his practical problem, and the academic is interested in solving a research problem. The premise is that the two parties are committed to help solving each other's problems. The co-authoring process can only be made via the other. In that sense a successful interventionist research project can only be achieved through helping the other. The implication of this analysis is that both parties becomes highly dependent upon each other. This can create a strong motivation for cooperation. But only if both parties are aware of how they are dependent on each other, and that success for the individual can only happen if the other also has the experience of a successful outcome.

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Story Completion for Qualitative Research

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Abstract: Organisational responses to the post BREXIT referendum may be protracted by organisational interpretations of issues. Thus seeking new ways to re-think the role of organisations, in this respect reflects the challenging and exposing of the norms, organisations have come to represent. Telling stories in response to a scenario, may allow for the uncovering of any 'cognitive gap' and reveal how employees have interpreted the changing nature of their workplace. By exploring through such a methodology allows realities to be revealed and facilitates re-thinking. Story completion has not previously been applied widely to researching the business context. The paper contributes to understanding meaning making by way of where participants are asked to provide stories in response to a briefing stimulus or cue story about a meeting they have attended. Collected stories imitate the realities of the workforce through their life worlds. Stories act as a mirror to illustrate the sophisticated combination of sense-making and imagination. The paper reflects particularly through the works of Boje, Weick and Maitlis since the imagination can be recognised as a providing sense making. This might then contribute also towards enabling the rethinking of any relationship between the psychic and the social. Imagining from story completion is further reflected upon in order to develop new ways for organising alongside sense making.

Keywords: story completion, qualitative, management research

1. Introduction

Story completion has been little considered within organisational research as a plausible source for thinking about organisational practice or managerial problems. It has largely been used in psychological studies (Kitzinger and Powell, 1995). As a method it allows participants to 'complete' stories in response to a brief or first sentences as a stimulus to stories to create. Their contributions then become empirically based stories. The constructed stories then allow the researchers to compare the perceptions of the participants and to reveal the sense-making (Braun *et al*, 2016) of the individual. The 'invented' story can then be analysed qualitatively. This extends some of the historical approaches of organisational research towards story interpretation or ethnographic enquiry for interpretative studies of viewings of the organisation. The approach helps researchers to reveal new ways of looking at the relationship between the individual and the organisation which alternative modes fail to address. It adds to the potential tools for the qualitative researcher.

Since story completion has had little application within management or organisational research then it might be viewed as a novel approach which provides an extension in terms of alternative contributions. Equally the sceptical may feel concerned by the imagination through a lack of appreciation for the relationship between the individual's rational activities and the imaginary which might inform action. This draws from a body of understanding from story-telling whilst also considering the imagination and imaginaries (Wright *et al*. 2013; Komporzozos-Athanasidou and Fotaki, 2015) to help consider more reflexively the relationship that participants have with organisations.

The paper contributes then to understanding the potential meaning-making of research participants, who are asked to provide stories in response to a briefing stimulus, or cue story from a well-known organisational activity, such as a meeting. It is known that story telling can act as a mirror. Stories can illustrate the sophistication of the sense-making process when it interacts with the imagination. Story completion reveals further the life world within which the participant has positioned themselves within. Stories collected by this method might imitate the 'realities' of the workforce, seen through the eyes of the research participants, by offering a perspective that more concrete experiential approaches fail to attain.

As such the central question of how story completion might provide new ways of investigating organisational assumptions which inform the silent understanding of individuals within organisations is explored.

2. Background

Organisational responses to the post BREXIT referendum environment may be protracted by the very organisational interpretations of issues or challenges faced. Seeking new ways to re-think the role of organisations in this respect reflects the challenging necessary to expose some of the norms organisations have come to represent. By understanding how organisations create a shared understanding of the environment helps appreciate the decisions or actions they might employ. Additional understanding how the actors or players, represented through the individuals participating in the organisational space, experience the expectations or cultural domain provides greater insight to the potential translation of organising through the differing participants to organisational acts.

When there are increasingly turbulent issues, such as might be anticipated by reviewing the post BREXIT period for organisations, then simplicity in action becomes necessary in order to allow sense-making to facilitate changes in direction. 'Simplicity' as a combination (Colville *et al*, 2012) through the telling of stories in response to a scenario, by considering the words used can illustrate how interpretations have been formed about the situation, or socially imagined about the organisation's circumstance. The imagination can indicate how receptive individuals might be for new emotions. Equally by engaging with the imagination might also allow for the feasible re-thinking of likely responses to situations, problems or challenges.

By exploring the links between the psyche and the social facilitates how the imagination engages, as a Castoriadian notion, to view organisations through the social and cultural discourse. This then allows for differing cognitive performances to be considered. By progressing this socialised imagining new meanings or 'realities' between participants might emerge or be manipulated (Komporozos-Athanasίου and Fotaki, 2015, Wright *et al*, 2013). Thus stories can initiate a radical imagination within individuals which represents or affects the ways that individuals might unconsciously and subjectively experience the dimensions of organisations. A social imagination within which different story plots evolve emerges without reducing this to the limitations of a Freudian psychodynamic viewing.

Such 'imagining' might not be brought to light by other traditional research modes. Stories are known to provide rich language where sophisticated mixes of interactions can reveal the individual's 'sense-making'. These can more fully represent new significations (see Tsoukas, 2000) by enacting another lens to allow 'active authoring' in terms of translating their interpretations of the organisation. This comes about as participants witness the politics and powers of organizing (Brown *et al*, 2015). This then informs to their potential imagining of potential events. As such Castoriadis' 'signification' (Komporozos-Athanasίου and Fotaki, 2015) represents the possibilities that potential opportunities to recognise similarities of perception which might not otherwise be uncovered.

Such imaginaries within the organisation discourse might prove alienating. By being enabled to use a reflexive tool to deconstruct, might facilitate a critical examination that allows any harmful imagining to be considered. Being so enabled to investigate the otherwise 'unknowable' might then avoid any downward sliding of shared holistic narratives that might undermine the relationships within the organisation otherwise. Story completion recognises that there are limited views within empiricism. For which expanding approaches, that allow us to think in ways that have not historically been applied to conceptualise, might allow future collective change to be more inspired (Castoriadis, 1987).

By considering the relationships between the social, philosophical and political allows an autonomy which might lead towards organizational approaches which might never been anticipated (Komporozos-Athanasίου and Fotaki, 2015). Thought given the plethora of existing research approaches and instruments for qualitative inquiry, it might be queried whether these not already over-burdened. Yet the defence for researchers is that each offer a new lens to view the organization. From which a kaleidoscope of approach might provide new discoveries wherein serendipity might offer greater value than had such exploration been neglected.

The value of story completion lies with the opportunity to reveal the secret, unconscious imagination of the participant to reveal the inner drama contained within the 'realities' of their self. By providing a window to illuminate how they construct their meanings, how identities of individuals within the organization might be informed in terms of their sense-making. This can allow viewings of the socialized influences which might impact research participants. From which multiple observations from many participants can help us see further how managerial beliefs might impact upon such collective or individual sense-making. In other words, how

individuals, within their own life worlds, are shaped by their interpretations from managerial beliefs (Van den Steen, 2005).

The ability to gain insights into any institutional imaginaries manifested by such imagined stories might allow greater understanding of shared ideologies and into how any alienating interpretations might be undermined. This can then consider mechanisms which might be employed to provide new ways of thinking about any negativities and to enable well-being, prosperity and healing (Wright *et al*, 2013; Komporozos-Athanasidou and Fotaki, 2015) which might otherwise have been missed. This allows later reflexive critical discourse then.

3. Story telling underpinning story completion

The telling of stories in response to a scenario, may allow for the uncovering of any 'cognitive gap' experienced whenever individuals attempt to make sense of events within the organisation. It may reveal how employees have interpreted the changing nature of their workplace. The exploration of their realities and identities also provides the opportunities towards new turns for re-thinking organising. The stories collected can be considered as imitations of the realities of the life worlds of the workforce. Such stories act as a mirror to illustrate the sophisticated combination of sense-making and imagination since they allow for the interweaving the noticing and engaging in action of the participants within their organisational setting. This can facilitate a window which illustrates the socialised influences upon constructed meanings. A strong alignment towards managerial beliefs might potentially impact upon the sense-making of others (Van den Steen, 2005). By discussing the stories collected allows the reflections of the constructed 'realities' of individuals' life worlds by essentially understanding the multiple realities of the realms within participants situate themselves. The telling of stories, in response to a scenario, provides opportunities for greater understanding of the dynamics of this sense-making process.

By employing stories as an intelligent process in order to frame the observations of participants can overcome otherwise inherent reasoning bias (Klein *et al*, 2006). Where they become puzzled or there is confusion, by creating stories their sense-making allows for order. This social process becomes one of meaning construction and reconstruction. Retrospective sense is attained then when individuals tackle experiences from organisational issues, (Weick, 1993, 1995). Such "sense-making" becomes a critical organizational activity (Weick, 1995; Maitlis, 2005). Traditional research approaches lack the ability to capture where managers then endeavour to create sense for others as their circumstances change, (Weick, 1995) and the expansive motivation which allows for sense-giving in action (Balogun and Johnson, 2004).

When there are major calamities, sense-making occurs more holistically (Weick, 1993). Deriving from Weick's (1995) work, Boje (2008) progresses that the sense-making process of constructing stories is founded within the emotional response. The narrative speculation of the voices of corporate life can be conceptualised then as the 'ante-narrative' which might otherwise be silenced (Boje, 2001, 2006, 2008). Sense-making itself comes from the understanding of a situation through explicit words (Taylor and Van Every, 2000). In such complex and dynamic events then the interplay between participants limits the certainty of any cause-effect relationship that might be observed by other methods (Tsoukas, 2000). Thus developing monologic, dialogic or polyphonic approaches may develop new insights.

Story interpretation can facilitate the discovery of meanings held but 'only to the extent that the researcher grasps the story in situ' (Boje, 1995) since configurations underpin the manifested situation. By story enactment (Boje, 2001) relational performances can be depicted by fragmentation (Boje, 2011) which might enable the linking of tensions from within workplace practice (Boje, 2001, 2006, 2008, 2011) and which then shapes individual identity relationships (Boje, 2001; 2006). By 're-storying' retrospective of the event, re-imagining might progress how the relationships might be understood. This allows for extended sense-making (Boje, 2008). This relational process may allow marginalised voices to surface (Boje and Rosile, 2001; Boje and Saylor, 2013; 2014) and a living story to materialise. This open-endedness allows an infinite number of plotlines and endings (story-disorder) (Boje, 2008) which helps to allow the projection of experiences felt in terms of the wider organisational environment (Boje, 1995; Schedlitzki *et al*, 2015).

As they 'engage in action' with their interpretations participants can construct their identifies (Maitlis, 2005 Maitlis and Christianson, 2014; Maitlis *et al*, 2013) from the issues arising through such sense-making narratives. By exploring what strategies organisational actors use, sense-giving studies have focused upon the conditions

within which the narratives emerge (Maitlis *et al*, 2007). Story completion techniques, as a form of account narratological discourse around the future of an organization, progresses then the notions of the use of storyline to explore organizational change processes (Boje, 1991). Story telling projects organisational interaction, but since stories are dependent upon the researcher grasping 'the story in situ' which is limited by the ability to interpret (Boje, 1995), whereas story completion allows the participant's imagination to provide possibilities through new lines for understanding such interactions.

Sense-making through story construction illuminates the local realities of the organisational actors 'meaning-making' of political processes from any conceived discourse founded within the workplace. It facilitates illumination of how individuals frame and understand behaviour (Zilber, 2007) potentially moving the emphasis from the individual to the collective. From which shared stories can construct their worlds and an expanded meta-narrative can be provided (Zilber, 2006). By providing any conceived imaginings founded within the workplace as a research method, story completion allows for the examination of 'distributed sense-making'. This can then evidence the sense-making process (Kitzinger and Powell, 1995) where people engage in overlapping processes to make sense of their social worlds. To which their dialogue then contributes towards the stories that can characterise the tensions, catastrophes and opacities experienced within the organisations (Brown *et al*, 2015, Karreman and Alvesson, 2001; Weick, 1993, 1995; Weick *et al*, 2005). From which a multi-vocality may emerge within the stories collected, (Boje, 2001) and 'taken for granted' interpretations (Weber and Glynn, 2006) might be informed by such imaginings. Once the stories are collected then sensitive mechanisms which reflect the vitality of the research methods might be used to interpret the findings and facilitate reflexive interpretations of the interactions and what projects they might offer to allow new understandings.

4. Enacting story completion as a method

Story completion as a method to assess generated stories can be used to explore constructionist 'readings' produced in response to a cue story. The cue story can be used to allow respondents to illuminate the probable issues by way of their imaginings which might be likened to anticipated reactions to the stimulus. For the purposes of the organisational, business or management research, by choosing a current catastrophe such as the post BREXIT environment might facilitate sufficient emotional response that research participants are enabled to draw from their subconscious. As such it reflects similar features to other empirical research methods. Story telling from the imagination in its structure and conceivable content however is something that small children learn within the primary setting and participants may find this difficult to engage with at the first viewing. Moreover the innocence of storying as children allows a naïve perspective to their constructions. As such although there is potential for the ridiculous or negative responses to stories, Kitzinger and Powell (1995) reflect that this is not common in terms of the responses of most respondents

The respondents are invited to provide a story and in so doing it allows them to delve into their imaginings but although this approach might lever less confidence, it lies with the recognition that allowing individuals to think about the possibilities of their stories allows them to reflect different ways of thinking about collective or anticipated responses (see Weick, 1993; Boje, 2001; 2008). From which the story completion research mode provides space and a condition for reflexive critical discourse as the participant attempt to engage in dominating imaginaries to construct their stories. It again provides the opportunity to re-think the expectations of those participating in the story completion and how they organise their stories. This allows for the exploration of the perceptions from which the construction of stories might draw. By getting them to consider potential interactions with others in their workplace in order to imagine stories which might emanate from the brief illustrates their sense-making and provides a different approach to engaging with their interpretations of the sense they make from daily situations and workplace problems or hassles.

Harvesting their stories reflects imaginable insights into their life worlds and provides a viewing of the rational meaning-given that social settings may allow them to present. As such a new conceptualisation by way of a radical imaginary allow for the conceptualisation outside the constraints of their concrete experiences which could be functional and instrumental (Castoriadis, 1987). The creativity of the process allows for greater dynamic sense making and allows for collective imaginaries affected by cultural constructions and discourses (Komporozos-Athanasidou and Fotaki, 2015). Absent of constraints of 'realities' the imagined is sourced from their lives and their experiences which still allows not only their interpretations of events but also an authoring in responses to the cue story. As such they turn their thoughts into words and such exploration of fantasies provides opportunities to find new turns for re-thinking the topic of the cue story. It is within this mechanism

any 'cognitive gap' may be revealed. Whilst concerns of fantasies and imagining might revolve around any limitations of empiricism, by the exploration of their identities and allowing the constraints within their thinking both releases new ways for exploring new alternatives but promotes collective understanding from polyphonic discourses where different participants' stories are compared during analysis.

5. Conclusions

Organisational responses to new phenomena or challenges issues such as the post BREXIT referendum may be protracted by organisational interpretations of issues. Thus seeking new ways to re-think the role of organisations, which reflect the challenging and exposing of the norms, organisations have come to represent may be illustrated by new methodologies or approaches. Story completion has been utilised successfully in psychology to allow participants to illuminate their underlying imaginations and provide a lens for understanding the schema or motivations which underpin their interpretations (Kitzinger and Powell, 1995) for example, to show the differing narratives story tellers may attribute to different genders thus illustrating their conceptual bias.

By extending the use of story completion towards organisational research by way of considering engaging with imagining and imaginaries (Wright et al. 2013; Komporozos-Athanasiou and Fotaki, 2015) allows for new ways of thinking about organising. To which unconscious, subjective responses to catastrophe, major events might be considered, alongside sense-making (Braun et al, 2016), through the storied accounts (Boje, 2001, 2006, 2008, 2011) where participants construct their identities (Maitlis, 2005 Maitlis and Christianson, 2014; Maitlis et al, 2013) from the organisational tensions experienced (Brown et al, 2015, Karreman and Alvesson, 2001; Weick, 1993, 1995, 2001, 2012; Weick et al, 2005). By engaging with the imagined rather than organisational stories retold, the witness of the research participant can be unveiled through a 'radical imagination' since how individuals frame and understand behaviour (Zilber, 2007) potentially moves from the individual to the collective.

Rather than a Freudian psychodynamic stance, story completion facilitates methodological opportunities to consider mechanisms which might be employed to provide new ways of thinking about any negativities and to enable well-being, prosperity and healing (Wright et al, 2013; Komporozos-Athanasiou and Fotaki, 2015). In terms then of management and organisational theory, the benefits of finding further new lens to think and re-think to explore how to progress the issues surrounding the challenges of organisational responses to major upheavals such as the post BREXIT environment needs further progression. For which, story completion might provide new approaches to inform future organising.

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Culture, Communication and Performance in Multi and Mono-Cultural Teams: Results of a Study Analysed by the System of Organisational Terms and Narrative Analysis

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Abstract: This paper presents results of a study which investigates the impact of culture and communication (virtual and face-to-face) on generating solutions in multi-and mono-cultural teams. The study was conducted among fifty BA business students in Helsinki, Finland. It combines qualitative (narrative analysis) and quantitative (structured work observation with online management tools) approaches. The narrative analysis provides retrospective insights into individual reflections on the team members communication process. The structured work observation provides simultaneous insights into team communication process. The study aims to determine the correlation between the cultural origin of the team and the team communication. Secondly, the study compares the findings of qualitative and quantitative methods of data collection. The discussion drew on Hall's (1976) concepts of communication patterns in low- and high-context cultures as well as Hofstede's (2010) selected cultural dimensions. The findings of narrative analysis revealed that communication during the process of task completion among participants from low-context cultures was more successful and generated more output than that of their counterparts from high-context cultures. Language barriers in multi-cultural teams did not have significant influence on the team performance in terms of output generation. The findings of the analysis produced by using online management tools showed that the amount of outputs did not strongly correlate with the way of communicating during the project. The contributions of this paper are (1) demonstrating the impact of culture on team communication, (2) highlighting the importance and influence of communication on team's effectiveness, (3) showing the benefits of applying two distinct research approaches at different stages of the study.

Keywords: culture, team communication, narrative analysis, system of organisational terms, online management tools

1. Introduction

Communication plays fundamental role in business activities, business being a collaborative activity. Daily business practices are shaped by deeply-held cultural attitudes toward work, power, trust, wealth, and communication (Hooker, 2008). Communication styles vary enormously around the world, thus creating a plethora of business styles. Communication is also a complex and dynamic process in which members of international and global companies exchange meaning (Clausen, 2007). As the teamwork approach is the organising principle in most modern business activities that involve innovation through solving problems (Leenders et al. 2003), work carried out in international, multicultural teams represents a crucial part of assignments completed in a business environment (Barczak et al. 2010).

From the perspective of team communication, whose rationale we present in Related works, this paper aims to answer the following research questions:

- how does culture of the team members influence their communication?
- how does communication in multicultural teams influence generating solutions?
- do culturally homogenous teams communicate better than culturally heterogenous teams?
- is there a correlation between the quality of communication and team performance and efficiency (generated solutions)?

From the methodological perspective, this paper compares the results of two distinct research methods: (1) narrative analysis and (2) an observation of teams using online management tools. This combined approach is unique to investigating cultural aspects of team communication. It allows deeper insights into the communication process from the point of view of individual members, as well as the teams, at different stages of the project.

2. Related works

2.1 Concept of culture

Despite their different takes on the concept of culture, many definitions (Murphy, 1986; Hall, 1996; Barker, 2002; Shein, 2004; Hofstede, 2010;) share such common understandings: combinations of customs, beliefs, practices, knowledge as well as “signifying systems” of languages. Hofstede’s (2010) concept of culture as “software of the mind” implies that all human activity is a result of conscious and sub-conscious mind. Barker (2002, 222-223) expands these concepts by acknowledging the temporary and dynamic aspects of culture. For him culture is a product of “routes” and “constellations of temporary coherence or knots in the field of social space that are the product of relations and interconnections from the very local to the intercontinental”.

Cultural encounters as well as cultural clashes can contribute to the success or failure of communities, organisations and other groups of people (Warrick, 2017). As culture is a product of meaningful practices constructed and shared by creative capacities of ordinary people, it is also expressed in a variety of ways by those people through shared or different ways of communication.

Therefore, the impact of culture on communication, especially in multinational environment of the 21st century cannot be ignored. It is especially important in the context of multicultural companies and organisations, as it strongly influences their productivity and efficiency (Hajro & Pudelko, 2009).

2.2 Influence of culture on team communication

Multinational companies rely increasingly on virtual means of team communication when working on projects (Grosse, 2002). In multicultural and multilingual teams, choosing the most appropriate means of communication is crucial to the successful flow of communication.

Previous research on culturally diverse teams explored a variety of factors influencing performance of teams. For example, Stahl et al. (2010) suggest that cultural diversity's effect on teams is mediated by specific team processes, such as losses and gains associated with increased divergence and decreased convergence. Carte and Chidambaram (2004) contribute to this view by developing an integrated model of ongoing team interaction, which describes how the purposeful deployment of certain collaborative technology capabilities helps leverage the positive aspects of diversity while limiting its negative aspects.

Challenges associated with creating and maintaining trust in global and virtual teams were explored by Jarvenpaa and Leidner (1999). They suggest that global virtual teams develop “swift” trust, but such trust is very fragile. Trust, liking and performance in virtual teams were further explored by Walther and Bunz (2005), who linked behaviours, subjective effect and output. Their research suggested that following a powerful set of collaboration rules reduces uncertainty and enhances trust in distributed work teams. Team face-to-face and computer mediated communication was explored by Becker-Beck et al. (2005), who focused on the principles regulating interaction in teams in terms of group work, satisfaction, and performance.

3. Environment of the study and research methods

3.1 Environment of the study

We conducted the study between 26th of September and 20th of December 2017 among 50 BA business students at Haaga-Helia UAS, in Helsinki, Finland. The class was divided into eight purposeful teams of five. Three teams were homogenous culturally and linguistically. Five teams were heterogenous both culturally and linguistically. The common working language was English.

Their task was to generate ideas for a development project aimed at improving communication among their teachers, during planning and implementing semester modules. The result of the teams’ work was a written report containing two parts: training programme details (number of participants, venue, duration, goals of the project, benefits for the participants, training methods) and teamwork process (individual reflections on the work process, possible difficulties, benefits). To complete the assignment, the students were asked to use managerial tools, available from Transistorhead.com. The platform consisted of ten online managerial tools for

setting goals, describing tasks, generating ideas, specifying ideas, creating options, choosing options, checking motivation, solving conflicts, preparing meetings, and explaining problems.

3.2 Research methods

In order to gain insights into the way communication took place we collected our data at two different stages of the study, applying two different approaches: retrospectively, through individual narratives written after the study, and simultaneously, through team observation using online management tools during the study. Whereas the narratives provided a qualitative data set (words), the observation produced recorded quantitative data set (frequency of using the online tools, longevity of time periods spent on teamwork).

In the narrative approach, we drew on the conceptual roots of narrative analysis (NA) located within the Deweyan ontology of experience (Dewey, 1938). We view the focus of NA as being located not only in the individual's experience, but also in the social, cultural and institutional narratives within which the individual's experiences are constituted and enacted. For the sake of this study we only focus on sociality (Connelly and Clandinin 2006). We see sociality as situations where people always and simultaneously find themselves in both personal and social conditions. The personal conditions can be feelings, hopes, desires, aesthetic reactions as well as their moral dispositions. This conceptualisation connects with Dewey's notion of interaction: people, in their experiences, are always in interaction with the situations as well as other people.

The epistemological implications of the above ontological approach meant that the purpose of our inquiry was not to create a faithful representation of the reality, independent of the knower, but on the contrary, to investigate the phenomena, and by an interpretative process generate an understanding of it based on the relation between a human being and his/her environment. Therefore, when interpreting the meaning of the narratives, we considered the wider context in which they were produced. This consideration made us discard two of the ten groups, as the narratives clearly showed that a negative attitude of the students towards their studies in general had too strong an impact on the reliability of their narratives in our study.

In the observation approach we drew on the theoretical concept called a managerial action, and which can be defined as a real activity, which a manager performs to play a managerial role when he has a certain managerial skill (Flak, Yang, & Grzegorzec, 2017). However, we did not observe only team managers but also all team members with the same theoretical pattern shown in Figure 1.

The theoretical background for such an approach is the system of organisational terms, an original methodological concept of research in management (Flak, 2013a). The philosophical foundation of the system of organisational terms is based on Wittgenstein's theory of facts (the only beings in the world) and "states of facts" (Brink & Rewitzky, 2002). This theory's main assumption is that there are two types of beings in the world: events and things.

As shown in Figure 1, when a team manager or a team member sets a goal, at a certain moment a managerial action occurs, represented by *set 1.1* (an event) and *goal 1.1* (a thing). Specifically, each event and thing have labels *n.m*, in which *n* and *m* represent a number and a version of a thing, respectively. What is important, *goal 1.1* has features in time, content and human relations domains.

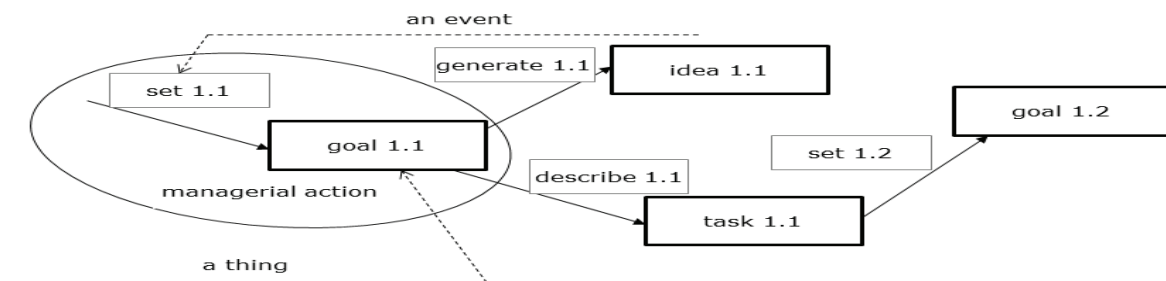


Figure 1: Fundamental structure of managerial actions

If later (e.g. after the next managerial action – *describe 1.1* and *task 1.1*) this team manager does the next setting of the same goal, he launches the next managerial action. Consequently, the features of this goal change (*goal 1.1* changed into *goal 1.2*) and represent the second version of this managerial action (described by the pair of

the event and the thing: *set 1.2* and *goal 1.2*). The difference between managerial action comprising *goal 1.2* and *goal 1.1*. allow reasoning on the events which happened in real time (what team manager/ team member really did).

From the theoretical point of view, online management tools have the following features:

- according to the idea of a “unit of behaviour” (Curtis et al., 1992) every online management tool tracks and records one specific managerial action (described in Section 3);
- every time a manager uses any online management tool an event occurs in the organisational environment. This affects a thing, in other words, equal to a process which results in a resource, respectively (Flak, 2013b) (Figure 1);
- every tool is useful for recording a certain managerial action (Flak, 2013a).

Online management tools were available with the website browser. The tool platform, called TransistorsHead, was available at transistorshead.com (logins for trial version – name of the team: manager, username: manager, password: manager).

3.3 Data analysis

The basic level of qualitative analysis involved eliciting emerging themes in the narrative accounts of the communication process produced retrospectively, after the completion of the task. To ensure “qualitative rigour” (Gioia et al. 2012), while at the same time keeping an open and creative mind, we used a “systematic inductive approach to concept development” (Gioia et al. 2012, 16). First-order analysis that adopts informant-centric in vivo codes (Saldana, 2009) were created. In the second phase of the analysis we grouped these codes according to the similarities and relationships between them.

Next, we tried to answer the question of whether the emerging themes point to concepts that might explain or describe the concepts relating to the way the team worked and communicated, and what the participants highlighted in their narratives. We identified all possible second-order codes and developed them further into what Gioia et al. (2012) call second-order “aggregate dimensions”, and what we call “motivation factors”.

The quantitative analysis was done based on numeric data recorded during teamwork observation using online management tools as research tools (2). This approach focused on the team communication process during the completion of the task.

The first level of the quantitative analysis comprised general statistics of participants’ activities they undertook during the study. The statistics included types of participants (team leaders or team members), duration of teamwork from the first login to last logout in seconds, number of actions, number of managerial actions (any subtypes). The second level of analysis was based on detailed parameters about particular managerial actions (e.g. setting goals, describing tasks etc.), numbers of their versions and correlations between them.

4. Results and discussion

4.1 Qualitative analysis

To better understand cultural intricacies in business communication, we draw on Edward T. Hall’s (1976) concepts of low- and high- context cultures, as well as Geert Hofstede’s (2010) dimensions of individualism vs collectivism. We see a strong correlation between high-context and collectivist cultures, as well as low-context and individualistic cultures, hence the selection. We also find these dimensions most relevant to our study of communication, hence the exclusion of Hofstede’s remaining four dimensions.

Also relevant is Hall’s distinction between rule-based and relationship-based cultures, grounded deeply in the understanding of human nature (Hooker 2008). In relationship-based, high-context cultures, the unit of human existence is larger than the individual and extends to a larger community. For individuals from relationship-based cultures, belonging to a group is unequivocal to their existence. The centrality of relationships in relationship-based cultures therefore has an ontological basis in a communal sense. These cultures are also what Hofstede (2010) calls collectivistic. Conversely, rule-based, low-context cultures regard human beings as autonomous individuals. Autonomy means in part that no individual has natural authority over another. The centrality of rules

in rule-based cultures therefore has an ontological basis in the conception of human beings as autonomous individuals. These cultures, according to Hofstede's dimensions, are individualistic.

The concepts described above explain the communication patterns and the work process in our study: the individuals belonging to rule-based, low-context individualistic cultures, with a common native language described their communication as "efficient, good, synergic". Their primary focus was completing the task, whereas building relationships was not of primary importance. The group was only an instrument in the process of task completion, hence the motivation factor: group-work to accomplish the task.

Conversely, the individuals belonging to relationship-based, high-context, collectivistic cultures described their communication as "challenging, really hard and difficult". Even though their motivation factor was completing the task, their primary focus was on relationship building. Their motivation factor was first building relationships, as a necessary step, before beginning the group work, to accomplish the task.

Both rule- and relationship-based cultures have rules and laws. The difference lies in the roots of compliance to these rules. In rule-based, low-context cultures, where the rules are spelled out explicitly, people respect them for their own sake, and communication is clear and straightforward. By contrast, in relationship-based, high context cultures people respect the persons who laid the rules down (Hooker, 2008). Therefore, the gradual process of building personal relationships and trust is of great importance. Communication is not always straightforward, and can be ambiguous, thus hampering understanding.

In our study, the low-context culture individuals from groups (1, 2, 3, 4 and 5) communicated faster, and the process went smoothly and efficiently, whereas the individuals from groups with high-context cultures described their communication as difficult. However, the two groups (1 and 2) that were composed of members who shared a native language generated different numbers of solutions, and used different words to describe the work process, and the motivation factors were different (Table 1). Whereas for group 1, their enthusiasm for working as group was the driving force, for groups 2 and 3 the driving force was solely the task completion.

We concluded that sharing a common native language did not guarantee generating the highest number of solutions. The main factor in our study was the groups' attitudes, as expressed in their narratives: group 1 that showed most enthusiasm for completing the task together as a group generated the highest number of solutions. Even though all three groups (1, 2 and 3), are classified as rule-based, low-context and individualistic, they differed in the way they communicated and in the number of solutions they produced.

The key words, also reflecting cultural values, provide an explanation for these differences (Table 1). The Finns (group 3), who are used to effective group work (*solutions*), as well as swift task completion (*we did not slack around*) divided the work equally among all group members (*equally contributing team members*). The French (group 1), being motivated exchange students, not used to team work (*motivation*), enjoyed the new experience of working together (*synergy, together*) and produced many solutions. Finally, the Americans (group 3), the most individualistic and highly competitive culture (Hofstede, 2010) *shared power* and through *effective decision making*, completed the task. International groups (4 and 5), although representing low-context cultures, expressed their co-operation with different key words. Group 4 focused more on *helping each other*, and group 5 relied on the team to complete the task. This difference is due to a slight mix in the collectivist/individualist composition of the team.

This mix is more visible in the composition of groups 6 and 7, representing high-context cultures, and predominantly collectivist. To overcome potential difficulties, they focused on *completing the task quickly* and using *straight talk*. Group 8, being high-context and collectivist, where centrality of trust and relationships plays pivotal role before any common task can be completed, used such key words as: *challenges and miscommunication*.

Table 1: Groups’ national and cultural characteristics, their communication and outputs. The numerical values in the third column express levels of individualism vs. collectivism

Group number	Group name and characteristic	Level of individualism vs collectivism	Low context vs high context	Generated solutions	Communication Key words	Motivation factors
1	Les Baguettes (French)	68	LC	7	Motivation, synergy, together	Team work motivated, task completion motivated
2	Mean Girls (American)	91	LC	5	Effective, power shared, solutions, decision making	Task completion motivated
3	The Sailors (Finnish)	63	LC	1	Effective, equal contribution, solutions, did not slack around	Task completion motivated
4	De Bedeendjes (International)	63, 68, 46,	LC	1	Worked well, help of others, challenges	Team work motivated
5	All Gucci (International)	75, 80	LC	1	Good co-operation, equal contribution, happy with the team	Team work motivated
6	Vindicators (International)	80, 30, 20,	HC	1	Quick, clear, team management	Task completion motivated
7	East meets West (International)	39, 38, 63, 30	HC	1	Quick, complete the task, straight talk	Task completion motivated
8	Noodles (International)	20, 48,	HC	1	Challenges, really hard, miscommunication	Task completion motivated

4.2 Quantitative analysis

The online management tools recorded the activities of participants and gave a precise view of what the teams did during the project. We decided to use general statistics to monitor the teams work process: the number of times a particular online management tool was used (Table 2) and the number of items (results of using the tools) generated in the final versions, at the end of the observation (Table 3). Based on these parameters we drew conclusions about the communication process.

Table 2 shows that team 4 was most active. They used the online management tools 3,620 times and was mostly focused on setting goals (815 times) and generating ideas (1,368). They used the tool to share and specify ideas 234 times, and to make decisions 271 times. This does not mean that they created a large number of items. The team created only 12 goals, four descriptions of ideas and made only one decision. These figures show that the team was motivated by their co-operation, mutual help in archiving their goals.

By comparison, team 5 used the online management tools only 756 times. The proportions of using the same types of tools were similar, but they used the tool for setting goals only 224 times and for generating ideas 253 times. They also created very few items (15 compared to 28 of group 4). Therefore, the communication process between members of this team was weak. However, they were motivated by the teamwork, which is seen in the parameter of decisions made together (3). They used the tool for that 52 times, which is a good proportion, compared to group 4, where these figures were 1 and 271, respectively.

Table 2 also shows that the three mono-cultural teams, group 1, 2 and 3, were also very active in communication. They reached a high level in using the tools (except the Finns) – about 2,000 times during the observation. Their last versions of items in the tools were also in high numbers (except the Americans). It is surprising to notice that the Americans, commonly perceived as goal oriented, had only one goal at the end compared to 5 and 6

for the French and Finnish teams, respectively. However, the Americans were better in generating ideas and creating options.

Team 8 demonstrated the weakest communication process. They used the online management tools only 416 times focusing mostly on setting goals (102) and generating ideas (156 times). The numbers of items were low as well. They did not make any decision together, did not describe any ideas in detail. They tried to find solutions to conflicts they encountered, and they used the tool to resolve conflicts 23 times. They created one solution in the end. The co-operation and the communication process were very weak.

Table 2: The number of times the tools were used during the research

Team number	Team name	Total	Setting goals	Describing tasks	Generating ideas	Specifying ideas	Creating options	Choosing options	Checking-up motivation	Solving conflicts	Preparing meetings	Explaining problems
1	Les Baguettes	2,027	548	689	355	54	27	84	88	60	104	18
2	Mean Girls	2,188	532	379	704	119	176	177	45	21	19	16
3	The Sailors	1,748	290	335	492	191	64	152	62	38	61	63
4	De Badeendjes	3,620	815	301	1,368	234	69	271	346	35	168	13
5	All Gucci	756	224	104	253	37	29	52	30	13	8	6
6	Vindicators	931	188	173	419	36	18	15	25	13	23	21
7	East meets West	2,038	409	484	407	132	405	56	42	47	30	26
8	Noodles	416	102	31	156	36	31	8	19	23	5	5

Table 3: The number of items in the last versions at the end of the observation

Team number	Team name	Total	Goals	Tasks	Ideas generation	Ideas specification	Options	Choices	Motivation check-up	Solutions	Meeting agendas	Problem explanations
1	Les Baguettes	24	5	7	1	0	1	6	1	1	1	1
2	Mean Girls	12	1	1	5	0	3	2	0	0	0	0
3	The Sailors	34	6	12	2	2	0	0	2	2	4	4
4	De Badeendjes	28	12	3	2	4	0	1	1	0	5	0
5	All Gucci	15	4	6	1	0	0	3	1	0	0	0
6	Vindicators	20	3	5	8	0	0	0	1	0	1	2
7	East meets West	10	1	3	1	0	4	0	0	0	1	0
8	Noodles	7	2	0	1	1	1	0	1	1	0	0

5. Conclusions

Staples et al. (2006) examined the effect of cultural diversity on team effectiveness when working face-to-face or using virtual tools. Their study revealed that culturally heterogeneous teams, when working face-to-face, were less satisfied and cohesive than the culturally homogenous ones. When working virtually, the performance of virtual culturally heterogeneous teams was superior to the performance of the culturally heterogeneous teams.

Our study complements these findings by adding the impact of communication on team effectiveness. There is a correlation between communication and generating solutions. There is also a correlation between the quality of communication and the cultural composition of the teams.

Firstly, culturally homogenous teams, communicated more effectively and generated most solutions. Culturally heterogeneous teams showed frequent communication but did not generate many solutions.

Secondly, the culture of individual team members played a significant role in their communication. Culturally homogenous teams, sharing native language, prefers face-to face communication, did not use management tools often but achieved high output results. Conversely, in culturally heterogenous teams the intensity of communication was high, but the output of results was low.

The combination of qualitative and quantitative methodological approaches provided comprehensive results. Whereas the quantitative analysis provided insights into the stages of the work process itself, the qualitative analysis of the narratives highlighted the personal aspects of the communication process. Monitored and recorded observation (online management tools) during the process of the study provided numerical measurements of the teams' work time periods and the number of actions taken. Narrative analysis of the individual written reflective accounts, after the completion of the study, provided insights into the communication of individual team members.

The findings of the two methodological approaches contributed to creating a deeper and more comprehensive understanding of the motivational influence of culture on communication, and the importance, and impact of communication on teams' effectiveness in terms of generating solutions.

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The Cat Shuts its Eyes When Stealing Cream: Ordinal Scale Taken as Ratio Scale

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Abstract: There are four types of scales used in social sciences and humanities research: nominal, ordinal, interval, and ratio; the first being the weakest in terms of accuracy and measurement, and the fourth the strongest, the one peculiar to physical (or in general, hard) sciences. The ratio scale usually used in hard sciences cannot be used accurately and precisely in social sciences where a complex, unpredictable, and immeasurable phenomenon such as human being is mostly the subject of research. The scales logically used in social sciences and humanities are mostly nominal, ordinal and rarely interval. When qualities measured by such scales are quantified to be tested by statistical tests and formulae, a mistake is commonly committed that call the findings of research in social sciences and humanities into question. An example of such a mistake would be when a statement like the following is presented in a check list: I feel happy when I use this information system, and a Likert-type scale is provided as a closed answer such as: Strongly agree, agree, no opinion, disagree, strongly disagree. In such a case, in fact an interval scale is used, that is the person, who strongly agrees with being happy when using the information system, is happier than the one who just agrees with it. We are not sure however, how much the person who strongly agrees with using the system is happier than the one who just agrees. We cannot also claim that the one who disagrees is three times less happy with the system than the one who just agrees. We also cannot say that the interval between for example, the qualities: strongly agree and no opinion is twice as much the interval between the qualities: agree and no opinion. When the number (value) 5 is allocated to strongly agree and 1 to strongly disagree, the second weakest ordinal scale is changed to the strongest scale, that is, ratio scale. False information is then reported in social sciences and humanities research and sometimes social miscalculations (and misjudgments) occur that call the whole findings of a research into question. The present paper examines this problem by calculating the statistical findings of some research and comparing them with another method of calculation that seems to be more logical.

Keywords: interval scale, ratio scale, research in humanities and social sciences

1. Introduction: Measurement scales and statistical tests

Nominal, ordinal, interval, and ratio scales are four types of scales that are used in social sciences and humanities research, the first being the weakest and the last, the strongest, the one peculiar to physical (or in general, hard) sciences. A common, widely accepted mistake (in the exact sense of the word “mistake”) however that often happens in social sciences and humanities research is employing the ordinal scale as the ratio scale. To better illustrate this mistake, the present author finds it necessary to firstly have a discussion on these four scales and their attributes, and for the same purpose, he draws on a source he thinks describes these four scales in an understandable way. The source (with some modifications made in it by the present author such as underlining some key points and deleting some parts) (My market research methods, 2018) reads:

There are four measurement scales (or types of data): nominal, ordinal, interval and ratio. These are simply ways to categorize different types of variables. This topic is usually discussed in the context of academic teaching and less often in the “real world.” If you are brushing up on this concept for a statistics test, thank a psychologist researcher named Stanley Stevens for coming up with these terms. These four measurement scales (nominal, ordinal, interval, and ratio) are best understood with example, as you’ll see below.

1.1 Nominal

Let’s start with the easiest one to understand. Nominal scales are used for labeling variables, without any quantitative value. “Nominal” scales could simply be called “labels.” Here are some examples, below. Notice that all of these scales are mutually exclusive (no overlap) and none of them have any numerical significance. A good way to remember all of this is that “nominal” sounds a lot like “name” and nominal scales are kind of like “names” or labels.

The figure shows three separate light blue boxes, each containing a question and a list of radio button options. The first box is titled 'What is your gender?' and has two options: 'M - Male' and 'F - Female'. The second box is titled 'What is your hair color?' and has five options: '1 - Brown', '2 - Black', '3 - Blonde', '4 - Gray', and '5 - Other'. The third box is titled 'Where do you live?' and has three options: 'A - North of the equator', 'B - South of the equator', and 'C - Neither: In the international space station'.

Figure 1: Some examples of nominal scale

1.2 Ordinal

With ordinal scales, it is the order of the values that is important and significant, but the differences between each one is not really known. Take a look at the example below. In each case, we know that a #4 is better than a #3 or #2, but we don't know—and cannot quantify—how much better it is. For example, is the difference between “OK” and “Unhappy” the same as the difference between “Very Happy” and “Happy?” We can't say.

Ordinal scales are typically measures of non-numeric concepts like satisfaction, happiness, discomfort, etc.

“Ordinal” is easy to remember because it sounds like “order” and that's the key to remember with “ordinal scales”—it is the order that matters, but that's all you really get from these.

Advanced note: The best way to determine *central tendency* on a set of ordinal data is to use the mode or median; the mean cannot be defined from an ordinal set.

The figure shows two separate light blue boxes, each containing a question and a list of radio button options. The first box is titled 'How do you feel today?' and has five options: '1 - Very Unhappy', '2 - Unhappy', '3 - OK', '4 - Happy', and '5 - Very Happy'. The second box is titled 'How satisfied are you with our service?' and has five options: '1 - Very Unsatisfied', '2 - Somewhat Unsatisfied', '3 - Neutral', '4 - Somewhat Satisfied', and '5 - Very Satisfied'.

Figure 2: Some examples of ordinal scale

1.3 Interval

Interval scales are numeric scales in which we know not only the order, but also the exact differences between the values. The classic example of an interval scale is Celsius temperature because the difference between each value is the same. For example, the difference between 60 and 50 degrees is a measurable 10 degrees, as is the difference between 80 and 70 degrees. Time is another good example of an interval scale in which the increments are known, consistent, and measurable.

Interval scales are nice because the realm of statistical analysis on these data sets opens up. For example, *central tendency* can be measured by mode, median, or mean; standard deviation can also be calculated.

Like the others, you can remember the key points of an “interval scale” pretty easily. “Interval” itself means “space in between,” which is the important thing to remember—interval scales not only tell us about order, but also about the value between each item.

Here's the problem with interval scales: they don't have a “true zero.” For example, there is no such thing as “no temperature.” Without a true zero, it is impossible to compute ratios. With interval data, we can add and subtract, but cannot multiply or divide. ...

1.4 Ratio

Ratio scales are the ultimate nirvana when it comes to measurement scales because they tell us about the order, they tell us the exact value between units, AND they also have an absolute zero—which allows for a wide range of both descriptive and inferential statistics to be applied. At the risk of repeating myself, everything above about interval data applies to ratio scales + ratio scales have a clear definition of zero. Good examples of ratio variables include height and weight.

Ratio scales provide a wealth of possibilities when it comes to statistical analysis. These variables can be meaningfully added, subtracted, multiplied, and divided (ratios). Central tendency can be measured by mode, median, or mean; measures of dispersion, such as standard deviation and coefficient of variation can also be calculated from ratio scales. ...

1.5 Summary

In summary, **nominal** variables are used to “name,” or label a series of values. **Ordinal** scales provide good information about the *order* of choices, such as in a customer satisfaction survey. **Interval** scales give us the order of values + the ability to quantify *the difference between each one*. Finally, **Ratio** scales give us the ultimate—order, interval values, plus the *ability to calculate ratios* since a “true zero” can be defined.

Table 1: Summary of data types and scale measures

Provides:	Nominal	Ordinal	Interval	Ratio
The "order" of values is known		✓	✓	✓
"Counts," aka "Frequency of Distribution"	✓	✓	✓	✓
Mode	✓	✓	✓	✓
Median		✓	✓	✓
Mean			✓	✓
Can quantify the difference between each value			✓	✓
Can add or subtract values			✓	✓
Can multiple and divide values				✓
Has "true zero"				✓

Due to the importance of the issue, some complementary information from another source (Measurement scales in social science research, 2018) is also presented below.

One of the primary purposes of classifying variables according to their level or scale of measurement is to facilitate the choice of a statistical test used to analyze the data. There are certain statistical analyses which are only meaningful for data which are measured at certain measurement scales. For example, it is generally inappropriate to compute the mean for Nominal variables. Suppose you had 20 subjects, 12 of which were male, and 8 of which were female. If you assigned males a value of '1' and females a value of '2', could you compute the mean sex of subjects in your sample? It is possible to compute a mean value, but how meaningful would that be? How would you interpret a mean sex of 1.4? When you are examining a Nominal variable such as sex, it is more appropriate to compute a statistic such as a percentage (60% of the sample was male).

When a research wishes to examine the relationship or association between two variables, there are also guidelines concerning which statistical tests are appropriate. For example, let's say a University administrator was interested in the relationship between student gender (a Nominal variable) and major field of study (another Nominal variable). In this case, the most appropriate measure of association between gender and major would be a Chi-Square test. Let's say our University administrator was interested in the relationship between undergraduate major and starting salary of students' first job after graduation. In this case, salary is not a Nominal variable; it is a ratio level variable. The appropriate test of association between undergraduate major

and salary would be a one-way Analysis of Variance (ANOVA), to see if the mean starting salary is related to undergraduate major.

Finally, suppose we were interested in the relationship between undergraduate grade point average and starting salary. In this case, both grade point average and starting salary are ratio level variables. Now, neither Chi-square nor ANOVA would be appropriate; instead, we would look at the relationship between these two variables using the Pearson correlation coefficient.

In some other part of the same source, we also read:

Although ordinal variables provide information concerning the relative position of participants or observations in our research study, ordinal variables do not tell us anything about the absolute magnitude of the difference between 1st and 2nd or between 2nd and 3rd. That is, we know 1st was before 2nd, and 2nd was before 3rd, but we do not know how close 3rd was to 2nd or how close 2nd was to 1st. The 1st place finisher could have been a great deal ahead of the 2nd place finisher, who finished a great deal ahead of the 3rd place finisher; or, the 1st, 2nd, and 3rd place finishers may have all finished very close together. The image below illustrates the ordinal ranking of individuals in a competition. The tick mark to the far right illustrates the person who finished in first place, while the tick mark to the far left represents the person who finished sixth out of six.



Figure 3: The ordinal ranking of individuals in a competition

The limits of ordinal data are most apparent when one looks at the distance between the third and the fourth place finishers. Although the absolute distance between third and fourth was not that large, the measurement of ordinal data does not indicate this detail.

The final part of the same source, subtitled as “Final Note” presents a point that is somehow the ultimate message of the present paper.

As a final comment, we alert you to what is perhaps the most common criticism of the measurement scales discussed in this tutorial. Even though this comment might seem at odds with much of what has been covered in this tutorial, it is an important issue that we must deal with.

In the social and behavioral sciences, much of what we study is measured on what would be classified as an ordinal level. We often ask if people "Strongly Disagree", "Slightly Disagree", or are "Neutral" to a series of statements. We then assign a value of '1' if they Strongly Disagree with a statement, up to a '5' if they Strongly Agree with a statement. To be sure, this type of measurement is ordinal, in the sense that "Strongly Agree" reflects more agreement than "Slightly Agree". This type of measurement is **not** an interval or a ratio level of measurement, because we cannot state for certain that the interval between "Strongly Disagree" and "Slightly Disagree" is equivalent to the interval between "Slightly Disagree" and "Neutral". Nor can we say that there is an absolute zero point for level of agreement. However, if we were to rigidly follow the rules of "permissible" analyses for ordinal variables, many of the analyses we conduct in social sciences research would be deemed impermissible. On the other hand, some scientists have conducted computer simulations to try and find out what would happen if we violated certain "rules" of data analysis. They have found that for the most part, it is alright to treat ordinal data (such as variables which have been measured using Strongly Disagree to Strongly Agree response alternatives) as though it were interval level data, and conduct statistical tests that are appropriate for interval level data.

The point of this concluding note is to inform you that while the classification of variables according to their measurement scales is useful to assist you in choosing an analytic procedure, it is not meant to be a substitute for using sound judgment when choosing a statistical analysis. In summary, when choosing a statistical analysis procedure, you should consider the level of measurement of your variables, but you also need to consider the assumptions of the statistical analytic procedure you are considering, and you also need to consider the substantive meaning and the interpretability of the statistics you are computing. There is no substitute for informed, sound judgment when choosing a statistical test for analyzing your data.

There are some key points in the sources above that the present author would like to draw attention to and these are:

The key point to remember with “ordinal scales”—it is the *order* that matters, but that’s all you really get from these.

Advanced note: The best way to determine *central tendency* on a set of ordinal data is to use the mode or median; the mean cannot be defined from an ordinal set (My market research methods, 2018).

They [some scientists] have found that for the most part [and not always], it is alright to treat ordinal data ... as though it were interval level data, and conduct statistical tests that are appropriate for interval level [and not ratio level] data (Measurement scales in social science research, 2018).

Even in case we accept what those scientists have found, it is alright to treat ordinal data as though it were interval data. We cannot take ordinal data as ratio data at all.

2. A real example

To better illustrate the issue, a real example from a dissertation supervised by the present author is given here for which, no information is given to observe scientific etiquette. A few years ago, a master’s research (dissertation) was carried out on personal information management status of postgraduate students of an Iranian university in their personal electronic collection based on Jones model. There were eleven research questions of which ten began with “how much is” phrase. The eleventh question was as follows: is there any significant difference among postgraduate students with different sexes, ages, grades, and the school in which they study in terms of personal electronic information management and its subcategories? The data gathering instrument was a questionnaire consisting of four sections and 81 questions, 80 of which were closed ones. A five part Likert type scale was used for the answers to closed questions, and the parts were: very much, much, medium, little, and very little.

For some questions, another part, namely: I don’t use, was added to the answers to questions that asked whether the respondents used any particular application for their personal information management.

As can be seen, the scale used in this research is ordinal, the scale that seems to be appropriate in some social sciences and humanities research. Numbers 5 to 1 were allocated to “very much” to “very little” respectively, causing the problem that is the topic of the present paper. Although as the writings about the four scales as well as table 1 above indicate, the statistical mean cannot be used for nominal and ordinal scales, the chapter dealing with data analysis of the research under discussion is almost full of tables in which means and standard deviations have been calculated for the answers to closed questions. In addition to these, in some tables, the mean for means and the mean for standard deviations have also been calculated. Some other tables calculate the mean for means for some activities in personal information management. T tests, one-way analysis of variance (ANOVA), and Tukey test have also been used to analyze the data gathered for this research all of which employ mean test that cannot be used for ordinal scale. The latter tests were used to answer the eleventh research question mentioned above.

The translation into English of a table from the research under discussion is presented below. As can be seen, there are two columns, mean and standard deviation that, since the scale used is ordinal, should not have been included in the table. The means, standard deviations, and the means for means and standard deviations (last row, columns second and first from right) give false information that cannot be relied upon in humanities and social sciences research. These tables have frequented the research.

Table 2: A sample table from the research under discussion

Scale		Very much	much	medium	little	Very little	mean	SD
Knowledge elements								
Individual’s attempt to increase their knowledge about computer environment and managing it	Freq.	46	85	82	19	2	3.63	0.93
	%	19.5	36	34.7	8.1	1.7		
Individual’s attempt to increase their capabilities according to current developments	Freq.	38	78	89	25	6	3.49	0.96
	%	16.1	33.1	37.7	10.6	2.5		
Usefulness of personal information management applications	Freq.	22	73	96	22	11	3.32	0.95
	%	9.3	30.9	40.7	9.3	4.7		
Increasing the skills to use personal information management applications	Freq.	14	66	91	39	16	3.10	0.99
	%	5.9	28	38.6	16.5	6.8		
Ability to recognize the meanings of computer error messages	Freq.	22	55	112	38	9	3.18	0.94
	%	9.3	23.3	47.5	16.1	3.8		
Ability to solve problems in computer	Freq.	15	51	98	52	18	2.96	1
	%	6.4	21.6	41.5	22.9	7.6		
Means for percentages, means, and standard deviations		11.08	28.81	40.11	13.91	4.51	3.28	0.96

The research under discussion finally reports the status of personal information management of postgraduate students by some numbers and then concludes that there are some (and in some cases, there are not any) significant differences among students with different sexes, ages, grades, and schools in terms of personal electronic information management and its subcategories.

Considering what was discussed above, some basic questions come to mind: is it logical at all to answer questions beginning with “how much” in social sciences and humanities research with some numbers that do not correspond to the answers? Is it also rational at all to use these numbers to indicate whether or not there is any significant difference, for example between sexes in terms of some certain variables? Is it also reasonable to assign a number such as 5 to quantify a feeling of very happy or satisfied that is greater than a feeling that has been stated as happy or satisfied? Are some concepts such as “significant difference” and “significant relationship” found in such ways, meaningful and helpful in real life situations?

A “how much” question is a qualitative question and cannot be answered quantitatively. One cannot say that an individual’s happiness is five times greater than somebody else’s happiness. Qualities such as happiness, sadness, patriotism, satisfaction, religiousness, etc. cannot be measured quantitatively. These are only measured by the choice of an option from a Likert type scale by individuals that feel some certain feeling and state it. The same is true with any situation in which we come to concepts such as “significant difference” or “significant relationship”. In other words, we cannot claim that the difference or the relationship between for example different age groups in terms of some certain variable is significant in real life situations when we erroneously quantify an ordinal scale.

3. Conclusion

Table 3 below that is the modified table 2, seems more realistic because there are no columns for means and standard deviations and no means for means and standard deviations. In reality, the only quantifying that can be made is to count the number of frequencies and percentages for each part of the scale, and give the means for percentages and frequencies. Any judgement concerning the findings of research must be based on these and nothing more. Naturally some other methods such as in-depth interviews must be performed to understand why the differences, if any, exist and how much (not how many) they are.

Table 3: Table 2 without mean and standard deviations columns

Scale		Very much	much	medium	little	Very little	
Knowledge elements							
Individual’s attempt to increase their knowledge about computer environment and managing it	Freq.	46	85	82	19	2	
	%	19.5	36	34.7	8.1	1.7	
Individual’s attempt to increase their capabilities according to current developments	Freq.	38	78	89	25	6	
	%	16.1	33.1	37.7	10.6	2.5	
Usefulness of personal information management applications	Freq.	22	73	96	22	11	
	%	9.3	30.9	40.7	9.3	4.7	
		Freq.	14	66	91	39	16

Scale		Very much	much	medium	little	Very little
Knowledge elements						
Increasing the skills to use personal information management applications	%	5.9	28	38.6	16.5	6.8
Ability to recognize the meanings of computer error messages	Freq.	22	55	112	38	9
	%	9.3	23.3	47.5	16.1	3.8
Ability to solve problems in computer	Freq.	15	51	98	52	18
	%	6.4	21.6	41.5	22.9	7.6
Means for percentages		11.08	28.81	40.11	13.91	4.51

The point is that “labelling” that is used for nominal scales is also used in other three scales. Words and phrases such as: very unhappy, unhappy, ok, happy, and very happy used in an ordinal scale are also some labels as are 40 degrees Celsius and 50 degrees Celsius in an interval scale, and as are 6-inch height and 7-inch height in a ration scale. The problem is that in the first two scales, namely nominal and ordinal labels are only labels and cannot be quantified. These two scales are only appropriate for humanities and social sciences and thus for qualitative research. Quantifying such scales in the way usually performed in humanities and social sciences research is a big mistake.

Using the ordinal (the second weak) scale as ratio (the strongest) scale, misleads researchers in humanities and social sciences. Findings of such research that are going to shed light on problems of real life situations, are mostly false and cannot be applied to real world. Some statistical tests applicable to analyze social sciences and humanities research data must be observed to acquire realistic findings. Mixed methods seem to be the most appropriate methods to use in such cases.

Social sciences and humanities researchers who rely on findings of their research based on using ordinal scale and taking it as ratio scale, and try to solve real social problems by such research, are very much like the cat that shuts its eyes when stealing cream.

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Interactions Enhancing the Impact of the Interventionist Research: Cases on Business Development

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Abstract: Interventionist research (IVR) approach can make a difference at scientific, societal and practical levels, similarly to other approaches. However, by taking advantage of certain distinctive features of the IVR approach, the impact of IVR projects may become remarkably greater and more easily communicated. IVR projects may identify to-the-point research questions and answer them with the help of unique access because these projects involve several actors. This paper focuses on interaction (among the researchers and managerial actors) as a remarkable feature of some IVR projects, underlying their contribution potential. The paper aims to answer the following research questions: What kind of interactions do take place in IVR projects? How do these interactions affect the identification and realization of IVR projects' contribution potential? The paper uses conceptual analysis on the recent IVR literature stream and 20 years of experience of the authors on IVR in management accounting, and reflects upon case studies of two industrial companies on management accounting supporting business development. The paper understands that IVR projects feature different types of interactions, e.g., i) interviewing managers, ii) observing interactions among managers, iii) facilitating interactions among managers, and iv) intentionally and reflectively using many of these forms of interaction. Based on these interaction types, the paper shows that in the first case study (A), service business development benefited from interactions in IVR in researcher-facilitated workshops that were initiated by the company. In these workshops, interaction took place among managers and researchers as collaborative construction of business impact analyses to support service business development. In the second case study (B), IVR supported new product development and program coordination. The data was collected in researcher-facilitated workshops that were initiated by the researchers. The paper shows how the workshops could focus program-level coordination by engaging managers in interaction by encouraging them to express and discuss their viewpoints about financial and nonfinancial impacts. Furthermore, best practices for governing service business development were reported for the society, and importantly, the theory contribution in the two case studies was scrutinized in an engaged manner to ensure its relevance to the management accounting, service, and project management literature.

Keywords: interventionist research (IVR), Impact, actor, interaction, management accounting, service business development

1. Introduction

Interventionist research (IVR) approach can make a difference at scientific, societal and practical levels (Lyly-Yrjänäinen et al. 2017), similarly to many other methodological approaches. However, by taking advantage of certain distinctive features of the approach, the impact of the IVR projects may become rather substantial, and it can be made more easily communicated for the academic community. By entering the "battlefield" of IVR that involves several actors, and by consciously and reflectively examining related practical, scientific and societal questions, the IVR projects may identify to-the-point research questions and answer them with the help of unique access (Suomala et al. 2014).

However, the academic importance and theoretical dimensioning of interventionist research needs to be thoroughly explicated (Scapens 2014). In this paper, this dimensioning means focusing on interaction as unique feature of the IVR projects with multiple actors involved. Interaction underlies these IVR projects' contribution potential. It is not yet adequately understood, however, how interventionist researchers' entanglement in professional interaction underlies theoretical contributions. Especially, despite the studies on the processes of IVR projects (Lyly-Yrjänäinen et al. 2017, see also Suomala et al. 2014) it remains unstudied, how the interaction among the researchers and other actors involved in the IVR projects actually facilitate, direct or affect the research outcomes of those projects.

The paper aims at answering the following research questions: What kind of interactions do take place in IVR projects? How do these interactions affect the identification and realization of IVR's contribution potential? The paper uses conceptual analysis on the recent IVR literature stream and 20 years of experience of the authors on IVR in management accounting, and reflects upon a case study on management accounting supporting business

development in an industrial context. In Lyly-Yrjänäinen et al. 2017 (Chapter 7) and Laine et al. (2016a), the authors got access to and were able to examine the dialogues that took place among the managers. Dialogues were facilitated by the researchers, based on earlier IVR projects. The paper combines and extends the analyses of the earlier studies by focusing on the aspect of how actors' interaction within IVR enable making theoretical and managerial contributions.

2. Literature review: Interventionist research and interactions of the actors involved

IVR is a legitimate management research approach with its potential strengths and weaknesses (Jönsson and Lukka 2006, Suomala and Lyly-Yrjänäinen 2012, see also Scapens 2014). Especially, IVR projects feature a battlefield of different actors with multiple motives, agendas and incentives (Suomala et al. 2014). Although it provides remarkable challenges for IVR project planning and execution, the dynamics and interactions within the IVR projects may provide fruitful possibilities for an engaged research endeavor (Van de Ven and Johnson 2006), identifying and responding to the clearly relevant yet scientifically meaningful challenges (Lukka and Suomala 2014). The recent IVR studies on management accounting report, how the balance between the different intellectual virtues, i.e., theoretical, practical and societal levels can be found during the IVR projects (Lukka and Suomala 2014, see also Lyly-Yrjänäinen et al. 2017). At the same time, it remains largely unstudied, how the interaction among the researchers and managerial actors actually contribute to the outcomes of the IVR projects.

The unique access of some IVR projects may enable an access to participate in real-life interactions among the managers and between the interventionist researcher (even as 'one of us') and the managers. The recent research already acknowledges interventionist research as (intentional) actors, both from the perspective of actor-network theory (Lukka and Vinnari 2017) and pragmatic constructivism (Laine et al. 2017b), with a special emphasis on the reality as perceived by the actors jointly and individually (Nørreklit et al. 2010). Thus, it becomes even more interesting to understand, what kinds of interactions do exist within the IVR projects and what are the background, nature and impacts of those interactions.

Regarding the interactions, Wouters and Roijmans (2011) focused their study on knowledge integration in the process of accounting development via prototypes. In their action research study, they got access to the accounting development among the parties involved. Similarly, with the help of their long-term action research and interview study, Englund and Gerdin (2015) examine the dialogue that takes place between the managers, and eventually the researchers make sense of that dialogue. These recent examples thus highlight the importance to understand the interactions both theoretically and as a vehicle for the managerial development work.

More recently, in Laine, Korhonen, Suomala, Rantamaa (2016b), the IVR researchers foster the dialogue through boundary objects and as boundary subjects. The authors show how interventionist researchers can act as 'boundary subjects' that mediate the greetings across functional departments in a company. Thereby, IVR is directly connected to knowledge integration within an organization. Interactions were spoken narratives of functioning and non-functioning practices (the greetings) that the researchers tabulated for making each department knowledgeable of what other departments hoped and expected from them. This form of interaction helped the researchers deepen and broaden their access in the company, and eventually develop purposeful ideas about developing management accounting tools to support the company's managers.

As a tentative analysis framework, based on the prior research, we acknowledge that the IVR projects may feature different kinds of interactions, e.g., i) interviewing the managers, ii) observing the interactions among the managers, iii) facilitating the interactions among the managers, and iv) intentionally and reflectively using many of these forms of interaction. In the cases, analyzed in this paper, on business development, the interaction took place in all the aforementioned forms, based on earlier experience of the interventionist researchers on the business phenomenon and contribution domain.

As a unique feature of this paper, the initiation of the IVR project phase, under particular examination in this paper, was remarkable different between the two cases. Indeed, the dialogue that took place among the managers and between the researchers and managers, was primarily initiated by the managers in one case (Industrial company A) and by the researchers in the other one (Industrial company B). Section 3 will present our findings of these two cases.

3. Empirical findings

3.1 Overview of the research process, data collection and analysis

The paper builds on two interventionist case studies, conducted by the authors (in 2011-2016). In the Industrial Company A, the case study was initiated by the company, building on the previous collaboration between the researchers and the firm. This case study took place in 2011-2016, but the focus is here in the years 2015-2016 during which the studied workshop interactions, on service business development took place. The case study has been presented in Lyly-Yrjänäinen et al. (2017, Chapter 7), but not analyzed from the viewpoint of interaction as a specific source contribution potential in IVR approach. In the Industrial Company B, the case study was initiated by the researchers, and took place in 2011-2014. The workshops studied were organized in 2013-2014. This case study has earlier been presented in Laine et al. (2016a), but again, not focusing on interaction in IVR *per se*. Building on these previous studies, this paper extends the analyses of Lyly-Yrjänäinen et al. (2017) and Laine et al. (2016a) by focusing on interaction in IVR.

3.2 Findings from the case study, Industrial Company A, initiated by the researchers

The Industrial Company A provides its customers with comprehensive production systems and related after sales services. The researchers have been engaged with the company in terms of multiple interventionist research projects. The researchers had earlier conducted a project on accounting and control supporting innovation, yielding a new tool for selecting and steering different kinds of R&D projects. Since the beginning of 2015, the research cooperation was focused on identifying, selecting and steering New Service Development (NSD) activities. The focus was on the analyses of the service business profitability and in supporting selected NSD activities with suitable accounting and control tools and techniques.

Before the workshops that are the key aspect in this paper, one of the interventionist researchers was focusing on the process of selecting and steering the innovation projects in the company. The initial research project sought to enhance the overall decision-making process, but more importantly, also yield a tool that would help the managers to assess and evaluate the impacts of different innovation projects of the company, ranging from product refinement activities to projects on radical innovations. The tool designed during the initial research project thus enabled an overall assessment of the innovation projects both quantitatively and qualitatively, featuring economic evaluation of the impacts of the projects at hand.

"[The tool] helps choosing good projects... And afterwards we are able to assess how well we actually chose." (R&D manager, Industrial Company A)

The initial project on innovation projects and the tool development within provided a fruitful background for the new project focusing on service business development and NSD projects. Indeed, the researchers already knew better the peculiarities of the innovation projects of the company. On the other hand, the managers better understood the possibilities embedded to the engaged research efforts with the interventionist researchers. Within the broader project on service business development, the Industrial company A organized a series of workshop to enhance its selected NSD activities, and the interventionist researchers were deeply involved in planning and executing those workshops. These workshops focused on ideas for new services (interventionist researchers' active participation), selecting appealing new services (interventionist researchers' active participation), and the business impact analyses of new services (co-organizing and facilitation of the workshop).

As a unique feature, the research project on service business development and the workshops on NSD projects were largely initiated by the company that wished to get substantial impacts from the engaged research project. Of course, the interventionist researchers identified a clear research gap on better understanding the possibilities of accounting and control activities in actually supporting new service development of machinery manufacturers, and the research project on service business development provided a natural and promising basis for responding to this gap. Methodologically, especially from the perspective of IVR, the interventionist researchers got access to an authentic development project, authentic workshops as initiated by the company, and could thus observe the discussions as they appear when selecting and steering promising new services.

Several managers of the company were involved in organizing the three workshops (R&D, service operations, NSD, technical support, etc.). Organizing the first workshop on new service ideas, already, mobilized these managers. Besides, there was a cross-disciplinary research team employed in facilitating and supporting the

execution of the series of workshops, including management accounting researchers (the interventionist researchers), service & operations management researchers, and psychologists. This is a feature that is in line with the engaged research with the focus on multi-faceted challenges (Van de Ven and Johnson 2006), and could potentially foster extremely interesting interactions and dialogues among the workshop participants. Indeed, the first workshop provided a nice discussion forum on different perspectives, approaches and examples regarding new kinds of service businesses.

In the second workshop, the focus gradually shifted to the initial screening of the most promising ideas. During the second workshop, primarily organized by the company itself, the company representatives identified and tested new ways to manage the process from service ideas to new services. The interventionist researchers were engaged with the process of preliminarily selecting the most promising service ideas. The role of the interventionist researchers was to actively contribute to the discussions during the workshop.

The interventionist researchers (co-)organized the third workshop, focusing on business impact analyses. This third workshop took advantage of the previously designed tool for business impact analyses, but it essentially also featured discussing the business impacts of the new services from multiple perspectives, among the multi-functional group of managers and the multi-disciplinary research team. The workshop on business impact analyses involved also people that had previously worked neither with these matters in general, nor with the business impact analysis tool. However, the use of the tool in the workshop fostered discussions among all the participants and it thus enabled the participation of all the people involved in evaluating the potential new service businesses. In fact, feedback received from one participant, whose work previously did not include financial evaluations of the new service businesses (or other innovations) confirmed this observation:

“The Excel platform [in the third workshop] was surprisingly easy to use and the logic enabled the participation of us who are not used to work with financial numbers...” (Workshop participant, Industrial Company A)

Regarding the three NSD projects, evaluated during the third workshop, it was found that the concept that was closest to the existing business performed best, whereas the two other concepts fostered discussions regarding their uncertainties and ambiguities, and the participants took the uncertainties into account as risks embedded to those projects. It seemed to be easier to estimate the number of customers and the expected price of the new concept than various cost issues related to the projects and the potential service businesses.

It is noteworthy that the discussions facilitated and witnessed during the workshop do not only tell the stories about the content of the potential new service businesses. Instead, the workshop structure, in general, provided a forum for cross-functional discussions on the overall objectives regarding the new service businesses and the actual actions to be taken in order to fulfill those objectives. As an important outcome of the workshops was that the ‘identities’ of the new service concepts were now discussed more thoroughly, by different voices. Besides, the workshops, that forced the managers to examine the new service business in a detailed manner, helped the managers to identify certain technical skills and capabilities that would significantly help the development of the new service businesses. Besides, certain uncertainties and ambiguities regarding the new services were identified.

The case study contributes to the literature on management accounting in supporting service business development of the machinery manufacturing companies. Laine et al. (2012a) suggest that the role of accounting should evolve as the overall uncertainties decrease during servitization initiatives. The workshops were a source of inspiration for the service business development, but also the business impact analyses were able to provide required ‘answers’ to the managers about the new services under development (Burchell et al. 1980). Besides, understanding uncertainties and ambiguities at a relatively early phase enables overcoming them during the NSD project execution (Laine et al. 2016a, 2016b).

3.3 Findings from the case study, Industrial Company B initiated by the company

Industrial company B operates in the machinery manufacturing sector. The IVR project took place at the time of massive new product development (NPD) program in which virtually all products in the line were updated and their technological basis renewed. The IVR researchers proposed that managers could be brought together to discuss financial and nonfinancial impacts they were meant to make, to possibly avoid sub-optimization that such a massive program could generate among departments or single projects within the program.

The workshops were planned with the company B representatives, based on longitudinal research cooperation between the company and the researchers. Formal interviews as one type of interaction were used as a point of reflection to set agenda but the workshops based more on informal interaction and the years of cooperation. The researchers' role was to organize the workshops. Smaller thematic groups were brought in to meeting groups at the company premises, to discuss the impacts of the NPD program. The thematic groups discussions were analyzed using qualitative data analysis software (Atlas.ti). Discussions on impacts in financial and non-financial terms were among:

- Expressions of certainty (Giving a real-life example, Reality check, Strong fact),
- Expressions of uncertainty (Guessing, Hesitation, Humour, Own opinion, Taboo, Wondering)
- Expressions of consensus building, Compromising, Conclusion, Consensus building, Strengthening others' opinions)
- Expressions of consensus destruction (Competitive sensemaking, Disagreement).

The first excerpt below exemplifies how engineers start collectively make sense about how new product features and respective cost implications are acknowledged in the company. They express their own opinions, make guesses and reality checks, use humor and finally conclude the discussion. They also use competitive sensemaking to make a point in the interactive event arranged by the reviewers. In all, the findings of the workshops enabled the researchers to contribute to academic literature: first, by showing that both financial and non-financial impacts are actually co-constructed and co focused via managers' interactive discussions (Laine et al. 2016a). In this excerpt, two engineer discuss cost target setting in the workshop:

Engineer 1: I think I think there is two aspects here. One is to understand the costs and how to deal with that. But then it's also how to put the target costs in the correct level. [...] Is the target price set in a way which is eh... eh... let's say, has it been mm-m accurate enough or does it reflect reality to put it that way? [...]

Engineer 2: Maybe it reflects the market price. [Humorously]

Engineer 1: Market the price is reflected but [how about] the target.

Engineer 2: Yeah, yeah, you can't have everything.

Engineer 1: Yeah, you can't have everything so... That is what I'm saying, that if you are [adding] features and features and how this is done is that [...] 'we want all the features in and then we forget'. That is basically how it goes.

Interactions took place also among the researchers and the workshop participants. In the second excerpt the researchers are facilitating the workshop as co-sensemakers. The focused issue here is that it is difficult to actually calculate the financial impact of product modularity. Whereas prior research acknowledges that modularity easily increases costs and can also serve as a source of innovation (Korhonen et al., 2016), these workshop participants were discussing the guidelines of making engineering decisions. The participants bring in their own opinions to competitive sensemaking. They interact together and try to get to the bottom of the issue. In the end, another participant points out that together with guidelines, discipline is also needed.

Interventionist researcher 1: How you would think that you would do your work in a very cost-conscious manner? What would you need? What would be your actions for you to consider 'ok now I am more cost conscious than I was before'?

Interventionist researcher 2: You can also hypothesize: if we had this and that then I could be..

R&D manager: Well I would say [...] an engineer [...] if he knows what his guidelines are he is let's say protecting those guidelines also then. But he doesn't know which [option] is actually better. Then it's all the same.. He is doing that what somebody is telling him to do, basically.

Interventionist researcher 1: So guidelines...

R&D manager: Yes the guidelines... If we know that the modular system is better, then we stick to that and to whatever let's say the end result is from a particular product point of view [...]

Interventionist researcher 1: So there is a problem with ambiguity, eh... not knowing exactly what to do. [...] So you need some cost-consciousness in order to make the guidelines more cost-conscious.

Engineer 3: Mm-m. And then you have to keep those guidelines... You can't change them.

Theoretically, the case study could contribute to academic research by showing what topics (impacts) are discussed in NPD program coordination and by whom. What is remarkable is that this contribution was strengthened by showing how managers interact. The workshops showed that difficult (even unsolvable or fundamentally contradictory) issues can be discussed in a productive manner: the talk itself focuses operations by making people more aware about each other's worries and viewpoints, and possibly informing upcoming decisions concerning the whole NPD program.

4. Discussion and conclusion

4.1 Discussion on the findings, unveiling the impact of different kinds of interactions

The two cases remarkably reported different kinds of interactions among the managers and between the interventionist researchers and the managers. Table 1 summarizes the observed features of those interactions and allows cross-case comparison of the observations. Indeed, as conveyed in Table 1, both the cases feature the facilitation of interactions among the managers, as real-life interactions as a source of theoretical implications and contributions. Still, the initiation of the workshop differed from one case to another. Because the workshops in Industrial company A were initiated and directed by the company, the interaction focused on the nature and content of the new businesses under development, whereas in the company B, the discussion took place at a more abstract level, although with direct connections and implications to the new businesses.

In all, both of the industrial companies took advantage of the IVR setting by organizing events where interaction took place among managers and researchers in a jointly facilitated manner, building on the previous interactions among the parties involved. (In a broader sense, both cases feature interactions initiated by the managers and the researchers, as part of the wider research cooperation.) As studied in this paper, the nature of interactions at hand enabled yielding valuable theoretical and managerial impacts. The industrial company A was able to support its service business development through business impact analyses produced in cooperation, best practices for governing service business development were reported for the society, and importantly, the theory contribution was scrutinized in an engaged manner to ensure its relevance to the management accounting and service literature. The industrial company B was able to get their employees discuss about a very ambiguous issue and thereby make them collectively make sense of potentially beneficial action within the NPD program.

Table 1: Cross-case analysis of the interactions in Industrial Company A and Industrial company B

<i>Type of interaction</i>	<i>Industrial company A: NSD</i>	<i>Industrial company B: NPD</i>
i) interviewing managers	Interviewing managers laid ground for more in-depth cooperative development that set the agenda for workshops.	Interviews served as a basis for setting the workshop agenda. However, interviews were not as important as the various forms of informal communication between the researchers and the company.
ii) observing interactions among managers	Interactions among managers took place as cooperatively calculating business impacts rather than only talking about them. The managers filled ex ante calculations based on the business impact analysis template in smaller groups. The made business impact calculations were then discussed among the whole workshop group.	Interactions among managers took place as talking about business impacts rather than cooperatively calculating them. Managers' interactions were observed in vivo and later analyzed using a qualitative data analysis software. Interactions were interpreted as expressions of certainty and uncertainty, or consensus building or destruction. Observations laid the ground from a theoretical contribution in (reported in Laine et al. 2016a).
iii) facilitating interactions among managers	New Excel tools and the workshop agenda were introduced to spark discussion about topics that had not been discussed in such early project phase before.	The interventionist researchers initiated, and organized the workshops and analyzed the data collected.

<i>Type of interaction</i>	<i>Industrial company A: NSD</i>	<i>Industrial company B: NPD</i>
iv) intentionally and reflectively using many of these forms of interaction	The interaction among managers was the source of a theoretical contribution. However, the role of interaction in IVR was not studied in Lyly-Yrjänäinen et al. (2017).	The interaction among managers was the source of a theoretical contribution. However, the role of interaction in IVR was not studied in Laine et al. (2016a).
Summary	The interaction between researchers and managers yielded contribution potential particularly in the area of management accounting supporting servitization.	The interaction between researchers and managers yielded contribution potential particularly in the area of how business impacts are discussed in a program coordination setting.

As an implication of the findings, we suggest that the interactions within the IVR projects require further examination. Not only should the IVR be recognized as a legitimate research approach (see e.g., Scapens 2014), but also the unique ‘real-life’ interactions enabled by the IVR approach should become a subject of a more thorough examination. The cases suggest that different kinds of interactions, with different kinds of initiations may yield both theoretically and managerially interesting contributions. Establishing, directing and taking advantage of such interactions provides ample scope of further studies. Such studies, importantly, should acknowledge (and take advantage of) the notion of researcher as an intentional actor (Lukka and Vinnari 2017, Laine et al 2016b) – similarly to the managers and other actors within the ‘battlefield’ (Suomala et al. 2014).

4.2 Concluding remarks

The paper focuses particularly on interventionist research (IVR) as a central theme of the ECRM 2018 conference. The authors use their 20 years of experience on publishing IVR contributions in management accounting and business research. In this particular paper, new empirical evidence is provided on the multi-level impacts of IVR through different kinds of interactions. Indeed, IVR projects may identify to-the-point research questions and answer them with the help of unique access because these projects involve several actors. However, to do so, IVR research needs to consciously and reflectively examine related practical, scientific and societal questions. Examining the interaction between the researchers and other actors in the IVR projects provides a vehicle for understanding the answers and implications of those questions.

Finally, interactions enable building a shared understanding among the actors, at multiple levels within and across the organizations. Thus, acknowledging the nature and implications of the interactions yields rather unlimited research opportunities for researchers within management accounting, business development and managerial studies.

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Research on the Impact of Crowdsourcing on Organisational Learning: A Sensemaking Perspective

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Abstract: The literature increasingly points to the relationship between crowdsourcing and organisational learning. Despite the fact that crowdsourcing is more and more often the subject of scientific investigations, many ambiguities may be noted in the literature which stem from a proliferation of various research approaches and perspectives. Research on this notion is conducted using different scientific methods which enable obtaining results of a qualitative or quantitative nature. Organisational learning, similarly to crowdsourcing, is a complex, multi-faceted, and dynamic process, which is strongly nonlinear. This results, for instance, from the fact that measuring immaterial resources, knowledge in particular, requires the application of many disciplines, branches of management sciences. The literature recognises the fact that the measurement of organisational learning constitutes, therefore, a difficult problem since it does not generate any quantitative data. This may mean that it is difficult to compare the effects of measurement. It is also hindered by the fact that one accepted and recognised method of measuring organisational learning does not exist. Various scales have been used by researchers, however the differences between them are a result of the accepted ad hoc definitions as well as the methods. Their form depends, above all, on the adopted perspective and conceptualisation. This is confirmed by the opinion which says that measurement in empirical studies should be founded upon theoretical bases. The aim of the article is to present the assumption and possibilities of applying the sensemaking approach to determine the impact of crowdsourcing on organisational learning. In this study a review of the literature devoted to the application of the sensemaking approach to studying crowdsourcing and organisational learning has been conducted. In addition, the article presents an overview of current, but still scarce, studies using sensemaking. Recommendations were also formulated regarding the possibility of using sensemaking in research on the relationships between crowdsourcing and organisational learning.

Keywords: crowdsourcing, crowd, organisational learning, learning organisation, sensemaking, giving meaning

1. Introduction

There is a belief in the literature that organisational learning is not a directly observable variable. It is a dynamic concept, because it belongs to the elements of organisational reality. In addition, organisational learning is a comprehensive and permanent organisational phenomenon and managing it requires creating and nurturing factors or conditions favourable for its start, development, and progress. They determine, stimulate, determine the effectiveness of organisational learning processes, determine needs, pace and its potential. These are usually phenomena that trigger the need to learn. Many researchers perceive the key role of relationships with the environment (Edmondson, Moingeon, 1998, Preskill, Torres, 1999), which facilitate access to sources of knowledge and obtain valuable information from outside (Bapuji, Crossan, 2004). Some authors claim that information technologies can improve it (Hansen et al., 1999, Yoon, Song, Lim, Joo, 2010). They can also promote and increase the organisation's capabilities related to organisational learning. In particular, Web 2.0 technologies are indicated, and more specifically one of the Web 2.0 solutions - crowdsourcing. However, the mechanism and course of organisational learning using Web 2.0 solutions is not well articulated. In addition, despite many demands - there is no answer in the literature to the question of how an organisation can use crowdsourcing for organisational learning (Flyvbjerg, 2004, Yin, 2013). There is also a lack of research methods to identify the importance of crowdsourcing for organisational learning.

In recent years, the concept of sensemaking has been increasingly used to analyse and research issues related to organisational learning. This concept enables the researcher, among others, to analyse the shaping of organisational reality by members of the organisation by using symbols, images, and signs (Gioia, Chittipeddi, 1991, Maitlis & Lawrence, 2007, Rouleau, 2005). In addition, it allows describing the context of a given organisational situation, but also to get to know the viewpoints of the organisation's members. By observing the behaviour of individuals in the organisation, the researcher can identify the role they play in the organisation and the behaviours undertaken during creation and creation. Hence, sensemaking is frequently used to search for connections between innovations, learning, and cooperation. This concept is also helpful in identifying organisational problems, understanding the fundamentals of a given process, and connections that occur between many concepts. In short, the concept of sensemaking facilitates understanding of what is happening in the organisation, including the course of processes and their impact on the members of the organisation. In this regard, given that crowdsourcing and organisational learning are social processes - it is assumed that the

indication of potential applications of sensemaking in research into the meaning of crowdsourcing for organisational learning seems justified.

The aim of the article is to present the assumption and possibilities of applying the sensemaking approach to determine the impact of crowdsourcing on organisational learning. In this study a review of the literature devoted to the application of the Sense-Making approach to studying crowdsourcing and organisational learning has been conducted.

2. Theoretical background

Crowdsourcing

The term crowdsourcing was used for the first time in the beginning of 2006 by a journalist Howe (Howe, 2006). This definition is related to the activity of an organisation, which consists in assigning certain functions and their outsourcing to a large group of people, which is not closely defined, in the form of an open invitation (Howe, 2006). This peculiar neologism constitutes a contamination of the following notions: outsourcing, crowd, social Internet services. Therefore, it is a new, Internet based business model, in which a network of dispersed persons is used to create creative solutions. And so the principal building material is the crowd, which is considered to be the expert (Jeppesen, Lakhani, 2010; Leimeister, 2010). These are usually virtual Internet communities and societies. In crowdsourcing information technologies, telecommunication networks, and software become significant, which are used for creating of a virtual outsourcing platform and inviting a dispersed circle of people, i.e. the crowd to carry out tasks. These technologies constitute a tool for communicating and exchanging opinions. Therefore, the crowd, on the basis of self-organisation, proposes new, innovative solutions, further on it evaluates the submitted ideas, and next chooses the best ones by means of voting. By the same, one may ascertain that crowdsourcing is a kind of participating on-line activity, in which the organisation invites the crowd to collaborate (Prpić et. al., 2015). Simply speaking, we may speak of crowdsourcing in a situation when the organisation would like to hand over a task to be executed into the hands of the crowd and the crowd executes it in a voluntary way (Gassmann, 2012), while the results of this work are beneficial to both parties.

Crowdsourcing and organisational learning

Organisational learning is a complex phenomenon. Numerous definitions include organisational learning as a mechanism for assessing, understanding, reacting and adapting to changes occurring in the organisation's environment, and as a response to mistakes made by the organisation or achieved successes. Researchers also emphasise that organisational learning is triggered when it is necessary to adapt to changes in the environment, but also when there is a need to share assumptions and "thought maps" with stakeholders, develop knowledge in the organisation and consolidate the effects of acquired experience (Shrivastava, 1983). This study assumes that organisational learning is a complex and interactive process. It can be initiated by changes that appear in the organisation's surroundings, but also when organisations want to influence them. In addition, there may be internal organisational incentives or conditions resulting from the aspirations of the management staff, the need to adapt, or the experience of new employees.

Crowdsourcing is a complex and often differently interpreted concept. This is due to the fact that it is a difficult, often imprecise, spacious concept, which hinders and limits the possibility of setting a conceptualisation framework, common features or components (Vukovic, Bartolini, 2010). Moreover, defining crowdsourcing is a big challenge for researchers (Sivula, Kantola, 2015), because it is a social phenomenon, it involves the human element and exists thanks to the actions of the social community and to be more exact the virtual community (Cacciattolo, 2015). On the basis of literature exploration, crowdsourcing in the further part of the study will be understood as inclusion by an organisation or a natural person, via an online platform, of the virtual community to perform specific tasks. For many year the literature has been postulating the need to search for and identify the importance of crowdsourcing for organisational learning. For example, Argote claims that "we need (...) research on how technology development affects learning in the organisation" (...) New knowledge management systems thanks to Web 2.0 technologies have a potential impact on organisational learning and knowledge management, more positive than previous generations of systems. Previous systems acted rather as knowledge repositories and catalogues of declared expert knowledge, while the new systems provide communication capabilities, as well as the ability to identify experts based on who answers questions. They provide communication capabilities (...) to transfer knowledge; specialist knowledge identified in the system can

be more accurate and useful than expert opinions. Research is needed on how these new and emerging technologies affect organisational learning" (Argote, 2011). Saxton, Oh, and Kishore (2013) postulate that advanced online technologies are one of the main elements of crowdsourcing. Prpić, Shukla, Kietzmann and McCarthy (2015) indicate the importance of crowdsourcing for organisations in the context of the involvement of the virtual communities for knowledge-related needs. In addition, it is assumed in the literature that crowdsourcing stimulates building relationships and cooperation with the virtual community, which in turn allows the organisation to diffuse learning and gives unlimited access to knowledge (Albors et al., 2008), located all over the world (Ipeirotis, 2010; Ross, Irani, Silberman, Zaldivar and Tomlinson, 2010). Crowdsourcing is also recognised as a source of knowledge (Dimitrova, Scarso, 2017), a means to acquire it and also a way to facilitate learning by the organisation (Tapscott Williams, 2006; Leimeister, Huber, Bretschneider, Krcmar, 2009). In turn, M. Fang, J. Yin, D. Tao (2014) argue that crowdsourcing contributes to the so-called active learning. According to research by D. Schlagwein and N. Bjørn-Andersen (2014), crowdsourcing is a new contribution and mechanism of organisational learning. The authors, based on the LEGO case study, considered crowdsourcing as a new learning mode.

3. The essence of sensemaking

The sensemaking refers to the cognitive act of understanding information (Whittaker, 2008). Referring first to the scanning of the environment, it should be pointed out that it is a process of monitoring the surroundings and collecting data about actual or potential changes (Thomas, Clark, Gioia, 1993). The purpose of the sensemaking scan is to identify key trends, problems, changes, and events in the organisation's environment that may potentially affect its functioning (Thomas, Clark, Gioia, 1993). Subsequently, the organisational interpretation is related to the explanation of events, the development of common, organisational understanding and the development of conceptual schemes common to all members of the organisation. Therefore, it is based on understanding the information collected during the scan (Thomas, Clark, Gioia, 1993). It takes place through the iterative process of matching information to existing conceptual structures such as: a schematic, scenario or cognitive map (Taylor, Crocker, 1981). The conceptual structure obtained in this way gives meaning to information and labels, which mobilises potential patterns for action. Labeling affects decision-making by the organisation's management staff (Dutton, Duncan, 1987; Dutton, Fahey, Narayanan, 1983). As a result, the actions taken constitute a response to trends, problems, changes or events appearing in the company's surroundings. Such response of the organisation may increase its competitiveness.

The sensemaking concept is used in many fields and research directions, including: organisational learning (Weick 1995), education (Schoenfeld, 1992), communication (Dervin, 2003), security sciences (Jensen, 2007), and information systems (Savolainen, 1993). Initially, the concept was used to construct social reality, descriptions of giving sense to things by individuals through their experiences and in research on cognitive dissonance. In management sciences, it started to be used much later, namely in the 1980s (Walsh, 1995). The concept was mainly used in cognitive studies of employee attitudes (Louis, 1980), interpretation of information obtained from the organisation's environment (Kiesler, Sproull, 1982), assessment of consequences of actions taken by employees (Porac, Thomas, Baden-Fuller, 1989), and analysis of the trajectory of events (Weick, 1988). In the 1990s, thanks to KE Weick's book "Sensemaking in Organisations", the application of this concept was extended to organisational culture (Drazin et al., 1999), social impact (Ibarra, Andrews, 1993) and strategic changes (Gioia, Chittipeddi, 1991, Gioia, Thomas, 1996, Thomas et al., 1993).

As of the year 2000, the concept of sensemaking started to be used to search for the relationship between giving meaning and language (O'Leary, Chia, 2007), narrative analysis (Dunford, Jones, 2000; Patriotta, 2003; Sonenshein, 2010), inter- and intra-organisational trust (Rousseau et al., 1998), and research on discursive practices (Balogun, 2003; Balogun, Johnson, 2004, 2005; Rouleau, 2005; Rouleau, Balogun, 2011). For a dozen or so years, the concept of sensemaking has also been used in relation to knowledge management and organisational learning (Dervin, 1998). Whereas, since 2015, the use of the sensemaking concept to study crowdsourcing has been observed.

The wide application of sensemaking makes the concept useful in identifying the connections between concepts, which boils down to the possibility of learning the conceptual bases of the theory. This means understanding the creation or making sense of things that are observable from the angle an individual in the organisation. This does not lead to the interpretation of reality, but to give one's own meanings - by referring to the past, to the knowledge already possessed. In this approach, the individuals in the organisation are therefore active

participants in complex events. Emerging opportunities interrupt normal operations for individuals and thus trigger a conscious process of matching signals to already existing frameworks. If the existing framework does not match the new situations, it is remodelled to understand the new event. This leads to a change in the perception of reality. The specificity of sensemaking can therefore prove to be useful for identifying the meaning and connections of concepts that have a social character and are dependent on the behaviour of individuals in the organisation.

4. Sensemaking in identifying the meaning of crowdsourcing for organisational learning

Making an attempt to assess the possibility of using sensemaking to identify the meaning of crowdsourcing for organisational learning, it should be pointed out that this concept is recognised in the literature as a "„process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn" (Maitlis, Christianson, 2014). Sensemaking can therefore enable analysis of the organisation's behaviour when interpreting data coming from an external environment. According to the concept of sensemaking, if the phenomenon is routine, then the organisation goes directly to the decision-making process, if not – it looks for additional information and analyses the alternatives. This allows learning from mistakes, but also reducing uncertainty, understanding weaknesses, revising and strengthening organisational routines (Ron, Lipshitz, Popper, 2006) - which is consistent with the idea of organisational learning by Crossan, Lane and White (1999).

According to Weick's approach, sensemaking allows understanding and explaining how individuals construct reality. In his opinion, it is triggered by them when new events appear that require confrontation with previous experiences. These new events are initially considered to interrupt the routine flow of information. This is due to ignorance and disruption in the stream of rational interpretations. These disruptions cause dissatisfaction, but over time, employees start looking for new solutions to the *status quo* – the employees become open to new insights of the situation they are experiencing. It becomes a contribution to the analysis of events that lead to learning. In this view, organisations are understood as dynamic processes in which individuals and groups engage in the search for solutions to complex situations while reviewing the world's image and creating order in chaos (Weick, 2005). In order to organise a large amount of information, people create representations. Sensemaking is therefore a process of coding information to external representations to answer complex, task-specific questions. Determining the sense of experienced situations is always a collective process that involves socially sanctioned communication codes. The linguistic resources of groups are used to identify, classify and thematise phenomena in such a way that they can become the subject of communication.

It is only in the medium of information exchange and conversation that there is the possibility of defining and fixing problems, solving them, and retrospectively diagnosing the reasons for successes and failures. In this way, the knowledge dispersed in the social structure is focused - through communication - on a given problem or event. This approach is in line with the specifics of organisational learning. In addition, sensemaking also allows the assessment of organisational learning in crisis situations when there is a need to assess the situation based on previous experience. For example, Haas' (2006) research on organisational teams analyzing difficult, ambiguous issues and requiring the search for new solutions to problems occurring in the organisation - showed higher efficiency of teams working in conditions enabling them to autonomously make decisions based on professional experience. These teams were involved and able to learn from the accumulated knowledge. The above findings were also confirmed by Ravasi and Turati (2005). They found that entrepreneurs with previous knowledge related to a given project were able to better understand the problems they encountered. The authors considered this a self-learning cycle of learning - they noticed that entrepreneurs spent more time and resources on projects they saw as promising, which in turn forced them to update the knowledge related to the undertaking and reduce the ambiguity associated with the development of the product or service. As already mentioned, this leads to the conclusion that sensemaking is important for learning in an environment in which various problems or unclear situations may occur. Sensemaking is also helpful where learning takes place at all levels of the organisation. It allows individuals to better understand themselves, their situation, and the meaning of the future.

In the area of organisational learning, the use of sensemaking - as a process of recognizing meaning or giving meaning - may consist in questioning existing obsolete interpretative patterns and creating innovative alternatives, as well as in pushing a new interpretation through actions (Gioia, Chittipeddi, 1991). Such an

approach situates sensemaking in the context of organisational change and leads to questions about what management measures should be used in such circumstances. Gioia and Chittipeddi argue that the initiation of learning requires taking into account the meanings that organisational members themselves contribute to the space of the organisational structure. The process of collective giving and creating meanings is conceptualised in the context of an interpretative and sociological-phenomenological approach. Therefore, the possibility of using the sensemaking concept for the analysis of organisational learning seems justified.

Crowdsourcing is also a holistic, complex, multi-faceted, and social concept. It also implies complexity. Frequently, simplifying reality and interpreting complex data is required. Obtaining simplicity for large data sets in organisations means, therefore, the possibility of their characterisation and understanding (George et al., 2014). Then it will allow understanding the dynamic complexity of the situations occurring in the organisation. Although many studies suggest that the earlier framework often prevents seeing the problem from different points of view or the possibility of changing perspective (Weick, 1988, 1993). Drazin et al. (1999) it can be considered that the use of sensemaking to identify the meaning of crowdsourcing for organisational learning may be useful. For example, to “understand connections (which can be among people, places, and events) in order to anticipate their trajectories and act effectively”. In practice, this can boil down to the analysis of the path that the knowledge gained from the virtual community overcomes, including the identification of the behaviour of the organisation's employees.

The purpose of this is to capture the moment of receiving the knowledge acquired as part of crowdsourcing and its processing. Additionally, the literature indicates that sensemaking is the key mechanism through which the creative process develops. Comparative studies by Dougherty, Borrelli, Munir and O'Sullivan (2000) showed differences in the way people shaped market and technological knowledge, as well as the products and companies with which this knowledge was associated. Individuals in innovative companies perceived themselves as engaging in the practice of knowledge and business processes, which were part of a regular relationship with customers for whom problems were to be resolved; in this way, they worked with a common understanding of the purpose of the same problem and quickly interacted to get the sense of unexpected problems. In contrast, people in less innovative organisations did not have a framework that would encourage common thinking. They treated market and technological knowledge as separate factors of production.

In summary, sensemaking provides an opportunity to analyze crowdsourcing as an organisational process with many meanings and compare it with subprocesses that require careful management at each sublevel. Thanks to the lens of sensemaking, crowdsourcing can be combined with knowledge processes that require different activities and management. Understanding this cannot be determined without examining the basic elements of each concept in order to identify links between individual concepts. It means understanding the diversity of knowledge that individuals use in the organisation. In this approach, sensemaking may prove useful for understanding the beliefs and actions of each individual in the organisation.

Sensemaking creates links between elements, which in turn allow the emergence of new ways of doing business that trigger and facilitate innovation. This pattern includes research on change, learning, creativity and innovations. A clear topic emerging from this review is the importance of meaning in the development of innovative concepts and practices in organisations. This is surprising, because sensemaking is a process aimed at creating order from confusion and chaos, while strategic change, learning, creativity and innovation tend to break with the status quo. This aims to create new meanings, which underlie new ways of organising and understanding. This happens when people get involved in new things and are looking for new ways to solve problems. This, in turn, changes the challenges faced by an individual, team, or organisation, but also lenses and sets of practices thanks to which reality is perceived by them. According to Weick, sensemaking determines how people deal with situations, including sharing information, and imitating one another.

5. In conclusion

The theoretical considerations made enable drawing the following conclusions:

- 1. Sensemaking allows for multidimensional analysis and identification of the meanings of concepts, taking into account their multi-level character. From the point of view of the discussion on this subject, one can conclude that sensemaking can be useful in defining the significance of crowdsourcing for organisational learning.. Sensemaking can help to constrain, and learning to enable, crowdsourcing, in terms of sources,

processes of data collection or creation, organisational sectors or operations where it has most potential for inquiry and innovation, and analyses conducted.

- 2. Sensemaking offers a welcome social constructivist perspective on the user-centred learning that occurs in experiencing technology, although the cultural antinomies of determinism–voluntarism and materialism–idealism need to be more explicitly acknowledged too (Leonardi, Barley, 2007).
- 3. Empirical verification of the above assumptions may contribute to the enrichment of knowledge on the methods of analyzing the importance of crowdsourcing for organisational learning. The justification for continuing research in this area not only provides cognitive and methodological considerations, but also the significance and importance of organisational learning and crowdsourcing for the practice of the organisation's operation. Further, it can help these organisations adapt to changing conditions of the environment, provide flexibility and the opportunity to learn. Finally, it is worth emphasizing that the use of sensemaking to look for connections between crowdsourcing and organisational learning is listed among the directions of future research.

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Deconstruction of the Past to Build a Future Research Project (DPBP)

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Abstract: Choosing a research topic is based on the researcher's personal knowledge and experience, and determining projects within the chosen research topic is mostly contextual. To streamline the process, researchers should consider stepping back and retracing their research history and intellectual evolution. Unfortunately, few tools can show representations of personal evolution. The original methodology we propose adds objectivity to this process of introspection that researchers must engage in to develop future research. The central idea is to deconstruct previous academic publications, then reconstruct (rewrite) them to compare the old and new versions and elicit potential intellectual evolution. This process, assisted by a digital tool, is based on a protocol that can be used in many disciplines, notably management science. We will illustrate this methodology by describing the specific process of writing an application for French accreditation of thesis supervision. For technical purposes, we use NVivo, a qualitative content analysis software. We will provide an example of how authors or PhD students develop future research agendas. One of the major positive outcomes of this methodology is that it significantly limits unavoidable subjectivity in choosing new research projects. We conclude by demonstrating how this tested methodology supports researchers by pointing to possible evolutions from their situational and contextual viewpoints. It adds a measure of objectivity to academic work.

Keywords: inductive coding, introspection, research project, accreditation of thesis supervision

1. Introduction

All researchers have personalities shaped through nature and nurture, personalities that inescapably determine their perspectives on reality. The nature-and-nurture dichotomy permeates the debate between positivists and constructivists. Moreover, the choice of a research project often remains a mystery in which conditioning and the "vicissitudes of life" play their parts. In that respect, the contribution of the resulting production depends as much on serendipitous phenomena as on rationality in choosing the project.

Finally, the end written product, inevitably involves two types of ambiguity:

- structural ambiguity, inherent in all writing, as noted in Derrida's thinking. "*Writing writes us as much as we write it,*" (Cooper 1989).
- situational ambiguity, related to a specific written work. An article has a title and a structure in outline form, reflecting the hierarchical subjective importance the author attributes to the ideas presented. Written at another time, the establishment of a hierarchy of ideas would have been substantially different.

Such are the ideas that I had in mind when deciding to write a dissertation to obtain a French post-doctoral habilitation degree (in other words, an accreditation of thesis supervision, "*Habilitation à Diriger des Recherches*" (hereafter HDR) in French). Reviewing my background, imagining the scope of my future research projects and being wary of writing led me to the wording of the following research question for this paper:

How does a history of research contribute to determining future investigations?

This question is motivated by different objectives coming together around four perspectives:

- Using my know-how, meaning not only acquired knowledge but also know-how discovered in the heart of the research process (Baray & Soulabail 2017).
- Charting a course to prevent meandering by developing a research strategy determined by my objectives (Wangchuk & Bedanta 2015).
- Focusing my attention on consistency issues concerning my own work and the work that I supervise through future-oriented navigation of a research domain. In addition, the examination of inconsistencies uncovered is generally a source of creative questions.
- Finally, delimiting a coherent field of research, making it possible to offer professional counterparts, students in my case, more thoroughness and supervision in exchanges.

Without formulating a completely new question, this research question is little discussed in management science literature. For example, project management focuses on issues related to managing projects and moves away from those related to choosing projects. In another example, publications from graduate schools, or, in the United States, the advice provided as part of PhD programs (Rugg & Petre 2010; Wellington et al. 2005), all cover determining a research question without considering the link that can be established between the past of researchers and their future work; of course, doctoral students seldom have pasts as researchers.

Historically, however, but from a different epistemological perspective, determining a field for future research was addressed indirectly with the concept of “research program,” developed by the Hungarian philosopher of mathematics and science Imre Lakatos (1970). Opposing Karl Popper’s falsificationism, Lakatos’ analysis recognizes the existence of “progressive” research programs, meaning fertile ground for developments and innovations. There is a source of inspiration that makes me want to anticipate, for my future investigations, a concept comparable to that of “hard core” aimed at giving my results a minimum of longevity and creative potential.

However, the integration of past research into the determination of future investigations creates a high risk of subjectivity in research (Girard et al. 2015) likely to influence the nature of results. This risk increases with the choice of a qualitative methodology (Dumez 2013), although better suited to the subject studied. Also, to reduce this risk, the level of inductivism of the approach was maximized using a computer tool (Bournois et al. 2002). Furthermore, for the same purpose, a type of “in vivo” encoding of my past work was used to reveal the elements that help to delimit the scope of future research (Point & Voynnet Fourboul 2006).

The methodology presented, DPBP, is one of the answers to the research question. It provides an original path to exploring the Researcher → Object of research → Production of paper sequence. It explicitly considers the researcher and the evolution of the researcher’s thinking to map the boundaries of an area of research, creating a pipeline of future projects. In addition, it makes it possible to chart a common course for all emerging projects, the common thread connecting them. Finally, this methodology opens a much broader perspective on a holistic approach to reality in management science. It also has two essential characteristics:

- Reflexivity, meaning that the researcher is working on their own work.
- The method involves experienced researchers with histories of work, which is the case for those with HDRs.

Thus, the general principles of the method are described; then, an example illustrating the most original part of the method is developed: the inductive sequence.

2. Deconstruction-reconstruction as a tool for revitalizing thinking

Two preliminary clarifications:

- Because the pool of data is the work of the researcher, it is appropriate to select a sample of it. Including all of a researcher’s work is impractical. The sampling criteria depend on the objectives. In the case discussed, the work is written, but any other form is possible (oral presentations, video, photos, etc.). Writings that appeared to be the most important, given the nature of the publication (defense of an HDR), were selected: a dissertation published as a book and five articles in peer-reviewed journals. Recently-published (2016 and 2017) articles were excluded because the evolution of my thinking between the time of writing and rewriting was insignificant and therefore irrelevant.
- Given the volume of data to process, the qualitative data analysis software NVivo was used.

2.1 Conduct of the research

Once the sample is selected, the method comprises three steps:

First step: Inductive coding (Point & Voynnet Fourboul 2006) of each of the selected publications. This coding is a first consolidation of the ideas expressed in the selected publications (free nodes in NVivo terminology). Recall that, when you code ideas while reading text, the ideas (free nodes) are progressively grouped on the same level and arranged in alphabetical order. This random order of the content of ideas is therefore different from that of the article. The initial drafting of the article was structured by choosing a title and developing an outline and its selected headings. Metaphorically, this amounts to “reshuffling the cards” to deal a second hand.

Second step: For each publication, construction of a three-level hierarchy of coded ideas to model a growing consolidation of the ideas. The model is represented by primary foci of attention, then by foci of attention and finally by the root of tree, which will be explained in more detail in the second part. For each level, the chosen idea best summarizes all the ideas expressed at that level. This choice includes the subjectivity inherent in qualitative analysis, as for any form of analysis.

Third step: “Rewrite” of the original text using an outline inspired by this modeling. The rewritten text is the culmination of the process of deconstruction-reconstruction and fosters thought-provoking observations in the second part.

The following diagram shows the three steps:

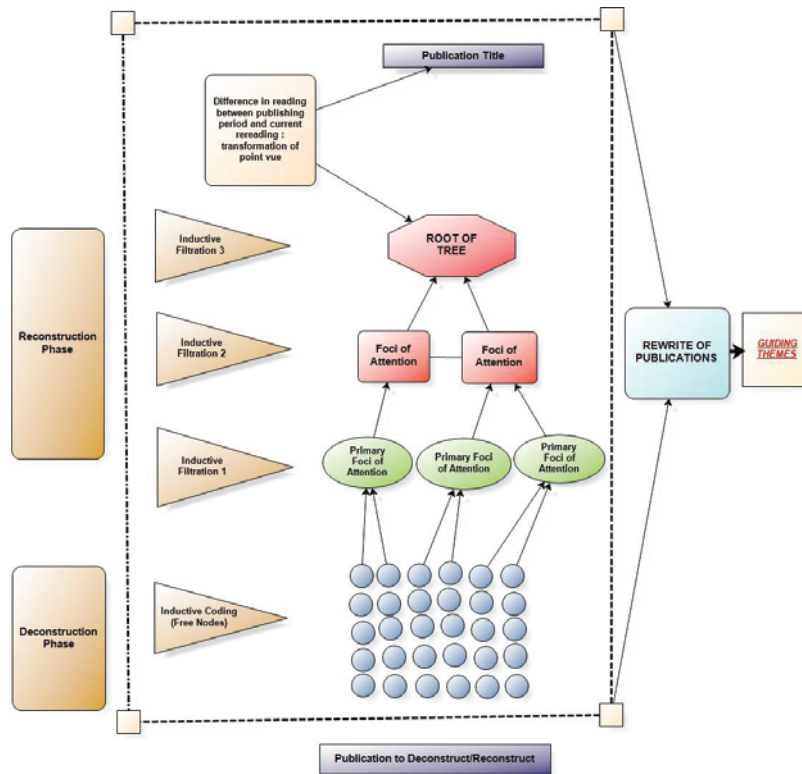


Figure 1: DPBP methodology (Lobre-Lebraty 2017)

To summarize: An original text is deconstructed by coding its ideas without reference to its structure, namely, its title and outline. Subsequently, this set of ideas, presented in no order other than alphabetical, is restructured by establishing a hierarchy of ideas through filtering. You then have two texts representing two visions of the same topic: an initial vision reflecting the state of my knowledge at the time of writing and a current version expressing the evolution and state of my knowledge at the time of the rewrite. Henceforth, the comparison of the two texts provides valuable information gleaned from new insights, which the researcher applies to the same topic from updated knowledge. Before providing an illustration of this information, a few words on the use of this methodology when preparing an HDR.

2.2 Use of the DPBP method for delimiting a pipeline of future projects

Many specialists have examined, from a methodological perspective, the development of doctoral theses; there are few, however, who have looked at the French HDR, which is a habilitation qualification, or post-doctoral degree required for supervising PhD students and obtaining professorships. Habilitation is the highest academic qualification a person can receive in some countries, including those in Europe (France, Austria, Switzerland, Sweden, and others). Pursued after a doctorate, habilitation requires the candidate to write an HDR thesis, which is defended before a jury, similar to the process for awarding PhDs. According to French law, “*The habilitation à diriger des recherches recognizes the high scientific level of the candidate, originality of the candidate’s approach in a field of science, the candidate’s ability to manage a research strategy in a scientific or technological field*

sufficiently wide, and the candidate’s ability to supervise young researchers” (decree of November 23, 1988).¹ We note three characteristics of this degree:

- The candidate has little guidance in understanding the rules of the game for a good HDR. This degree of high academic standard has several ambiguities regarding management science (Perez & Pesqueux 2006). A candidate generally relies on the research supervisor.
- One thing is certain: the importance given to methodology, because candidates must demonstrate through the HDR their ability to lead research other than their own, usually that of young, even novice, researchers.
- For this, a candidate presents to the jury a research history and perspectives on future research. During the presentation, it is desirable to demonstrate the consistency between past work and projects for the future.

With this in mind, the use of DPBP has a dual objective:

- Cultivate the emergence of a future field of research from the rewrite of a researcher’s work. This field must be delineated by concepts that give it an identity.
- Across this field of research, find a common thread that links the chosen projects. This common thread, also drawing from sources in the researcher’s past, must express the prevailing direction orienting future investigations to give meaning to all the research activities.

The data on which I worked to delimit my future field of research was generated from the sample of my work mentioned above (published thesis and five published articles). Several compelling ideas across the three levels described emerged from the deconstruction-reconstruction process. Even limiting myself to the second and third levels (all the foci of attention and roots of tree for the six publications), the number of concepts remained far too high for me to delineate an identifiable field of research. Here is an extract: “Valuation, Business Model, Co-construction of Trust and Ethics, Crowd, Skill-Talent-Passion Triptych, Structural Layouts, New Types of Outsourcing, Virtuality Management, Governance, Conflict Resolution, Stacking of Controls, Managerial Skills, Heterosis Effects, Cooperative Values” etc. I could have made a final hierarchy of this set to maintain the most inductive character possible in my approach. I preferred at this stage to introduce a filter to pass from a mainly inductive approach to a combined analysis (inductive-deductive). This was a dual filter: focus on concepts related to the fundamentals of management science (for example, value), and give priority to choosing projects related to organizational and managerial innovation to stick as closely to the current concerns of organizations. This filtering led me to select four “key concepts” defining my future area of research, as shown in the following figure:

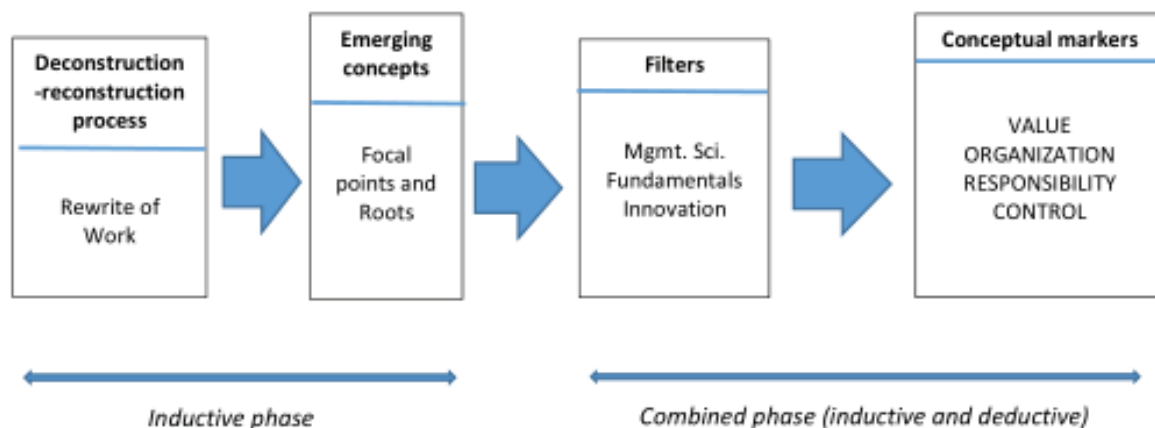


Figure 2: DPBP methodology and its use for HDRs

From my published writings, I therefore created an area of research with four dimensions: Value – Responsibility – Organization – Control (hereafter VROC).

¹https://www.legifrance.gouv.fr/affichTexte.do;jsessionid=00AA501F627D2A6A9278BE1DFB630E66.tpdjo08v_1?cidTexte=JORFTEXT00000298904&dateTexte=20140922

Simultaneous consideration of these areas seemed to provide many possibilities for investigations through all their variations, for example, the most literal: “Control of the creation of value in a responsible organization.”

The last step was to give general meaning to the four dimensions and determine a cross-cutting concept for the many eligible research projects.

A return to the rewrite of my work and a new review of foci of attention and tree roots of the hierarchy directed my attention to a major scenario that appeared several times: hybrid structural forms in an organization’s response to complexification of its internal and external environments.

At that point, the concept of hybridity seemed to form the cross-cutting approach that gives consistency to future research projects in time and space.

The following diagram gives an idea:



Figure 3: Concept of organizational hybridity cross-cutting the VROC

In summary, the area of research was defined by the four VROC dimensions and a cross-cutting concept expressing the idea of hybridity.

These considerations led me to focus on the following question, among many others, for my HDR: “*Does major hybridization of an organization require a specific form of control?*”

Limiting the discussion here to methodological aspects, I will not go much further in describing this usage case for the DPBP method. The approach led me to a series of fascinating questions, such as:

- Incorporation of the concept of hybridity in the institutionalist trend and conflicts between thought processes and the action they mediate. Beyond the neo-institutionalists, this gave me the opportunity to return to the writings of Thorstein Veblen (1979)
- The trend in some organizations is to create a strategic hybridity, choosing this path as the best way to meet the complex needs of customers (Richez-Battesti & Oswald 2010).
- A fresh look at the strategy of some large private groups, for example, in the banking sector (cooperative banks), large institutions in the public sector (including public-private partnerships), or large organizations in the social economy (Lobre-Lebraty 2017, p. 104).

Let us conclude this first part by pointing out that the hybrid organization studied through its Value – Responsibility – Organization – Control dimensions is a large source of future research projects, making it possible to avoid confining oneself to a narrow specialization, nonetheless precise enough to allow consistency in the selection of projects.

Now, let us set aside the use of the DPBP method for an HDR and illustrate the originality and the heart of the method: its inductive part. This involves showing what deconstruction of the past can add to interpretation.

3. Benefit of the text deconstruction-reconstruction process

To discuss this second part, it would be ideal for the reader to have the original text selected as an illustration and the reconstructed text (rewrite). That is impossible in the context of this paper. I will therefore focus on the interpretation that can be drawn from the rewrite of a specific text (in this case, in management and innovation). I chose for illustration one of my publications: *“Créer de la valeur par le crowdsourcing : la dyade Innovation-Authenticité”* (Lebraty & Lobre 2010).

Before proceeding with this analysis, let us summarize the spirit in which the analysis was conducted. The qualitative methodology used generated a high volume of data. Several types of analyses were possible (descriptive, explanatory, interpretative, etc.). I chose an approach based on interpretative phenomenological analysis (IPA). This approach derives from the work of psychologists (Restivo et al. 2018) and, because of the interest generated, has extended to other disciplines (including management science). IPA is used when seeking to give meaning to more personal experiences by studying the narratives of individuals and their interpretations (Antoine & Smith 2017).

The process of review and deconstruction of my papers and then rewriting them seems to be in line with a search for meaning in a personal narrative of my activity as a researcher.

3.1 Deconstruction and basic structure of the rewrite

To extract the main ideas expressed in this work, I proceeded as explained in the first part for a coded reading. For this specific article (I had five, plus a book), the abundance of ideas to address justified software support. My objectives were as follows:

- Draw up an inventory of the ideas in the article, after analyzing my own work, disregarding the structure given to the article at the time of its writing. That structure reflected my point of view at that time and therefore expressed a system of preferences and dated interpretations. At another time, I would have perhaps selected for the same topic another title, another outline, or other headings and highlighted other ideas or other hierarchies.
- Give the key extracted themes a purely inductive character, offering no prior categorization. Key themes had to gradually emerge from codified qualitative analysis.
- Establish a hierarchy of the themes through successive filtering, analogous to the extraction of essential oils from plants.
- Perform a “rewrite” of the text based on the hierarchy of the coded ideas and their representation modelled using software.

The objective therefore, through a deconstruction-reconstruction process, is to give the analyzed text an updated vision reflecting the evolution of my thinking between the time of the original writing and the current rewrite: “this is how I see today what I wrote in the past.”

I thus achieved a model of the article that NVivo helps present in the following diagram (Figure 4):

This model includes three levels of consolidation of ideas:

- The first, in the shape of an ellipse, is the primary foci of attention.
- The second, rectangular, represents foci of attention, so called because they are used, with the roots of tree, to extract the key concepts delineating future research.
- The third and final, octagonal, refers to the last level of consolidation of the coded ideas that we call the root of tree and that corresponds to the title of the article to be rewritten.

Keep in mind that the first level of consolidation consists of ideas coded while reading the article and does not appear on the model diagram.

Now that the article has been rewritten, how do you interpret the two moments of writing, the original and the current?²

² The HDR thesis has all the rewritten articles (pp. 137–227) (Lobre-Lebraty 2017).

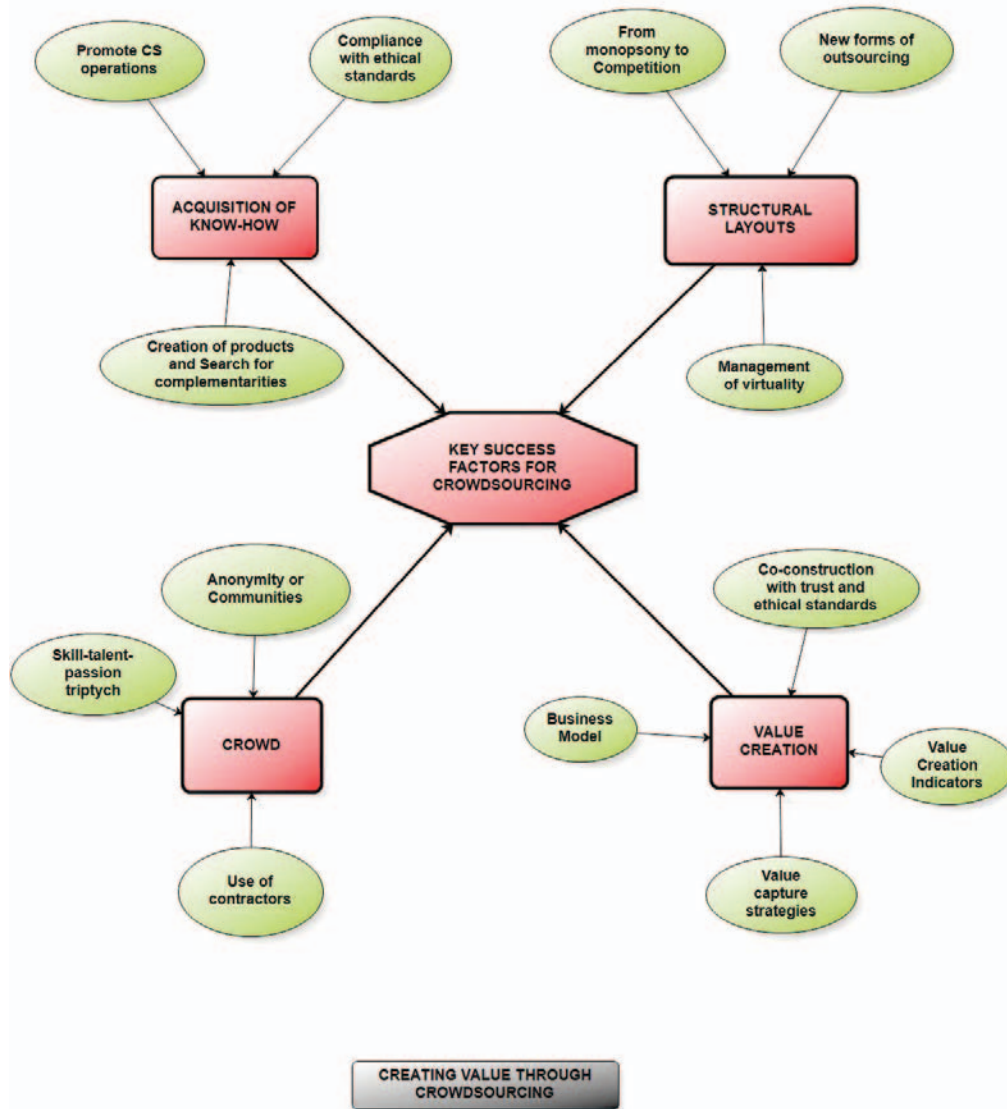


Figure 4: Modeling of the article: “Créer de la valeur par le crowdsourcing : la dyade Innovation-Authenticité” (Lebraty & Lobre 2010)

3.2 Interpretation: A new point of view for the same reality

It is at this level that the researcher and his/her personality become involved. The researcher is no longer the same, having evolved since the original writing on at least two fronts: knowledge and experience. The rewrite of the article can therefore be an indicator of the evolution of the vision that the researcher has of the matters under examination. It is particularly worthwhile to compare the two visions and look at them through the proposed illustration.

The first salient point in the model shown in figure 4 is the difference between the titles of the article: “...” and root of tree: “Key Success Factors (KSFs) in Crowdsourcing (CS).” This difference reflects an evolution of my priorities between the time of writing (value creation) and rewriting (which KSFs?), denoting the passage from “why CS?” to “how does CS work?” This is logical because the research and its publication in 2010 address a new phenomenon (the conduct of CS operations appeared in the early 2000s), and related research started with the work of Howe published in 2006 (Howe 2006). Initially, it is the purpose of the new technique that attracts attention (justification phase). Then, as for any significant innovative practice, a period of trial and error is necessary to determine how to proceed and organize. Experimentation is required to ascertain the beneficial or damaging consequences of the new practice. It is therefore normal that, in a second phase, my interest in CS relates more to the conditions for its success, as seen in of some of the latest research on the subject (Ruiz et al. 2017). The change in my areas of interest between the time of the writing of the article and that of the rewrite

reflects this evolution and reveals it. In other words, I coded, without being fully aware, based on my current centers of interest more than my past questions.

The second benefit of the model lies in the four foci of attention (crowd, acquisition of know-how, structural layouts and value) that emerged from all the ideas expressed in the article and that received more attention in the rewrite than in the original text:

- The use of the crowd is not new. It is as old as the Internet, which, by connecting members of the crowd, allowed easy access to it. What is new is its systematized use by a company to outsource a part of its productive sequence by obeying specific procedural codes; it is also the full awareness of the crowd as a resource.
- This use of the crowd, because of its novelty, involves the acquisition of know-how, which constitutes the second focus of attention. The most important question to ask about CS is perhaps the following: how do you find the needle in the haystack, meaning the rare Internet user in the multitude of all others? The acquisition of know-how by the leaders of CS operations is fundamental. These leaders can be companies or specialized intermediaries; currently they are mainly CS platforms.³ Know-how can come from three sources: recent research published by academics and practitioners, observation and the study of good practices, and, finally, the experience gained by companies or intermediaries practicing CS.
- This acquisition of know-how then takes place within an evolving structural framework (the third focus of attention): structures of a new market (competitive degree?), structure of a business activity (level of outsourcing), and internal structuring (optimal structuring of CS platforms or CS departments in the organizations that created them).
- The fourth and last focus of attention appeared as the culmination of the other three. High-performance treatment of the crowd, significant acquisition of know-how, and proficient structural layouts are all KSFs contributing to value creation.

This is the general pattern that emerges from foci of attention after rewriting the original text. It is possible to investigate in greater detail in the model-based analysis by using primary foci of attention. For example, if you consider the focus of attention “value creation,” primary foci of attention point to the fact that value creation implies the existence of a reliable and unambiguous “business model”. As part of this business model, “strategies for value capture” accompanied by sets of “indicators” measuring the product of the capture must be developed. This development makes it possible to establish transparency in the activity of the main players involved in CS, thus avoiding any challenge about the relevance of their work. Finally, all this CS activity must take place in a participatory climate of “co-construction governed by mutual trust”. The performance-trust link and the role it plays in ICT (Godé-Sánchez 2005) exceeds the strict framework of the organization.

In summary, the rewrite of the article after its deconstruction through the NVivo coding process provides an update of the original text, reflecting the evolution of my thinking through the knowledge and experience I acquired since the time of the original writing.

Of course, one could find the focus of this evolution obvious, even commonplace, but that is not the purpose of the method. The purpose is to make the researcher aware and to provide a record. It shows the researcher the various perspectives you can have on a given topic, given that reality changes and—this is fundamental—because the researcher has changed. Our method could almost be viewed as the researcher’s attempt to objectify his/her own subjectivity (Girard et al. 2015).

4. Conclusion

These questions remain:

- Does not the use of a computer-aided qualitative approach introduce a false impression of objectivity? The distinction between inductive coding and deductive coding remains relative, as already noted by Böhm-Bawerk (1890) when writing that induction and deduction are both essential, as two legs are for walking. Pure induction is utopian, and analysis remains interpretative and involves the path of the researcher conducting it (Dumez 2013).

³ Banks, for example, can one day decide to develop these formulas, and some of them have begun to cite my work on the subject (Lebraty et al. 2016).

- Does the proposed methodology reflect a form of narcissism? I do not think so because the point-in-time analysis of a researcher's own work is a kind of "freeze frame" that is perfectly legitimate at certain times in the career of a researcher. This analysis demonstrates a desire for clarity about the inevitable link between researchers and their research and the time elapsed since a specific vision of reality was documented in writing.

Considering the objectives discussed in the introduction, the proposed methodology is innovative while remaining rugged. It offers researchers, metaphorically, the possibility of becoming their own spectators, enabling them to reflect on their evolution. This feedback about themselves and the discovery report that can result from it offer a rare opportunity for researchers to measure the paths traveled in their personal work itineraries.

In conclusion, the time to reflect on an analysis of one's path, consideration and use of knowledge acquired, and, finally, consistency in the choice of research can only improve the assistance that directors of research provide to other researchers under their responsibility. Is not this desire to assist and to transmit knowledge the foundation of a pedagogical mission far beyond the strict domain of education and concerning all managers?

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Towards Evidence-Reflected Practice: Paradigms as Heuristics in Business Research

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Abstract: The purpose of this paper is to develop a conception of paradigms in research as heuristics of research. After having reviewed recent discussions about incommensurability between research paradigms, I argue that the concept of research paradigm should not be considered as a fixed set of assumptions organized into individual schools of thought but rather should be considered as invitations to critical reflection on the logic and limits of particular approaches to organizational research, i.e. as heuristics that open up new questions and possible vistas for further research. The paper sketch three heuristic structures of research paradigms; inference, narrative and demarcation. These structures allow paradigmatic reflection to be actively situating research into the continuous production of knowledge. The ultimate job of paradigms as heuristics, then, is to help us see how it is reasonable to go on in research and related practices.

Keywords: paradigm, philosophical assumptions, methodological principles, incommensurability, heuristics

1. Introduction

Today, the point that all business research is based upon a “paradigm” that reaches into implicit assumptions about the phenomenon under study is well established and has been made for decades (e.g. Burrell & Morgan 1979), however the concept of research paradigm continues to be open to debate. Thus, there has been an ongoing debate about how research paradigms should be conceptualized in business research (Hassard 1991; Schultz & Hatch 1996), and recent research suggests that the number of publications that focus upon this issue is growing (Shepherd & Challenger 2013).

A dominant conception, developed by Burrell & Morgan, stresses that research paradigms are incommensurable belief systems. As a consequence, it is impossible to cross paradigms because different assumptions mutually exclude each other and that there are no common assumptions from which to work from. Burrell & Morgan dissect social science by two dimensions, a “theory of social science” and a “theory of society”, which taken together serve to distinguish between four paradigms in organization research: a functionalist, structuralist, interpretive, and radical humanist paradigm.

The idea of paradigms as logically consistent and unified systems of thought has frequently been challenged (e.g. Crotty 1998). Some have argued that the concept leads to academic “laissez faire” (Pfeffer 1995) that eventually will result in the disintegration of coherent theory into ad hocery, muddle and mere description (Donaldson 1988), and argue that apparently different paradigms can be integrated into a unified functionalist paradigm (Donaldson 1985, 1988; Pfeffer 1993, 1995).

Others have argued that research paradigms should not be conceptualised as isolated islands not as only apparent differences, but dissolved and substituted with the concept of different discourses (Deetz 1996), which opens up a space for conversation and exploration of similarities and differences in research programmes that can encourage scholars to learn from each other (van Maanen 1995).

Still others have argued that both isolation and integration of paradigms leads to theoretical hermeticism and limits creativity and suggest instead that paradigms are conceptualized as different perspectives that can be crossed under certain circumstances. Such multi-paradigmatic research that combine different perspectives, which will lead to a more comprehensive understanding when several relevant perspectives are discovered, evaluated and juxtaposed (Hassard 1988).

The purpose of this paper is to move the debate further by arguing that paradigms should be conceptualized as heuristics, i.e. as situating research in an examination of the logic and limits of a particular study.

2. Research paradigms in business research

The paradigm debate is itself paradigmatic. It shows that scholars not only do research in different ways but also show that scholars think about the paradigmatic nature of their research in different ways.

It was Thomas Kuhn, who introduced the concept of paradigm in his historico-philosophical analysis of the *Structure of scientific revolutions* (Kuhn 1962). According to Kuhn, "historical investigation of a given speciality at a given time discloses a set of recurrent and quasi-standard illustrations of various theories in their conceptual, observational and instrumental applications. These are the community's paradigms, revealed in its textbooks, lectures, and laboratory exercises. By studying them and by practicing with them, the members of the corresponding community learn their trade" (Kuhn 1970:43) Kuhn, thus, introduce the concept of research paradigm to describe how and why science develops through revolutions rather than continuous progression and evolution. According to Kuhn, research is guided by paradigmatic assumptions, which sets the standards for legitimate research within the discipline it governs. Different research paradigms, then, speaks different languages and cannot be compared to each other nor translated into each other, i.e. they are incommensurable. Incommensurability literally means "no common measure" (Hacking 1994:67). When paradigms shift, members of a new paradigm use another language. In that sense, they live in a different world (Kuhn 1970:192).

Burrell & Morgan (1979) have set the scene for the discussions of research paradigms in business research. Others have made the same point – that business research is based on a particular approach and a set of assumptions – both before and after, but none have gained the almost hegemonic capacity to define the alternatives in organisational analysis (Deetz 1996).

Thus, the framework suggested by Burrell & Morgan (1979) has been a source of inspiration and debate for decades, however, it has often invited a notion of research paradigms as a different school of thought and research communities with no interaction between them. For instance, Parker & McHugh (1991) states - with reference to Burrell & Morgan – that a researcher must be several persons to shift between paradigms. This express a general tendency to understand the notion of research paradigm as denoting unified systems or of thought or research traditions.

However, the idea that research is based upon a paradigm that reaches into implicit assumptions about the about the phenomenon under study does not involve an idea of paradigms as logically consistent and unified systems of thought, nor an idea that research communities adhering to different. assumptions should be hermetically sealed off from each other. Recognizing the importance for research of basic assumptions is not to assume that these assumptions are "foundational", i.e. that they constitute a unitary, coherent pattern or paradigm, but that they are ontological and epistemological premises regarding the phenomenon under study and the kind of knowledge provided in the study. Such assumptions and premises provide resources for research, however they also represent possible blinders. Any research group dominating over time tends becomes inward looking and filled with blinders and trained incapacities. When Tomas Kuhn (1962, 1970) introduced the concept of "paradigmatic" the intention was to exactly to point to this tendency and its problems, however, when the concept today is typically used as a way to position a study in a school of thought or research tradition, descriptions and reflections tend to focus upon the positive – and even popular – aspects of a paradigm whereas the basic logic and limits are left unattended. Similarly, although Burrell & Morgan argues that (1979:25) "a synthesis [of paradigms] is not possible, since in their pure form they are contradictory, being based on at least one set of meta-theoretical assumptions", and consequently "one cannot operate in more than one paradigm in any given point in time, since in accepting the assumptions of one, we defy the assumptions of all the others" (ibid.) they also stress – in the same paragraph – that "one can operate in different paradigms sequentially over time." (ibid.)

As mentioned in the introduction, reactions to the argument made by Burrell & Morgan for paradigm isolation can be grouped into arguments for paradigm integration, paradigm dissolution and multi-paradigm approaches. In the following I will move the debate further by presenting and adding to a point made by Abbott (2004) who has argued that paradigms function as heuristics, i.e. conceptual and practical "tools" that are used to solve specific problems in the research (Abbott 2004:42).

3. The heuristics of paradigms

According to Abbott, research is basically “a conversation between rigor and imagination. What one proposes, the other evaluates. Every evaluation leads to new proposals, and so it goes on and on” (Abbott 2004:3)

Thus, Abbott criticizes that much of the literature on research methodology stresses the rigor aspect more than the imagination aspect, and as a consequence present research as a matter of logics and consistency rather than imagination and creativity. He acknowledges that the “machinery” of research in terms of particular methods and procedures that have become stylized ways of conducting research are easier to describe than the critique and creativity of the continuous conversation of research (Abbott 2004:3), however, the simple fact that there is no consensus regarding how to categorize methods and procedures is a reminder of the continuous conversation in research: “Methodological traditions are like any other social phenomena. They are made by people working together, criticizing one another and borrowing from other traditions. They are living social things, not abstract categories in a single system” (Abbott 2004:15). As a consequence, research methods and paradigms are subject of continuous debate and critique, which can be source of creative and imagination, since it is through critique that researchers figure out new things to say and thus make genuine contributions. According to Abbott then, “mutual methodological critique is important not because it makes us more right but because it gives us more – and particularly more complicated – things to say. That is, paradigmatic critique is useful heuristically.” (Abbott 2004:76). Specific ways of thinking and working in research serve as heuristics in the sense that they are particular ways of doing research, and each one of them, then, is *a way and doing several or many things*. Specific ways of doing research entail a metacritique of other ways of doing research. When a way of doing things does not work, we must either find a new way of doing things or stop doing those things.

Recognizing the importance of the basic assumptions of a particular research paradigms, then, is not to assume that these assumptions are “isolated”, i.e. that they constitute a unitary, coherent pattern or paradigm, not that they can easily be “integrated”. They are ontological and epistemological premises regarding the phenomenon under study and the kind of knowledge provided in the study, but this does mean that a paradigm should be conceived of as a logically consistent and unified systems of thought. Abbott stresses that the “basic debates are *not* grand, fixed positions taken once and for all in one’s choice of method. They arise choices day in, day out. They pervade the process of research. And hardly anyone makes them the same way in all contexts and at all moments.” (Abbott 2004:78-79) There is no inherent gradient or order to paradigms, then, but each paradigm privileges some aspects of analysis over others, and as a consequence each is more or less important as we attend to this or that criterion for our analysis. A paradigm, then, is “not necessary better in any global sense. They may be better locally, but overall the cyclical character of methodological critique guarantees [...] that there is no real ‘better’ in a global sense. What *is* better in the global sense it to know more or to know reality in more detailed ways or in more different and mutually challenging ways” (Abbott 2004:76). Thus, the debate between paradigms is not so much about separating the true from the false. Continuous debate and mutual critique is important not because it makes us more right but because it gives us more – and particularly more complicated – insights.

Paradigms, then, should not be conceptualized as unified ‘schools of thought’, but as resources for thinking in general and for research in particular (Abbott 2004:42). They provide resources for thinking in a double sense: Firstly, they are essential for our understanding and thus a resource for designing a study, secondly, the views they provide are fallible and incomplete, and consequently, premises are also a resource for thinking in the sense that we need to think about their limits – and try to think beyond them – in order to attain a more valid, adequate knowledge of the phenomena we study. For instance, particular phenomena can be studied as both “real” and “socially constructed” and something to be both “explained” and “understood”. While such categories can be used as means of classification that allow researchers to present themselves as belonging to different and unitary communities, however, when used as heuristic concepts, they allow researchers to pay attention to basic assumptions, possibilities and limitation. Thus, a heuristic approach resists the invitation to reification made by classification by claims of paradigmatic incommensurability, since it does not reduce conceptions to categories. Rather, it insists that paradigmatic concepts are sensitizing concepts rather than fixed definitions, thus allowing for a detailed debate of research practices. The interesting questions from a heuristic point of view are not: Are these the right categorise and definitions, and who fits them and who does not? Rather, the interesting questions from a heuristic point of view are: Do the differences make a difference, and how can the delimitations and difficulties of diverse approaches be dealt with?

The purpose of heuristics is to open to new topics, and to be able to do that, we need to be able to shift positions. Abbott stresses that this is not easy. Rather, researching from a fixed position and a ready-made stance is “somewhat easier and in some ways less intellectually self-defeating than a position that tries to see a problem from all sides” (Abbott 2004:85). However, it is possible and fruitful when paradigmatic debates do not get stuck in fixed positions but stimulate new questions and new problems. Thus, according to Abbott, “the main importance of the [...] debates may not be as organizing principles of the disciplines, but rather as heuristics for the disciplines. Indeed, I might even propose that the great debates had their *first* existence as heuristics and became general, organising principles for how we view whole disciplines and methods only because so many kind of people, believing so many substantive things, used them as heuristics.” (Abbott 2004:166). He goes on to give a list of examples of heuristics that he labels argument heuristics, descriptive heuristics, narrative heuristics and fractal heuristics, however, he thus stresses the performative quality of understanding paradigms as heuristics rather than the philosophical and theoretical aspects of how this addresses issues of incommensurability and conflicting assumptions and aspirations.

In the following, I will further develop the conception of paradigms as heuristics by suggesting that it is structured by three interrelated aspects, which can be labelled inference, narrative and demarcation.

4. The heuristic structures of paradigms

The heuristic structures of paradigms that I suggest is inspired by John McCumber (1989, 1990, 1995), who argues – like Abbott – that philosophical debates seems to be stuck in fixed positions that share a common, but inadequate idea; philosophical reflection is about asserting universal truths. Different positions in philosophy take different view on this idea. To illustrate this point – in a simplifying manner – he argues that philosophical positions typically asserts that philosophical truths are universal and unsituated or the opposite, that universal and unsituated truths are not possible and philosophical assertions are rather contextual and situated (McCumber 1995). Two typical approaches suggest themselves. Realist approaches attempt to find general if not timeless and universal truths whereas constructivist approaches, by contrast, insists that truths are always specific and local to a particular context, i.e. do not hold always and everywhere but only here and now. In the English-speaking world, this view is typically associated with a Quinean or Hegelian philosophy (McCumber 1989).

However, McCumber argues that we do not have to accept the common idea about philosophy of these fixed positions. Rather, there is a third form of philosophy, which is actively situating philosophical claims, i.e. which does not consider them contingent states of affairs, but attempts to clarify and articulate them in the first place together with their implications for practice. In so doing, this way of philosophizing has affinities with reflective judgment. The structures are structures of paradigms as heuristics in the sense that they are general ways of broadening what is going on in a study, ways to get unstuck and ways to come up with new ideas. Such an account of the structures of paradigms as heuristics paradigmatic debates by introducing “methods” which relate paradigmatic reflection and discussion to time, i.e. to past, present and future, in ways which do not reduce to stating truths about them, but have definable goals and techniques of their own.

Following McCumber (2005), I call these ways of relating philosophically to past, present and future “narrativity”, “inference” and “demarcation” respectively. “Narrative”, “inference” and “demarcation” correspond loosely to ordinary activities of telling stories, giving reasons and formulating questions, however, when they are undertaken philosophically, they have special opportunities and constraints on them.

In an inference or argument, it is the aggregate of all the assertions made in its course that justifies the conclusion. In that sense, inference is about identifying the conceptual logic and coherence of a study. Thus, inference as a structure of paradigms as heuristics is about analysing the basic warrants for what a given study asserts. Thus, inference identifies the arguments. Often, however, arguments and their warrants are not explicitly stated, and, thus, this kind of analysis must go beneath the definitions and decisions playing upon the surface of a study to engage more basic concepts and arguments (McCumber 1989:8) Thus, analysing inference involves giving an accurate account of the conceptual structures of an argument in general and of a piece of research in particular. All forms of research have implicit assumptions, and it is always important to reflect on and question those assumptions. For instance, depending on the research paradigm, a study is interested in general or contextual conclusions. However, inference depends on a predefined situation, which can be stated narratively.

We define situations narratively, by connecting present givens to the story of how we came to know the world in a particular way. In that sense, narrative is about identifying the context and concrete experience that stimulates a study and to which it is a response. A study is not an isolated historical event, but responds to insights and questions in a particular context, for instance experience from other studies or from practical settings. Thus, research is not only responsive to the various phenomena and facts that it seeks to understand and which are contemporaneous with it, but to larger historical trends as well. These historical trends are philosophical in nature, i.e. there involve the development of the history of ideas, which it tries to carry forward. General conclusions become quite different when they are seen contextually. Considering the role of context and contingency is always important when doing and evaluating research. The heuristic reflection on either invoking more context and contingency or ruling out context and contingency is often a key aspect of the design of a study – and ideas for the design of future studies. As a heuristic structure, the question is not whether some research findings are in fact contextual and contingent or not. Rather, the question is whether it provides a more comprehensive understanding to attend to context and contingencies or not. A typical move is to take something that is presented as general or universal and to put it in a context, or, conversely, to take something that is presented in a particular context and consider it as more general or even universal. The more familiar move is from the general to the contextual and contingent. One can generate new views of a theory and new ideas for further studies by considering it contingent on something. Conversely, one can sometimes produce extraordinary results by disregarding contingency. There is sometimes experiences that indicates that perhaps contingency is not as important as we might think. This is a standard move made in most formal and quantitative research.

Finally, a piece of research is not the final answer since any research study has limitations. First, research has a focal area and a context, and both of these are limited. Demarcation is about what is sometimes called internal and external critique, i.e. is about pointing out the limits to the logics and context of a study. Demarcation, then, is about pointing out that there is work left to be done, and as such, it can suggest ways to go on, i.e. vistas for further studies. In this sense, demarcation is oriented towards the future. Demarcation grows out of acknowledging this and questioning the things that are said or taken for granted. Research is not an innocent process, but has assumptions built into it, and evaluating those assumptions is important when evaluating research and developing new ideas. Demarcation is first and foremost about problematizing the obvious. Even well-accepted and well-articulated ideas can be profoundly wrong. They turn out not to have been carefully tested at all. Even widely accepted “facts” can be problematized and even mainstream propositions of the scholarly literature can be rejected. Demarcation, then, can lead to a reconceptualization and reconstruction of the logic and context of a study, and as a consequence, demarcation can lead to an exciting investigation, one that challenges old truisms and raises new questions.

The contribution of this paper is not in identifying these three modes of investigation, but in pointing out their heuristic qualities and the connections between them. The function of a heuristic reflection on a paradigm, in other words, is not “knowing”. Knowing is an affair for research. What paradigmatic reflection undertakes is the rational construction of research. It goes about this by reflectively placing research – the choices and considerations of a study – in a context, thus endowing them with, or allowing them to have relations to other studies, i.e. a past and a future. The ultimate job of paradigmatic reflection as a situating activity in this sense, is to help us see what we need to (or what it is nice to) know, and hence what we should explore in research and how this should be done.

5. Conclusion

In this paper, I have suggested and sketched three structures of paradigms as heuristics that can serve as a stimulation and structure for continuous paradigmatic reflection; inference, narrative and demarcation. These structures are not new, but well-established in the history of philosophy and in the ordinary activities of giving reasons, telling stories and formulating questions, however, the contribution of this paper has been to point out their heuristic qualities and the connections between them. Thus, I have suggested that a focus on inference stimulates and structures reflection upon the conceptual logic and coherence of a study in order to analyze the basic warrants for what a given study asserts, whereas a focus on narrative stimulates and structures reflection upon the context and concrete experience in order to analyse the experience to which it is a response, and a focus on demarcation stimulates and structures reflection upon critical issues such as the limits to the conceptual logic and coherence as well as the context and concrete experience of a study in order to suggest vistas for further studies. These structures, then, can help us to beyond the fixed positions in the stuck debates

about philosophical assumptions and paradigms in organizational research, for instance regarding “evidence” in health care organizations. Thus, searching for evidence should not invite a fixed idea of evidence-based practice or practice-based evidence, but provide inspiration for an evidence-reflected practice. This, however, involves contested issues regarding which kinds of reflection should be considered relevant as well as which kinds of reflection should be the basis of decisions. Already Kuhn pointed out that the researchers are not dealing with data in terms of the “given” of experience but rather “the collected with difficulty” (Kuhn 1970:126). In other words, data is not data before the attention is focused. And Abbott adds to this when he points out that trained researchers know that good research is not only about rigor, but a continual interchange between method and imagination. He stresses that trained researchers “know about the endless teasing of reality as it evades them” (Abbott, 2004:3)

And as a consequence, ending debates about paradigms in research is neither necessary, nor possible. It is not even desirable, since this can allow for rethinking differences in order to make them productive rather than just replacing one set of categories with another set, i.e. replacing boxes with different boxes.

Paradigms as heuristics, then, can help us to do what research alone cannot; to situate ourselves among scientific and other truths. Already Aristotle pointed out that science can only give us general information, such as what kind of training can stimulate the recovery after a brain damage or what level of cholesterol is best in general. But applying those findings requires inserting them into the ongoing practice, which in turn means seeing how the application would carry the practice forward and what kinds of futures it would open up. Thus, regarding paradigms as heuristics for an evidence-reflected practice provide an orientation to both organizations and organization research, when they are seen not as fixed positions in a stuck debate but, rather, in a heuristic mode to open up new questions and possible vistas for further research. It goes about this by reflectively placing research – and other claims to knowledge – into a temporal flow, thus endowing them with certain types of not only present, but also past and future. The ultimate job of paradigms as heuristics, then, is to help us see how it is reasonable to go on in an evidence-reflected practice – whether in research or in related practices.

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The Perception of Quality in Qualitology: Selected Aspects

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Abstract: **Aim:** The aim of the article is to outline the potential of qualitology based on a literature review and the results of own research into the determinants of changes in the perceptions of quality in the Polish interior design industry over the last two decades. **Research approach / methods:** Continuous and discrete quantitative statistical variables are analysed based on a survey of over 100 interior design entrepreneurs from all across Poland. The survey covers: 1) nominal variables, 2) qualitative variables, 3) continuous quantitative variables, and 4) discrete random variables. The findings are presented mainly in graphs to better illustrate differences among SMEs representing various forms of business organisation (sole proprietorships, general partnership, limited liability company). **Results:** The results are intended to highlight differences in the perception of quality in Poland broken down by business location and the form of business organisation of enterprise as well as the SME-owner-observed socio-economic impacts on consumer behaviours, expectations and choices. An attempt is made to present qualitology and its specific areas and functions on the basis of empirical research. **Practical and research implications:** Qualitology is generally a fledgling discipline of science that is yet to be fully formed. Its origins, which date back to the 1970s, were defined in Poland by Romuald Kolman, who systematised the achievements and issues encountered in qualitative modelling research and theory. **Originality / value:** Being relatively young, qualitology is rarely mentioned in the literature, especially international. This makes all the findings and research attempts in the field all the more valuable.

Keywords: qualitology, quality management, SME, Poland, cycle

1. Introduction

As a fledgling discipline of science, qualitology is yet to become fully formed. Its origins, which date back to the 1970s, were defined in Poland by Romuald Kolman, who systematised the achievements and issues encountered in qualitative modelling research and theory (Kolman, 1971 p. 457; Kolman, 1971, p. 511; Kolman, 1973; Kolman, 2009; Kolman, 2013). As it evolves, qualitology continues to propose ideas for the classification of issues that are of interest to quality experts, reflected in the literature by W. Mantur, T. Borys and A. Hamrol (Borys, 1984; Hamrol, Mantura, 1998, p. 15; Mantura, 2010). In the most general sense, qualitology is an interdisciplinary field centred on quality (Latin: *qualitas*) and science (Greek: *logos*) (Duda, 1995, p. 80). "Qualitology is a logical choice of name for the science of quality, justified in substance and etymology and sufficiently catchy for its promotion. The field attracts interest and has a well-established and growing presence" (Mantura, 2012, pp. 24-37). A key challenge faced by qualitology is to systematise and harmonise quality-related concepts and issues in each area of its interest, and adopt a uniform methodology for quality assessment (Biegański, 2004, p. 11).

The literature has systematised the field around 10 major subcategories, which are: (1) qualitosystematics, which systematises quality-related issues, (2) qualitogenesis, which deals with the history of quality and the origins and development of quality studies in various fields of knowledge, justifying the need for quality-related research in such fields, (3) qualitographics – the depiction of facts: actual transformations of quality, and taking stock of the factors that affect quality, (4) quantomethodology – the methodology of quality, dealing with the methods used in quality research, the rational action algorithms developed to achieve quality, and guidelines for resolving a variety of quality-related issues, (5) qualitoveristics - quality modelling, the search for mathematical functions that underlie quality varieties and patterns, (6) qualitonomy - qualitative research, the study of various forms of quality and the causes of their change, (7) qualito cybernetics – the control and securing of quality, the use of cybernetics to create rational quality control and management systems, (8) qualitoprognostics - quality planning and forecasting, (9) qualitoduction – the assurance of quality, from its implementation to the study of the determinants of the impact and development of quality, as they affect effectiveness, (10) other miscellaneous fields (Kolman, 2009, pp. 50-51). A key premise made in tackling the issue are the two components that define qualitology as the knowledge of quality. The components are basic qualitology, focused on theoretical studies, and applied qualitology, focused on practical issues. The two account for 40% and 60% of the research volume respectively, their division resulting in the recognition of the practical subfield in quality research referred to as quality engineering (Kolman, 2013, p. 54). Together with qualitonomy, this latter sub-discipline forms the central focus of this article, whose aim is to present research on factors affecting variations in the perception of product quality by Poland-based interior-design-industry entrepreneurs over the last two decades. Emphasis has been placed on differences between the perception of quality in Poland

depending on the location and form of business organisation and in terms of the socio-economic factors that shape consumer behaviour, expectations and choices, as observed by SME entrepreneurs.

2. Methodology

Continuous and discrete quantitative statistical variables are examined by surveying over 100 interior design entrepreneurs from all across Poland. The survey covers:

- Nominal variables (business object, form of business organisation),
- Qualitative variables (gender of owners, owners' relevant knowledge),
- Continuous quantitative variables – with focus on the number of years in business and entrepreneur age,
- Discrete random variables – with focus on the number of enterprises operated and employee headcounts.

The findings are presented mainly in graphs to better illustrate differences among companies of various sizes, i.e. micro, small and medium-sized businesses.

3. Selected quality application doctrines

Regardless of quality sources, perspectives and prerequisites, every study of quality should recognise the applications of quality. In addition to technical applications (research on the quality of raw materials, products, equipment, accessories and technological processes) and economic applications (research on the quality of business facilities and processes), the literature also distinguishes social applications (research on human requirements, society and the processes that occur in it) and natural applications (research on the efficiency of living organisms and biological processes), the former two being believed to directly influence the findings of own research (see also: Powell, 1995, p. 15-37; Kolman, 2002, pp. 255-256; Ooi et al, 2007, pp. 62-77; Nwabuze, 2013, pp. 21-29, Kaur and Sharma, 2014, pp. 17-30). Starting with the most general view of quality as the degree of compliance with relevant requirements, the knowledge of the field is critical for anyone who manages a business, regardless of its type or industry. This approach extends the scope of research and applies to the quality of life, products and services, allowing one to explore processes, activities and systems across a wide range of organisations (see also: Bourke and Roper, 2017, pp. 1505-1518; Pelantowa and Slaichova, 2017, pp. 951-965). Such knowledge is also essential for the competencies of managers at any level, as well as their experience and enterprise size, critically affecting the ability to delegate responsibilities and seniority. Micro, small and medium-sized enterprise owners face the same quality expectations as large company leaders. Regardless of whether a product or service is of a poorly recognised brand or belongs to a market leader, few consumers will choose it by researching the size, years in operation and sales volumes of their manufacturers or providers (see also: Salaheldin, 2009, pp. 215-237; Kaur and Sharma, 2014, p. 17-30; Khamalah and Lingaraj, 2007, pp. 973-982). In this aspect, the 5 areas of the knowledge of quality can be used to define constant quality improvements in any aspect of activity and any specialty on both the micro and macro scale (Figure 1).



Source: Own research based on Kolman, 2009.

Figure 1: Areas for the development of quality-related knowledge

In the above cycle, the system of structuring information on quality, quantitatively adopting quality levels, employing a methodology to define optimal quality and recognising variations and suggestions for improvement

will clearly determine the qualitative changes observed in the environment of enterprises (Kolman, 2009; see also: Black and Porter, 1995, pp. 149-164). The above contributes to the interdisciplinary nature of qualatology, which increasingly relies not only on technical sciences but also on the potential of the methodologies and concepts developed in such auxiliary fields as philosophy, mathematics, cybernetics, organisational and management sciences, praxeology, metrology, psychology and economics (Kolman, 2009, Mantura, 2012, pp. 24-37; Bon and Mustafa, 2013, pp. 516-529).

4. Theoretical and practical applications of qualatology

The literature offers predominantly proprietary concepts for comprehensively utilising both well-established and newly-emerging knowledge in the field of quality. Some of the central issues that arise in this context include the formulation of a uniform definition of quality. In this article, the approach to qualatology is based on an epistemological (descriptive) definition of quality, which views the whole of reality as an object of quantitative research. This approach defines "... the theoretical and practical scope of qualatology that is more universal than reliance on an axiological definition of quality ..." (Mantura, 2012, p. 25) allowing one to perceive each quality category as parts of universally-applicable cognitive categories and to model reality components based on information and develop a paradigm in the relationship between man and reality, referred to as the qualitative approach (Mantura, 2010, pp. 155-155). The significance and undeniable value of qualitative research across all areas of human activity has been demonstrated by the classification of qualatology applications into: (1) practical and (2) creative/enabling. The former category addresses the continuous and systematic acquisition of information, while the latter concerns itself with the creation and deliberate transformation of reality. Such a classification is clearly defined by (1) cognitive (scientific) pursuits aimed at developing and broadening the existing body of knowledge, and (2) practical activities. All of the above result from on-going economic growth that is further accelerated by all-encompassing globalisation. This is most evident in the processes of manufacturing, trade, product use and service provision, as demonstrated by international trade statistics (see: Małecka, 2017, pp. 1-13; Łuczka and Małecka, 2017a, pp. 116-125). It ensures continuous improvements aimed ultimately at enhancing the quality of life of individuals, who, as integral parts of societies, have a direct effect on the efficiency of entire economies (whose macroeconomic performance, in its main aspects, is powered by SMEs). Since 2013, the Polish SME sector has been contributing to a growing proportion of the GDP, currently amounting to 50%. Prior to 2013, its share fluctuated between 47.3% and 48.6% (Łuczka and Małecka, 2017b, 375-387; Małecka, 2016a, pp. 117-129). Micro, small and medium-sized enterprises create three-quarters of all jobs, with the share of micro-enterprises rising steadily. Micro, small and medium-sized enterprises account for 96.9% of all enterprises in the EU. They create two out of every three jobs in the private sector and generate more than a half of the total value added contributed by EU businesses. Such enterprises number about 21 million, employ nearly 33 million workers and constitute a significant source of the entrepreneurial spirit and innovation, crucially affecting the competitiveness of the EU business sector. Nine out of ten SMEs are in fact micro enterprises, employing less than 10 workers. Polish SME statistics coincide with the corresponding EU averages (European Parliament, 20.08.2017; see also: Małecka, 2016b, pp. 91-122).

A precept made for the purposes of this study is that qualatology may apply to three integrated research perspectives (Table 1). As the design accounts for temporal differences, it enables one to confront the quality of the present components of reality with their quality in the past and, even more importantly, in the future.

Table 1: Integrated research perspectives according to W. Mantura

Research perspective	Research type	Outcomes	Open-ended questions
Descriptive	qualitative modelling methods	insights into nature of components of reality	What have they been and what are they going to be?
Comparative	comparative qualitative research methods	classification and ordering of components of reality	What have similarities among them been and what are they going to be?
			What have differences among them been and what are they going to be?
Axiological	quality assessment methods	insights into value-based hierarchies of components of reality	How much have they been worth and how much are they going to be worth?

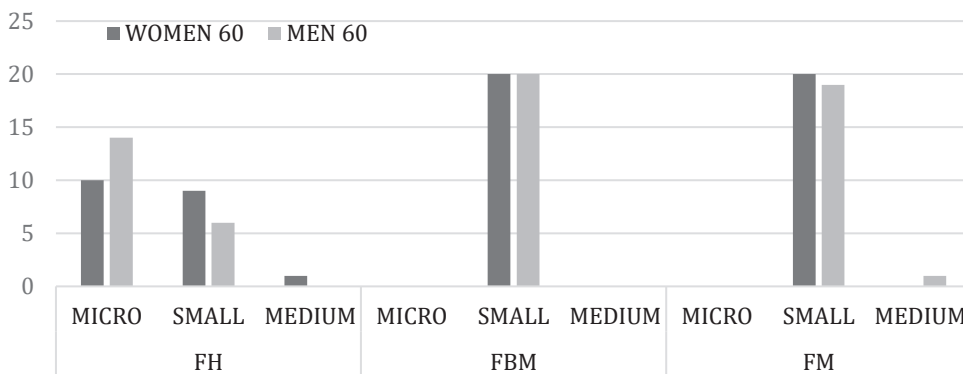
Source: Own research based on W. Mantura 2012, p. 28

The method should serve as a rule-based procedure designed to achieve desired objectives. It is expected to support quality management and account for specific product and service life cycles. The method is usually universal and contains a set of tools for achieving goals (Hamrol, 2007, p. 537). Quality is currently one of the most critical economic categories, which serves as a measure for assessing an organisation’s performance and its market competitiveness. Therefore, it is well worthwhile considering the use of sequential operations that rely on quality. To this end, it is crucial to constantly improve quality through endeavours undertaken for mutual benefits (in a win-win scenario) (Juran, 1999; see also: Juran, 1994, pp. 29-37; Juran, 1995, pp. 125-129; Juran and Schruben, 2004, pp. 355-367).

Under such precepts, each research perspective could be subdivided into even smaller cycles, i.e. elementary projects that would ensure continuous quality improvement aimed at satisfying the requirements and expectations of customers while helping to improve enterprise operation. The latter improvements usually employ the Deming cycle (Plan, Do, Check, Act), TQM (Total, Quality, Management) and the Six Sigma technique, which deserve a whole separate article in the context of small and medium-sized companies (see: Deming, 1966, p. 112; Deming, 1985, pp. 6-11; Juran, 1999; Basu & Wright, 2003; Gupta, 2004; McCarty et al, 2004; Brue, 2006; Levine, 2006; Srinivasu et al, 2009, Deming, 2012). This suggests the conclusion that once a universal tool set has been developed that satisfies company needs, it supports quality improvements in any enterprise regardless of size. All the more so in SMEs, considering they are typically the suppliers and cooperation partners of large business organisations and, as such, are forced to align their management systems with market requirements.

5. Application of quality in empirical studies

The study covered 120 enterprises from all over Poland from the interior decoration and design industry. A total of 40 companies were surveyed that were either (1) independent FH retailers operating as sole proprietorships; (2) an FBM franchise chain operated as a limited liability company; or (3) business associations operating similarly as an FM franchise chain (using a shared purchasing platform to conclude contracts without purchasing loyalty commitments to the franchise, 99% of which operated as limited liability companies (with only two of the surveyed entities being general partnerships) (Figure 2). 50% of the survey’s respondents were women and 50% men. In-depth interviews and two open-ended questions (out of 45) made possible the selection of more than a single answer for better response accuracy. The owners of the surveyed companies have been professionally active for over two decades.



Source: Own research.

Figure 2: Qualitative characteristics of study group

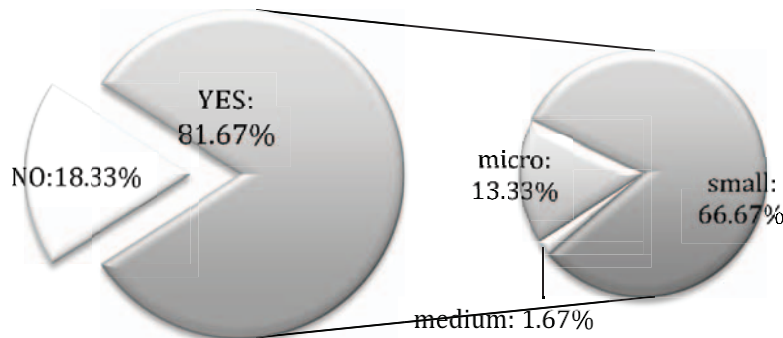
The surveyed enterprises carry out their business predominantly in towns with populations from 5,000 to 50,000 (50%), and less frequently in cities with populations ranging from 50,000 to 150,000 (36%). None of the respondents operated in rural areas. A small minority conducted their business in cities with populations of either up to 5,000 or above 151,000 (5% and 9% respectively). In terms of size, in accordance with the classification of the relevant European Union directive, 2% were medium-sized companies, 20% micro-enterprises and the vast majority (78%), small enterprises. None of the businesses were sole proprietorships. Thus, each of the surveyed undertakings employ workers and are obliged to comply with relevant national laws (Table 2).

Table 2: Sample size in terms of qualitative and quantitative criteria

Company size	City population							
	≤5		[5-50)		[50-150)		≥150	
	quantity	share	quantity	share	quantity	share	quantity	share
micro	2	1.67%	14	11.67%	8	6.67%	0	0.00%
small	4	3.33%	46	38.33%	33	27.50%	11	9.17%
medium	0	0.00%	0	0.00%	2	1.67%	0	0.00%

Source: Own research

For the majority of the surveyed business owners (81.67%), the companies we examined were not the first business venture they have established, which significantly affected their responses. On the other hand, 18.33% of the surveyed businesses were the first enterprises run by the respondents (Figure 3).



Source: Own research.

Figure 3: Share of companies run by experienced managers in the sample

A study of the impact of experience on quality management reveals a direct correlation valid across all company sizes: the entrepreneurs who have previously run a business tend to be knowledgeable about tools for assessing and continuously improving quality in their enterprises. Meanwhile, only 12.5% of the respondents who ran their first business have ever heard of ISO. Only 4.14% of them were aware of just-in-time systems (Figure 4). None of them thought it vital to invest in such tools to boost profit. The “no” responders failed to see any need to learn more about quality management nor have they ever heard of “qualitology”. However, the respondents who mentioned the Deming cycle during their in-depth interviews even spoke of the 14 principles that are integral to the process, although they were unable to enumerate them specifically. 13.33% of the owners, who accounted for 72.73% of the “no” group, are actively engaged in supporting all activities in their companies. The remaining 27.27% have on desire to get directly involved in quality management and suggest that such efforts, including educating themselves in this area, are completely unnecessary.

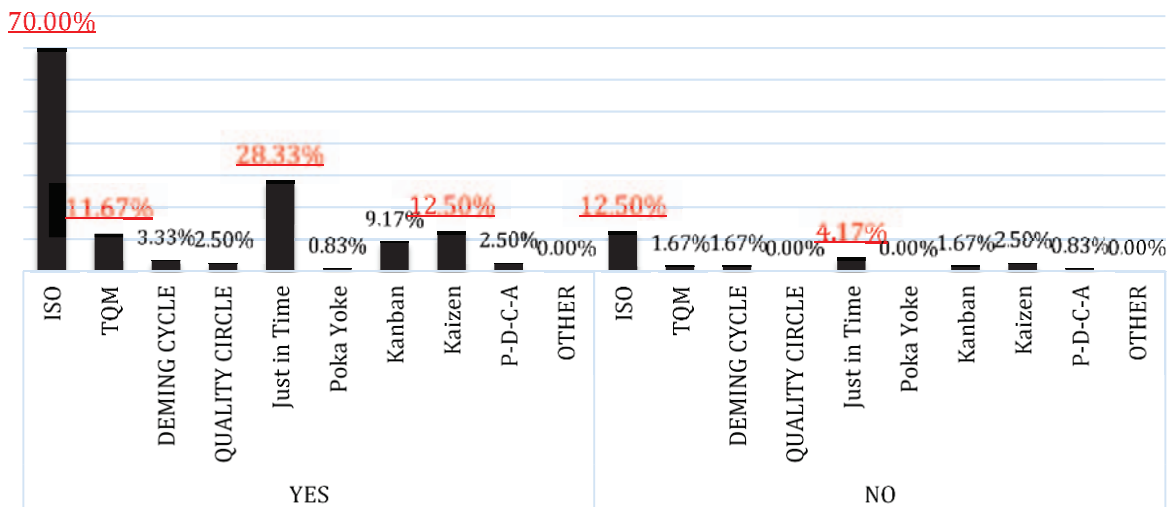


Figure 4: Knowledge of processes supporting quality management: Source: Own research

The survey of the experienced entrepreneurs, whose successive critical business decisions were based on knowledge derived from prior business failures, paints a whole different picture of the small and medium-sized enterprise owners. 100% of the “yes” responders chose to franchise outlets as the preferred form of business organization for their next venture. In-depth interviews only confirmed that the business decisions they made were motivated chiefly by their desire to meet modern market demands, create their image as specialists and select the product range offered to customers by large-area DIY chains in the same industry. They often visit their competitors’ outlets to observe them and conduct comparative analysis in a clearly polytomous approach. Despite the fact that 89% of them cannot describe their actions using the proper scientific terminology of benchmarking, they speak of their behaviour as a regular process of comparing the practices used by their own company with those of local industry leaders. This is in fact what marketing experts call comparative studies by the heart-ring method. They even follow their complete procedure. Their responses to the auditorium questionnaire show that 39.80% of the respondents carry out such observations at least once every quarter, and that 22.45% of the “yes” responders even perform analyses monthly with a view to improving quality, using a special panel designed by their headquarters featuring all measures necessary for that purpose, i.e.: (1) developing a plan for analysing data collection methods, (2) defining model companies, (3) collecting data, (4) comparing and analysing data, (5) preparing a change deployment plan, (6) executing changes, (7) recognising effort, (8) and repeating the process once the changes have been put in place. SME managers often leave out step 7 in the model’s cycle as the majority of decision makers either perform the measurements themselves or have their employees take them by including the task in their job descriptions. Nonetheless, 26.53% of the “yes” responders see no need for such changes. However, all such responders are sole proprietors who run their own unaffiliated businesses rather than being franchisees (their businesses are neither limited liability companies nor general partnerships).

Notably, varied responses in both groups were given regarding the Deming cycle (A) and P-D-C-A (B), which in fact describe the same tool (Figure 4). The reasons for this are either that the respondents chose not to reveal their actual knowledge, or that they were simply unaware or could not remember that these two concepts were interchangeable. Detailed analysis shows that the latter, i.e. the lack of knowledge, is the case as criterion (B) forms a closed-ended subset of the responses that meet criterion (A), and is not perceived as such by the respondents.

The qualitative issues should be analysed by individual areas of human activity. The above-mentioned classification of quality applications into either (1) practical, or (2) creative/enabling, is supported by the findings of empirical research, whose respondents, although unable to describe the issues in proper technical terms (as found in the literature) as the continuous and systematic acquisition of information or the conceptualisation and deliberate transformation of reality to achieve quality improvements, nevertheless apply them in the SME sector.

6. Conclusions

Qualitology offers a wide range of applications with a promise of future benefits. It enables organisations to clearly define individual theoretical and practical spheres that unambiguously and continually influence all aspects of quality in an integrated manner. As such, qualitology combines insightful theoretical descriptions offered in the literature with a pragmatic approach that allows the adoption of broad perspectives that exceed beyond the dichotomous features of the investigated phenomena and issues. Defined as a set of projects undertaken to have all links in the chain (i.e. both the enterprises and their customers) reap additional benefits, the approach allows organisations to grow in concert with market demands while maintaining the required flexibility. The findings of the authors’ own research, focused predominantly on Poland-based small and medium-sized enterprises from the interior decoration sector, appear to contradict the claims posited in the literature regarding entrepreneurs.

More promise can be found in such franchise networks whose central management systems force them to adopt and follow network-wide procedures in both internal and external communications with their ultimate customers. In-depth interviews have shown that those owners of such enterprises who have previously operated other businesses and who are now running franchise outlets increasingly focus on quality and quality management, often without realising the possibilities afforded in the form of surveys commissioned by franchise purchasing centres. Such tools include mystery customer surveys designed to gauge customer satisfaction, implementation clarity and value for money. Neither are such entrepreneurs aware of being engaged in quality

circles by virtue of their mandatory visits to purchasing centres and their membership in various committees that rely on experience- and capacity-sharing to help select product ranges for national campaigns, or that their products (deal catalogues, billboards, TV commercials) are complementary, with slippage duly accounted for. In effect, everything boils down to knowledge and the ability to competently capture and communicate information in the language of competencies. Compared to large business organisations where proper education, know-how and result-orientation are by far greater, SMEs tend to neglect these particular aspects. This ties directly to ownership and decision-making capital. The authors' own research shows that decisions in micro, small and medium-sized enterprises tend to be made by individuals whose education fails to equip them with proper quality management competencies.

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Qualitative Modelling Theory in the Eyes of Female Entrepreneurs

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Abstract: Aim: The aim of the article is to demonstrate the relationship between qualitative modelling, and, in particular, total quality management, and standardisation in relation to entire enterprises. A literature review and own research are used to illustrate changes in the perception of quality by SMEs representing the DIY industry in Poland and managed by women. **Research approach / methods:** The results of own research were analysed for qualitative characteristics. An auditorium survey was carried out with closed-ended questions and five-point Likert scale questions. The results were presented in tables and graphs, and are based on calculations performed with the use of statistical tools and mathematical analysis. **Results:** The results are intended to identify differences between the perception of quality by female managers of small enterprises in Poland in relation to changes in consumer behaviour affecting the companies they manage. Qualitative modelling and its specific tasks and functions are presented against the backdrop of empirical research. **Practical and research implications:** The ancient Greek philosopher Plato associated quality with perfection. Today, his perspective is making a comeback with a more pragmatic approach in which the market becomes the ultimate judge of quality. Continuous improvement across the enterprise can inspire one to share positive experiences in all areas of business. **Originality / value:** The perception and understanding of quality evolves constantly owing to its multiple meanings and subjectivity. In parallel, continuous advances in technology and globalisation affect the way quality-related issues are seen. This gives any approach to the issue and any research attempts in this area the potential to add value.

Keywords: qualitative modelling, quality, SMEs, Poland, TQM

1. Introduction

Quality is a multifaceted concept. In the words of Plato: "Quality is a certain degree of perfection". "Quality is conformance to [internal and external] requirements" (Crosby). "Good quality means a predictable degree of uniformity and dependability with a quality standard suited to the customer." (Deming). "Quality is the degree to which a set of inherent properties fulfils a set of requirements" (PN-EN 9000:2001 standard). What, then, is quality, used as both a concept of science and utility, and one that has been inherent in nature from the dawn of time? As quality evades a uniform definition, it is more readily captured by its characteristic attributes that affect the perception of final products, values and services by their end users. Since such choices tend to be subjective, how, then, should one formulate standards to define the concept scientifically? Ubiquitous globalisation forces manufacturers to be competitive, making them strive to outdo one another, not only in quality assurance, but also in displaying quality, innovation and flexibility in unprecedented ways to keep up with omnipresent technology and change. Viewed as such, the belief that quality is "everything which can be improved" seems to be the most appropriate way to describe the current consumer approach (Masaaki Imai).

The socio-economic dimension of quality was first recognised in the late 1940s in Japan and, subsequently, in the 1950s in Western Europe (Kolman et al., 1996, p. 7). A plethora of international deployments earned the decade of the 1990s the label of a "qualitative revolution". The many facets of the approach have become part and parcel of every possible cooperation model (manufacturing, trading, purchasing, etc.), thus emphasising the interdependence of needs. There is an additional aspect to the approach that comes to the fore in post-communist countries. In 1996, R. Kolman argued that "considering Poland's current situation ... the quality of our economy can safely be viewed as ... our ticket to Europe!" The free market requires competitiveness, which, in turn, calls for the development of individual attributes, of which quality is an integral part (see: Williams et al., 1993, pp. 85-141; Juran, 1994, pp. 29-37; Garvin, 2004, pp. 7-8). Focus on quality starts, for the most part, with the owners and managers of businesses operating in each national economy. The advent of Total Quality Management (TQM) has made it possible to approach quality comprehensively, emphasising the rational use of human resources and the pursuit of corporate objectives. Continuous improvement in all endeavours is an integral part of the philosophy of action (see also: Williams et al., 2004, pp. 603-611; Welch & Welch, 2005).

Quality is worth considering in its every aspect and against every background. Given its specific nature and the opportunities associated with quality, as well as the factors that affect its achievement, its pursuit is particularly promising in micro, small and medium-sized enterprises, which, despite the on-going globalisation, struggle with impediments to their growth (Galbraith, 1957, pp. 124-133; Małecka, 2016, pp. 91-122; Łuczka and Małecka,

2017, pp. 375-387). The above focus affects access to funding for both development purposes and the improvement of management practices and, as such, influences quality in every possible aspect of doing business. Evidence for that can easily be found in the relevant literature across the world (see: Brüderl and Mahmood, 1996; Łuczka, 2002, pp. 277-290; Casaar and Holmes, 2003, pp. 123-147; Mira, 2003; Tuunanen, 2007, pp. 213-233; Wellalage & Locke, 2012; pp. 1-17; Małecka, 2015, pp. 39-54). However, a question arises: how the perception of quality in business is influenced by gender?

The article attempts to illustrate changes in the perception of quality among Poland's DIY franchise outlets managed by women.

2. Methodology

Quality was analysed by quantification to determine the quantitative quality of the sample and individual responses to the survey. The results of own research on quality characteristics were analysed. The survey was carried out by means of an auditorium questionnaire containing both closed-ended and five-point Likert scale questions. The analysis covered variable continuous and discrete quantitative statistical characteristics by surveying 120 entrepreneurs from all parts of Poland, representing the interior design industry, 50% of whom were women. The results are presented in tables and graphs and are based on calculations performed with the use of statistical tools and mathematical analysis.

3. Quality – literature review

The perception and understanding of quality evolves constantly owing to its multiple meanings and subjectivity. Quality as a phenomenon associated with perfection was described by the ancient Greek philosopher Plato, who compared it to beauty, which itself depends on a value judgement made by the user (Kiliański, 1979). In contrast, Aristotle emphasises the significance of product attributes (Skrzypek, 2000). Technological advances have changed the perception of quality, prompting a return to a more pragmatic approach in which the market is the ultimate quality verifier. Around the 13th century, the proof of quality was in the price. With the advent of standardisation in the early 19th century, this particular link was severed.

D.A. Garvin (1984) broke down the definition of quality by distinguishing its seven basic categories attributed to the authors of relevant literature titles. The categories are as follows:

1. Transcendent categories – attributed to W.A. Shewhart, who, in 1931, described quality as “the goodness of product, such goodness being applicable to all kinds of products and services”, thus providing a general view of quality;
2. Categories related to production and conformance to internal and external requirements, attributed to P. Crosby (1979) – while the specification is measurable and can reflect an approved quality level, the end result is nevertheless subject to customer assessment (see: Crosby, 1979; Crosby, 1995);
3. Value creation, as underlined in the definitions of quality proposed by I. Boh (1982), J. Ishikawa and D. Lu (1985), who stress the importance of price acceptability;
4. Categories associated with the product, proposed by R. Smalensee and J.H. Swan, A. Feigenbaum (1983), G. Taguchi and D. Clausing (1990) and D.A. Garvin himself (1984), which contain crucial features related to product life; however, these theories leave out production cost and customer needs (see: Garvin, 1984a; Garvin, 1984b, pp. 40-43; Garvin, 1998a, pp. 40-41; Garvin, 1998b, pp. 358-360);
5. Categories containing elements related to use, with attention shifted to customer requirements and needs, as proposed by B. Hagan (1984), L. Dobyns and C. Crawford-Manson (1991), J. Juran (1941) and A. Feigenbaum (1987) (see: Juran, 1994, pp. 29-37; Juran, 1995, pp. 125-129; Juran, 1999);
6. A multidimensional approach, represented by A. Parasurman, L.L. Berry and A. Zeithami (1991);
7. The strategic definition, attributed to R.D. Buzzell, F.D. Wiersm (1981), M. Porter (1980) and W.E. Deming (1986), which views quality as “a way to differentiate a product against their competition, as is necessary in areas of importance to the customer” (Porter, 1980), which refers to both the market and the organisation (see: Deming, 1966; Deming, 1982, pp. 6-11; Deming, 2012; see also: Garvin, 1984a and 1984b; Seawright and Young, 1996; Rura-Polley & Clegg, 1999).

It is worth noting the theory of C.A. Reeves and D.A. Bednar, who distinguish other categories, i.e.: (1) excellence, (2) value, (3) conformity with specifications, (4) satisfying or exceeding customer expectations, and process dynamism (Reeves & Bednar, 1994).

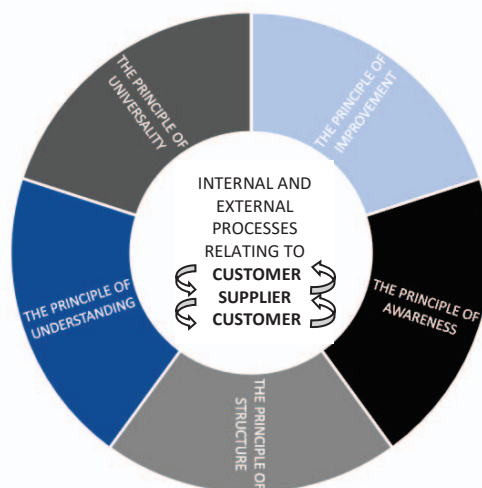
Contemporary researchers tend to define quality in relation to (4), i.e. as meeting, or even exceeding, customer requirements. This is one of the reactions to globalisation and the ever fiercer competition, which appears to be the common and the only possible approach in terms of free market principles.

4. Total quality management

The method considered to be the most effective in managing both manufacturing and services, which focuses on quality and incorporates all relevant factors, is Total Quality Management (TQM). Under its broad-based approach, everyone in the company is committed to quality in its broadest sense. This includes, to the extent possible, customers and suppliers (T), the satisfaction of customer expectations and requirements (Q), and the management at all levels, all the way to the top, all of whom actively support quality efforts in the company (M) (Kolman, 1971a and 1971b, Garvin, 1999, pp. 29-37; Juran, 1999).

By adhering to TQM principles in their activities, manufacturing and service companies can be sure of becoming competitive. They achieve this by raising the awareness of their entire team and securing their commitment to continuously identify and satisfy both internal and external needs of customers by streamlining all activities, commonly with reference to the Deming cycle. The above also applies to costs and involves a strive for excellence rather than mere acceptability, as postulated by the Japanese philosophy of Kaizen, which argues that performance efficiency and quality require adequate management (1 – complete each task well and on time; 2 – prevent as opposed to taking *ad hoc* measures, 3 – adopt team approach to problem solving, 4 - invest in human capital (people being the most valuable asset of the enterprise). The plan-do-check-act (P-D-C-A) cycle, often referred to as the Deming cycle, is designed to improve every process by embracing prior improvements as a standard in every successive cycle. The new standard is thus constantly revised and perfected. In this sense, standardisation becomes a perfecting process intended to inspire the whole company to share good practices across all areas of activity.

The TQM philosophy enables companies to benefit from any ideas, information and inspiration coming from any of their employees, regardless of their place in the organisation structure. Rather than pointing out flaws, which usually only leads to the concealment of problems, the management should encourage teams to openly share their opinions and experience. For this principle to work, organisations must meet 5 conditions, all of which rest on the basic principle of co-existence (Fig.1).



Source: own research

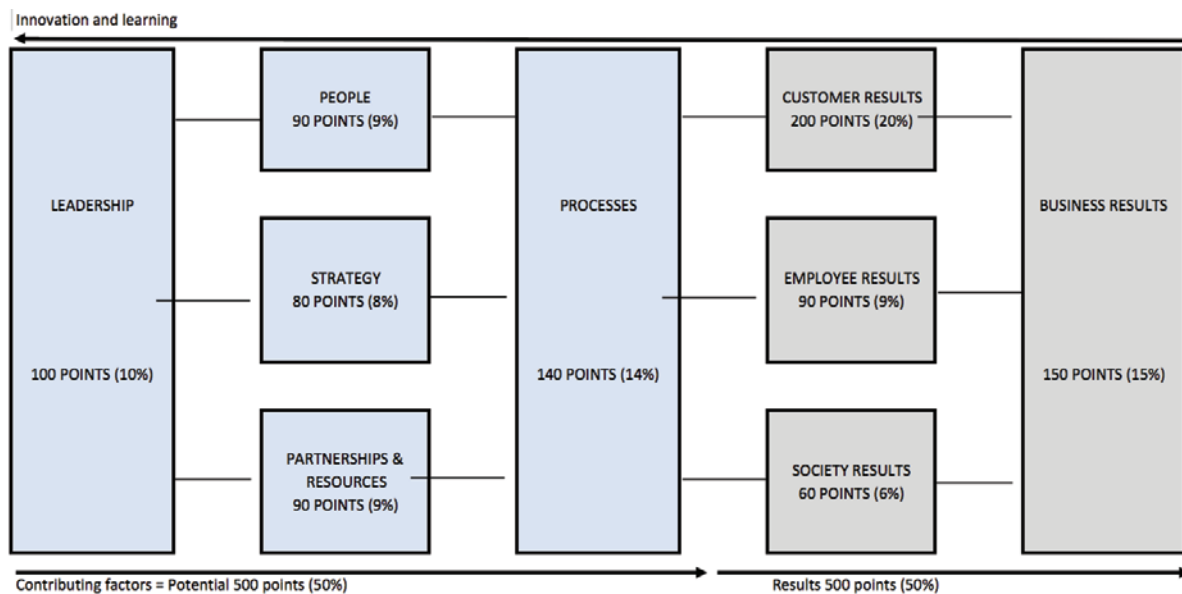
Figure 1: The principles underpinning effective implementation of TQM

The principle of universality refers to the universal engagement of all company employees, and especially the management. The principle of understanding refers to the comprehension and acceptance of processes, and to providing methods and measures to assess their effectiveness. The principle of structure calls for establishing

an organisational structure that facilitates effective communication and proper information flows to ensure immediate rectification of any non-conformities at any time. The principle of awareness refers to proactively conducting constant checks and observations to anticipate the requirements and expectations of both internal and external customers. Finally, the principle of improvement consists in adopting and arranging a continuous programme of training covering the entire environment of the enterprise. An effective application of these principles is enhanced through synergies within and beyond organisational boundaries.

The implementation is usually broken down into individual elementary stages and outlined in the company's vision, objectives and quality policy. It is, therefore, critical to have every employee understand and accept each principle and see them as an inseparable part of strategic planning and management oriented at the satisfaction of all customer requirements pertaining to quality and the continuous improvement of the company's performance, philosophy and mission (Deming, 1982, Garvin, 2004, pp. 18-19; Walch and Walch, 2005). In this sense, and thanks to a policy that nurtures all aspects of the business, the enterprise gathers social capital. The stronger its market position becomes, the more likely it is to view profit as a means for growth rather than the ultimate objective. Conversely, a quality policy should always reflect the type of business a company is pursuing. Both the literature and business practice offer a plethora of methods and models that are quality-centred. These include quality wheels, just-in-time systems, AQL and poka-yoke. The question that remains is whether such methods and models can be clearly and effectively employed not only in manufacturing, or and manufacturing and service companies, but also in those focused exclusively on service provision.

In reviewing quality prize awarding criteria¹, attention should be paid to the basis of the evaluation model, which, in principle, distinguishes two sets of criteria, i.e. enablers and results. Both attach a great deal of importance to the human factor. The results themselves account for 15% of the evaluation score (Fig.2)



Source: EFQM Leading Excellence, accessed on 31.01.2018, www.efq.org

Figure 2: Model of the European Quality Award

5. Application of quality in empirical research

As a concept, leadership lacks a single broadly recognised and accepted definition. Its perception is cognitive rather than based on a specific model. General Colin Powell has said that "leadership is the art of accomplishing more than the science of management says is possible". Professor Michael Porter believed that "in describing business leadership, we persistently rely on old metaphors, cite ancient Chinese generals and relate their concepts to business. However, defeating the enemy is a thing of the past. We must strive to be unique rather than the best" (see also: Sun Tzu, 2008). However, broadly speaking, the concept defines the ability to influence individuals, and even entire groups, to achieve specific goals. Hence, management may be viewed as the ability

¹ Such as Japan's Deming Prize, the United States' Baldrige Award, the EFQM Award in the European Union conferred since 1992 by a Brussels foundation formed in 1989.

to influence employee behaviours to attain specific aims, whereas leadership should be seen as based on authority that is acceptable to the people affected, the ability to set the course and to formulate a vision and a mission for the enterprise. Phil Dourado’s postulate that “the essential truth is that management and leadership are different modes, but managers and leaders are the same people” effectively boils down to the well-grounded principle of “lead people, manage things”, which brings both concepts together and forms an integral part of effective qualitative modelling.

The empirical research was focused on the perception of quality management by female managers of franchise chains in the Polish DIY industry. 120 auditorium surveys were completed by CEOs and commercial proxies in limited liability companies, as well as sole proprietors who employ workers while themselves engaging in the running of their business. 60 women who met the above criteria were selected from this group. 33.33% of them run independent, non-affiliated companies. The remaining 66.66% operated under a franchise (see: Altinay et al., 2014, pp. 722-728). A study of their enterprises differentiated by size shows that the largest share of such companies (81.67%) are small operations employing either from 10 to 50 workers, operating mostly in cities with populations ranging from 5,000 to 50,000 (Table 1).

Table 1: Female respondents by enterprise size and the populations of towns in which their companies operated

Employee headcount	Total		Town population							
			≤5		[5-50)		[50-150)		≥150	
	quantity	share	quantity	share	quantity	share	quantity	share	quantity	share
up to 10)	10	16.67%	2	3.33%	8	13.33%	0	0.00%	0	0.00%
[10-50)	49	81.67%	1	1.67%	22	36.67%	21	35.00%	5	8.33%
[50-250)	1	1.67%	0	0.00%	0	0.00%	1	1.67%	0	0.00%

Source: Own research

The in-depth interviews showed headcounts of 32 to 38 employees and usable areas of the business establishments ranging from 2000 m² to 9000 m², suggesting that rather than consciously and effectively striving to make the most of each square meter of retail space, the companies duplicate or widely use the same product ranges and display them in store in the same commonly repeated manner, in accordance with the Pareto principle. Further analysis showed that 95.0% of the female decision-maker respondents managed their businesses by means of quality models. 65.0% of them hoped some day to expand both their knowledge of quality management and adopt new quality management tools. 62.5% of the female SME managers/owners saw qualitative modelling as a necessary condition for improving profitability and developing their enterprises. Compared to men managing small franchise outlets, the women were more mature in their management practices, focused on meeting the requirements and expectations of not only their own teams but, as is necessary in their specific industry, also those of their customers. This demonstrates those women's propensity to recognise management as both an internal and an external process (Figure 3).

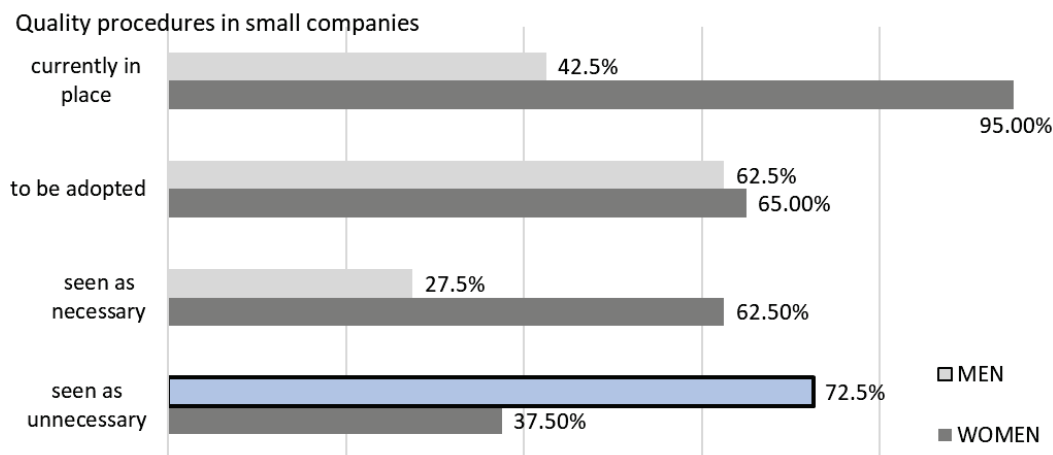


Figure 3: Awareness of the importance of quality among male and female small enterprise managers

Source: Own research

Only one aspect of the gender-related study showed similar opinions on the future use of quality assessment procedures in enterprises (women: 65.0%, men: 62.5%). However, the in-depth interview demonstrated that this outcome did not reflect the actual needs of the surveyed managerial staff and, in fact, resulted from measures performed centrally by the purchasing hubs of franchise chains, whose costs are borne by outlet owners (presidents of limited liability companies), who believe that such spending provides no benefits. None of the respondents described the need to adopt such a procedure as an investment. This lends credibility to findings on the nature of qualitative modelling tools and their impact on enterprise growth and the bottom line, which showed that 62.5% of women (but only 27.5% of men) considered such tools to be necessary. Particularly noteworthy against this background is the 72.5% share of men (compared to a mere 37.5% of women) who, as shown in the study, considered quality improvement efforts to be completely unnecessary. This raises an additional question of what education and experience underlies such findings. The industry itself is of significance, although DIY product ranges have been split between “men’s” sections, focused on DIY and construction products, and “women’s” sections, centred on interior design finishing, opening up further points for analysis.

One of the basic TQM features is the involvement of managerial staff in the day-to-day activities of companies. This aspect also reveals differences between female and male managers. As it turns out, 87.5% of the surveyed female business owners had developed a company strategy, with more than half of them (52.5%) being confident that such strategy was known to every employee (the “definitely yes” and “yes” responses on the Likert scale). 20% fewer companies run by men had such a strategy, with only 40% of them being confident that their staff were committed to its implementation. Notably, the majority of the responses given by women reflect their uncertainty. 47.5% of them were not certain that their company mission and objectives were known to employees, compared to 27.5% of men. However, while as many as 32.5% of men were convinced that the employees were unaware of their company’s philosophy, not a single woman indicated such doubts, suggesting this was impossible in the enterprises they managed (Figure 4).

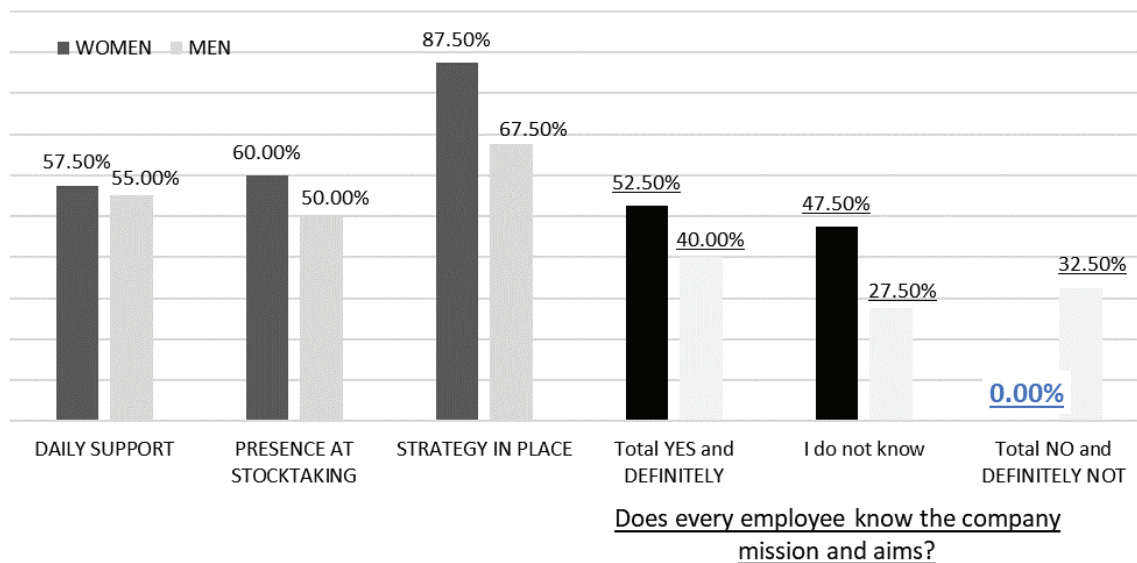


Figure 4: Management engagement in supporting company activities

Source: Own research

Both genders were equally involved in the day-to-day activities of their companies (women being 2.5% more likely to be engaged). However, 10% more female business owners compared to their male counterparts were actively involved in stocktaking. The sheer complexity of this issue and the large number of its possible implications opens up grounds for further research into and analysis of the perceptions of the use of quality methods in enterprises of the size in question. However, the above-mentioned principle of universality, which suggests universal involvement in this process by all company employees, and especially by all managerial staff (who, in small firms, additionally include business owners), always (in the case of both men and women) stops short of 100% engagement. The research suggests that women, who tend to be more conscious entrepreneurs, view engagement with their teams in the form of e.g. participation in critical business performance reviews, as a way to support their employees and of affording them with opportunities to be proactive. This brings us to

other research questions regarding the extent to which such knowledge and engagement closes the quality management cycle and the quantifiability of both quality management and the performance of individual companies, opening up another potential area of research.

6. Summary

Qualitative modelling applies to every function and field of business and concerns both external and internal factors. TQM is a three-pronged approach comprised of (1) teamwork methods, (2) a formal and documented quality assurance system, and (3) tools and methods designed to promote improvements, all of which converge in a quality-centred approach relying on the support of the company's workforce, and especially that of its management, for quality and information sharing across the enterprise, particularly internally, on the interface between different company functions, which are the most conflict-prone parts of the company and ones that are also most likely to experience emergencies. Within enterprises, there will always be processes which, in this model, will take the form of client-supplier-client relationships, which are assumed to exist both at the end of the chain and within enterprise structures, where employees of particular departments apply the same process to one another, i.e. view one another as either customers or suppliers of products and/or services.

Our research shows distortions in the factors underlying effective quality model management, albeit such distortions are considerably less pronounced in enterprises managed by women. Failures to ensure universality, understanding and awareness preclude the effectiveness of the whole process. This highlights the importance of care for both the internal and external factors in enterprises, which is not at all common in small firms. The empirical research showed that enterprises managed by women were more competent in quality management and more caring about such management in each of the analysed aspects, although only some of them displayed major differences in this respect.

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Confirming the Validity of a Trust Measure in a Security Environment

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Abstract: This study sought to confirm both the factor structure and the invariance across biographical groups of trust in the direct supervisor, as measured by the Trust Relationship Audit (TRA), using data of a sample that consisted of $n = 352$ in a security environment. It is usually assumed that a measurement instrument operates in exactly the same way irrespective of environment, and that the underlying constructs being measured have the same theoretical structure for each group under investigation. As evidenced in reviews of the literature, however, these two critical assumptions are rarely, if ever, tested statistically. Each organisation, sector and country has its own unique culture and climate. It can thus be assumed that the same measurement tool might not always be applicable to all. The validity and reliability of the TRA was confirmed in various studies in, for example, manufacturing, academic and electricity environments. The assumption was that, due to the uncertainty and high stress of the security environment – as well as its often-violent nature – trust might be experienced differently there. The TRA measure and model were revalidated in a security environment by means of structural equation modelling. The model fit indices show that the model did fit the data. A new five-factor model emerged from the study. The results verify the adapted structural model and, in essence, confirm the basic premises upon which the original model was based. However, the results indicate that the previously validated factor structure and model changed in the security environment. A new construct of objectivity was postulated, and the construct of credibility was not confirmed. Objectivity was defined as the manager's qualities of being open, honest and tolerant towards mistakes. The remaining four dimensions were retained, but with some differences in the dimension constructions. The invariance testing indicates that the TRA could be applied only to some of the measured biographical groups in a security environment. The study confirms the value of testing the validity and reliability of an instrument in a different environment, rather than assuming that the psychometric properties are experienced equally in different environments and for different biographical groups.

Keywords: trust, security environment, structural equation modelling, objectivity

1. Introduction

Smith (2016) emphasises that the private security industry in South Africa is facing challenges, such as growing economic pressures, rising costs, increased crime levels, shrinking margins and managing large workforces. and that these challenges bring with them a high degree of complexity.

Private security providers must cut costs whilst providing an ever-increasing level of quality service. To achieve these goals, rigorous training and organisational development strategies are necessary.

The organisation at which the research was conducted embarked on a comprehensive strategic and change journey intended to sustain viability and to establish a performance culture. One of the focus areas is the change of mind-sets – towards trust and teamwork, agility, empowerment, ownership and courage – whilst new technology, innovative products, joint ventures and efficiency are crucial for the continued existence of the organisation (Durandt, 2017).

Various authors (such as Dodgson, 1993; Zaheer, McEvily & Perrone, 1998) have shown the importance of organisational trust in innovation (Jones & George, 1998), change, partnerships and continued performance. This study sought to confirm the factor structure, and invariance across biographical groups, of trust in the direct supervisor, as measured by the Trust Relationship Audit (TRA).

2. Organisational trust

Ping-Li, Bai and Xi (2011) emphasise that there has been a surge in research in, especially, interpersonal and interfirm trust in the recent past. Paliszkievicz (2012) is of the opinion that the popularity of organisational trust as a topic is attributable primarily to increased insecurity in the workplace and a realisation of the importance of trust in all areas of social life. Von der Ohe and Martins (2010) report that research on trust has increased in the past decade, with renewed interest in the relationship between trust and organisational benefits, such as commitment, organisational citizenship behaviour, team performance and organisational performance. There also seems to be a decline in leadership trustworthiness as aspects such as the rise in executive compensation levels, management negligence and malfeasance result in a perceived breach of the psychological contract on

the employer's side. The two authors furthermore see trust, as a primary attribute of leadership, having adverse effects on group performance when it breaks down. Martins (2002) sees organisational trust as the willingness of a person to be vulnerable to the actions of another with the expectation of reciprocity, regardless of the ability to monitor or control the other party. Mayer, Davis and Schoorman (1995, p. 712) define organisational trust as "a willingness to be vulnerable to the actions of another party".

Although some theories focus primarily on intrapersonal factors (such as those by Mayer et al [1995] and Rousseau et al [1998]), others tend to focus on interpersonal and environmental conditions (such as those by Gimbel [2003] and Abrams et al [2003]). Models such as the split organisational trust continuum of Swift (2001) focus on the complex interplay of factors, while the models of Rossiter and Pearce (1975) and Bews, and Martins (2002) introduce developmental aspects. In their research, Van der Berg and Martins (2013) found that managerial practices, more than personality factors, influence the establishment and progression of the trust relationship in the organisation.

3. Problem statement

Researchers and practitioners usually assume that a measurement instrument operates in exactly the same way in different environments and that the underlying constructs being measured have the same theoretical structure for each group under investigation. Research does, however indicate that these assumptions first need to be tested. The validity and reliability of the TRA was confirmed in various studies in, for example, manufacturing, academic and electricity production environments. The assumption was that, due to the uncertainty and high stress of the security environment – as well as its often-violent nature – trust might be experienced differently there. For the study being reported on in this paper, the research aim was to confirm the measurement model of trust for a security environment. A secondary aim was to determine whether invariance existed for the biographical variables.

4. Research methodology

The measuring instrument used for this research was refined and validated in previous research (Martins, 2002; Van den Berg and Martins, 2013; Von der Ohe, 2014). The questionnaire was designed for the South African market, taking the local environment into consideration. Furthermore, the psychometric properties of the questionnaire, such as validity, reliability and fairness, were well documented and had been reproduced subsequent to the original validation studies. Only the section focusing on organisational trust was used in this research. The questionnaire consisted of five biographical items and 34 Likert scale test items. The managerial dimensions in the model of Martins (2000, p. 757) are as follows:

Credibility – relates to the manager being willing to listen to subordinates and allowing for mistakes, expression of feeling and submission of proposals. The manager also ensures that his or her subordinates are seen as prestigious and credible in the organisation.

Team management – relates to the successful resolution of conflict in the group and the effective management of individual and group goals.

Information sharing – relates to giving the subordinates honest feedback and information on aspects in the organisation and their performance levels.

Work support – relates to the willingness of the manager to support his or her subordinates when required, as well as to provide the necessary information related to their job activities to support them in achieving goals.

Martins (2000) also included in the questionnaire five questions dealing with aspects of trust between the immediate supervisor and the employee. This aspect refers to dimensions such as fairness, honesty, intention to motivate employees, and openness.

The sample consisted of $n = 352$ employees out of a population of 400 (88%) who attended the training in a security solutions organisation. The training centre of the organisation is situated on the West Rand in Gauteng, a province of South Africa. The employees represented all geographical areas across Southern Africa.

The sample comprised mainly people in the age group 35 to 44 years (40.5%), followed by 25 to 34 years (38.2%), 45 to 54 years (15.5%), 18 to 24 years (4.6%) and, lastly, 55 years and older (1.1%). The sample comprised mainly males (82.1%), with females constituting 17.9%. This seemed to be a fair reflection of the gender distribution in the security organisation. Almost half of the respondents did not have matric (49.1%), whilst the remaining group had matric (45.9%), a trade or technical certificate or diploma (4.1%) or a national diploma (0.9%).

5. Summary of the findings

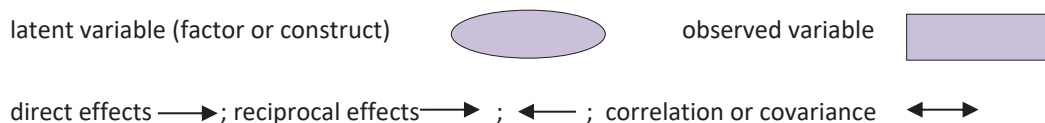
To reduce the dimensionality of the data, principal component analysis (PCA) with IBM SPSS Statistics 22 was used to examine patterns of correlation among the questions used to measure the respondents’ perceptions of their relationship with their direct managers. No communalities were below 0.30. Considering the exploratory nature of the research, the five extracted constructs all demonstrated acceptable internal consistency, as illustrated by the Cronbach’s alpha coefficients listed in Table 1. The correlation matrix demonstrated high correlations, and all were above 0.5. The KMO value was 0.947, well above the recommended minimum value of 0.6 (Kaiser, 1970) and Bartlett’s test of sphericity (Bartlett, 1954) reached statistical significance, $p < 0.001$. Thus, the correlation matrix was deemed factorable. The items were subsequently subjected to exploratory factor analysis (EFA) and Varimax rotation, which resulted in a 5-component solution that explained 63.01% of the variation in the data. After an inspection of the factor structure and theory of organisational trust, the dimensions were named as indicated in Table 1, below. The dimension of credibility was renamed as objectivity.

Table 1: Cronbach’s alpha (internal consistency) statistics for the five extracted components of the trust model

Subscale	Description	N of items	Cronbach’s alpha	Mean
C1	Work support	10	0.903	3.35
C2	Team management	9	0.887	3.17
C3	Trust relationship	7	0.873	3.27
C4	Information sharing	5	0.796	3.43
C5	Objectivity	3	0.652	3.00
Overall	All dimensions	34	0.966	3.24

The generally agreed-upon lower limit for Cronbach’s alpha is 0.70, although it may decrease to 0.60 in exploratory research (Hair et al, 2006). All the Cronbach alphas exceeded the 0.70 limit, except objectivity.

During EFA, the dimensionality of the data was reduced, identifying which items loaded on the different latent components. The number of retained components was established using primarily the eigenvalues (greater than 1), the scree plot and the factor loadings. The results of the EFA were used to specify the measurement model to determine the extent to which the relationships were valid and to test the composite reliability.



In confirmatory factor analysis (CFA) for the trust model, a low (0.286) SMC was estimated for question 68 under the factor objectivity. The other two items, question 87 and question 91, had SMCs of 0.421 and 0.415, respectively. A decision was made to retain question 68 and re-evaluate its value after CFA had been done. This model resulted in reasonable fit when allowing question 68 (with an SMC of 0.286) to remain part of the model, even though its SMC was less than 0.3, and by allowing correlations among the error variances of items loading the same constructs. The reason for retaining this item was that it was one of only three items loading on the objectivity construct and was supported by the theory. As can be seen in Figure 1, the item was retained. This made theoretical sense as the toleration of mistakes is part of the performance management and measurement process (Moss & Sanchez, 2004), and it also relates to objectivity and trust during the process (Latham et al, 2005).

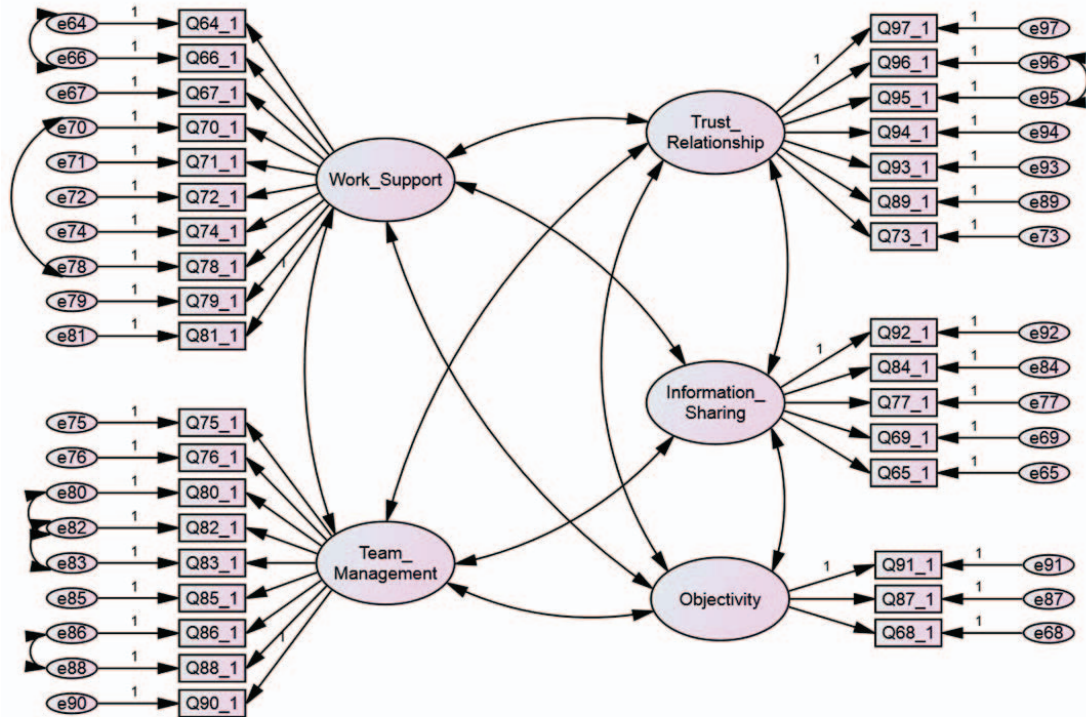


Figure 1: Measurement model for the trust components

The constructs of work support, team management and information sharing were similar to the constructs described by Martins (2002) and Kreitner and Kinicki (1995). Martins (2002) obtained a four-factor model: information sharing, work support, credibility and team support as the managerial practices related to trust. The constructs of trust relationships were similar to the constructs of fairness and respect of Kreitner and Kinicki (1995).

Objectivity was defined in the current study as the manager’s qualities of being open, honest and tolerant towards mistakes (questions 68, 91 and 87). The construct objectivity was similar to the concept of authentic-i leadership by Luthans and Avolio (2003). Authentic leadership is built upon three dimensions: balanced processing, relational transparency and self-awareness. Martins’ construct credibility refers to a willingness to tolerate mistakes, to listen, to consider proposals, to allow others the freedom to express feelings and to ensure that employees enjoy prestige and credibility. This construct shares similarities with objectivity.

The fit indices were calculated and are reflected in Table 2, below.

Table 2: Model fit indices for the trust components

Model	GFI	CMIN/DF	AGFI	NFI	RFI	NNFI	IFI	TLI	CFI	RMSEA
Index	0.848	2.167	0.823	0.833	0.816	0.892	0.902	0.892	0.902	0.057

Notes: Prescribed thresholds for fit indices: GFI, AGFI, NFI, RFI, NNFI, IFI, TLI, CFI = values close to .90 indicate a good model fit; RMSEA, reasonable fit 0.05-0.08; CMIN/DF = values below 3 indicate a good fit (Hair et al, 2006; Schumacker and Lomax, 1996).

The root mean square error of approximation (RMSEA) showed a reasonable fit, whereas mediocre fits close to 0.9 were found with regard to the goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), relative fit index (RFI), non-normed fit index (NNFI) and Tucker-Lewis index (TLI). The incremental fit index (IFI), CMIN/DF (chi square) and comparative fit index (CFI) indicated proper fits. The chi-square value was 1107.220 with 511 degrees of freedom and a probability level of 0.000. It was therefore concluded that the model did fit the data.

With the sample sizes not being large enough, the combined measurement model of the trust was too complex to test invariance among groups as defined by the group variables. The values for each of the latent constructs

were subsequently determined by calculating the average of the items that loaded on them as confirmed using SEM. The group variables were recoded into two groups, and independent sample t-tests were done. In Table 3, the descriptive values for the grouping variables can be seen. Except for the gender group, these dichotomous groups had comparable sizes.

Table 3: Descriptive values for the group variables

Variable		Count	Column N %
Age	Younger than 35 years	149	42.9%
	35 years and older	199	57.1%
	Total	348	100.0%
Q3 Please provide your gender:	Male	285	82.1%
	Female	62	17.9%
	Total	347	100.0%
Q6 Please provide your highest qualification:	Less than Gr12	169	49.1%
	Gr12 or higher	175	50.9%
	Total	344	100.0%
Q11 How many employees are reporting to the same manager as you do?	< = 45 employees	148	55.8%
	> 45 employees	117	44.2%
	Total	265	100.0%
Q61 Below are statements on your current state of proficiency in your present job. Please mark the appropriate statement:	Little proficiency	183	57.7%
	Good to high proficiency	134	42.3%
	Total	317	100.0%
Q62 What is the frequency of contact with your direct manager:	Less to infrequently	162	52.5%
	Frequently	147	47.5%
	Total	309	100.0%

The values for the constructs were created by calculating the mean of all the items that loaded on a construct. The Kolmogorov–Smirnov and Shapiro–Wilk tests were used to test for normality of the mean distributions of the created constructs for the normality of these values and for the tests of normality. It was found that the constructs deviated significantly from normality. However, since the sample size was large and the visual distributions of the scores indicated that the deviations were not large, parametric measures for inferential testing were subsequently used for further analysis.

In order to determine whether being younger or older than 35 years had an effect on any of the created constructs on average, the independent sample t-test was used to test the null hypothesis of the two group means being equal. The t-test (N = 346) found that this age dichotomy had a marginal effect on team management ($t = -1.967$ ($p = 0.05$)). Age did not have any effect on any of the other constructs and it could therefore be assumed that these constructs were group-invariant with regard to the group means.

Levene’s test for equality of variance, were used for gender, education and proficiency in the job analysis. The t-test results indicate that gender, education dichotomy and proficiency in job did not have any effect on any of the constructs. Thus, it could be assumed that all the constructs were group-invariant with regard to the group means.

The t-test results indicate that the contact frequency dichotomy did indeed have a significant effect on work support ($t(307) = -2.054$, $p = 0.05$), objectivity ($t(307) = -2.434$, $p = 0.05$) and strategic execution ($t(307) = 2.521$, $p = 0.05$). On average, those respondents with frequent contact with their direct managers scored higher on each of these constructs than those with less to infrequent contact with their direct managers.

6. Conclusion and recommendations

The t model for organisational trust was submitted to EFA and CFA, and a five-factor model was confirmed. The factors were named work support, team management, trust relationship, information sharing and objectivity. The relationship and validity of these constructs were also tested and confirmed. Internal consistency scores for the factors were above 0.7, except objectivity, which measured 0.652.

Model fit indices confirm a proper fit between the postulated model and the data.

As a measure to determine the possibility of invariance between groups, the sample was divided in terms of age profiles, gender, qualifications, and number of peers reporting to the same manager, proficiency and contact frequency with the manager. Due to too small a sample and the complexity of the model, invariance testing could not be used for all the groups. An alternative was used, i.e. calculated means, which were compared to get an indication of equivalence. For the age, gender, qualifications and number of peers reporting to the same manager, no significant differences between the calculated means for the groups were found. Invariance could therefore be assumed for these groups. However, for proficiency and contact frequency, differences were found. For proficiency, the $p < .05$ in the case of the measurement residuals model indicated statistical rejection of the constraint that error variances in the measurement variables were invariant across groups. Thus, invariance could not be assumed.

The results indicate that the trust questionnaire can be used with confidence in the security environment. It is, however, important to note that some statements do not fit measurement in this environment and that the dimension of credibility was changed and renamed as objectivity. With regard to invariance testing, the results indicate that the questionnaire can be used with confidence for age, gender, qualifications and number of peers reporting to the same manager. More research is, however, needed to determine which questions pertaining to proficiency need to be adapted or changed. These results confirm earlier statements that invariance cannot always be assumed without adequate testing. It is proposed that the model also be tested by means of different levels of invariance testing done by comparing the model with increasingly stringent qualities.

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A Review of Mixed Methods, Pragmatism and Abduction Techniques

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Abstract: The purpose of this paper is to propose that mixed methods research is complementary to traditional qualitative or quantitative research and that pragmatism is an attractive philosophical partner for mixed methods. The research question is whether 'pragmatism' as a philosophical choice to combine positivism and interpretivism can lead to an appreciation of 'what works' in practice? (Tashakkori & Teddlie, 2010). The paper posits that pragmatism supports the use of different research methods and that a continuous cycle of inductive, deductive and when appropriate, abductive reasoning, produces useful knowledge and serves as a rationale for rigorous research. Firstly, the so called "paradigm wars" of quantitative or qualitative analysis are briefly reviewed; and the tenets of pragmatism are explained. A comparison is made of the different approaches and the value of applying abduction techniques to 'surprising facts or puzzles'. Secondly, the literature regarding the ubiquity of abduction techniques is explored. Third, two recent empirical case studies in the airline and engineering sectors are summarised. Abduction thinking was key to explaining empirical phenomenon relating to competition, and in particular how leading UK and German multinationals developed rather different approaches to outsourcing. Finally, in conclusion, mixed methods were found to combine numerical and cognitive reasoning that led to a 'best answer' to data that otherwise could not be adequately explained. Furthermore, the application of different approaches can lead to research and subsequent management decisions that reflect both the interplay of social and scientific aspects of the world today.

Keywords: mixed methods, pragmatism, paradigm wars, abduction, empirical phenomenon, case studies

1. Introduction

This paper focuses on mixed methods and the extent to which a combination of different approaches can lead to better research and subsequent management decisions reflecting both the social and scientific aspects of today's world. Firstly, a comparison is made of different approaches and the value of applying abduction techniques to surprising facts or puzzles. Secondly, the literature regarding the ubiquity of abduction techniques is explored. Third, two recent case studies are summarised where abduction thinking was key to explaining empirical phenomenon relating to competition in the airline and engineering sectors; and how UK and German multinationals developed different approaches to outsourcing in the same sector. In conclusion, mixed methods were found to combine numerical and cognitive reasoning that led to a 'best answer' to data that otherwise could not be adequately explained.

Evidence of growth in the use of mixed methods research has in a wide range of academic fields notably social sciences and business management (Tashakkori & Teddlie, 2010). In 2007, SAGE launched a Journal of Mixed Methods Research. There have been arguments about the relative merits of paradigm choices drawn from quantitative versus qualitative methods, positivism versus interpretivism, and whether it was naïve (or worse) to mix or attempt to use techniques drawn from paradigm extremes. Terms such as pragmatism and abduction have also become more widespread in their use. Researchers, perhaps those more recently qualified, have been able to employ both deductive and inductive analysis in the same research study. The mixed methods approach to research provides researchers with the ability to design a single research study that answers questions regarding the nature of phenomenon from a participant's point of view as well as the relationship between measurable variables (Williams, 2007). Supporters of the mixed methods promote doing 'what seems to work' to investigate, predict, explore, describe and understand the phenomenon. That quantitative and qualitative research approaches are not only compatible but also complimentary, underpins the need for continued research studies that deploy mixed methods (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). Fig 1 below is both popular and helpful in making choices regarding research philosophy, approach, method, strategy, time horizon and subsequent techniques (Saunders & Thornhill, 2012).

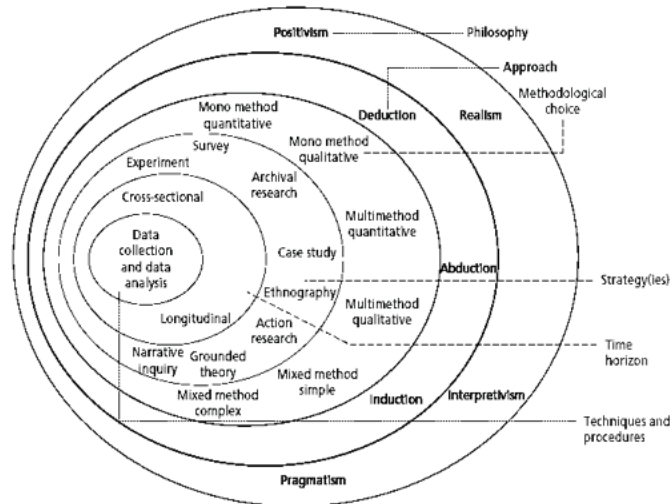
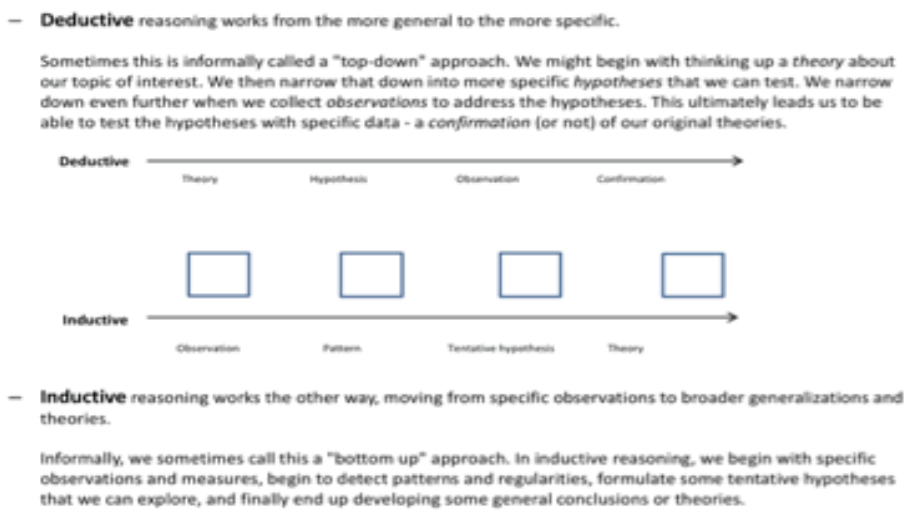


Figure 1: Research Onion adapted from ref: Saunders, Lewis & Thornhill (2012)

The approach selected has traditionally been either inductive reasoning where a series of specific observations lead the researcher to a general conclusion that may be true (Dudovskiy, 2016); or deductive reasoning that starts with a hypothesis or general rule that is then tested with data, and only if found to be true leads to a specific conclusion. See Fig 2.

Deductive versus Inductive approach



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Figure 2: Paradigm War 1 – comparing deductive and inductive approaches

However, there is a third choice of approach. Abductive reasoning also referred to as 'abductive approach', is set to address weaknesses associated with both deductive and inductive approaches (see 3. Literature Review below). Abductive reasoning, follows a pragmatist perspective, taking incomplete (or 'messy') observations from experience and reality that may then lead to a best prediction of the truth, and perhaps even to a new theory. At the same time, it has to be clarified that abductive reasoning is similar to deductive and inductive approaches in so far as it is applied to make logical inferences and construct theories. With the abductive approach, the research process starts with 'surprising facts' or 'puzzles' and is then devoted to their explanation (Kovács & Spens, 2005). A researcher may encounter an empirical phenomenon that cannot be explained by the existing range of theories. The researcher then seeks to choose the 'best' answer from among many alternatives in order to explain the 'surprising facts' or 'puzzles' identified at the start of the research process. Both numerical and cognitive reasoning may be combined. See Fig.3 below.

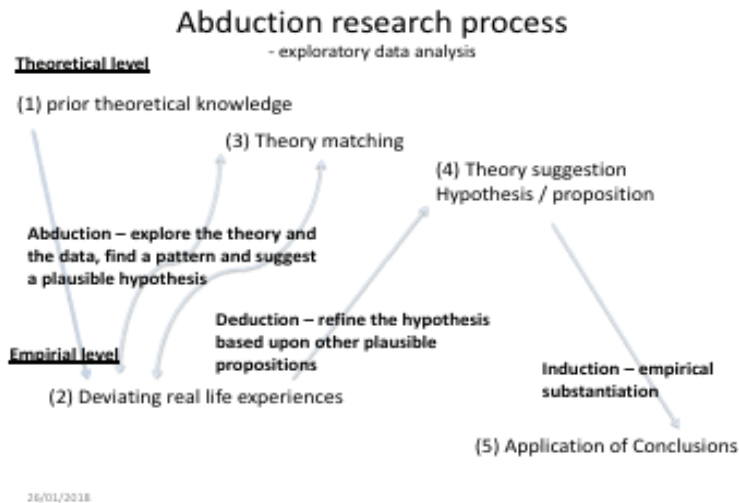


Figure 3: The best of both? – Abduction. Ref: adapted from Kovács & Spens, K.M (2005)

Table 1 below illustrates the major differences between deductive, inductive and abductive research approaches in terms of logic, generalisation, use of data and theory. Further detail is provided in the literature review. While the choice of method should be led by the research question(s) the role of the researcher also changes. For example, hopefully detached and impartial with quantitative methods and able to be objective. Whereas with qualitative methods the researcher tends to be more involved on a personal basis and hence likely to be empathetic.


Data collection, analysis and the understanding of research should lead not only to further effective research but also enable managers to take better decisions. Davenport (2009) argues that adopting multiple perspectives, leads to better decisions and robust conclusions, typically overcoming bias and weakness from single method approaches, see Fig 4. It is also important to know when a particular decision approach does not apply. For example, analytics is not a good fit when you have to make a really fast decision. Almost all quantitative models, even predictive ones, are based on past data, so if your experience or intuition tells you that the past is no longer a good guide to the present and future, you'll want to employ other decision tools, or at least create some new data and analyses.

Multiple Perspectives Yield Better Results

Critical to balance decision tools with human intuition & judgement

- Don't use models without understanding them
- Make assumptions clear
- Keep track and manage the models in use
- Cultivate human backup
- Understand the context e.g. analytics not good if a fast decision is needed. Most predictive models are based on past data so is the past a guide to the future?
- Triangulate results – check from different perspectives with different data....

By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer and single-theory studies.



26/01/2018

Figure 4: Better research leads to improved decisions and results. Ref: Davenport (2009)

Table 1: Comparative approaches ref: Dudovskiy (2016)

	Deduction	Induction	Abduction
Logic	In a deductive inference, when the premises are true, the conclusion must also be true.	In an inductive inference, known premises are used to generate untested conclusions.	In an abductive inference, known premises are used to generate testable conclusions.

From/To	Generalise from the general to the specific.	Generalise from the specific to the general.	Generalise from the interactions between the specific and the general.
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory.	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth.
Theory	Theory falsification or verification.	Theory generation and building.	Theory generation or modification; incorporating existing theory where appropriate, to build new theory or modify existing theory.

Table 2: Paradigm war 2 - quantitative versus qualitative approach

<http://www.gifted.uconn.edu/siegle/research/Qualitative/qualquan.htm>

Quantitative Mode	Qualitative Mode
Assumptions Objective reality Variables can be identified and relationships measured Outsider's viewpoint	Assumptions Social construction Variables are complex, difficult to measure Insider's viewpoint
Purpose Generalise Predict Causal explanation	Purpose Context Interpret Understand actor's perspective
Approach Begin with hypothesis and theory Use formal instruments Experimentation Deductive Seeks consensus, the norm Abstract language write-up	Approach End with hypothesis and grounded theory Researcher as instrument Inductive Search for patterns Seek pluralism, complexity Descriptive write-up

2. Literature review

A brief review of mixed methods, the debate regarding quantitative and or qualitative analysis, along with pragmatism follows; as will examples of combining inductive, deductive and abductive approaches. Deductive reasoning can be criticized for a lack of clarity in terms of how to select the theory to be tested via formulating hypotheses. Inductive reasoning, on the other hand, has been criticised because “no amount of empirical data will necessarily enable theory-building” (Saunders, Lewis & Thornhill, 2012). Abductive reasoning, can address some of the weaknesses traditionally associated with deductive and inductive approaches (Dudovskiy, 2016) by adopting a pragmatist perspective.

2.1 Mixed methods and pragmatism

Feilzer (2010) argues for the practical relevance of pragmatism as a research paradigm through the example of crime scenes, criminal data and interpretation in court that not only uses both quantitative and qualitative research methods but also exploits the inherent duality of the data analysed. Thus, Feilzer aims to make the case that pragmatism supports the use of a mix of different research methods as well as various modes of analysis combined with a continuous cycle of abductive reasoning. Dudovskiy (2018) suggests that either or both observable phenomena and subjective meanings can provide acceptable knowledge that is dependent upon the research question. Johnson and Onwuegbuzie (2004) present mixed methods research as complementary to traditional qualitative and quantitative research, and pragmatism as offering an attractive philosophical partner for mixed methods research. They briefly review the paradigm “wars” and incompatibility thesis, and show some commonalities between quantitative and qualitative research. Williams (2007) proposes that researchers collect or analyse not only numerical data for quantitative research, but also narrative data for qualitative research in to address the research question(s). The mixed methods approach to research is regarded as an extension to rather than a replacement for quantitative and qualitative approaches (Johnson & Onwuegbuzie, 2004). The

goal for researchers using the mixed methods approach to research is to draw from both the strengths and to minimize the weaknesses of a more traditional single approach.

2.2 Quantitative and qualitative comparisons and the ‘paradigm war’

There are many differences and research role differences between the two methods for example quantitative research is deductive while qualitative research is inductive, see Table 2. Lincoln and Guba (1985) believe that quantitative and qualitative research are incompatible, while Patton (1990) thinks that an open-minded researcher should be able to combine both of the research methods. Different research methods allow us to understand different aspects of the world but researchers may conform to the methodology that is most related to their view of the world. These paradigms have totally different assumptions on the nature of the world, deploying different procedures and instruments to gather data (Table 2). Qualitative research is seen as naturalistic as it follows human behaviour. Qualitative methods have many different forms Goetz and LeCompte (1984) refer to it as ethnography. A researcher’s perspective directs the type of research questions and methods chosen. It has been suggested that a researcher must pick which paradigm they choose to use, as this paradigm will dictate which research question and methods that they will use in the study; but this statement has been challenged by Goetz and LeCompte (1984) where they think it is not useful to put simple dichotomies on research models. On balance, there seems to be little reason why research methods cannot be combined to produce a more accurate and descriptive study increasing the quality of the research.

2.3 Abduction techniques

Reichertz (2010) and Mitchell (2015) have referred to abduction as a knowledge-extending means of drawing an inference, as distinct from a logical conclusion based upon either deduction or induction. The idea of abduction can lead to rule governed and replicable knowledge that is both new and valid; and is increasingly popular in social science research. This approach has some links to grounded theory and was first popularised by Peirce an American philosopher, logician, mathematician, and scientist. Reichertz (2010) further suggests that there is a risk that in bringing order to chaotic¹ data, and fitting that data into a typology. Chong (1994) proposes that abduction and deduction are the conceptual understanding of a phenomena, and induction is the quantitative verification. With abduction, the goal is to explore the data, find out a pattern, and suggest a plausible hypothesis with the use of proper categories. Deduction is building a logical and testable hypothesis based upon other plausible premises; while induction is the approximation towards further inquiry. Chong offers this summary: as abduction creates, deduction explicates, and induction verifies.

2.3.1 Examples - the ubiquity of abduction thinking and approaches

Douven (2017) in the Stanford Encyclopaedia of Philosophy suggests a number of examples that demonstrate the variety of applications for abductive thinking. Philosophers as well as psychologists tend to agree that abduction is frequently employed (perhaps without appreciation) in everyday, routine reasoning.

- Our trust in other people’s testimony, which has been said to rest on abductive reasoning is one example. This may well be correct, although one does not normally seem to be aware of any abductive reasoning going on in one’s mind.
- Similarly, the role of abduction in linguistics where it has been argued that decoding utterances is a matter of inferring the best explanation of why someone said what he or she said in the context in which the utterance was made.
- Scientists have argued that abduction is a cornerstone of scientific methodology referring to abduction as “the inference that makes science.” Two examples of this application include:
- *When it was discovered that the orbit of Uranus, one of the seven planets known at the beginning of the nineteenth century, departed from its predicted orbit (on the basis of Isaac Newton’s theory of universal gravitation); then the assumption was made that there were no further planets in the solar system. Two astronomers, Adams and Leverrier suggested independently, that there was an eighth, as yet undiscovered planet and that this provided the best explanation of Uranus’ deviating orbit. Neptune, was discovered shortly after.*

¹ ‘chaotic’ reflects the assimilation of views from different interviewees, in different business units and /or companies expressed over time. In the case example given below (see 4.) some order is given by targeting senior executives and following the same questions.

- Secondly, discovery of the electron by the English physicist Thomson. He conducted experiments on cathode rays to determine whether they were streams of charged particles. The conclusion that cathode rays consist of negatively charged particles does not follow logically from the reported experimental results, nor could Thomson draw on any relevant statistical data. Nevertheless, he correctly assumed that this was the best and only plausible explanation.
- Abduction is said to be the predominant mode of reasoning in medical diagnosis: physicians tend to go for the hypothesis that best explains the patient’s symptoms.
- Finally, abduction plays a central role in philosophical debates on so-called under determination arguments. Under determination arguments generally start from the premise that a number of given hypotheses are empirically equivalent, which their authors take to mean that the evidence is unable to favour one of them over the other.

3. Case example research methodology – outsourcing decisions

The aim of this research was to examine the extent to which the offshoring and outsourcing practices in Multinational Corporations when the headquarters are registered and located in either the UK or Germany; are embedded in the institutional contexts of their respective home countries (Mitchell, 2015). This is primarily assessed through the ‘varieties of capitalism’ perspective. Additional theory was drawn from global production networks and the resource-based view of the firm. Two case studies were developed, one for the Airline sector and one the Engineering sector. In each case a leading UK and German company were compared. The overall approach is summarised below using the format established earlier in Fig.1.

Table 3: Selected combination of approaches

Philosophy	Approach	Strategy	Choice	Time Horizon	Techniques
Pragmatism	Abduction	Two paired case studies	Multi-method qualitative	Cross sectional	Semi structured interviews

3.1 Theoretical underpinning

The core underlying theory is known as varieties of capital (VoC) and the starting proposition here is that UK and German headquartered firms will behave differently largely in accordance with national characteristics and constraints. While a number of the ideas embedded in this theoretical concept have been criticised it is felt that the theory as a whole is sufficiently compelling that it can be central to our understanding of why German and UK companies in the same sector compete and behave in rather different ways.

3.1.1 Germany and the UK – VoC

The UK is widely regarded as a ‘Liberal Market Economy’, while Germany is best characterised as a ‘Coordinated Market Economy’ Vitols, (2001), Hall and Soskice (2001) further suggest that countries with a high-profile stock market tend to offer less labour protection (e.g. LME) than CMEs (e.g. Germany) where the agencies and institutions will adapt differently to sudden changes or shock thus leading to different corporate strategies, levels of innovation, employment practices and income distribution. The Case Study comparisons below (Mitchell, 2015) suggest that a UK company is likely to be dominated by a CEO with strong performance incentives linked to share price. The UK model is largely shareholder driven and regulated by the equity market that has dispersed ownership. A German company is typically characterised by consensus decision making balanced by multiple goals, and strong representation of employees (through works council etc.) who could block, or moderate the pace of corporate change; it is stakeholder driven.

3.2 Research questions

There are six research questions relating to differences in approach and choice of location, ownership and coordination, employment practice, cultural proximity, trade union influence and finally the extent of re-shoring (see abridged table 4 below). Three steps were followed:

- Step 1: Develop a novel conceptual framework based on a taxonomy of criteria that help to explain outsourcing and offshoring behaviour (Table 4 below). This ‘*abduction*’ provides a focus, to commence research and testing and is a useable re-construction of the predicted outputs from the research (the hypothesis).

- Step 2: Derive predictions from the hypothesis (*deductions*) these are where the researcher reflects upon answers to the interview questions for the airlines case study and for the engineering case study.
- Step 3: Search for evidence that will verify the assumptions (*inductions*) that are the propositions summarised in Table 5 below. These propositions are verified and lead to Conclusions.

3.3 Data collection

Fourteen interviews (including follow-up meetings) with senior executives, responsible for policy and strategic decisions were held over two phases with the case study companies. The interviews were held with business units from the four companies in the UK, Germany, India, Poland and the Czech Republic. The relatively small sample of interviews was not considered a limitation as the same questions were asked of executives with a high level of seniority, experience and involvement with outsourcing / offshoring policy.

3.4 Linking findings to propositions

From the findings and analysis, a detailed comparison of Table 4 with the ‘actual’ results were undertaken with a process of abduction, deduction and induction to derive propositions as in column three of Table 5 below.

4. From propositions to conclusions

Each proposition in Table 5 (abridged) was summarised and extended as an evidence-based conclusion. This included noting the contradictions and idiosyncrasies established from further searches of the primary data. In developing two case studies abduction thinking was key to explaining the empirical phenomenon relating to competition in the airline and engineering sectors; and in particular how UK and German multinationals developed different approaches to outsourcing. Finally, in conclusion, mixed methods were found to combine numerical and cognitive reasoning that led to a ‘best answer’ to data that otherwise could not always be adequately explained and contained a number of ambiguities. The findings were of practical use to managers in complex multinationals developing and implementing their strategy, also in understanding why their own organisation as opposed to an international competitor follow rather different paths given similar industry challenges. For students, researchers and academics the conceptual framework and taxonomy developed during this mixed method research proved to be a useful template for predicting how organisations might operate in practice and pulled together differing theoretical constructs.

Table 4: Taxonomy – theoretical projection of the hypothesis (author)

Research Question	Approach	Dimensions	Liberal Market Economy (LME) predictions	Coordinated Market Economy (CME) predictions
1. What are the differences in the geographical, functional and temporal patterns of outsourcing and offshoring?	Outsource	Motivation	<ul style="list-style-type: none"> • Cost cutting and employee reduction • English speaking countries • Traditional trading zones 	<ul style="list-style-type: none"> • Quality and performance, cost control is ‘a given’. • Central / Eastern Europe preferred
2. How far do mechanisms such as ownership, control, coordination and the degree of autonomy differ?		Ownership	<ul style="list-style-type: none"> • Shareholder driven 	<ul style="list-style-type: none"> • Multiple stakeholder
		Control & Coordination	<ul style="list-style-type: none"> • Arm’s length on strategy. Strict cost and budget control 	<ul style="list-style-type: none"> • Tight HQ control of strategy, policy and resources
3. How is this reflected in divergent international divisions of labour regarding the employment of indigenous or ex-pat managers?	Offshore	Degree of autonomy	<ul style="list-style-type: none"> • High – if meet financial targets then local control 	<ul style="list-style-type: none"> • Low • Hierarchical structure • Can be slow to respond to change
		Managerial Division of labour	<ul style="list-style-type: none"> • Low initial use of ex-pat managers who then stay on 	<ul style="list-style-type: none"> • High initial use of ex-pat managers for set-up and training. Subsequently local management
4. To what extent do preferences for cultural proximity affect location?		Cultural Proximity	<ul style="list-style-type: none"> • Low, flexible, opportunistic 	<ul style="list-style-type: none"> • High – language, behaviour.

Indicative extract only for brevity

Table 5: Case study findings lead to the development of propositions

Table 5: Case study findings lead to the development of propositions

Indicative extract only for brevity

Case Study 1 - Airlines	Case Study 2 - Engineering	Proposition
<p>1. Motivation – is primarily cost in UK with a focus on outsourcing support or back-office processes. In Germany while cost is significant it is not given the same over-riding priority; more concerned with central coordination of shared activities (e.g. Krakow) that can then be replicated around the world.</p>	<p>1. Motivation – outsource non-core activity locally in the UK, offshore to China and India (less keen). For German company offshore but retain ownership in a range of key international markets. Long-term development of embedded software products (India) and new platforms (Czech Rep). Driven by local expertise as well as cost.</p>	<p>1. Cost control is a key consideration in both sectors with UK and German companies. Coordination from HQ and a replication of shared services is important for both the German airline and the engineering company. Market development and local expertise is also important for the German engineering business. Both sectors seem to be consistent with the country VoC hypothesis.</p>
<p>2. Ownership – willingness to offshore and outsource in UK, reluctance to outsource by the German company who wish to retain ownership but at a lower cost.</p>	<p>2. Ownership – UK flexible with an initial willingness to offshore and outsource, only retaining control following a loss of IP. Reluctance to outsource in Germany contact with OEM through HQ.</p>	<p>2. In both sector cases, the UK companies were open to outsourcing and progressive offshoring; they were also flexible and prepared to divest, start joint ventures or acquire when circumstances changed. Reluctance to outsource from both German companies but willing to take lower costs from moving offshore if control is retained. Outsourcing in Germany however, remains on the agenda as further productivity improvements are demanded. Recent evidence of outsourcing IT systems at the German airline to IBM.</p>
<p>3. Control & Coordination – both outsource and move offshore from UK a significant role played by Procurement and contract management. In Germany tight control from HQ.</p>	<p>3. Control & Coordination – shareholder value a priority in UK, retaining control as an offshore subsidiary is important in Germany.</p>	<p>3. Procurement and Contracts drive the operational changes in the UK airline. Performance measures and SLAs are regarded as part of achieving budget in UK but the business is left alone to meet targets. German operations, are more constrained and have fewer 'degrees of freedom' they must consult with HQ on delivery.</p>
<p>4. Degree of autonomy – relatively loose in UK, high autonomy and flexible, tight in Germany but relaxes with trust over time and preference to near-shore.</p>	<p>4. Degree of autonomy – relatively loose in UK. Tight central control of design in Germany also close budget monitoring.</p>	<p>4. As suggested above – consistent with LME (loose) and CME (tight) styles for the UK and Germany respectively.</p>

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Research Paradigm and Philosophies Swept Under the Carpet: A Summative Content Analysis

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Abstract: Research methodology, paradigms and philosophies are considered important frameworks to guide all research. However, the nature and connections between methodologies and philosophical applications are relatively unexplored. There is no systematic attempt to draw out in great detail the practical implications of the disparity between the importance of philosophies and paradigms, on the one hand, for conducting research, and their application, on the other hand. A qualitative summative content analysis explores the extent of the application based on 225 articles, representing three broad academic fields. The practical implication of the disparity between theory and practice at a post-graduate level is drawn.

Keywords: research paradigms, philosophical application, research methods

1. Introduction

It is widely recognised by different scholars that different types of research are based on systematic scientific methodology (Saunders, Lewis, & Thornhill, 2012; Bryman & Bell, 2011; Zikmund, Babin, Carr, & Griffin, 2013), and on different sets of paradigms and philosophies, also known as worldview or set of beliefs (Guba & Lincoln, 1994; Seale, 1999; Saunders et al., 2012; Killam, 2013). Advocates of research methodology and paradigms (Killam, 2013; Guba & Lincoln, 1994; Saunders et al., 2012; Parahoo, 2006; Polit & Beck, 2008; Steen & Roberts, 2011) attest that to understand research, one must examine the methodology of the study and philosophies that underpins researchers' paradigms. This is because knowledge is not neutral (Habermas, 1972), and all researchers' have deeply embedded world views and inherent preferences that affect knowledge production and shape research designs (James & Vinnicombe, 2002; Volbers, 2009; Kuhn, 1970; Habermas, 1972; Jensen, 2000).

Yet, it is unclear whether researchers include their research methodology, paradigms and philosophies in the research papers published. Creswell and Clark (2007) note that 'some' researchers make their world views explicit by discussing them in their research; others recognize their presence but do not actively discuss them in their research'. Based on this view, the question arises: How can research be understood when the research paradigms and philosophies are not presented or acknowledged in most articles? Especially, since some scholars (Johnson & Onwuegbuzie, 2004; Guba & Lincoln, 1994; Saunders et al., 2012; Bryman, 1984; Becker, 1996) suggest that both qualitative and quantitative methods may be used with any research paradigm and consider the association thereof as a secondary matter to research methods, making it difficult to predict the scholars' epistemological stances from the basic methodology described. Unless, of course, the authors of all those articles without research paradigms and philosophies belong to the school of thought that research paradigms and philosophies are primary to research methods (Parahoo, 2006; Polit & Beck, 2008; Steen & Roberts, 2011).

Even so, there is more than one research paradigm and philosophy with differing implications that can be linked to one or more research approaches, so one cannot simply presume and assume associations to qualitative, quantitative or mixed methods.

Within the literature reviewed, fundamental differences exist on the actual references pertaining to types of paradigms vis-a-vis philosophies, approaches and strategies. Some scholars' references of types of paradigms include positivism, critical theory and interpretivism (Lincoln & Guba, 1994; Mackenzie & Knipe, 2006), qualitative and quantitative (Cluett & Bluff, 2006), and axiology or values (axios), epistemology or knowledge (episteme), ontology or reality (ontologia), and doxology or belief (doxa) (Killam 2013). Other researchers consider philosophies such as positivism, critical theory (Seale 1999; Saunders et al., 2012; Newman & Benz, 1998), epistemology and ontology (Guarino 1998; Bryman 1984). On the same basis as Killam (2013), this paper understands that the terms mentioned above are often debated, described, interpreted and referenced in numerous 'correct' ways. Therefore, in this paper ontology, epistemology, axiology, and doxology are paradigms; hence types of philosophies include, but are not limited, to pragmatism, critical theory, positivism, interpretivism, strategist and reductionism. This paper investigates several research articles in various research fields to determine whether researchers include their methodology, paradigms and/or philosophies in their

papers. The aims of this paper are, firstly, to draw out the disparity between the importance of philosophies and paradigms, on the one hand, for conducting research, and their application, on the other hand. Secondly, to draw out in great detail the practical implications of the latter to teaching and learning at Masters and PhD levels. The paper commences with the theoretical background, followed by the importance of research methods, philosophies, and paradigms with specific attention to its common views in shaping all types of research. The aim is not to dwell on the differences of whether research paradigm and philosophies are secondary or primary to methods but, rather, to focus on theory with relative to practice. As this demonstration, serve as a necessity, given the practical implication of the latter to masters and PhD students. Hereafter, the background is explained and the findings and discussion of findings follow.

2. Background: Relevance and application to research

A careful exploration of scientific paradigms and their relations to theory (theorists) that guided thought and knowledge development is necessary so that a clear identity in the broader discipline is established. Philosophies and paradigms can be explored within the guidelines of some of the major knowledge development theorist, amongst others, John Locke, David Hume, Rene Descarte, Immanuel, Kant, and Hans Reichenback (Rosenberg, 2000; Bunge, 2009). Taking rationalist and empiricist as default examples in this context, the two philosophical views brings forth two different school of thoughts. One that is pioneered by John Locke and supported by David Hulme points towards knowledge development from experience, hence rationalist differs, and advocates for knowledge gained through reasoning and logic such as those in mathematical disciplines. Although different, the relevance of research paradigms and philosophies as guides and framework for research culminate from these latter theorists. Much of these theoretical backgrounds are discussed greatly by studies on philosophy of science and research methods (Theunissen, 2014; Miller & Grimwood, 2015; Rosenberg, 2000; Denzin & Lincoln, 2003; Patton, 1982; Saunders et al., 2012; Killam, 2013; Lincoln, 1990).

Viewed together, their central contention is that philosophy is a fundamental prerequisite for understanding studies of all science, including its methodology. Looked at differently, science and philosophy are inextricably inquiries; where philosophy focus on logic, nature and extent of justification of knowledge, and science focuses on the reliability of logical reasoning (deductive), and finite bodies of data to general theories (inductive sciences). That is philosophy is indispensable for understanding science and vice-a-versa. It is for the indispensable nature of philosophy and science, that philosophy and paradigms are divided into two broad roles that include, but not limited to: (1) guiding researchers in choices of methods, and (2) frameworks that reflect the basis on which research is conducted (discussed below).

2.1 Research paradigm and philosophies as guides to choices of methods

The guiding thread of research paradigm and philosophies to choices of methods stems from the role of 'episteme' or knowledge and ontologia as inner cognitive state that is connected to observations, experiments, abstracts, narratives, interpretations of experiences and conceptualised practice (case studies). The latter guiding thread becomes the basis on which reality is measured and research variables are validated (Jensen, 2000; Guarino, 1998; Bryman, 1984). Wahyuni (2012) states that many research scholars, including but not limited to: Creswell (2013); and Saunders et al., 2012, (2009), emphasise that it is important initially to question the research paradigm to be applied in conducting research because it substantially influences how one undertakes a social study from the way of framing and understanding social phenomena. Although presenting from an ontological perspective of computer science, Guarino (1998) emphasises strongly the methodological and architectural peculiarities associated with philosophies from a high interdisciplinary approach that play a role in analysing the structure of a given reality and in formulating a clear and rigorous vocabulary. Put differently, the former connection and latter views is what scholars (Killam, 2013; Newman & Benz, 1998; Blaikie, 2000), consider as guides to choices of methods which influence design and the conclusions drawn from the research. These guides to choices of methods are consistent with methods described by many research advocates (Svivasta & Rego, 2011; Saunders et al., 2012; Sekaran & Bougie, 2010). The importance and relevance of research paradigm and philosophies is discussed by several scholars (Blaikie, 2000; Hatch & Cunliffe, 2006; Guarino, 1998); emphasising strongly how paradigms encourage academics to observe the same phenomena in different ways and, subsequently, to derive different kinds of knowledge from different philosophical perspectives. Further implications of paradigm and philosophies to research are offered by Guba and Lincoln (1994) and include an outline of the nature of knowledge, knowledge accumulation, and quality of criteria, values, ethics, the voice of a researcher, training and accommodation with relative to the practical conduct of inquiry and interpretations of findings. Against this background, Becker (1996) believes that 'a lot of energy is

wasted hashing over philosophical details, which often have little or nothing to do with what researchers actually do'. Counter to Bercker's (1996) view, opposing studies warn that if these underlying paradigms and philosophies are taken for granted, not identified or discussed; issues of bias and implicit assumptions to certain aspects of the inquiry or phenomena are prevalent (Blaikie, 2000; Hatch & Cunliffe, 2006). Making it difficult to question, consider and discuss the findings and views of such research. The question therefore is how different streams of knowledge can flow and continue to be derived from the same phenomena in cases where paradigms and philosophies are less considered. Unless, of course, recent scholars can derive different streams from the same phenomena independent of paradigms and philosophies; and if so, what are the implications of research paradigm and philosophies given such independence in the 21st century? It is an issue similar to that raised by Morgan and Smircich (1980), of whether or not researchers can manufacture any form of knowledge that is independent of subjective construction, since the researchers are the agents through whom knowledge is perceived or experienced.

2.2 Research paradigm and philosophies as frameworks for research

The application of knowledge or 'episteme' produced within the framework of research dates back to the second century BC, where Euclid's elements and Plato's empirical research concept of knowledge set the platform for general, logical and practical applications that lead to what constitute theoretical knowledge with the aid of objective procedures and evidence (Jensen, 2000; Fuchs, 2005). The view of 'episteme', 'axios', 'ontologia', and 'doxa' in research grew in the 13th century with the creation of some of the world's best university including, but not limited to Bologna, Paris and Oxford (Jensen, 2000). Since the initial offering of paradigm and philosophies as frameworks by Euclid and Plato (Jensen, 2000), several scholars continue to offer different views of paradigms and philosophies as frameworks for research (Killam, 2013; Denzin & Lincoln, 2003; Patton, 1982). Whilst Denzin and Lincoln's (2003) view is that of 'interpretive framework'; Patton (1982) refers to paradigm as frameworks for thinking about research design, measurement, analysis, and personal involvement. Morgan (2007) extends the view of framework as shared belief systems that influence the kinds of knowledge that researchers seek and how the evidence collected is interpreted. Hence, Killam's (2013) framework uses the analogy of 'coloured glass lenses' that direct everything in research. The emphasis put forth by the latter scholar is that research can be viewed differently, depending on the 'colour of glass lenses' one is wearing, that is ontological: epistemological or axiological stances and associated philosophies.

Therefore, to minimise bias and understand the position of such knowledge in research, others needs to understand the epistemological, ontological, axiological stances and associated philosophies adopted. In supporting view, Morgan (2007) indicates that the examination of issues raised by qualitative, quantitative or mixed methods approach must start with the dominant paradigm, rather than assessing the approach on its own. This is because the implications presented by particular approach are dependent to researchers' pre-existing commitments to their beliefs and practices. Therefore, evaluation of research issues has to be considered within the researchers' paradigm and philosophical stance. Similarly, Lincoln (1990) attests that the pervasive effects of paradigms permeate every aspect of research inquiry. Whilst the latter scholars' framework perspective implies that paradigm and philosophies are the 'veins' through which research flows; Seale (1999) encourages social researchers to 'break 'free' from the obligation to fulfil philosophical schemes through research practice, while remaining aware of the value of philosophical and political reflexivity for their craft'. In other words, Seale's (1999) 'break-free' perspective is different from that of 'no knowledge is neutral' of Habermas (1972), and risk being interpreted as if all social sciences hold a single or neutral philosophical view.

If the scholarly field and journal editorial bodies are engaged in knowledge production, but without acknowledging the paradigm and philosophies that underlies that particular knowledge, one wonders what evolution of knowledge production is emerging from these practices. What is the relevance of paradigm and philosophies in teaching and learning if practice is not necessary or does not contribute much to knowledge re-production?

3. Methodology

From a critical realist epistemological stance, this paper reviewed 225 articles using a summative content analysis approach. Hsieh and Shannon (2005) explain that 'a study using a summative approach to qualitative content analysis starts with identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content. This quantification is an attempt not to infer meaning but, rather, to explore usage'. This approach seems quantitative in the early stages, but its goal is to explore the

usage of the words/indicators in an inductive manner (Zhang & Wildemuth, 2009). In this paper, a critically analysis is conducted to identify whether the research articles included the following words or context: “methodology”; “research design”; “research approach”; “paradigm”; “philosophy”; “qualitative”; “quantitative”, “experiment”, “case study”, “archival”; “ethnography”, “survey”, and “action research”. Several journals were selected from broad major academic fields of Education, Health Sciences and the Social Sciences. Furthermore, 15 sub-disciplines were included, namely, from Education: child education, education management, education psychology, human education, and mathematical sciences. In the Health Sciences, the sub-disciplines are: anatomy, dentistry, neurology, radiology, and surgery. The Social Sciences’ sub-disciplines include: business management, economics, finance, human resources and marketing. The aim of this broad selection is to demonstrate explicitly the argument of relevance and its implication for teaching and learning on the basis of application of research, paradigm and philosophies in top journals across several disciplines. The academic fields that were reviewed are presented in Table 1. The years 2000 and 2007 were used as benchmark comparison periods against which 2014 articles could be examined. For all three years, all articles were coded that employed research paradigm, philosophy and/or methodology words. Refer to Table 1 for main fields of study and their respective subfields (25 articles per respective year, totalling 75 articles for each main field of study).

Table 1: Academic sub-fields reviewed

Main Field of Study			Year of Publication			Total
			2014	2007	2007	
Social Sciences	Sub-Field of study	Business Management	5	5	5	15
		Economics	5	5	5	15
		Human Resources	5	5	5	15
		Finance	5	5	5	15
		Marketing	5	5	5	15
	Total	25	25	25	75	
Education	Sub-field of study	Maths Science	5	5	5	15
		Education Management	5	5	5	15
		Education Psychology	5	5	5	15
		Child Education	5	5	5	15
		Human Education	5	5	5	15
	Total	25	25	25	75	
Health Sciences	Sub-field of study	Dentistry	5	5	5	15
		Neurology	5	5	5	15
		Radiology	5	5	5	15
		Surgery	5	5	5	15
		Anatomy	5	5	5	15
	Total	25	25	25	75	
Total		75	75	75	225	

3.1 Sampling

Following global universities classification of sub-disciplines framework, the study randomly selected 225 published articles from top International Scientific Indexing (ISI) journals. The ISI/Web of Science journals represent a pool of global academic scholars and are considered the cream of the scholarly field. From each sub-discipline, a total of 15 articles were randomly selected, five each from the years: 2000, 2007, and 2014 respectively. The list of ISI/Web of Science Journals from which articles were randomly sampled are: *Journal of Management Studies (JMS)*, *Cambridge Journal of Economics (CJE)*, *Human Resource Management Journal*, *Abacus-A Journal of Accounting Finance and Business Studies*, *Journal of Business and Industrial Marketing*, *Journal of Research in Mathematics Education*, *Education Management Administration and Leadership Journal*, *Education Psychology Journal*, *European Early Childhood Education Research Journal*, *Cambridge Journal of Education*, *Journal of Dentistry*, *Journal of Neurology*, *Journal of Clinical Radiology*, *Journal of Surgery*, and *the Journal of Anatomy*.

3.2 Analyses

The study aimed to assess the inclusion of research methodology section; and the application of research paradigm and philosophies in articles published in top ISI/Web of Science journals across 15 sub-fields or academic disciplines. This was done to determine the relevance in practice as expounded in research theory.

The 225 randomly selected articles were analysed by means of a two-step method. The first step involved recording a list of all 225 articles into an Excel spread sheet. The coding scheme in the Excel spread sheet included eight (8) columns. The first six (6) columns were categorized using open coding scheme and comprised of: broad field of study, sub-field, title of the article, author(s), volume and issue number, and year of publication. The remaining two (2) were added to reflect findings from a summative analysis of each reviewed journal and categorized in excel as: methodology section, and research paradigm/ philosophy. Open coding allows researchers to identify the key research methods contained within each article reviewed (Babbie, 2013). The scholar’s emphasis is that, it is necessary to uncover and open up the articles, in order to expose the thoughts, ideas, and meaning contained in the articles. The latter scholar warns that the inability to uncover (open up) the articles, compromises the rest of the analysis and communication that follows the research. The summative content method involved identification of key words related to research methodology terms such as: methods, qualitative, quantitative, case study, survey, experiment, action research, archival, ethnography, interviews, questionnaires’, focus groups, paradigm, philosophy, epistemology, ontology, axiology, interprivist, pragmatist, positivist etc. Under methodology section column 7 of Excel spread sheet, a dichotomous nominal scale was adopted to elicit yes or no answers in the assessment of the inclusion of methodology section. Hence a category format scale was considered to reflect the type of paradigm/ philosophical stance discussed and a ‘none’ option where not applied in the last column 8. After summative analysis recording in Excel, the second step commenced and involved exporting the data of the 225 into SPSS where they were analysed to obtain descriptive frequencies and for cross-tabulation purposes. The quantification in this context was to explore usage for the purpose of latent content analysis (process of interpretation of content) embedded within summative analysis. It should be noted that data relating to authors, titles of articles, volume and issue numbers and any other direct details of the articles are not presented to maintain anonymity and respect the scholars’ integrity. The findings, frequencies and cross-tabulation presented in the results section represent the two-step method of analysis, namely: summative and SPSS analysis.

4. Results

Although the primary aim of the paper is to draw out in great detail the practical implications of and the disparity between the importance of philosophies and paradigms, on the one hand, for conducting research, and their application, on the other hand; information pertaining to inclusion of methodology section is also reported since the application of paradigm and philosophies are mainly reviewed in this section. This also helps to assess common practice and standards across all three broader disciplines and associated journals. Analyses of application per broader field of study and inclusion of methodology section are presented in Table 2 for the three years (2000; 2007 and 2014). From the analysis in Table 2, it appears that there are articles published without the methodology section, most appearing in the broader field of Social Sciences (44 out of 75), followed by Education with 27 out of 75. Interestingly, only two of the 75 articles in Health Sciences are without a methodology section. Hence, none of the 75 articles from Health Care explicitly discussed or applied their paradigm and philosophical stance. Comparing Social Sciences with Education, no difference could be found between the two academic fields; both hold 3 articles with paradigm and philosophical stances. Overall, only 6 (2.7%) of the 225 articles sampled applied research paradigm and philosophical stance. Contrary to the relatively limited paradigms and a philosophical application however, a significant number of articles, 67.6 per cent (152 of 225), have methodology discussions across the three fields.

Table 2: Broad field methodology inclusion and paradigm/ philosophy application

Main Field of study			Methodology section included		Total
			Yes	No	
Social Sciences	Is research paradigm and philosophies discussed	Yes	3	0	3
		No	28	44	72
	Total		31	44	75
Education	Is research paradigm and philosophies discussed	Yes	3	0	3
		No	45	27	72
	Total		48	27	75
Health Science	Is research paradigm and philosophies discussed	No	73	2	75
	Total		73	2	75
Total	Is research paradigm and philosophies discussed	Yes	6	0	6
		No	146	73	219
	Total		152	73	225

4.1 Sub-fields and names of journals with no methodology

Results findings pertaining to no methodology sections raised curiosity to assess the sub-fields and journal origins of these articles. Starting with Social Sciences, the majority of articles with no methodology are from the sub-field of Economics published in the Cambridge Journal of Economics; literally none of the 15 sampled articles had methodology section. Notably, there are methodology sections appearing from the sub-field of Human Education published in the Cambridge Journal of Education as opposed to the sister Cambridge Journal of Economics. The sub-discipline of Finance in the field of Social Sciences follows suits with 10 articles without methodology published in Abacus-A Journal of Accounting Finance and Business Studies. The difference of one article with no methodology separates the total number of articles from the sub-field of Human Resources published in the Journal of Human Resource Management and sub-field of Marketing published in the Journal of Business and Industrial Marketing respectively.

The journal with the least occurrence (4 articles) came from sub-field of Business Management published in the Journal of Management Studies. The sub-field of Business Management concludes the Social Sciences' most record of no methodology section articles. Moving on to the field of Education, the sub-field of Human Education published in the Cambridge Journal of Education holds the most (10) articles) without a methodology section. This is followed by 8 articles with no methodology sections from the sub-field of Child Education published in European Early Childhood Education Research Journal. The latter journal exceeds the sub-field of Education Management published in the Educational Management Administration & Leadership with 3 articles without a methodology section. The sub-field of Education Psychology holds only 1 article published in Education Psychology Journal. The last sub-field of Education, namely, Mathematical Sciences contains fewer frequencies (2) of articles with no methodology section published in the Journal of Research in Mathematics Education in the field of Education. The 2 articles with no methodology appearing in the field of Health Sciences relate to the sub-field of Neurology. In comparing all Journals, the Cambridge Journal in both Social Sciences and Education fields combined, tops the charts with most prevalent articles without methodology sections (87% or 26 of 30 articles sampled in the Cambridge Journals had no methodology section). The Cambridge Journals alone represent 12% of the total 32.4% articles without methodology sections across all disciplines.

4.2 Sub-fields with paradigm and philosophical stance application

From the 2.7% (6) articles that applied paradigm and philosophical stance in Table 2, the sub-fields of Business Management and Human Education hold 2 equal records each, representing the broad fields of Social Sciences and Education. Hence, Marketing and Human Education hold single record each, also from the latter broad academic fields. Interpretivism appeared in both fields of Social Sciences and Education. Hence, strategist and positivism are other Social Sciences' philosophical stances, which are different from reductionism and phenomenology, two stances reflected in the field of Education. Although the fields of Social Sciences and Education have the most articles without methodology on the one side of a coin, on the flip side, both fields have highest number of articles with paradigm and philosophical discussions.

4.3 Main field of study with years of paradigm and philosophical application

Of particular interest was whether or not there is an increase or decrease in application of paradigm and philosophical stance over the sampled years presented in Table 3. The results findings of the field of Social Science are consistence for 2014, 2007 and 2000, with one record of application appearing each year from the 75 sampled articles. Hence, there is a degree of change in the field of Education; from the total of 75 articles sampled, there was a slight increase of 1 more article in 2007 from just 1 article recorded in the year 2000, but the increase did not hold in year 2014, recording zero paradigm and philosophical application. Comparing 2000, 2007 and 2014; the paradigm and philosophical application in year 2000 increased by 1 article from 2 to 3 articles in 2007, but decreased by 2 articles in 2014. The trends appear to suggest that from the current, relatively limited application, paradigm and philosophical application are swiftly disappearing.

Table 3: Main field of study with years of paradigm and philosophical application

Is research paradigm and philosophies discussed			Main Field of study			Total
			Social Sciences	Education	Health Science	
Yes	Year of Publication	2014	1	0		1
		2007	1	2		3
		2000	1	1		2
	Total		3	3		6
No	Year of Publication	2014	24	25	25	74
		2007	24	23	25	72
		2000	24	24	25	73
	Total		72	72	75	219
Total	Year of Publication	2014	25	25	25	75
		2007	25	25	25	75
		2000	25	25	25	75
	Total		75	75	75	225

5. Discussions and conclusions

This paper reviewed 225 articles published in 15 different sub-disciplines Journals to explore the application of (1) methodology sections and (2) paradigm and philosophical stances in the scholarly field. The investigation serves as necessity, given the question of its relevance and implication for teaching and learning for Masters and PhD students and its future in the scholarly field. The findings indicate that statistical differences exist amongst disciplines when differentiated by their sub-fields and journal types in relation to inclusion and discussion of studies' methods of investigation. Of the 225 articles surveyed from the 15 sub-disciplines and associated journals, 73 articles (32.4%) have not included methodology section. Most of this practice is found in the Social Sciences and Education, rather than Health Sciences. Put simply, 152 articles (67.6%) included research methodology sections. The sub-fields giving rise to the practice of not including a methodology in the field of Social Science is Economics, where not a single article, published in the Cambridge Journal of Economics had a methodology section. The latter sub-field is followed by the sub-fields of: Finance, Marketing, Human Resources, and Business Management sharing a total of 29 articles amongst them. In Education, the practice of not including methodology sections in articles is more prevalent in the sub-field of Human Education, Child Education, Early Childhood Education and Education Management. What can be deduced from the different journal types is that articles published in the Cambridge Journal of Economics and the Cambridge Journal of Education are not inclined to have methodology sections and discussions. This suggests that there are different perceptions of research methods across disciplines and journals; which have implications for teaching and learning. Therefore, to ensure consistency of standards and quality, the differences should be considered across disciplines. This is not to advocate that the practice in Economics and associated Cambridge Journal of Economics and Cambridge Journal of Education be amended in line with the findings of this study, only that the implications of differences in practice be reflected in teaching and learning or be carefully considered. This should be carefully considered to avoid confusion and misunderstanding in teaching research methodology courses. Of the total of 225 articles analysed, only 2.7% (6 articles) applied a paradigm and philosophical stance across 15 sub-disciplines. The findings provide some interesting statistical evidence concerning the application of paradigm and philosophies and the question of its relevance in research and the scholarly field.

The findings have implications for advocates of research methods and, for academia, in that the message conveyed in the teaching and learning of paradigms and philosophies, and the way in which the learning is applied in journals, at national and international level, may have to be reconsidered. To offer paradigms and philosophies as: (1) guides for researchers in choices of methods, and (2) frameworks that reflect the basis under which research is conducted; yet, potentially ignoring the findings of this study, makes the advocacy of paradigm and philosophies in research appears to be inappropriate. If the advocacy of research paradigm and philosophies is to be encouraged, certain practices of scholars in top journals must be taken into consideration; otherwise its limited application may deem paradigm and philosophies to be irrelevant to the development of and outcome of research knowledge. Put simply, the findings appear to negate the view and importance of paradigm and philosophies in the literature previously discussed (Blaikie, 2000; Hatch & Cunliffe, 2006; Guarino, 1998; Guba & Lincoln, 1994); and embrace Becker's (1996) belief that 'a lot of energy is wasted hashing over philosophical details, which often have little or nothing to do with what researchers actually do. Therefore, if Becker's (1996) view is to be deemed irrelevant, then research theory should reflect research practice in top ISI journals, to justify the relevance of paradigms and philosophes as guides and framework for research in teaching and learning.

Considering that scholars taking part in top ISI/Web of Science journals are important drivers of knowledge production, their application, influence and power in propagating the use paradigm and philosophies can serve as a model that widen the process of knowledge production, especially for teaching and learning at Masters and PhD levels. This is because the practices of scholars and editors in ISI/Web of Science Journals alone have a tendency to affect knowledge development outcome positively or negatively. Further areas of interest included an observation of whether the application of paradigms and philosophies across disciplines was increasing or decreasing. The analysis shows a decrease from 6 articles to 1 article between the years 2000 and 2014, with Education disappearing in the scene, leaving only the field of Social Sciences as the main player. Interestingly, Seale (1999) states that 'philosophy is often presented as underpinning the craft of social research', but the findings present a different view, contradictory to Seale's statement. Only 3 of the 75 Social Sciences articles presented philosophical discussion for their research.

The fact that only 6 articles applied research paradigms and philosophies across the years: 2014, 2007, and 2000, suggests a strong indication that research paradigms and philosophies have reached a critical juncture in their relevance in academia. Whether this juncture represents maturity, a rising trend or a decline remains an interesting future research question. The relatively limited application found in these journals has evolved to the point where retrospective assessments are warranted from both scholars and the editors of the journals. Perhaps the exclusion of paradigm and philosophical is due to the fact that most papers are co-authored, and the presentation of different stances causes even more confusions. Since the primary focus of this paper is on application, it would be beyond the scope to elaborate on this point.

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Entangled Biographies: A Multi-Biographical Approach in Study of User Communities Around Information Infrastructures

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Abstract: In research into the field of technological user communities, we note the emergence of long-living user groups around large-scale information systems designed to be used over long periods of time, possibly decades. These communities around such complex infrastructures are growing in numbers universally. They facilitate effective information exchange, activity coordination, and advances in innovation between geographically, organisationally, and culturally diverse groups. Complexities of the user communities and information infrastructures around which they operate, calls for consideration of multi-temporal and multi-spatial research into these settings. This paper is inspired by concerns about the methodological weakness of many studies of technology user communities; in particular as most studies often have a single site, short-term view of such settings. To achieve this, the current paper, intends to represent how the diverse presence of time and space in information systems user communities effects the outcomes of the research. Hence it applies the Biographies of Artefact – BoA (Pollock and Williams, 2008) approach to study of IS user communities. The paper which is a part of a larger study of Enterprise Resource Planning (ERP) user communities shows how the methodology is applied and it will reflect upon the implications of adoption of the BoA in investigating IS user communities within a limited time period. In order to do this, the current paper primarily investigates the need for widening the study lens of communities around information infrastructures in different locales and moments. It then provides a critical review of the BoA approach. Then it demonstrates how this approach can be adapted and applied to a large number of communities around different products to fit in a shorter duration of the time, while it also takes into account the long-term presence and consequence of technological user communities and information infrastructures. This new approach in study of technological user communities is particularly relevant and timely, as scholars have called for better methods in understanding the ongoing challenges encountered in studies of infrastructures and their surroundings.

Keywords: user communities, biography of artefact, research approach, information infrastructures

1. Introduction

There has been an increase in spatial awareness in studies of technology user communities through notions such as spaces of knowing, spatial proximity, localised learning, and knowledge spaces (Amin and Cohendet, 2004, Maskell et al., 2006, Matthiesen, 2013). The importance of space has also been a central theme in collaborative work studies (Olson and Olson, 2000). However, despite its importance, the ‘time’ dimension of user communities has remained relatively undertheorised. Activities unfold over time and therefore temporal aspects must remain the central theme in examination of collaborative practices conducted in community settings (Karasti et al., 2010). Hence, this paper will focus on the time dimension and examine ‘multi-temporal’ facets of user communities around technological artefacts.

This paper draws on 150 hours of observations of various user community events followed by 15 formal interviews with the governing body of the community, attendees of the events and the vendor employees. The observations were carried out on 24 events (including more than 85 sub-events) over a period of six years, between May 2010 and April 2013. The study also collected data from the group’s e-mail conversations and the web documentations available to its members. This data was collected between 2012 and 2016.

2. Biography of Artefact

In attempting to provide better templates for analysing technology over time and location, Pollock and Williams introduce the BoA approach, which asserts the need to move the analytical lens beyond the immediate inter-organisational level of direct interactions between suppliers and users. To do this they build upon the spatial metaphor of ‘Arena’ by Jørgensen and Sørensen. (1999): ‘...a development arena is a visualising spatial expression of processes of competition and co-operation. It should convey the idea that several actor-worlds are being construed within the same problem area. It depicts the idea that several actor networks co-exist and interfere with each other within a certain problem space...’. This distances BoA from earlier approaches like ANT by suggesting that space is shaped by numerous other arenas in constant collaboration needing to be explored. ANT addresses multiple locales to the extent (and only when) actors move between spaces. It also does not consider how entrenched structures and repertoires of action shape and constrain action. BoA seeks to address both of these aspects using the notion of ‘arena’. The concept of ‘arena’ counters ANT’s approach in that, in ANT

by 'following the actor' the researcher share the blindness of the actors being followed, meaning that if actors are unaware of other competing innovations then they don't appear in the analysis and lots of other innovations are therefore ignored. Instead, in BoA, by considering 'arenas', dislocated processes and actors are brought together into one place, allowing the researcher to analyse other innovation possibilities.

This characteristic of the BoA framework leads to examining the relationships between various arenas and how actions are set in broader environments. Secondly, the BoA framework also emphasises the need to move beyond a short timeframe, drawing attention to the changes occurring over time to organisation and technology. This refers to the term 'biography' as it follows an artefact over its lifespan. Pollock and Williams (2008) suggest that this could involve multiple levels of detailing and generality and the ability to move in and out of each level of analysis if need be. Finally, BoA underlines the fact that research that black-boxes technology and its vendor tends to lack examination of development processes and history behind technology formation. This leads to underestimation of design decisions as well as simplistic presumptions of development trends. As a result, a multi locale research is required to take into consideration design, implementation and use. Pollock and Williams (2008) suggest that to examine development and evolution of information infrastructures, different overlapping arenas should be studied, which include the development arena, the implementation arena, and the networks of external experts. In investigating these arenas, research needs to reflect upon not only the user and vendor, but also other actors surrounding the technology.

BoA argues that studies need to be tackled in extended timeframes and for this to happen complex temporal design methodologies such as a combination of longitudinal studies, follow-up studies and long-term historical investigations are required. However, like many other studies which have an artefact-focused agenda, by implying that success in technologies is realised through the mobilisation of a community of users (Oudshoorn and Pinch, 2005), BoA also places technology at the core of the analysis. This sometimes results in having a tendency to offer the vendor's view of the artefact and paying less attention to other perspectives. Hence, in this paper, by placing the community (an assemblage of different actor types and artefacts) at the centre of analysis, we aim to extend the BoA approach to offer a better understanding of growth and evolution of information infrastructures and its community in tandem. In doing so, we will also attempt to offer a more structured way of applying a biographical approach in the study of complex artefacts and user communities by introducing a phased-wise model of analysis.

3. Exploration of the events over time

Our fieldwork in examining multiple spaces shows a dynamic view of the user communities by highlighting the role of time in the evolution of communities and showing how the purposes and hence the discourse and processes of several user groups change over time.

UKOUG is a collection of specialised groups. Each group comprising of volunteers from user organisations, the vendor, and intermediary organisations. This diversity of actors involved in the group, conforms to the first characteristic of the BoA, which is considering multiple actors and actor types. In this respect, the study was explorative in terms of discovering all the possible actors that emerged in the study spaces. This explorative approach made it evident that in various cases the same actors performed different roles over time and between different spaces. This also allowed for investigation of how each community interrelates with other arenas. To take into consideration the other two characteristics (multi-temporality and multi-spatiality), we moved the analytical lens beyond a single user group and looked into several spaces in tandem. This will be explained in more detail in the following subsection.

Here we will summarise the evolution of the events (with regard to the technology) of three specific user groups: Financial Special Interest Group (FSIG), Public Sector Human Capital Management Customer Forum (PSHCM), and Scottish Public Sector Oracle User Group (SPS).

PSHCM was a long-standing group running for almost 10 years. The activities of this group were observed from 2010 to 2013. We then followed the online activities to understand the changes over time. Table 1 summarises the activities over the four years.

Over the months as the PSHCM community grew in numbers and more users attended the meetings, more collaboration was observed in generating solutions. The community also became more organised in approaching

the vendor in developing UK specific needs. As a result of the successes that users achieved in this group, they launched a new public sector user community on the financial modules of the product, known as the Public Sector Financials Customer Forum (first meeting held in October 2012).

Table 1: A summary of PSHCM activities

September 2010	User experience of implementation of R12, issues and problems Interactive talk of functionalities of self-service and unmet needs Presentation of Oracle E-business Suite upgraded features and changes in Human Capital Management module Interactive talk on requirements and new developments on 'academies' functionality, challenges in roll-out and use
February 2011	Presentation of the Self Service Absence Planner product and its integration with Oracle Update on Fusion applications (the new ERP product by Oracle). Presentation on Oracle on the Human Resource Analytics product and its benefits Update on the academies solution followed up from the meeting in September Update on the status of School Workforce Census solution (a requirement by PSHCM user community).
September 2011, May 2011	Users expressed their needs and solutions and asked Oracle for enhancements. Slow update provided on previous requests.
February 2012	Update on the enhancements requests prioritised by the community: Self Service Batch Element Entry (SSBEE) and Multiple Payroll Solution. User stories: Implementation of Oracle Absence through Self-service functionality Talks by Oracle on real-time information (RTI) functionality and its availability in different versions of EBS, updated support timelines, and Oracle's solution for teacher pensions. Oracle explained their teacher pension solution. Then this led into an interactive session where users explained what they expected Oracle to develop to meet their needs.
May and September 2012 and February 2013	Large extent of user involvement including sharing of stories as well as participating in solutions generation and exerting power on the vendor to incorporate their needs.

We also studied sessions from FSIG, from October 2010 to September 2012. These user group meetings showed a transformation of functionality within the user group from what may be referred to as 'vendor and third party driven' events to more 'user-centric' sessions.

In the meeting held in October 2010, Oracle informed users about the latest features and functionalities of the system and trained used about how to set-up and work with the system (including multi-organisational architecture and Fusion application). There were two presentations by third party organisations on new products and some short presentations by users on their experiences in implementation and use of the system. There were also a large number of exhibitors presenting their products during the breaks. In this meeting, one of the users made a very sharp comment that third party organisations come to each meeting with promotions of their products. Other users supported this comment as they requested 'pure user meetings' where they can talk openly and share their ideas. This showed an increasing conflict, which had remained silent for a while but had burst into something that users asked to be acted on. Although some partner organisations were approved by users as 'helpful and informative', for the most part they were known as 'companies wanting to sell their products' or in more extreme cases as 'resellers of user ideas'.

The next meeting, held in February 2011 was very different. There was only one exhibitor, the number and contents of user stories had grown significantly, the focus had shifted from Oracle version 11i to R12. The event also had a 'Surgery' event in which users discussed their problems and requirements. In this event, other users and in some cases Oracle offered solutions. There was also an open forum in which users concentrated on their current issues with Oracle and discussed their solutions, workarounds and customisations. Oracle also asked for volunteers who would be willing to participate in design and test activity for a future version of the product to step forward.

In meetings that followed in May 2011 and September 2011, the contents were much similar to the February meeting: user stories and discussions of ideas amongst users in surgery sessions. In the cases of presentations by third party organisations, they also reported on their products through user presentations. What changed more significantly in the next meetings was the extent of attention given to Oracle R12, the most up-to-date

version of the EBS. There was also a new initiative by Oracle to gather information from Oracle EBS Financials R12 customers for preparation of roadmaps for the future releases of R12 and Fusion applications (the new Oracle product line which was not released at that stage of the study).

In March 2012 and May 2012, two main 'pain points' were identified: 'E-Tax' and the 'Payments' process. These issues, which had led to limited usability of the functions and ad hoc customisations by users, were followed up as a result of participation of users in planning solutions and providing recommendations to the vendor. Then in September 2012, the first introductory workshops on the solutions for these two issues was held, which received a lot of input from the audience.

During the above mentioned period, the user group underwent significant transformations in two ways: 1) the aims and structure of meetings - from being a place where users received product updates and trainings from the vendor and other third party providers to functioning as a place where users' knowledge and experiences were shared; and 2) from version 11i of the product to version R12 and in occasional cases to Fusion applications.

Finally we studied SPSUG's first event on March 2011. This group was shaped as a result of conversations that took place in October 2010. In October a meeting was held in Oracle premises in Edinburgh entitled 'Quick Start Masterclass for Fusion Development with JDeveloper and Oracle ADF'. In this meeting, which was organised by Oracle, customers mainly from Scotland and North of England were trained on Oracle ADF. During the break times, one of the users from a Scottish Public Sector Organisation (John) started a conversation on the need for a Scottish Public Sector user group. The conversation was welcomed by other public sector users and led into the planning of the first event in March 2011. The planning took six month, in which John called for collaborations between Scottish users. He asked them to give presentations on their experiences at this event. He also asked Oracle and one of its partners to give updates on their new offerings. The user group meeting attracted 27 delegates, six speakers and two Oracle representatives. The meeting started with a presentation on the importance of having a SPSUG. The presentation involved a discussion of what the needs are and how they can be met by this group. Then three presentations were given by the speakers: a user presentation on the experience of moving from version 11i to R12, an Oracle presentation on the financial modules, and a partner organisation presentation on the golden rule of implementation management. Then a long discussion was shaped around the common issues faced by Scottish public sector users. This discussion went into details of their requirements and how they can convince Oracle to take them into consideration. In this regard, although the users found common grounds for collaboration and sharing of solutions, they were very doubtful on whether they would have enough power to exert on the vendor. Their main argument was that the number of users in Scotland is not yet sufficient for the exertion of power. There was also a feeling of not having the 'suitable contacts' to get in touch with Oracle. The group then agreed that having the power to influence the products was the highest aim of the group. However, not all members reached agreement on having enough authority yet. Hence, they decided to assess the situation in two years' time in anticipation of having a larger body of public sector users in Scotland who would have a 'louder say' which could 'influence vendors products'.

4. Discussion: The biography of community

This study shows the need to explore user communities beyond a single timeframe as the lifespan and trajectory of the community is inextricably wound up with the development and evolution of the technology. The study revealed how the emergence of technologies leads to the formation of new communities and how the evolution of technologies influences the attached communities (and vice versa).

The findings show that observation of user communities at different points in time, present a different perception of their functions. Therefore, we need a longitudinal approach to gain a better understanding of their nature. The biography of a community is dependent on two time dimensions: the community age and the product age. These present two 'multiple historical timeframes' (Williams and Pollock, 2011) when investigating user communities and their actions with respect to a particular technology. So the object of analysis is not a standalone community, instead it is an entity (i.e. the technology user community) which functions predominantly in response to a second entity (i.e. the technology).

Therefore multiple intertwined timeframes exist which need multi-levels of analysis. Table 2 shows a possible division for the age of community and age of products proposed by this study. This categorisation of ages, which we have adapted from Utterback and Abernathy's dynamic model of innovation (Utterback, 1974, Abernathy

and Utterback, 1978, Utterback, 1994), explains the dynamic nature of the community during the evolution of a technology. Utterback and Abernathy's model offers four phases of lifecycle: fluid phase, transitional phase, specific phase and discontinuity. In their model in the 'fluid phase', there is a considerable amount of product and market uncertainty. Developers are not sure about the features of products and customers are not certain about their needs and expectations. Then after there is a standardisation of the core components and features, the product enters its 'transitional phase', in which the uncertainty lessens and the dominant design emerges. Then the evolution enters the 'specific phase' in which the product proliferates in the market and finally after its replacement with other products it enters 'discontinuity'. By adopting this stage division, we are not conveying anything with regard to the technological evolution and the inputs to design and development. Rather we are using this categorisation to show a stage-wise nature in the lifecycle, for both technology and its surrounding user groups.

In the categorisation offered in this paper, the product age can fall in any of the four phases whereas the community age may only fall in the last three phases. As the aim of this research is to provide a community perspective on information infrastructures, we propose a slight change to the original model by incorporating the view of users and vendors on the products to define each stage. To do this, primarily, we divide the product lifecycle into three stages: (1) prior to product release; (2) throughout release and while supported by the vendor; and (3) post product support stage, also known as 'de-supported'. The first stage is while the product is not commercially available to all users; it could range from the idea generation period, to development and test in pilot sites. This is the 'fluid' phase at which the vendor is keen to know the users' requirements and users are curious about the future technology and only have an incomplete 'vision' of it. The second stage starts as the product is publicly released for general implementation. This stage is then divided into two further periods in the perspective of adopting organisations: the first is the period when the majority of the users are in pre-implementation and implementation phases of the product, and the second stage is the period in which the users are predominantly in their post-implementation phase. We refer to these two stages as the 'transitional' and the 'specific' stages of the product respectively. Finally, the last stage of product age is when the product is no longer supported by the vendor. These products are out-dated products, which are still used by the user organisations; however, the organisations cannot obtain a support licence for them from the vendor. This means that the vendor is no longer obliged to provide support or patches for the bugs in the system. We refer to this period as the 'discontinuity' phase of the product age.

Table 2: Community/ product age characteristics

<i>Stage Name</i>	<i>Description of Community Age</i>	<i>Description of Product Age</i>
Fluid	-	Unreleased products; Initiates from product design Continues until initial early adoptions
Transitional	In the process of formation or newly formed	Newly released products; Initiates from early adopter user organisations; Continues until the majority of user organisations are in the pre-implementation or implementation phase; Vendor product support available
Specific	Established Communities; Structured events	Released products; Majority of user organisations in the post-implementation phase; Vendor product support available
Discontinued	No events organised or recurring event cancellations	User organisations in the post-implementation phase; Vendor product support expired

Community age is defined based on the event development and member enrolment of each user group. There are three stages in the community age: transitional, specific, and discontinued. The transitional age is when a community is in the process of formation or it is newly formed. In such communities, the rate of member enrolment is high and there is high uncertainty in the details of the events. As a result of this, diverse needs are negotiated and new events emerge continuously. The events of these communities are not yet set into routines and the community members meet on a need basis. There are also communities stemming from existing communities and following similar forms that have a more structured launch. PSFCF was an example of such community. Yet again, they are more flexible in their agenda and members negotiated on needs and plans.

The specific stage starts as the community events occur on a more regular basis. The needs of the community members are recognised and acknowledged; new needs arise on a less frequent basis, and then evaluated by the organising committee. An example of these occurred in the FSIG in October 2010 in which a number of users argued about having too many third party organisations in the meetings. This led to significant change in the

FSIG in February 2011, in which the sessions started to be more focussed on ‘user stories’ rather than ‘third party sales pitch’.

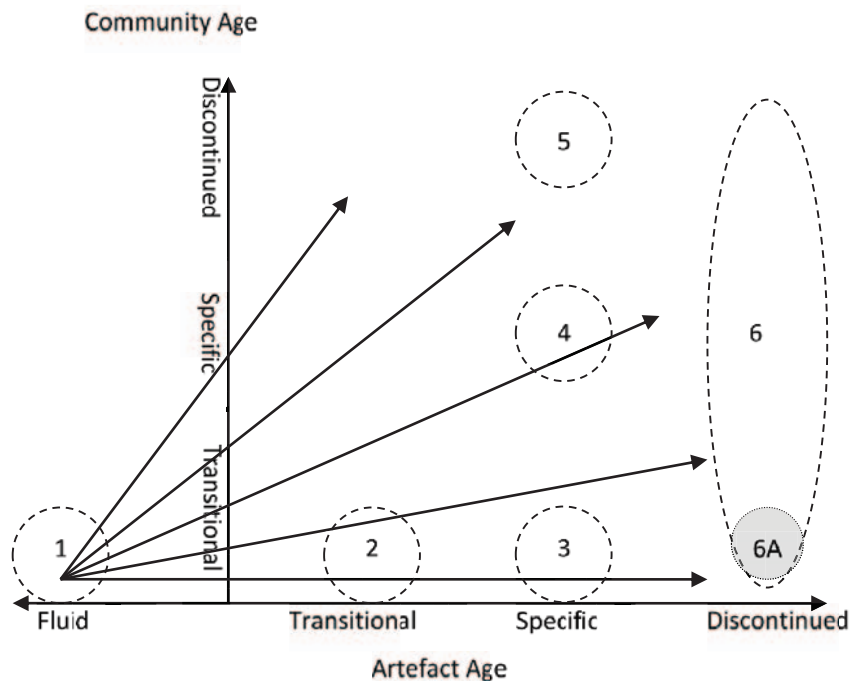


Figure 1: Biography stages

Finally, the discontinued phase occurs as the regularly organised events lessen gradually, the members leave the community or withdraw from attending the events, until a point that the community stops functioning.

We present Figure 1, to illustrate the possible environments and spatial metaphors with respect to product lifespan and community maturity. This figure illustrates how the community may evolve from one phase to the next in either direction.

In this model, the community can move from one stage to the other on two different dimensions. The horizontal axis demonstrates the age of the artefact so moving from left to right shows the changes that occur as the artefact evolves over time. The vertical axis shows the community age, hence moving from bottom to top shows the different positions a community could be based on its maturity. The numbers on the graph illustrate some possible points of time of the biography of the community. For instance, Area 1 shows the communities in the process of formation or newly formed communities around unreleased products – this includes products under development and test. Area 2 illustrates the communities under formation or newly formed communities around newly released products. As the product matures and the majority of users (members of the community) become live on the product, the nature of the community moves to areas 3, 4 or 5 based on the maturity of the community. These communities are all surrounding the same types of artefact with respect to product lifespan: released products adopted by users and supported by the vendor.

Figure 1 shows a linear view of transformation of a user community. However, our empirical case shows that there are points of time when the evolution of the community from one stage to the next goes beyond the linear movement on the X- and Y-axis. It can form a spiral movement. This occurs as a community centred on a particular product changes nature due to the introduction of new versions of vendors’ products. This is evident in cases where the community matures around a particular product and then the product evolves into its discontinued stage. In such cases, the mature community continues its existence in a stable situation but new versions of the old products become the main point of attention for the community. This shows the possibility of a spiral movement on the X-axis. An Example was the FSIG which functioned around financial modules of Oracle 11i products. As version 11i moved toward its old age, version R12 became the point of focus for the community. In this way, the community continues its functions around the new version. Hence in a single

community, as time goes on the old artefact will be ruled out by the new artefact. In such cases, there is a possibility of formation of a new user group around a discontinued artefact. In such cases instead of having a spiral move on the Y-axis, a new community is formed. This is shown in Figure 1, in area 6A.

5. Conclusion

In this paper, we have produced a multi temporal study of user communities. In this way, we have unfolded both the history of the community and its underlying artefacts. This multi-temporal timeframe is vital to capture not only the evolution of technology but also the evolution of the communities attached to it. Accordingly, what we observed in the community was a co-evolution of both the space and the technical artefact. Without such an analytical lens detecting the dynamism of the community and its effect on the technology, and vice-versa, would have not been possible. For instance examining a newly formed community around a newly released version of the product could imply that the user group is a 'marketing community' (Szmigin et al., 2005) in which users are being updated about the future products. Instead, what we observed was a bi-directional influence as the technology shaped the community and, the community reformed the technological artefact.

The biographical approach in the study of communities enables the researcher to view the community as an 'arena', a concept used to refer to a space that holds together different elements (e.g. actors, artefacts, and standards) and several locales of knowledge and actions. In this way no actor is made 'other' (Pollock and Williams, 2008). Through this lense, we can observe not only a wide range of possible actors but we can also account for their potential conflicting viewpoints. So following a biographical approach, we observed several overlapping 'arenas', each showing a different view of the community. Moreover, through this multi-spatial lens we could see that the diverse range of actors are performing differently in each setting. The variation of the roles as well as change of members' attitudes towards the community over different locales as well as over different timeframes (both with regard to product and community maturity) shows the need for multi-spatial and multi-temporal studies.

Finally, in contrast to the mainstream studies around user communities of information infrastructures, which refer to user communities as merely an 'innovation community' (Lakhani and Von Hippel, 2003, Von Hippel, 2005) or studies that only focus on communities knowledge practices such as 'communities of practice' (Wenger, 1999), without considering the evolution of technology or the conflicting viewpoints on the technological artefacts, a biographical approach enables us to see a co-evolutionary community with heterogeneous practices. This shows the importance of considering 'time' and 'space' as key elements in study of such user groups. This is not just to say that we should study the same community(ies) for longer – rather that we should deploy more nuanced methods for accessing such complex spaces. Therefore, this study shows that instead of prolonging the study duration, we can study the same family of artefacts and several user groups at different stages of their lifecycle simultaneously. It also suggests that the same artefact families –for instance different products from the same vendor - can be studied at the same time to capture different characteristics of varying spatial and temporal aspects.

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Analysing Qualitative Data: The Value Interviewee Reviews Add to Constructed Analyses

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Abstract: This paper demonstrates how `interviewee reviews` add value to constructed analyses of qualitative data. As assumptions amongst researchers continue to differ about what reality is and whether or not it is measurable, `interviewee reviews` are not only adding value to analyses but, more importantly, provide clarification, explained meanings, and help researchers to arrive at recommendations. This paper draws on the novel use of reviews as cultural artefacts to demonstrate how they enrich analysis in the construction of case-studies for Oxfam GB, Action Aid, Christian Aid, Water Aid and Amnesty International. Using interviewee reviews is an extended iterative phase relied on to ascertain whether or not the perspectives of key informants are represented with a high degree of validity. The *constructionist* approach underpinning the proposed enrichment of analyses is a key element of Representation Theory. Five elements are discussed in relation to the subject, these are, *Key Informants, Interviewee Reviews, Constructed analyses, Contested Issues, Representation Theory*

Keywords: Constructed analyses, Key informants, Contested Issues, Interview Reviews and Representation Theory.

1. Introduction

This paper aims to demonstrate the value interviewee reviews add to analyses and, how aggregated reconstructions help researchers to arrive at recommendations.

The paper focuses on a discussion of analysis used in research regarding Developmental Charities (DCs), whose stakeholders have conflicting views regarding how the use of Developmental Funds (DFs) can be improved upon in the beneficiary communities. The enrichment of analyses discussed in this paper is not only of interest to those who manage DCs, funders of DCs and researchers but, also, to all the different stakeholder groups and societies associated with the aforementioned organisations (Mukasa & Warburton, 2017).

This study contends that the allocation and use of DFs can be improved upon; firstly by a novel analysis of the conflicting perspectives of all stakeholder groups associated with DCs regarding the subject. Secondly, by offering all conflicting voices through representation the opportunity to ascertain whether or not their perspectives are rightly represented in analyses and, thirdly, by relying on aggregated reconstructions to arrive at recommendations.

The decision to propose the use of reviews as a highly iterative phase to enrich analyses is motivated by; firstly a concern about increased anxieties from donors regarding expenditure of DFs, and their shared view that the managers of the organisations they are involved with have a different perspective compared to other stakeholders regarding how DFs should be allocated and used. Secondly, the narrative shared by a considerable number of stakeholders that the directors of DCs are managers of other people's money as opposed to their own, who cannot naturally be expected to watch over it with the same anxious vigilance like private business owners would do and, thirdly, that the understanding of those who manage DCs regarding the use of DFs is attained and amended through their own individual experiences and therefore, should not be generalised to represent all stakeholder groups or societies (Jensen & Meckling, 1976; Walker, 1997; Stake, 1978).

This paper begins with a discussion of possible approaches which can enrich qualitative analysis. It then discusses the construction of analyses regarding contested and complex issues. The other sections focus on demonstrating how meanings are constructed from texts, how value is added to analyses, and how aggregated reconstructions carry recommendations. The paper draws on the author's experience as an informed key informant when working on his doctoral thesis: `The adoption of business-related practices by overseas developmental charities (DCs): A comparative study of the relationship between organisational ethos and the use of resources`.

2. Alternatives to Interviewee Reviews

Other approaches which add value to qualitative analysis were considered. The first of these was to consider the value participant observations add to analyses. This was rejected because (i) the researcher was an informed key informant who had already looked at all the different sets of data gathered from every key informant, (ii) the researcher was familiar with the subject and interviewed the actors and non-actors associated with it and, (iii) relying specifically on participant observations would make the study to lack objectivity. On the other hand the study considered enriching analyses by way of using case and cross-case analyses, matching-patterns, and triangulating data sources. This approach was also rejected as it would not offer interviewees the opportunity to provide clarification and further meanings to what they meant. Thirdly, the study considered relying on examples of key moments, critical incidents and quotes from key informants to enrich evidence. It was observed however, that such evidence was already carried in narrative accounts (Evered & Louis, 2001; Newman & Benz, 1998; Creswell & Miller, 2000; Zahra & Pearce, 1990).

The use of reviews is considered extremely useful for this specific study because; key informants are the principals who reflect on their individual experiences and understanding to provide clarification and further meanings to what they meant.

3. Adding Value to Analyses

The best practices associated with interviewee reviews are (i) they provide specific clarification and explanations which help researchers to make sense of or interpreting phenomena in terms of the meanings people bring to them, (ii) they add clear and precise texts to analyses which draw on a variety of empirical materials (*case studies*), personal experience, introspection, interview, observation and interactions, (iii) that they can confirm or refute description of situations, events, people, interactions, observed behaviours, and direct quotations from people about their experiences, attitudes and beliefs and, (iv) they help researchers to make well-informed conclusions (Creswell & Miller, 2000; Patton, 1990).

In this study, interviewee reviews are used in unique ways which are novel to DCs. Firstly, they are used as cultural artefacts which add meanings to analyses of contested issues. Secondly, they are used as a highly iterative phase of analysis to confirm or refute the validity of the differing perspectives of stakeholder groups represented. Thirdly, they carry specific texts used to arrive at recommendations (Mukasa, 2016; Weber & Mitchell, 1995; Warburton & Saunders, 1996; Hall, 1997).

The use of reviews is underpinned by a *constructionist* approach, which is a key feature of Representation Theory. This approach emphasises that responses to contested issues which have to be interpreted by others in order to make sense are carried in what people say (Weir, 2005; Hilpinen, 1992; Thomasson, 2003a, 2003b). The *constructionist* approach guides the use of reviews to demonstrate firstly, that specific groups or societies associated with DCs share similar views, interpret or make sense of contested issues in roughly similar ways, and their shared views are based on social experiences. Secondly, that the author's productive intention is to use reviews to ascertain whether or not the differing perspectives of all stakeholder groups are represented by a high degree of validity and, if not, to use aggregated reconstructions to enrich analysis.

4. Analysing Contested and Complex Issues

The main factor which provided the motivation to propose the use of reviews was the observation that; the perspectives of those who manage DCs regarding the subject under study differ from those of other stakeholders. A considerable numbers of stakeholders who are not directly involved with the management of DCs argue that although those who manage their organisations are experts in their role, their understanding and interpretation of the issues which might affect other stakeholders is attained through their individual experiences and therefore, such understanding is likely to differ or to conflict with that of other stakeholders. The terminology 'contested issues' is used to describe the conflicting, differing or contradicting responses gathered from a wide range of key informants regarding the subject of how DCs can improve the allocation and use of DFs. Every key informant has a different story to tell and when all relevant texts are compiled the study then effectively deals with the analysis of contested issues (Yin, 2003; Zahra, 1990; Kvale, 1996; Mukasa & Warburton, 2017).

All stakeholders should have the opportunity to contribute views and ideas regarding how their organisations can improve the use of DFs. We propose that analyses regarding contested issues can be enriched if the

principals who were interviewed are given the opportunity to confirm or to refute the perspectives represented in the constructed analyses. This approach can prove extremely useful to arrive at conclusions and recommendations respectively which incorporate all differing views.

This paper relies on semi-structured-dialogic interviews as an integral part of the method to gather texts. The objectives of the study are:

1. To identify factors relating to the need for DCs to improve the allocation and use of developmental funds.
2. To explore a significant problem, i.e. that the managers of the DCs represented in the study described might not have seen the benefits that could be gained by their organisations incorporating wider public perceptions into the strategic planning of how DFs can be effectively used.
3. To address the benefits of why public understanding should be incorporated into the allocation and use of DFs, and to put forward a new and robust operating model incorporating the perceptions of all stakeholders who contribute and/or have a vested interest in the operations of DCs - by accretion and aggregation which could help them improve the spending of DFs.

5. Outline of the Method

Research questions were reformed to suit all key informants who were categorised in four data sets and introduced to de-briefing interview prompts, which carried pre-determined themes taken or developed from the research questions. Interview prompts were used as a guide to probe for specific *texts* that respond to specific themes. In effect, prompts guided the interviewer to ask general questions at the start of the interviews, which become more specific as the interviews progressed.

Based on their individual experiences and reasoning, the 54 key informants interviewed were expected to suggest how DCs can improve the use of DFs.

The interview schedule was divided into five sections. The interview themes were:

1. The Management of Developmental Charities
2. Income Sources of Developmental Charities and Expenditure of Developmental Funds
3. Projects Undertaken by Developmental Charities and Improving the Management of Projects
4. Resource-Use Practices That are in Common with Businesses and Developmental Charities
5. The Transfer of Practices From Profit-Driven Organisations to Developmental Charities, Which are Novel to Those Charities

Figure 1: overleaf shows key informants, differentiated by type.

Data Set 1 This set was made up of senior managers representing the five DCs.
Data Set 2 This was an integrated data set. It was made up of managers of the five DCs at lower management levels, regular donors/funders to the five DCs, and informants representing the regulators of DCs in the United Kingdom.
Data Set 3 This data set was made up of managers experienced in the management of both DCs and businesses, campaigners, and activists for DCs.
Data Set 4 This data set was created to specifically provide documentary data relevant to the study from informants associated the five DCs (information which has never been made public before)
Data Set 5 This data set was made up of beneficiaries of DFs, opinion leaders, celebrities, and fundraisers.

6. Thematic Analysis – Method of Representing Meanings

In this section, we demonstrate how meanings are constructed from texts gathered from a wide range of key informants who provide conflicting perceptions.

The Management of Developmental Charities

The majority of the 54 key informants interviewed are of the opinion that though DCs may be well-managed, some of their practices relating to the allocation and use of DFs are a concern to stakeholders. Of the 54 key informants interviewed, 32 described the management of DCs to be appropriate, 12 described it as good, while 10 described it to be outstanding:

“People in the United Kingdom do support DCs not necessarily because their use of DFs is outstanding. The tradition of giving to charities is deeply ingrained in their culture”. (Informant D19)

The view carried in the above text is shared by 31 other interviewees who made three observations (i) the managers of DCs associate the increase in the number of donors and DFs respectively to outstanding resource use practices of their organisations, (ii) people who are motivated and inspired to help others in need will always do so before questioning how DCs use DFs and, (iii) donating to charities is morally rewarding especially for those people with the desire to help others.

Of the 54 key informants interviewed, 47 appreciated that (i) DCs are organisations working towards relief of poverty and distress in the poorest communities of the world and, (ii) that DCs are trying to help `needy and vulnerable` people in the poorest communities of the world by establishing sustainable infrastructures which can provide them with the basics of life.

From the interview constructs, 37 key informants strongly argued that DCs need to improve the management of DFs. They argued that because DCs help people in need, they seem to be immune from scrutiny.

“When you try to advise DCs to improve their use of DFs others might think you don’t care for those suffering or dying. With £billions being received as donations every year, the management of DCs has to be improved”. (Informant D33)

Income Sources of Developmental Charities and Expenditure of Developmental Funds

Some of the approaches DCs use to generate income were a concern to many stakeholders. From the responses gathered, 39 informants were concerned with the practice of face-to-face street and door-to-door fundraising. They shared three issues associated with the practice which are; firstly, the practice is perceived to be associated with `guilt-trips` and `harassing` members of the public, and thus, damaging the image of charities.

“I believe people are increasingly getting tired of being stopped every single day by different fundraisers asking for money. It’s possible to be stopped on every street in central London by a fundraiser and I guess this is the case in other parts of the country”. (Informant D19)

Secondly, the practice is perceived to be very expensive and unethical for charities. It takes at least 18-24 months to recover fundraising costs (i.e. for a donor paying by direct debit, the first 18-24 monthly payments go towards fundraising costs). Thirdly, the practice is associated with encouraging the cultural of paying higher salaries and bonuses to employees in the not-for-profit sector.

“The management of DCs is okay but I don’t agree with their expenditure and I don’t believe its right to pay their marketers and fundraisers bonuses or performance-related pay”. (Informant D22)

On the contrary, 10 of the 54 key informants who are directly involved with the management of DCs stressed the importance of face-to-face and door-to-door fundraising for charities. They offered three reasons as to why the aforementioned practice is important for the existence of DCs. Firstly, street and door-to-door fundraising rescued charities from a downward spiral in income when the cost of the tried and trusted methods of fundraising escalated. They explained that every £1 spent on street and door-to-door fundraising, generates at least £4 over a period of time (normally 5 years).

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Secondly, DCs and fundraising agencies are comfortable with the practice. It has been relied on for so many years to generate £millions for worthy causes and, thirdly, the practices lead to the employment and work experiences of hundreds of people within the not-for-profit sector.

“One of the reasons why charities [were perceived] to be badly managed is that they relied too much on goodwill and provided little financial reward for those people involved with their management”. (Informant D3)

Of the 54 key informants interviewed, 41 were concerned with the expenditure of DCs. They stressed six areas which concerned them most, and these are; the failure by those who manage DCs to find more cost-effective means of generating incomes, paying higher salaries to employees working in the not-for-profit sector, sanctioning expensive marketing and publicity costs, undertaking large-scale projects hastily, inadequate monitoring and supervision of developmental funds and projects, and the ‘unsatisfactory’ management of emergency and disaster funds.

Projects Undertaken by Developmental Charities and Improving the Management of Projects

The need for DCs to improve the supervision and management of developmental funds in the beneficiary communities was a recurring theme emerging from the responses of the interviewees. Of the 54 key informants interviewed, 38 were concerned those who supervise developmental projects in the beneficiary communities are trusted to supervise, allocate and to use DFs without close supervision by the executives of DCs.

“...remember those who manage DCs are professionals hired to allocate and use other people’s money and not their own money. We shouldn’t expect them to watch over it with the same rigorousness like those who manage private organisations.

The majority of key informants (38) shared two issues which are represented in the above text, which are (i) too much freedom is given to partners in communities where projects are undertaken to allocate and to use DFs without close supervision, monitoring or adequate accounting systems in place for the effective management of donor funds and, (ii) the ‘top managers’ managers of DCs are not always based in the communities where developmental projects are undertaken to practically oversee organisational activities and, the cost of operations.

Of the 54 key informants interviewed, 14 were satisfied with how DFs are allocated and used in the beneficiary communities.

“We are satisfied with how DFs are spent on projects and we would not have increasing numbers of funders and donations if the majority of members of the public disagreed with our resource use practices”. (Informant D2)

Of the 14 key informants who are satisfied with how developmental funds are spent in the beneficiary communities, 10 who are directly involved with the management of DCs shared two views. Firstly, they appreciate that their style of allocating and using DFs might not satisfy every individual stakeholder and therefore, some stakeholders will always have concerns.

“...you might have a million volunteers but it can be difficult to trust them to manage £millions donated every year. Such funds have to be handled by professionals with the knowledge, right skills and experience. If charities fail to do so donors will be discouraged”. (Informant D9)

Secondly, they are of the view that DCs are organisations managed by professionals who put systems in place to ensure DFs are used effectively.

Resource-Use Practices That are in Common with Businesses and Developmental Charities

The perception that DCs can adopt some of the practices common in the business field in order to improve their management of DFs was one held by 39 key informants. They shared the narrative that; what is construed or described as business-related practices, are in effect practices that can be applied by all organisations irrespective of the sector as long as they do not conflict with organisational ethos.

They emphasised that as long as practices which are widely associated with businesses do not conflict with the ethos of DCs and can lead to the improvement of how DFs are used, then such practices should be considered by those managing DCs to improve the management of DFs.

The 39 key informants who held the aforementioned perception mentioned specific practices widely applied by businesses and, likely to improve the allocation and use of DFs if considered by those who manage DCs. They mentioned; specialisation in specific projects, vigorous and tight supervision of funds, robust cost-cutting measures to reduce operational costs, limiting the influence of politicians in the management of projects, and representing causes based on the preferred priorities/demands of the service users/beneficiary communities.

The Transfer of Practices From Profit-Driven Organisations to Developmental Charities, Which are Novel to Those Charities

Thirty three key informants held the perception that the management and supervision of funds by business organisations is more vigorous and tight than that of not-for-profit organisations.

“What I have observed over some many years is that negligence and profusion must always prevail more or less, in the management of the affairs of not-for-profit organisations that use agents and volunteers.”
(Informant D21)

The 33 key informants shared the narrative that because managers of DCs allocate and use other people’s money as opposed to their own, it should be assumed that they will not always be expected to vigorously supervise it tightly in comparison to partners of a private company.

7. Interviewee Reviews

In this section, we demonstrate how the value of interviewee reviews rests in the clarifications and further meanings which key informants provide to compliment what they meant in their interview responses.

When constructed analyses responding to the theme *‘The Management of Developmental Charities’* were reviewed, 40 key informants agreed with the constructs and 14 provided clarification and further meanings to what they meant in the interview responses. Of the 54 key informants, 44 provided clarifications on two issues; firstly they clarified that people donate to DCs without knowing how their donations will be used because DCs represent ‘needy and vulnerable’ people in the poorest communities of the world who cannot survive without urgent help. Secondly, it can be difficult to critic how DCs are managed because if you do so, you might be construed as someone who does not care for those in desperate need of help or those likely to die if urgent help is not provided.

When constructed analyses responding to the theme *‘Income Sources of Developmental Charities and Expenditure of Developmental Funds’* were reviewed, 35 of the 50 key informants agreed with the constructs, and 14 suggested possible measures that can help DCs to improve the use of DFs. They suggested that (i) DCs should limit the limit the influence of politicians and governments of benefitting communities in the management of donor funds, (ii) DCs should put more pressure on governments to make policies that help those in poverty, (iii) DCs should be more bold and encourage people world-wide to unite against [perceived] oppressive leaders who are described as responsible for the suffering of many people in the poorest communities of the world and, (iv) DCs should allocate most of their funds towards protecting people’s rights, improving representation of the beneficiary communities, and setting up their head offices and operational structures in communities where projects are undertaken

When constructed analyses responding to the theme *“Projects Undertaken by Developmental Charities and Improving the Management of Projects”* were reviewed, 43 key informants agreed with what was constructed but provided suggestions. They suggested that DFs should be closely monitored and supervised in the communities where projects are undertaken. They recommended that (i) DCs should setup their head offices and operational structures in the communities where most of their projects are undertaken in order to achieve their defined objectives, (ii) their management should review the scale of projects undertaken and concentrate on those which reflect their visions, beliefs, objectives and purpose, (iii) they should limit the influence of politicians in the allocation and use of DFs and, (iv) they should adopt robust cost-cutting measures on overhead costs.

When constructed analyses responding to the theme “*Resource-use Practices That are in Common with Businesses and Developmental Charities*” were reviewed, 39 of the 54 key informants explained that (i) both businesses and DCs outsource to minimise operational costs and risks and, periodically re-brand their services/causes; (ii) both work in partnership with other organisations and third parties to achieve their defined objectives and, are managed by professionals; (iii) both are competitive and aim to dominate in their respective fields and, their allocation and use of funds relies on tacit or codified decisions; (iv) both market their products/causes to individuals and organisations using similar methods and, have systems in place to consolidate their existing customers/supporters; (v) both invest to generate incomes and to expand their products/causes and, value public relations and corporate social responsibility; (vi) both rely on strategic and business plans and, their activities are audited.

When key informants reviewed constructed analyses responding to the theme “*The Transfer of Practices From Profit-Driven Organisations to Developmental Charities, Which are Novel to Those of Charities*”, 42 of them relied on their individual experiences and observations to explain that; there are procedures, methods, processes or rules widely applied by profit-driven organisations to achieve their objectives which DCs have not tried before, which are likely to improve the allocation and use of DFs if are considered by those who manage charities. They recommended that those managing DCs should consider; specialisation in specific projects which reflect their aims and objectives, vigorous and tight supervision of funds, robust cost-cutting measures to reduce operational costs, limiting the influence of politicians in the management of projects, and representing causes based on the preferred priorities/demands of the service users/beneficiary communities.

However, 10 key informants clarified that; what is construed or described as ‘business-related’ practices are in effect practices which can be applied by all organisations irrespective of the sector as long as they do not conflict with organisational ethos or lead organisations into disrepute.

8. A Brief Methodological Note

We would recommend the use of interviewee reviews for (i) unscientific analyses which represent people’s reasoning regarding contested issues using socially constructed knowledge derived from views which are real, and evidence that explains why people’s perspectives cannot be rightly represented by simply relying on scientific methods or rule-governed acts, (ii) for studies where the role of the researcher is likely to compromise or impact analyses, (iii) for studies where natural languages of key informants are relied on as cultural artefacts to represent meanings using the principal of either *naturalist*, *constructionist* or *interpretive* approach to *Representation Theory* and, (iv) for studies where a researcher is able to establish a relationship with interviewees for purposes of gathering data and re-contacting them to review analyses (Usher, 1996; Flyvbjerg, 2006; Mukasa, 2016; Weber & Mitchell, 1995; Warburton & Saunders, 1996).

Interviewee reviews are extremely useful for qualitative studies focusing on contested subjects.

9. Conclusion/Recommendations

This paper has demonstrated how the perspectives of individuals and groups regarding contested issues can meaningfully be attained from constructed analyses. As demonstrated, interviewee reviews adds a distinctive feature to constructed analyses, which is that, reviews do not only provide clarification and further meanings to what key informants meant in their interview responses, but also, help researchers to easily arrive at recommendations by reflecting on aggregated reconstructions.

Interviewee reviews helped us to arrive to four conclusions. Firstly, although those who manage DCs perceive the increases in donations as a key success indicator and evidence to support their resource-use practices as outstanding, the majority of stakeholders argue on the contrary, that such increases result from DCs representing worthy causes which are close to people’s hearts. Secondly, the study identified previously unreported or under-researched practices likely to improve the use of DFs. Thirdly, the study discovered benefits associated with adopting practices construed as ‘business-related’ that managers of DCs have not yet identified, tried or applied in their organisations. Fourthly, the dynamics in the not-for-profit sector make the adoption of ‘business-related’ best practices worth consideration by managers of DCs if they want to achieve further success, as long as such practices do not conflict with organisational ethos or lead DCs into disrepute.

The use of interviewee reviews as an extended iterative phase to enrich constructed analyses has proved extremely useful. Moreover, it allows contradicting views of the different stakeholder groups associated with DCs to contribute to how the allocation and use of DFs can be improved upon.

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Methodological Insights From two Experimental Studies Into Complementarities of Productive IT use

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Abstract: Numerous studies have attempted to determine factors that condition the IT-enabled productivity of information workers but have not yet arrived at a comprehensive conclusion. A so-called complementarity systems approach has been proposed recently, holding that a number of factors need to be managed in a deliberately synchronized manner in order to generate productivity gains from such workers. However, this proposal does not provide specifications for how such synchronization must be conducted and researched. To remedy this gap, this research conducts two parallel and differently designed studies: a longitudinal quasi-randomized field experiment and a well-controlled online experiment. Regarded jointly, each study offers insights into the investigated phenomenon that the other does not, indicating that both studies complement each other. In particular, these two different research approaches to study the complementarities of productive IT use help us to establish how further research design should be developed to investigate individual productivity when a new, more aligned IT system in a company is used together with complementary factors. Moreover, the results from both studies jointly demonstrate that a mandatory context of IT use might provide better access to individuals with both adaptive and innovative cognitive styles than a voluntary working environment. Finally, both studies demonstrate that more detailed research is needed to understand how the productivity of individuals differs when inappropriate cognitive styles are included in complementarity set-ups. Therefore, the two studies offer new insights into the interplay between the studied factors that condition the productivity of information workers and show the importance of analysing a complex phenomenon with multiple, different, and complementary research designs, as each design has inherent conditions with opportunities and limitations, in order to reveal characteristics about the phenomenon being investigated.

Keywords: complementarity systems approach, individual productivity, information worker, methodological insights, online experiment, quasi-randomized field experiment

1. Introduction

Effective use of new information technology (IT), including IT systems that support a specific kind of work process, has become critically important for modern companies. Although companies invest heavily in new IT systems, frequent decisions about acquiring or using new IT are based on executives' speculation rather than on consistent knowledge about IT impacts (Tallon, 2014; Nielsen and Persson, 2017). Current literature demonstrates that in order to obtain a productivity increase from IT use, it is necessary to focus on a set of complementary factors that have to be synchronized with new IT systems (Brynjolfsson and Milgrom, 2013; Jain and Kanungo, 2016). However, the literature is less certain about how to study these complementary factors at the level of an individual so as to increase IT-enabled productivity. Studying complementarities is challenging as unlike conventional studies with few variables, where independent variables are assumed independent of each other and offer a linear cause-effect relation to the dependent variables, the complementarity approach recognises the complexity of reality where a set of factors interacting with each other to generate effects on one or several dependent variables (Ennen and Richter, 2010).

In this paper, we present methodological insights from two parallel and differently designed experimental studies that were conducted independently to investigate configurations of complementary factors that influence individual IT-enabled productivity of information workers. We stress, however, that we do not discuss the detailed settings and findings from each study, we provide some background and results for each study, but our key focus is on the key methodological insights obtained from two studies. Studying the same phenomenon using two different research approaches not only helps us to uncover new configurations of complementary factors but also provides us with new methodological insights that neither of these two approaches could offer on its own.

2. Background and formulated complementarity set-ups

We applied the complementarity systems approach (Milgrom and Roberts, 1995; Ennen and Richter, 2010) which investigates the impact of a system of multiple factors on performance outcomes to study complementary factors in a situation when a new, more aligned IT system is introduced and used in a company. An aligned IT

system is defined as that which offers information and information-processing functionality that is adjusted and tuned to support specific work activities within a specific kind of work process.

In general, individual productivity of an information worker is conceived as a function of a single worker, IT tool used by the worker, a task conducted and contextual settings of the worker, i.e. processes that govern the interactions among the individual, task and IT tool in order to complete tasks (Hopp, Iravani and Liu, 2009). Therefore, based on these premises and the systems approach of complementarity theory, we formulated two complementarity set-ups in which the following factors fit each other in a particular manner: adaptive/innovative cognitive style, since human cognition is the main act of information processing by information worker (Kirton, 1976, 2003), the structural complexity of the operational process (MacCormack, Verganti and Iansiti, 2001; Weber and Wild, 2005), training activities, incentives, and decision-making structure (Amabile, 1996; Ryan and Deci, 2000; Baer, Oldham and Cummings, 2003; Sense, 2007; Bloom and van Reenen, 2011). These factors were linked together into one greater system of factors that complemented each other, in which each factor was assumed to hold a binary value set. This provided a foundation for the formulation of the two key complementarity set-ups that were subjected to empirical tests (Table 1).

Table 1: Summary of predicting complementarity factors and their value range

Predicting complementarity set-ups and factors	Value range	
	Stable	Dynamic
Cognitive style	Adaptive	Innovative
Work process	Stiff	Flexible
Training mode	Push	Pull
Motivation mode	Exogenous	Endogenous
Decision-making mode	High centralization	High decentralization

Therefore, we expect that (i) individuals with adaptive cognitive style generate higher productivity when matched with a ‘stable’ complementarity set-up that includes a stiff operating process, push mode training in work technology, exogenous incentives, and centralized decision-making compared to other configurations of these factors when a more aligned IT system is used. In contrast, we expect that (ii) individuals with innovative cognitive style generate higher productivity when matched with a ‘dynamic’ complementarity set-up that includes a flexible operating process, a combination of minor upfront mandatory training with optional on-demand training in work technology, endogenous incentives, and decentralized decision-making compared to other configurations of these factors when a more aligned IT system is used. Our contribution to the literature is that by applying the systems approach of complementarity theory, we propose new configurations of complementary factors that have been established and explored independently by other studies mentioned in this section.

3. Methodology

The research strategy was based on two independent studies: a longitudinal quasi-randomized field experiment (Study A) in which we investigated the operational productivity of sales representatives and an online experiment of software programmer productivity (Study B). The choice of research methodology and its rationale is explained in more detail below.

First, since we needed to study whether changes in operational set-ups cause productivity differences owing to different configurations of complementary factors, the experimental design was appropriate for testing the formulated complementarity set-ups. Second, in order to study the impact of IT use on individual productivity it was necessary to capture productivity data over a period of time and to take into account the time-lag effect on productivity gains from IT use (Brynjolfsson, 1993; Devaraj and Kohli, 2003). Therefore, a longitudinal research approach is important when studying complementarities of productive IT use to demonstrate their effect over time. These two premises form a foundation for the longitudinal field experiment, which enables analysis of a targeted phenomenon in its natural setting without artificially introducing confounding variables as well as capture of the effect of intervention over time (Hassett and Paavilainen-Msntymski, 2013). Third, in addition to the time-lag effect, we needed to provide better control over complementarities and their impact on IT-enabled productivity that could be achieved by conducting well-controlled laboratory experiments. However, recent online experiments have become even more popular than laboratory experiments, since they reduce the influence of experimenters’ expectations on participants’ behaviour, provide access to wider populations, and increase the uniformity of the experimental procedure across participants (Reips, 2002). Therefore, both a

longitudinal field experiment and a well-controlled online experiment responded to the complementarity set-ups tested in this research. Finally, we chose two information-intensive professions – sales representatives and software programmers – as appropriate examples of information workers (North and Gueldenberg, 2011) who require cognitive skills to process information which is an input and output of the production process and use non-trivial IT systems as their main production tool. Thus, two independent studies are appropriate for in-depth exploration of complementarity configurations, because we can identify whether the emerged patterns in one study are confirmed in the other, and thereby, can aspire to stable results. The set-up characterization of Study A and Study B is presented in Table 2.

Table 2: Set-up characterization of Study A and Study B

Key characteristics	Study A	Study B
Type of study	Longitudinal quasi-randomized field experiment	Web-based online experiment
Focus	Productivity of sales representatives	Productivity of software programmers
Data collected	Data were collected over a period of 5.5 years: January 2012 – June 2017 (9 quarters pre-change and 13 quarters post-change)	The online experiment was available online for 4 months (October 2015 – January 2016)
Context	Nordic affiliate of a global pharmaceutical corporation	Dedicated website for experiment; subjects recruited globally through online staffing firms
Metric	Number of sales calls and products sold in relation to the duration of time worked by an individual	Programming time and quality (completeness and correctness) of the product developed
Subject participation	Mandatory participation as part of regular work tasks	Voluntary participation incentivized with minor payment
No. of subjects investigated	91 of which 31 are innovators and 60 are adaptors	113, of which 110 are innovators and 3 are adaptors
Study design	4-factor configurations distributed over 16 business units (4 products; 4 counties): Design 1: no change; control group Design 2: new IT system only Design 3: new IT system, new sales process Design 4: all factors; new IT system, new process, training and education mode, incentives, and decision-making authority	3 sessions/assignments for software programming for each subject. Session 1: simple IT-tool support Session 2: advanced IT-tool support and all factors Session 3: advanced IT-tool support and all factors Each session lasted between 20 minutes and 1 hour
Subjects' context allocation	Adaptors in a 'stable' complementarity set-up Innovators in a 'dynamic' complementarity set-up	Innovators in 'stable' and 'dynamic' complementarity set-ups
Data analysis method	Difference-in-difference	Repeated measures analysis of variance
Study deviation	Subjects' allocation did not allow us to identify productivity of adaptors in 'dynamic' and innovators in 'stable' complementarity set-ups	The study succeeded in attracting mostly innovators

Study A was conducted in a Nordic affiliate of a global pharmaceutical company that is among the top 50 largest life-science corporations in the world. The affiliate received a new sales-support IT system that was designed to facilitate sales representatives' daily work at the end of April 2014. This IT system was installed in the company with four different designs (operational–organizational configurations of complementary factors) to study their impact on individual productivity of sales representatives. These four designs were allocated into a four-by-four operational structure (with four different products, A, B, C, and D, and four different markets, Denmark, Finland, Norway, and Sweden) to neutralize the influence of the product as well as the market over sales performance. Participants in the first group (Design 1) acted as a control group and operated in the way the whole company operated prior to the introduction of the new IT system. Participants in the second group (Design 2) received the new IT system, yet remained with the same operational set-up as prior to the change. Participants in the third group (Design 3) received the new IT system together with a new and specific type of sales process (sales representatives were not obliged to follow all operational steps in the new process). In the fourth group (Design 4), the 'full' or comprehensive set of IT complementarities was assumed, based on the developed complementarity set-ups. Productivity data (the number of sales calls and products sold relative to the length

of time worked by an individual) were collected for every quarter over a period of 5.5 years (9 quarters before and 13 quarters after the introduction of the new IT system).

In Study B, we used a dedicated website to test whether a set of matched complementary factors can indeed affect productivity in relation to adaptive/innovative cognitive style when a more aligned IT system was implemented and used. We expected that adaptors rather than innovators have productivity advantages when a more aligned IT system is used together with a ‘stable’ complementarity set-up. In contrast to adaptors, we expected that innovators would gain productivity advantages when a more aligned IT system is used together with a ‘dynamic’ complementarity set-up. The experiment consisted of three sessions/assignments. In the first session, in order to establish a benchmark, participants developed a software application using a text editor, which represents an existing IT system in a company. In the second session, an advanced IT system, Cloud9, an online integrated development environment that provides comprehensive facilities for software development introduced in a synchronized manner with both cognitive styles and complementarity set-ups. The third session was designed to take into account a learning-curve effect (Womer, 1984; McLeod, Clark and Dietrich, 2008). This session also included the advanced IT tool and complementarities of the second session. Each session had identical time frames (approximately 20 minutes to 1 hour) and a slight variation of assignments, yet with an equal level of complexity. The time taken by the subjects to complete each session was used to characterize a quantitative dimension of the productivity metric. In addition, as a measure of productivity, we used completeness (how many of the functional requirements were completed) and correctness (how well the functional requirements were implemented) of the application developed to evaluate the quality of the developed product.

4. Results

Table 3 summarizes the characterization of the key results from both studies that together offer insights into the methodology of the investigated phenomenon about complementarities and IT-enabled productivity.

Table 3: Results characterization of Study A and Study B

Key characteristics	Study A	Study B
Study results	Design 1: no productivity change Design 2: decreased productivity Design 3: decreased productivity Design 4: increased productivity	Session 1: Innovators in a ‘dynamic’ context worked faster yet generated lower quality of the product developed, while innovators in a ‘stable’ context worked slower yet generated higher quality of the product. Session 2: Innovators involved in a ‘dynamic’ context had a greater change in completion time when they learned a new IT system. Session 3: Innovators involved in a ‘dynamic’ context set-up learned a new IT system faster than did innovators involved in a ‘stable’ context
Key conclusions	Synchronization of complementarities conditions productivity of information workers. There is a learning effect from the changes made for productivity gains that takes no longer than 3 months	In the first and third sessions, innovators involved in a ‘dynamic’ context worked faster, yet with significantly lower quality than did innovators involved in a ‘stable’ context. A learning effect is achieved from two sessions of the new IT system and complementarity set-up versus the old IT system and complementarity set-up. However, the study suggests that the learning effect has just started
Key methodological insights	Complementarity set-ups might have both positive and negative productivity impacts. With productivity data provided on a quarterly basis, it is difficult to identify the learning effects of the adoption of a new IT system and work practices. Further research is needed to understand how the productivity of individuals with different cognitive styles is affected by non-matched complementarity set-ups	Future research has to take into account whether a work environment is mandatory or voluntary to collect data on individuals with both cognitive styles. More sessions of the experiment are needed to achieve saturation in productivity scores before and after use of a new, more aligned IT system is stabilized. Both performance metrics (time and quality) have to be monitored closely to understand the impact of complementarity set-ups

In Study A, the final sample for the analysis comprised 91 participants located almost equally in each design. The average age was 39 years old and most participants had a Master (52%) and Bachelor degree (42%). On average, participants had 5 years of experience in the company, 7 years of experience in sales and 10 years of experience in the sales industry. By using Kirton's inventory of adoption-innovation (Kirton, 1976), we identified that out of 91 subjects 31 were innovators and 60 were adaptors and in particular in Design 4, out of 27 subjects 7 were innovators and 20 adaptors. In this study, we expected that sales representatives involved in Design 4 with a full set of complementarities would generate greater productivity than sales representatives involved in Design 1 without operational change, Design 2 with structured partial change, and Design 3 with semi-structured partial change. Consistent with our expectation, the obtained results in Study A showed a positive and statistically significant effect of complementarities on individual IT-enabled productivity of sales representatives. In particular, the results indicated that the productivity of sales representatives involved in the design with the full complementarity set-up increased significantly after the implementation of changes compared to the productivity of sales representatives involved in designs with no or only partial complementarity set-ups. In addition, our results showed that when the more aligned IT system was used without complementarities, the opposite (negative) effect could occur. Moreover, the results showed that limited or incorrectly assumed complementarity factors might negatively affect individual IT-enabled productivity. These results are in line with those of previous studies (Roberts, 2007; Poon, Davis and Choi, 2009) which demonstrated that some configurations of factors might generate positive performance while others might generate negative performance. Moreover, the study demonstrated that the learning effect from the changes made for productivity gains does not take more than 3 months.

In Study B, we were able to collect data only for software programmers with innovative cognitive style. Out of 113 participants that completed the experiment, only 3 have had an adaptive cognitive style and were excluded from the analysis. The majority of participants were from Europe (47%), Asia (23%) and North America (14%). The average age was 28 years old and 80% male gender. The largest number of participants had a Bachelor degree (39.8%), up to five (34.1%) and ten years of programming experience (30.7%). In Study B, the results demonstrated that when completing the first session with a less aligned IT system, time scores were significantly different for innovators who were involved in 'stable' and 'dynamic' complementarity set-ups (42 minutes vs. 33 minutes, $p = 0.009$). Quality scores were significantly different for innovators involved in 'stable' and 'dynamic' complementarity set-ups (77% vs. 63%, $p = 0.006$). As we expected when completing the second session with a more aligned IT system, time scores increased for both groups. However, average session completion time increased by 7 minutes (16%) for innovators involved in a 'stable' complementarity set-up and by 18 (54%) minutes for innovators involved in a 'dynamic' complementarity set-up compared to the baseline. Nonetheless, the difference between time scores for both groups of participants became insignificant. Quality scores remained similar to the first session and the difference between these scores was statistically significant (75% vs. 62%, $p = 0.002$ respectively). The results demonstrate that in comparison to the second session, in the third session, time scores decreased for the participants involved in both complementarity set-ups. The average session completion time decreased by 2 minutes (4%) for innovators involved in a 'stable' complementarity set-up and by 6 minutes (12%) for innovators involved in a 'dynamic' complementarity set-up. Quality scores did not change significantly in comparison to the second assignment (73% vs. 61%, respectively, $p = 0.032$). Overall, besides the results that demonstrate that individual productivity of innovators differs in relation to complementarities, the study offers several insights about the design of similar experiments.

5. Methodological insights

In order to generate insights into the same target phenomenon, in our case complementarities of productive IT use, two very different research approaches have been applied. This research strategy helped us to produce new knowledge that neither of the two research approaches was able to produce individually. Below, we summarize the key methodological insights from both studies regarded together, which can be taken into account by future research in the field of complementarities and individual IT-enabled productivity.

First, the obtained results from Study A showed that complementarities introduced together with a more aligned IT system positively affected the productivity of employees. These results provide strong support for the systems approach of complementarity theory (Ennen and Richter, 2010) which investigates the impact of a system of multiple factors on performance outcomes. In addition, these results add new and unique configurations of complementary factors for individual IT-enabled productivity studies (Athey and Stern, 2002; Autor, Levy and Murnane, 2003). However, although the data in Study A showed that it took around 3 months for individuals to

learn the new IT system, this study did not show how exactly individuals with different cognitive styles learned and mastered this IT system. At the same time, Study B demonstrated that a learning effect was achieved from two sessions of use of the new IT system. However, the study demonstrated that the learning effect had only just emerged. Therefore, the results from both studies regarded jointly showed that the learning effect of a new IT system requires more than two sessions, but less than 3 months of daily use. This requires further research to understand how the learning effect is achieved.

Second, Study A was conducted in real work settings, meaning that information workers had to partake in the study, as it was part of their conventional work and employment held. On the other hand, in Study B, participation in the experiment was voluntary. This voluntary-based approach merely attracted individuals with innovative cognitive style. One plausible conclusion is that in order to study both cognitive styles in the same context, a mandatory context has to be used, as voluntary participation might fail to attract both cognitive styles. On the other hand, an online environment as a working environment could mostly attract individuals with innovative cognitive style, rather than individuals with adaptive cognitive style. For example, internet-based jobs are characterized as temporary and rapidly changing (Sadler, Robertson and Kan, 2009), which is more suitable for innovative individuals. This fit between cognitive style and working environment seems to match findings from previous studies (Kirton, 2003; Chilton, Hardgrave and Armstrong, 2005), suggesting that a rapidly changing environment requires individuals with innovative cognitive style. Nonetheless, more research is needed, since online work environments have not been researched extensively.

Third, Study A showed that the productivity of a particular cognitive style increased in a particular complementarity set-up, that is, adaptors in a 'stable' complementarity set-up and innovators in a 'dynamic' complementarity set-up. However, Study A did not show whether a cognitive style could perform differently in the non-matched complementarity set-up, all else being the same. This implies that further detailed research is needed to understand how the productivity of individuals with different cognitive styles is affected by other complementarity set-ups. Study B showed that individuals with innovative cognitive style performed differently in different complementarity set-ups (stable vs. dynamic). For example, innovators involved in a 'dynamic' complementarity set-up spent, on average, much less time performing the first assignment. However, on average, the quality was higher for applications developed by innovators involved in a 'stable' complementarity set-up. The manner in which both groups of participants learned a more aligned IT system was also quite different. Innovators involved in a 'dynamic' complementarity set-up had a greater change in completion time when learning to use the more aligned IT system first. However, the learning pattern was lower than that of innovators involved in a 'stable' complementarity set-up. These results imply that both performance metrics (time and quality) have to be monitored closely in future research to understand the impact of complementarity set-ups.

In summary, our empirical investigations demonstrated that in order to explore complementarities and their effect on IT-enabled productivity, multiple research designs are required to address the limitations of each design on its own. For example, although we were able to take into account the effect of complementarities on IT-enabled productivity over time in the first study, data collected quarterly did not allow us to identify the learning effects of adopting and using the new IT system. On the other hand, in the second study we collected data from only three sessions (two of which were related to use of a new IT system), which was not enough to identify the learning effect. Therefore, since more runs are required to establish saturation with old, less aligned IT systems as well as new, more aligned IT systems, time-series design of the experiment would be appropriate. This design would enable the assessment of productivity prior to and after the introduction of a new IT system and identification of the existence of complementarity effects on IT-enabled productivity within a temporal sequence of events.

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Experiment as a Research Method in the Field of Human Resource Management: A Literature Review

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Abstract: The main purpose of this article is to present the experimental method in the context of research in the field of human resource management (HRM). Firstly the general approach to research in the analyzed area is discussed. Then, the basic principles of experimental method are described. The historical and contemporary application of the experimental method in HRM research is presented. Certain dilemmas and errors which limit the quality of research are emphasized. Taking into account the last eight years one can state that experiments are used mainly in HRM research related to such issues as employee motivation and work performance factors, participation, training and development and recruitment and discrimination. It was stated that so-called true real-world experimentation is rarely used and really difficult to carry out within HRM studies. Therefore, the majority of studies are quasi-experimental and conducted in an artificial environment. The article is purely analytical, based on existing subject literature.

Keywords: management science, human resource management, empirical research, experimental method

1. Introduction

As Popper (2005) states, a scientist puts forward statements, or systems of statements, and tests them step by step. In the field of the empirical sciences, more particularly, he constructs hypotheses, or systems of theories, and tests them against experience by observation and experiment.

One of the most important research questions in HRM is the relationship between HRM practices and processes and both employee and organizational performance. Guest (2011 cited in: Sanders, Cogin, Bainbridge, 2014) states that after hundreds of research studies we cannot be confident that good HRM has a positive impact on organizational outcomes. There are different epistemological concepts, scientific approaches and methods that can be used in research on Human Resource Management (HRM). Experiments are rarely used in this area. Therefore, the main goal of this article is to present the experimental method in the context of research in the field of HRM, an overview and synthesis. The above-mentioned research question concerns a cause-and-effect relationship. The experimental method is designed to test for a cause-and-effect relationship.

Firstly the article discusses the general approach to research in the analyzed area. Then, the scientific rules are described in relation to the method in question. The paper also presents brief characteristics of experiments whose results were published between 2009 and 2017. Certain dilemmas as well as errors limiting the quality of research are presented.

As mentioned before, the article is purely analytical, based on subject literature studies. A literature review is a summary of an existing body of research in light of a particular research issue. In a literature review researchers describe, evaluate and clarify what is already known about the research area. The author used a stand-alone review (Easterby-Smith, Thorpe and Jackson, 2015), in order to provide an overview and synthesis.

2. Epistemological paradigms in HRM research

Six different paradigms classified into two groups can be identified. The first group is comprised of phenomenological epistemology and positivist epistemology. Interpretative, functionalist, radical structuralist and postmodern paradigms constitute the other group.

The phenomenological paradigm is consistent with an idiographic approach whose purpose is to present and explain individual facts. The goal of qualitative phenomenological research is to describe a "lived experience" of a phenomenon. Essentially, a researcher is focused on meaning, the meaning of the experience, behavior etc. (Waters, 2017). The positivist paradigm is consistent with the nomothetic approach, whose goal is to formulate general laws and scientific rules based on representative, quantitative research. Positivist epistemology assumes that a research problem is objective and can be discovered and understood by a scientific examination of empirical evidence (Fong, 1986). Interpretivism accentuates pragmatism and coherence. Research programs are based on qualitative research methodology. Interpretive approaches rely heavily

on naturalistic methods (interviewing and observation and analysis of existing texts) (Angen, 2000). The functionalist paradigm is described by integrated systems and verification of hypotheses with the use of objective, quantitative methods. Radical structuralism is also based on quantitative methodology but it adopts a critical approach to the social status quo. In this case the researcher’s role is to recognize social mechanisms and to implement changes in the social systems. Eventually, the postmodern paradigm negates the possibility of reaching an objective truth (see: Sułkowski, 2011). One can also define critical realism, which addresses the connection between the natural and social worlds and is a useful basis for analyzing the environment of and events within an organization (Bhaskar and Danermark, 2006).

K. Susabowska (2017) identified the dominance of the positivist paradigm in the study of human resource management in Poland. She examined all research articles published in HRM between 2007 and 2016. The clear and frequent use of research tools and procedures located in the positivist stream was confirmed.

Researchers should choose the methods which are best suited for the research goal, scientific paradigm and scientific approach. As mentioned above, one can classify two general scientific approaches: a nomothetic one and an idiographic one. The first approach uses representative, quantitative research based on surveys, for example. The second approach uses qualitative research based on focus interviews, for example. With this in mind the author of this paper will present the experimental method.

3. Basic principles of the experimental method

Cooperstock (2009) states that an experiment is an empirical procedure that arbitrates competing models or hypotheses. Researchers also use experimentation to test existing theories or new hypotheses in order to support or disprove them (Griffith, 2001). Typically the experiment is treated simply as a research method or a type of observation method which is a qualitative research one (Piwowar-Sulej, 2018). In this context the experiment is an active observation which creates a change and records the process (Hajduk, 2007). This method is based on the implementation of an independent variable. The observed changes which are influenced by this factor are treated as dependent variables. It is designed to explore a cause-and-effect relationship between the independent variable and the dependent variable. Research design in the experimental method is presented below.

Table 1: A classical true experimental design

Participants	Pre-test	Time →	Post-test	
Random assignment	Q1	Manipulation	Q2	Experimental group
	Q3	Without manipulation	Q4	Control group

Source: (Sanders, Cugin and Bainbridge 2014)

The experiment can be natural (real world, field) or laboratory (in cases when we put the independent variable artificially). Researchers can intentionally create different levels of the independent variable and observe its effect on the dependent variable. A controlled experiment is a phenomenon where research is conducted by changing only one variable at a time. All the other parameters are kept constant and only one parameter is changed for research purposes in a controlled experiment. Controlled experiments minimize the likelihood that research findings will be attributed to extraneous or omitted variables (Singleton, Straits, and Straits, 2009). Regardless of the type of experiment the main steps we should follow while using the research method are: isolating the testing environment from external influences, setting the variables, creating changes in the tested environment and describing the character and scope of the resulting changes in dependent variables (Apanowicz, 2002).

The experiment is an appropriate research method for repeatable phenomena. An experiment in the strictest sense (a classical, true, traditional experiment) requires the use of two groups – known as a test group and a control group – and the random selection of participants (Sułek, 1986). The first group is experimented on while the control group is used for comparison and is not subject to the independent variable. Measurements are taken repetitively. This classic approach to experimentation has some disadvantages. It is difficult to fulfill the requirements, especially forming two similar groups, guaranteeing similar conditions and measuring the changes at the appropriate moments. In the subject literature the position is presented that an experiment can be

conducted without a control group or based on only one measurement (Kaczmarczyk, 2003). A so-called quasi-experiment is not as powerful as a true experiment in establishing a cause-end-effect relationship.

In the hypothesis verification process the elimination inference based on Mills' work is used (see: Sułek, 1979). The most popular induction method is a method of difference. Student's T-test can be an analytical tool used in the case of quantitative variables.

As Kuc (2012) points out, in the sciences experiments are the basic research method and the main source of knowledge, whereas in management sciences experiments are used only occasionally. Thus, in the next chapter of the article, some examples and statistics of using experimentation as a research method in the area of HRM will be presented.

4. Experiments used in HRM research in practice

In the social sciences, the prevalence of experimental research varies widely across disciplines. When used, however, experiments typically follow the form of the clinical trial (Holland, 1986). Undoubtedly, HRM uses the results of experiments conducted in general psychology. One can state that the academic knowledge about moral behaviors, motivation and propensity for cooperation is based on experimental techniques called behavioral game theory. As Gints (2006) says, the social situations generated on the basis of behavioral game theory methodology are extremely detailed and cover most of the contingencies that determine how subjects will actually play the game; thus an experiment performed in one laboratory can easily be replicated in a second laboratory.

There are five classic psychological experiments which can teach workplace leaders, i.e. Stanford prison experiment, the experiment on the Pygmalion effect, the experiment related to the Piano Staircase, the Milgram experiment and the experiment with an invisible gorilla (Kelly, 2016). There is also a subdiscipline called industrial and organizational psychology which is strictly connected to HRM. Münsterberg and Scott are the best known authors who used experiments in industrial and organizational psychology. Münsterberg (1913) focused on the problem of memory, attention span, intelligence, accuracy, speed and work monotony. In turn, Scott is considered the first scientist who used experiments in research on hiring processes (Northwestern University, 1939).

In management science the best known researchers are Mayo and Taylor. All these authors conducted experiments in real-world conditions. Mayo conducted research on the influence of the physical environment on workers' productivity (Sułek, 1979). Taylor was also focused on workers' productivity (Martyniak, 1989).

For the purpose of this article, a review of subject literature was carried out by analyzing the databases available at the Library of Wrocław University of Economics. Such keywords as "experiment" or "experimental method" in combination with "human resource management" and "HRM" were used. The author used a multi-searching tool which gave results from all databases. Then the author read all the reports and articles in order to classify them into different thematic categories. The focus was put on academic papers and business reports (in Polish and English) that have been published in the last eight years (2009-2017). The results of the databases scanning are presented below.

Table 2: Experiments in the field of HRM published in the last eight years

Topic	Year of publication									
	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Employee participation		2	1	1		1	1			6
Motivation and work performance factors			2	3	2		2	3	3	15
Recruitment and discrimination (R&D)	2		1			2	4			9
Training and development (T&D)				2	1	1	2	1	1	8

Source: own study

The author noticed that many studies on discrimination at work are regarded to recruitment processes, therefore, she created the „R&D” category. The most popular research problem is employee motivation. The publications in the topic „Motivation” presented in table 2 include research on incentive schemes and other factors which affect employee motivation and work performance. The author is conscious of the fact that all activities undertaken in an organization have motivational or demotivational influence on employees, but decided to separate such topics as i.a. „Employee participation” and „T&D”.

5. Brief description of research problems and findings from the recent HRM experiments

Motivation and work performance

The experiments in the field of motivation include studies on non-material motivational factors. For example, in the research on subconscious motivation conducted by Shantz and Latham (2011) the employees who were primed using a photograph of a woman winning a race were more effective than those who were randomly assigned to a control group. An experiment conducted in India (Munro, Verschoor and Dubey, 2013) showed that working with spouses is connected with significantly higher output. In turn, the quasi-experimental job redesign intervention implemented by Holman and Axtell (2016) showed that this intervention affected a broad range of employee outcomes (i.e., employee well-being, psychological contract fulfillment) through changes in two job characteristics, i.e. job control and feedback.

The experimental method was also used in research on the importance of communication in the context of work performance. Farrell, Kadous and Towry (2012) examined employees’ effort allocations in the no-communication condition. They found that communicating a qualitative causal linkage nearly eliminates melioration, but that communicating a quantitative causal link provides no incremental benefit beyond that provided by the qualitative link. Latham, Ford and Tzabbar (2012) used a quasi-experimental method in order to evaluate the effect of feedback obtained from mystery shoppers. They showed that both employee and organizational performance increased as a result of this intervention (mystery shoppers’ feedback). Kvaloy, Nieken and Schottner (2015) found that motivational talk improved performance only when accompanied by performance pay.

When it comes to material motivational factors, it is worth mentioning the results of an experiment conducted by Kosfeld and Neckermann (2011). These authors found that the symbolic award increases performance by about twelve percent on average. Hesse and Rivas (2015) found that there exists a general strong positive relation between own wage and effort levels for the workers, while the managers’ effort reaches a maximum for intermediate wages and decreases for very high wages. In turn, there were experiments on specific personal features which have impact of motivational choices. For example, a laboratory experiment Larkin and Leider (2012) investigated the relationship between incentive schemes and employee confidence. The overconfident employees are more likely to choose a nonlinear incentive scheme. The linear scheme attracts demotivated workers. Additionally, Yang published in 2016 a study of how people with heterogenous individual characteristics self-select into different compensation schemes. The main findings from his laboratory experiment show that subjects with high relative performance always prefer individual tournament. Moreover, Han Ming Chng and Cong Ying Wang (2016) found that under the condition of declining performance, managers’ career ambition only accentuated the positive relationship between incentive compensation and strategic change.

There are also publications describing experiments on the salespeople motivation (Kishore et al, 2013; Friebel et al, 2017), cultural differences (Nastase, Alami and Taleb, 2017) and employee generations (Lipka 2017).

Finally there is an experiment combining the issue of material motivational tools with employee participation. Faillo and Piovanelli (2017) showed that when people are allowed to choose their own wage, they tend to increase their performance more than when they are assigned a random bonus. Highly motivated subjects who are allowed to self-set their wage are the ones who perform better. The subjects with higher intrinsic motivation ask for lower wages.

Recruitment and discrimination

In 2015 the Polish recruitment website Pracuj.pl (2015) conducted the general experiment using an eye-tracking device in order to determine which elements of a CV are the most important for recruiters. The study showed that the recruiters spent the most time looking at candidates' job experience. In the same time in Germany Frosch et al (2015) studied strategies for the recruitment of highly qualified R&D workers in high-tech firms. They found that HR decision-makers prefer candidates first of all with technology-specific patenting experience.

When it comes to the topic "Discrimination" in the context of recruitment processes, it is worth mentioning that Düttschke and Boerner investigated in Germany in 2009 the chances of former flexible workers to be employed in a permanent full-time position. Results of their experiments indicated that former part-time work was perceived as a disadvantage for candidates when applying for a permanent full-time position. Similar experiments were conducted in 2015 in UK. Koellinger et al (2015) examined whether having previously been self-employed is a negative signal on the job market. They found that entrepreneurs systematically received fewer responses than non-entrepreneurs.

Pager, Western and Bonikowski (2009) conducted a field experiment in the low-wage labor market of New York City. The results of this experiment showed that Black and Latino applicants with clean backgrounds fared no better than White applicants just released from prison. Steward and Cunningham (2015) also studied the discrimination issues in the USA. The purpose of their research project was to examine how Whites evaluate African Americans with a strong racial identity. Applicants believed to possess a strong racial identity were rated as a poorer fit for the job.

An experiment conducted in Sweden showed that, on average, women have a somewhat higher callback rate to interview in female-dominated occupations, while in male-dominated occupations there is no evidence of gender difference (Carlsson, 2011). In an experiment, also conducted in Sweden but in 2014, researchers made a male job applicant taller or shorter by digitally manipulating photographs attached to job applications. They found that in the context of hiring a project leader, the height premium consisted of increased perceptions of the candidate's general competence, specific job competency (including employability), and physical health (Agerstrom, 2014).

Results of the experiment conducted by Blommaert, Coenders and van Tubergen (2014) in Nederland showed that individuals who have more positive interethnic contacts, higher educational levels, and higher educated parents are less likely to discriminate against ethnic minority applicants. Taking into account the above considerations one can state that the character of labor market and cultural aspects are very important in the research on job candidates discrimination.

Training and development

Many articles about training effectiveness were identified. The purpose of a study conducted by Selden, Sherrier and Wooters (2012) was to examine the effects of a new approach to performance appraisal training. The findings showed that a whole-brain approach results in positive returned from the perspective of the employees. Sunardi, Widyarini and Tjakraatmadja (2012) used a quasi-experimental approach in order to diagnose the impact of training on behavioral changes (using DISC technique). Their study showed that training had a permanent impact on employees' behavior. Results of the experiment conducted in 2013 by Nieminem et al (2013) showed that executive coaching has positive influence on leader self-ratings and perceived effectiveness. In 2015 Evers, Brouwers and Tomic conducted a quasi-experiment on general coaching effectiveness. Results showed that the coached group scored significantly higher than the control group on two variables: outcome expectancies to act in a balanced way and self-efficacy beliefs to set one's own goals. The experimentation was also used in order to measure effectiveness of virtual training systems. The results of experiments conducted by Jia, Bhatti and Nahavandi (2014) revealed that self-efficacy had a significant positive effect on perceived virtual environment efficacy. Georgiadis and Pitelis (2016) studied training efficiency in service sector. Their empirical results suggested that employees' training had a stronger positive impact on firms' labor productivity and profitability than that of managers'. Results from experiments also provided empirical evidence that forming implementation intentions at the end of a training program increases the likelihood of using the newly acquired skills (Friedman and Ronen, 2015).

Restubog et al (2017) showed that career-focused activities, such as participating in an internship (as a method of HR development), resulted in greater career adaptability. Within the experiment the researchers observed that the capacity of an internship to influence the development of career adaptability is contingent upon the individual's level of conscientiousness.

Employee participation

Different results of effectiveness of employee participation come from different experiments. For example, subjects in the experiment conducted by Burse and Peter (2012) who were forced to multitask performed significantly worse than those forced to work sequentially. Surprisingly, subjects who could freely organize their own schedule also performed significantly worse. These results suggest that scheduling – not employee decision making – is a significant determinant of productivity. In turn, the purpose of a study conducted in Finland (Linnaa et al., 2011) was to examine whether a participative intervention had an effect on perceptions of justice among employees. Their analysis showed that the participative intervention approach was associated with improvement in employees' perceptions of justice (at both the individual and the work group levels).

The researcher also tried to answer the question: how to increase the employee willingness to participate in work-related problem solving. One of the tools used within employee participation can be an IT system. In the experiment conducted by Sorensen, Mattsson and Sunbo (2010) the hypothesis was that the introduction of a specific IT solution will increase the number of ideas reported by the employees. This hypothesis was disproved. Another popular tool used within employee participation is an employee survey. Croteau, Dyer and Miguel (2010) used a field experiment in order to test the differences between paper-based and electronic employee surveys. Results from their study indicated that electronic surveys were seen as marginally easier to use and more enjoyable than paper surveys. However, the paper-based questionnaires produced a higher response rate. The findings of research conducted by Gibbs et al. (2014) suggest that rewards are a suitable tool to induce employees to think about process and product improvements and to use a formal ideation system. Finally, Sanders and Yang (2015) conducted an experiment on high-commitment human resource management (HC-HRM). The results showed that the effect of HC-HRM on organizational commitment was stronger when employees understood HRM as was intended by management.

University students are very often the subjects of experiments. They also participated in the above-mentioned experiments conducted by i.a. Deci, Kosfeld, Blommaert and Lipka. Students usually take on the role of line employees or managers. However, this begs the question whether a student in laboratory conditions will behave the same as real employees. The practice of using undergraduate or graduate students in experimental research in organizational studies has been criticized (Levitt and List 2007). There are many requirements which one should follow in order to properly use the experimental method. There are also pros and cons of using the analyzed research method in the field of HRM.

6. Pros and cons of the experimental method in the field of HRM

Experimentation is hard to carry out in the social sciences and thus in HRM as well. It is complicated to manipulate social phenomena (Kuc, 2012). One should guarantee anonymity, confidentiality and honesty in providing information (for more see: Lipka, Waszczak and Winnicka-Wejs, 2015).

An experiment must be appropriately designed in order to ensure high accuracy and reliability of research. There are three basic types of errors (Center For Innovation in Research and Teaching, 2017):

- Human errors, which effect the findings through inaccurate measurements or inappropriate conditions.
- Systematic errors, which are connected with the way the experiment is designed or conducted. Because these types of errors are inherent in the experimental set-up, they skew the data consistently in one direction. Systematic errors are difficult to detect and cannot be analyzed statistically.
- Random errors, which are unpredictable and are chance variations in the measurements over which the researcher has little, if any, control. They arise unexpectedly through slight variations in test conditions.

The influence of external factors which cannot be predicted is also important. The researcher should study the HRM practices and processes in a controlled situation. Moreover, the researcher should not change the measurement tool or the composition of the study groups during the course of experiment. The experimental groups should also be representative.

The main types of mistakes within experimentation are as follows (Center For Innovation in Research and Teaching, 2017):

- The Hawthorne effect, in which test subjects realize they are a part of an experiment and thus change their behavior. For example, people start to behave the way they think they are expected to behave. Participants can also change their behavior after learning the pretest assessment (see: Sulek, 1979). Moreover, there can be interactions between the test group and the control group. The bilateral communication can affect the behavior.
- The placebo effect, which occurs when the test subjects believe that the experimental treatment will cause a change. The participant may respond with a change in behavior or performance that is not actually due to the independent variable.
- The John Henry Effect, which applies to a control group. This is a threat to internal validity in that the participants in the control group try harder if they know they are in the control group.
- The rating effect, which refers to the subjective nature of rating the participants. The rater will often rank some high and some low.

Apanowicz (2002) advises that socio-economic processes should be studied under real-life conditions. It should be stressed that natural conditions mean many varied conditions and that the researcher should take them all into consideration. For example, it is hard to select only one factor and evaluate the influence of this factor on HRM processes. Moreover, organizations are constantly in a state of flux, which makes it impossible to repeat the experiment under the same conditions.

7. Conclusions

Research is a continuously developing phenomenon. Researchers try hard to test certain hypotheses. It is therefore of great importance to know the rules which every researcher aims to comply with while working on a research objective.

In this article the experimental method was presented as a method which can be used in HRM research. Examples of its use in HRM were also shown. In conclusion HRM is based both on the results of experiments conducted in the field of psychology and on the experimental method specifically designed for HRM. The research topics most often investigated by experimentation in the last eight years were motivation, employee participation, training and development, and recruitment and discrimination. It was also stated that so-called true experiment is rarely used and very difficult to carry out within organizational studies. Therefore, the majority of studies are quasi-experimental. Moreover, many experiments in HRM are laboratory experiments.

The article can be a basis for conducting deeper analyses of scientific gaps which can be covered with the use of experimental method. The results of briefly characterized experiments can also be used in the meta-analysis of detailed HRM research problems. It would be also interesting to repeat specific studies (e.g. on employee participation) in different countries or in the context of different form of employment (employment contract vs flexible work arrangements).

Taking into account the direction of further use of this method in HRM related research, it seems to be necessary to strengthen the cooperation between science and business practice. HR practitioners say that conducting quasi-experiments is their everyday job. They change incentive systems in different departments, replace recruitment tools, etc. and then measure the results of these changes. These efforts could be developed in a more scientific way and even contribute to the development of science.

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Guidelines for Qualitative Case Research in Operations Management: A Banking Service Industry Perspective

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Abstract: This paper provides useful recommendations that may help researchers to effectively conduct their case studies in the banking service industry. This paper uses a qualitative multi-method research strategy, which combines different qualitative research methods. It contains two main sections, a systematic literature review and the authors' experience in the banking industry over the course of eight years of in-depth research in a Portuguese private bank. The results indicate that some sampling strategies are being neglected in the literature. The snowball sampling may become a useful strategy to build up samples from an initial small pool of informants and, thereby, mitigate the effect of banking data inaccessibility. Building upon Yin's (2003) guidelines, we recommend four sources of data collection, which fit well the banking industry research. Due to space limitations, we had to leave aside such important areas as data analysis, validity or ethics, but we hope this can instigate other researchers to conduct further research and, therefore, contribute to the management literature.

Keywords: private banking, service industry, multi-method research, case study, systematic literature review, sampling strategy

1. Introduction

Despite being considered an underutilized research strategy (Noor, 2008), the case study method has been an essential form of research in management and social sciences (Stake, 1978). Although case research has been criticized for lacking scientific rigor (see Yin, 2003), it is considered appropriate when dealing with a process or a complex real-life activity in great-depth (Noor, 2008). In operations management (OM), for example, the number of published scholarly articles using case research has been increasing progressively (McCutcheon and Meredith, 1993). Late nineties, Meredith (1998) argued that case and field research studies were rarely published in operations management journals, in spite of increased interest in reporting such types of studies and results. The author argued that case and field studies exhibit the same level of rigor and adhere to the same requirements of good research as rationalist studies, but achieve these goals by different means. Later on, Voss *et al.* (2002) draw guidelines and a roadmap for OM researchers wishing to design, develop and conduct case-based research. Barratt *et al.* (2011) started to review qualitative case studies in the field of OM and found that sufficient details in research design, data collection, and data analysis were missing. These authors also realized that there are studies that do not offer sampling logic or a description of the analysis through which research outcomes are drawn.

Case research is such a wide subject, and to provide relevant guidelines in such a few pages is a difficult task; therefore, we restricted this investigation to sampling strategy choices and sources of data collection selection. We made this option because the banking service industry is known for dealing with confidential information and it usually restricts the researchers' access to sensitive data. An adequate sampling strategy and sources of data collection are helpful in mitigating these constraints. To best of our knowledge there are not any methodological studies regarding case research in the banking service industry literature. Hence, we try to build knowledge upon relevant literature and, therefore, attempt to elevate the scientific rigor by assisting researchers on their decision-making process of choosing adequate sampling strategies and methods of data collection. This paper is organized as following: (1) literature review and concepts; (2) methodological options and systematic review process; (3) authors' experience (4) finally, the conclusion, limitations and suggestions for future research.

2. Literature review

Contemporaneous service is a complex process and over the last years the proliferation of technologies, strongly diffused by the wide use of Internet, has extraordinarily changed services (Reis *et al.*, 2014). Within the universe of existing service organizations, the banking sector was chosen for this study as it is a fruitful unit of analysis for researchers wishing to study marketing, operations or general management. Although it is widely known that banks are difficult to access and that there is a tendency for banks to always spy on their competitors (Iman, 2014), there are effective ways to mitigate these constraints. In Portugal, the banking sector has been characterized by strong changes in both its structure and its system, resulting from a process of profound transformations over the last few decades, where modernization is required so that they can remain profitable and competitive in the market (Moreira *et al.*, 2014). In this extent, banks also have become a fertile ground for practitioners and managers, in order to improve their competitiveness and profitability. Hence, the importance of this investigation is to enable researchers to conduct effective case studies in the banking system. Yin (2003) defines *case* as an event, an entity, an individual or even a unit of analysis. According to Yin (2003), case studies, in general, are the preferred strategy when “how” or “why” questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. Case study may involve the examination of a single unit of analysis (*holistic case study*) or more than one unit of analysis (*embedded case study*).

The sampling process may involve decisions such as choosing the sampling strategy and the number of case studies. The sampling is a complex issue in case study research, because there are many variations of sampling strategies described in relevant literature (Mills *et al.*, 2010). The literature identifies two basic types of sampling: probability and non-probability (Tharenou *et al.*, 2007). Probability sampling allows the researcher to generalize results of the study from the sample to the population from which it was drawn (Merriam and Tisdell, 2015). Scientific generalization within case study research has often been challenged, and some scholars argue that statistical generalization is often not relevant for case studies because sample sizes are typically small and not representative (Mills *et al.*, 2010). However, research which uses sampling based on probability theory, such as random sampling or systematic sampling, improves the generalizability of research findings on the basis that the sample is more likely to be representative (Bloor and Wood, 2006). For the other side, non-probability sampling is a common technique of choice for most qualitative research and, as Given (2008) argues, case studies can generate theories or, to put it differently, theoretical generalization. The same author reinforces that social sciences are full of examples where theoretical propositions were derived from a close study of individual instances. Consequently, many famous theories in operations management were generated using case study research. Table 1 describes briefly key sampling strategies and their types.

Table 1: Sampling strategies (Blaxter *et al.*, 2006)

Probability sampling		Non-probability sampling	
<i>Types</i>	<i>Short description</i>	<i>Types</i>	<i>Short description</i>
Simple random sampling*	Selection at random	Convenience sampling*	Sampling those most convenient
Stratified sampling*	Sampling within groups of the population	Snowball sampling*	Building up a sample through informants
Cluster sampling	Surveying whole clusters of the population sample at random	Purposive or purposeful sampling*	Handpicking supposedly typical or interesting cases
Systematic sampling	Selecting every <i>n</i> th case	Dimensional sampling	Multi-dimensional quota sampling
Stage sampling	Sampling clusters sampled at random	Quota sampling	Convenience sampling within groups of the population
		Voluntary sampling	The sample is self-selected

*Most common forms of Probability and Non-probability sampling (Neuman, 2007; Tharenou *et al.*, 2007; Given, 2008)

Probability samples require that every item of the universe has an equal chance of inclusion in the sample (Kothari, 2004). The most basic form of probability sampling is simple random sampling, where every member of the population is selected completely by chance; therefore, each member of the population is equally likely to be chosen (Tharenou *et al.*, 2007). Another common form of probability sampling is stratified sampling, where a researcher first divides the population into subpopulations (strata) on the basis of supplementary information, then the researcher draws a random sample from each subpopulation (Neuman, 2007). The most common types of non-probability sampling are convenience sampling, snowball sampling, and purposive sampling (Given,

2008). In convenience sampling is just what is implied by the term – you select a sample based on time, money, location, availability of sites or respondents, and so on (Merriam and Tisdell, 2015). With snowball, chain, or network sampling, first people with relevant characteristics are interviewed or answer a questionnaire, and then these subjects are asked for the names of other people who possess the same attributes as they do (Berg, 2004). Purposive sampling refers to a process where participants are selected because they meet criteria that have been predetermined by the researcher as relevant to addressing the research question (e.g., people of a particular age or other demographic category) (Given, 2008).

3. Methodology

This article employs an exploratory multi-method research strategy. Abdullah (2017) remarks that when dealing with an objective that needs both primary and secondary data, a multi-method research technique is usually required. The multi-method research was chosen for this study since the focal point of the research involves a combination of multiple objectives. The main objectives are: first, to provide a content analysis of methodological aspects in the banking service industry literature focused on examples as sampling strategy selection and sources of data collection; second, to provide methodological contributions and guidelines for researchers. As research methods, this paper employs a systematic literature review to cover the first objective. The extant literature is, thus, our primary source of data collection. This is followed by the author’s experience, as secondary source, and mainly to cover the aforementioned second objective. These methods are complementary, since they have corroboration purposes. Table 2 resumes the multi-method approach.

Table 2: Multi-method approach

	Objective	Research method	Data collection methods
First	Content analysis of the selected articles	Systematic review	Academic databases (digital) – Scopus
Second	Methodological contributions and guidelines for future research	Authors’ experience	Direct observations – research diary with notes. Interviews to highly knowledgeable informants – approximately 2,790 hours of data collection.

In relation to the systematic literature review process, the data search was conducted on November 6th, 2017, and it was based on a scientific peer-review database – Scopus; a bibliometric and qualitative analysis was then conducted. We have selected Scopus because it is one of the largest multidisciplinary databases of peer-reviewed literature i.e. scientific journals, books and conference proceedings. The inclusion process started by typing the keywords “Banking Services” and “Case Study” on the Scopus search toolbar in the title, abstract and keywords.

Table 3: Systematic literature review process

Scopus		
Criteria	Filters	Documents
Keywords	“Banking Services” and “Case Study”	#
Restriction	Title, Abstract, Keywords	111
Document type	Articles and Conference Proceedings	94
Subject area	Business, Management and Accounting; Social Sciences; Economics and Econometrics and Finances; Decision Sciences; Multidisciplinary	57
Language	English	55

The search for articles was conducted regardless the time limitations, but it was reduced to the coverage of journal articles and conference papers from the management area. To avoid wrong interpretations, we selected documents written in English (Table 3). The exclusion process resulted in 55 academic articles. Regarding the second objective (Table 2), the first author of this article had the opportunity to collect experience during 8 years of in-depth field research in a Portuguese private bank. During that period, the following sources of data collection were used – direct observations, which involved systematically seeing and listening (Taylor-Powell and Steele, 1996) to enable empirical knowledge about the integration of new technologies in the banking industry phenomenon; more than 62 formal interviews with highly knowledgeable bank employees; and the collection and analysis of innumerable archival records and official documents. The results from this experience are discussed in the next section.

4. Findings

This section provides the literature review insights. Data analysis and discussion integrates the authors' perspective based on several researches in the banking service industry.

4.1 Systematic literature review

The systematic literature review tails a comprehensive approach based on a single database in order to provide greater transparency and ease reproduction of results. Figure 1 outlines the publications distribution over time. After 2011, we registered a significant increase in the number of publications due to customers' adherence to technological banking service innovations. For instance, the American Bankers Association survey registered an increment of mobile banking popularity and as consumers named the Internet as the favourite way of banking business (ABA, 2012) it called the researchers' attention. Therefore, cases of Internet Banking, e-Banking and Online Banking are some of the studied topics during, and following the year 2012.

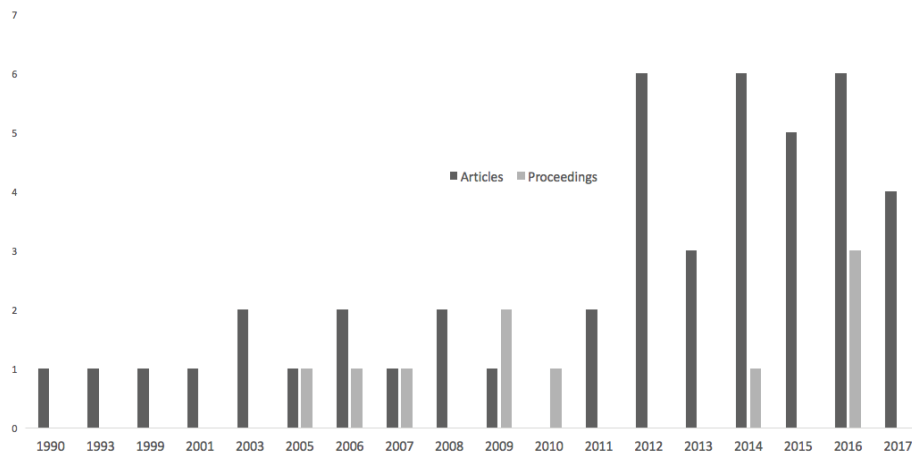


Figure 1: Publications distribution (International peer-reviewed Journals and Conferences)

The 55 identified articles were also classified according to country. The articles without any specific geographical reference were excluded from this classification. Conceptual (non-empirical) papers were rarely set in a region. The ranking is shown in Figure 1. The result was particularly high in a country – Iran, followed by the United States of America and the United Kingdom. The reason why Iran stands out, in comparison with other countries, is because its Internet banking services are still in a primal stage of innovation and development (Salehnia *et al.*, 2014). It is also related to the fact that e-banking services are attracting Iranian customers to become online (Divandari *et al.*, 2012). The e-banking is seen by many banks in Iran as a competitive tool to get advantage over their rivals (Vakili, 2014); thus, as a developing country, Iran is trying to upgrade its banking systems to achieve a higher banking quality.

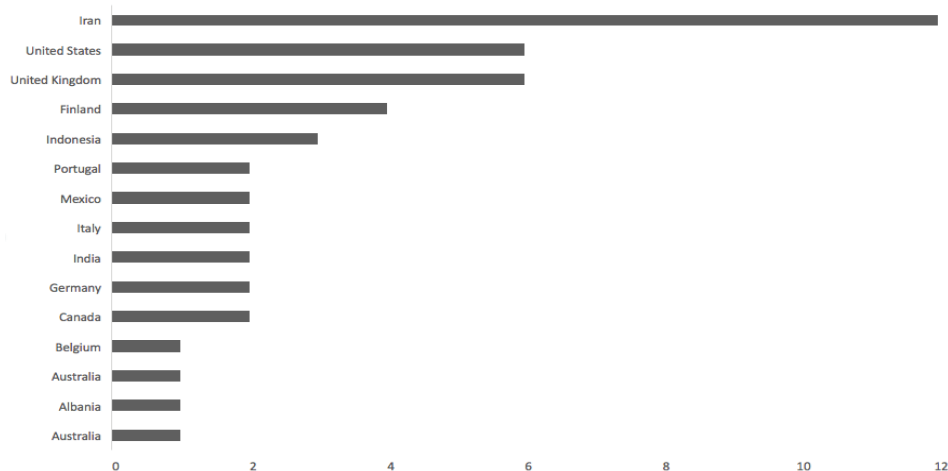


Figure 2: Country ranking

One question that normally researchers have when conducting case studies is: how many cases are recommended? In the banking service industry, the answer is a somewhat complex, for many reasons: some of the reasons are aforementioned, but most part of the banks is reluctant to participate (e.g., Moreira *et al.*, 2014). Without making distinction between qualitative or quantitative research's, out of the 55 articles studied we registered 110 banks involved, where: 23 were single case studies, 11 multiple case studies. The average number is 3 banks per study. The sampling strategies that best suits the banking service industry is another issue. We only considered those sampling strategies that were implicit in the articles text. Thus, the article analysis revealed two known sampling strategies inside the bank (e.g. clients, employees), which are: simple random sampling (probability), convenience and purposeful sampling (non-probability). This analysis is in line with the most frequent forms, but we did not find any case of snowball sampling. However, two new cases emerged, i.e. criterion and selective sampling. Although some authors refer to criterion sampling as a substitute term of purposeful sampling (Merriam and Tisdell, 2015), identifying this sample as a kind of purposive sampling alternative may be more acceptable (Given, 2008). Criterion sampling involves searching for cases or individuals who meet a certain criterion, for instance, that they have a certain disease or have had a particular life experience (Given, 2008). The second new type is selective sampling, which has also been labelled as criterion sampling and it refers to selecting cases or respondents based on an initial set of criteria (Fletcher and Plakoyiannaki, 2011). Table 4 illustrates the top sampling strategies.

Table 4: Top sampling strategies

Sampling	Types	Author(s) (Date)	Title	Source
Probability	Random	Salehnia, M., Saki, M., Eshaghi, A. and Salehnia, N. (2014)	A model of E-Loyalty and word-of-mouth based on e-trust in E-banking.	8th International Conference on IEEE
		Heydarizadeh, M. and Freidoonsalimi, S. (2016)	Investigating the effect of viral marketing on customer's preferences in selecting banks.	International Journal of Applied Business and Economic Research
		Fragoso, T. and Espinoza, I. (2017)	Assessment of banking service quality perception using the SERVPERF model.	Contaduria y Administracion
Non-probability	Convenience	Kashani, B. and Kasmani, A. (2015)	Users' value perceptions of new communication technologies and their willingness to pay: A case study of mobile banking.	Indian Journal of Science and Technology
	Purposeful or purposive	Saripan, H. and Hamin, Z. (2010)	Digital signature as a blue ocean?: An analysis of the application of its law in Internet banking.	International Conference on Science and Social Research
		Vakili, B. (2014)	Identifying the factors of customer satisfaction in e-banking system case study: Export development bank of Iran.	International Journal of Information Science and Management
		Puriwat, W. and Tripopsakul, S. (2017)	The impact of e-service quality on customer satisfaction and loyalty in mobile banking usage: Case study of Thailand.	Polish Journal of Management Studies
		Tipu (2014)	Employees' involvement in developing service product innovations in Islamic banks.	International Journal of Commerce and Management
	Criterion	Iman, N. (2014)	Innovation in financial services: A tale from e-banking development in Indonesia.	International Journal of Business Innovation and Research
	Selective or Specific	Pérez, A. and Del Bosque, I. (2012)	The Role of CSR in the Corporate Identity of Banking Service Providers	Journal of Business Ethics

Lastly, concerning the purposive sampling, the case studies showed that this strategy is suitable to situations where the respondents are selected because of their experience inside the company, as well as their knowledge concerning the phenomenon that is being under study. We also observed that most papers using interviews referred to service innovation studies. Prior service innovation literature has been mainly focused on conventional banks (Tipu, 2014). The involvement of front-line employees is considered at the heart of the product/service innovation process (Schneider and Bowen, 1984). What makes it important to purposive

sampling is the pivotal role of employees, who have direct interaction with the customers. Hence, they are most likely to better understand their needs.

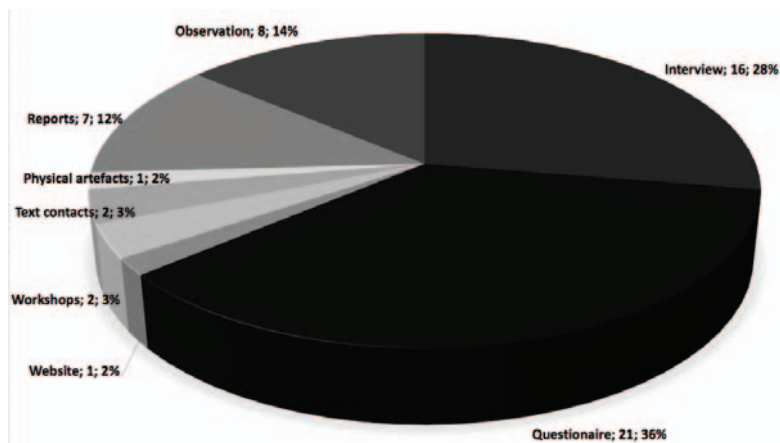


Figure 3: Major research methods

Figure 3 shows the major research methods used in the studies. The questionnaire was the preferable research method of data collection. Most researchers opted for 8 different sources of data collection: questionnaires (36%), in-depth interviews (28%), observation (14%), organizational reports (12%), textual contacts (e-mails or SMS) (3%), workshops (3%), physical artefacts (2%), website crosscheck (2%). This is in line with the methodology literature, as in management research the use of interviews comes second in frequency to questionnaires for data collection and the questionnaires are the most frequently used method (Tharenou and Cooper, 2007). These data collection methods were used individually or conjugated. Not all the articles mentioned the number of interviews and questionnaires, and as such they were excluded from the analysis.

Saunders and Townsend (2016) provide a good insight about reporting and justifying the number of interview participants in organization and workplaces. They recognize that while a norm of between 15 and 60 interviews participants is likely to be considered sufficient, our analysis revealed that the norm is between 13 and 22 interviews participants, depending if the respondents are bank employees or bank users, by this order. A similar analysis was conducted to quantitative research, the norm ranges from 117 up to 367 questionnaires, also depending if it is applied to employees or bank users. Although this data is slightly below Saunders and Townsend (2016) recommendations, this is perfectly reasonable given the fact that researchers face difficulties getting access to banks and their employees. Because of the sensitive nature of the information, some of the banks which participate in the studies had to remain anonymous.

We found three ways to conduct interviews: 1) Li (2001) decided not to use recordings. People being interviewed tend to be more reluctant to discuss sensitive issues in detail when they are being recorded. A list of questions was prepared before each interview, but the interview took the format of free discussion – the questions were mainly used to make sure key issues were covered in the discussion. Then, based on the notes taken, Li (2001) wrote immediately the report after each interview; 2) in other cases, the interviews were formal, focused only upon the research and recorded. However, the researcher also conducted informal interviews in informal settings such as the cafeteria, canteen or pub and were not recorded (Shah and Siddiqui, 2006); 3) the last case, more traditional, case researchers recorded (voice record) all the data and transcribed the interviews (e.g., Saripan and Hamin, 2010). The purpose of choosing interviews provided the opportunity of examining the interviewee responses through additional factors, not only by consciously transmitted information (Saunders *et al.*, 2003). Moreira *et al.* (2014) reinforces that it was possible to detect that some of the banking employees interviewed refrained from responding, with details and faithfully, to questions they considered compromising the banks privacy; the same would not be possible with a questionnaire.

The questionnaires used in the investigations were highly structured so as to generate quantitative data from large samples in order to test the research questions. From an academic point of view, it seems that questionnaires, as source of data collection, are being used on mature areas, while, for the other hand, interviews are being used for exploratory purposes, especially the non-structured and semi-structured interviews, which gives more freedom to the respondent. Although, in a case study context, generalizations are likely to prevail only in specific contexts, authors are recommending transferability to other sectors, in order to

corroborate the findings (Lähteenmäki and Nätti, 2017). Another recommendation is the conduction of mixed methodology research (Puriwat and Tripopsakul, 2017), in order to mitigate the weakness of the research strategy as traditional concerns regarding the limitations of case studies – such as the lack of rigour or basis for scientific generalization, as highlighted by Yin (1994) - are fully recognized in many researches (Li, 2001).

4.2 Author experience

Several choices may be made during case research. As aforementioned, sampling strategies and sources of data collection are empirically explored.

4.2.1 Sampling strategy

When designing a case research, a key issue is to determine the reason(s) why to conduct a research in the banking service industry. The motives are many times explained by the availability of empirical evidence. While conducting the literature review, we found that the snowball sampling was neglected. According to our experience, to ignore the potential of this strategy may be seen as a weakness given the difficult conditions to access banking data. The snowball sampling may become a useful strategy to build up a sample through informants and thereby mitigate the effect of inaccessibility. Therefore, we agree with Given (2008), to include the snowball sampling as one of the recommendable strategies, but in this instance to case research in the banking industry. When available, researchers should make use of their personal network inside the bank to identify the respondents who are in a best position to reply the interview protocol. Subsequently, respondents may be asked to nominate other employees, from different functional areas and different levels of responsibility at the bank. This process should continue until theoretical saturation is achieved (Saunders and Townsend, 2016).

4.2.2 Sources of data collection

Multiple sources of data collection are normally employed in case research. The evidence from at least two sources is recommendable for corroboration and triangulation purposes. We endorse Yin (2003) guidelines for data collection, as we have selected suitable methods to banking industry research the following: Interviews – are often considered to be the prime source of data collection and perhaps the most common type of source of data collection in qualitative social research. As it is difficult to get access to bank employees it is important to establish the number of participants. A sensible justification is theoretical saturation, which may be considered a gold standard. Banking participants may be chosen according to different functional areas and different levels of responsibility inside the bank. As employees tend to follow very similar rules and procedures across branches, we have reasons to believe that data collection from different branches may not be substantially different. Moreover, in the banking industry we strongly suggest interviewing highly knowledgeable informants, who are able to view the banking phenomenon from different perspectives. Bank interviews tend to be informal, especially when dealing with sensitive information. This means that researchers are encouraged not to record their discussions but, alternatively, stimulated to take field notes in a research diary. When formal meetings take place, bank employees tend to be reluctant to provide details about specific processes. To mitigate this aspect, a solution is to show to the respondents that the researchers have full access to the information; they are more receptive to explain the processes when they realize their job is not at risk. Direct observation – observation as a data collection method should involve systematically seeing of the phenomenon (Taylor-Powell and Steele, 1996) and is highly recommendable. We often conducted visits and tours to the bank facilities in order to take notes and observe operations in first-hand. Direct observation includes field notes from informal conversations and observation of meetings and processes, it served to document the real life phenomenon and serendipitous moments. Archival records –banks usually keep diaries and archives to register their activity. In some specific cases, banks may be enforced by law to register sensitive information; one example is customer complaints registration. By collecting and analysing customer complaints records may be useful to map the customers' path during the service recovery process. As some banks are currently engaging a large amount of resources to address failures, this limitation may be seen as a good opportunity to improve processes. For instance, archival records may be quality enquiries, or bank internal/official reports. Documentation – are institutional documents generally produced by the organization for external communication purposes and a source of exceptional data collection because they are of easy access and typically based on the organizations' day-to-day activities. Official documents include organizational newsletters and reports available from the official website. We make a distinction from the previous source since general documentation is more easily collectable when compared with official banking records that usually contain sensitive information, and therefore is more inaccessible. The

goal is to collect a rich set of data addressed to a specific research issue, as well as capturing the contextual complexity of the phenomenon; the following process, which is the analysis of case data, depends on the quality of the sources of data collection.

5. Concluding comments

Case research is a wide subject that has been calling the attention of researchers. Lately, qualitative case studies in OM field have not provided enough details about case design in rapidly changing phenomena. The results highlight the importance of choosing adequately sampling strategy. Although it is difficult to find a sampling strategy that fits all banking service research, it might be useful to learn from the literature. Our paper shows that the literature focus on two generalist sampling strategies, which have been used on the banking industry research: simple random sampling and purposeful sampling.

From the banking service literature, two new cases of sampling strategies emerged from the articles indexed in Scopus, i.e. criterion and selective sampling. Snowball sampling is, however, being widely neglected in the literature as we considered it a useful strategy to build up samples from an initial small pool of informants and, thereby, mitigate the effect of banking data restriction. Statistically, 36% of the banking research is based on quantitative data collection methods, while 28% is mixed qualitative sources. Subsequently, we presented the benefits from resorting to multiple data collection methods and the way each source should be used. We have built on Yin (2003) guidelines and recommended four qualitative sources of data collection to the banking industry – interviews, – direct observations, – archival records and – official documents.

We suggest conducting comparative studies to confront the results with other perspectives than our own experience. Future research should focus on experts' perspectives from different countries that have been conducting case research in the banking industry. Furthermore, the Scopus database is constantly being updated and the inclusion of data from other scientific databases might display new articles, not included in this paper. Although, we conducted a search with the same criteria (e.g., with ISI Web of Science), we found fewer articles when compared to Scopus. The search terms "banking services" and "case study" also dictates which publications were included, as different keywords may change the results. Nevertheless, we believe that the articles analysed in this paper provide a comprehensive overview of the theme. Due to space limitations this article does not list all references although they will be provided if requested to the first author. For the same reason, we had to leave aside such important areas as data analysis, reliability, validity or ethics, but we hope this can instigate other researchers to conduct further research and therefore contribute to management literature.

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Incorporating Research Skills into a Newly Designed Undergraduate Business Management Degree

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Abstract: This paper is set in the context of the launch of a major redesign of the Business Management undergraduate degree offered by a UK business school. This takes place during a period of flux in the higher education landscape, and of rapid changes and uncertainties in the nature of the employment that graduates from this degree can expect to seek. Given these factors, it proved necessary to review the extent to which students needed to develop their own research skills and how these could most effectively be taught at undergraduate level. The redesign entailed a robust review both of areas where the existing undergraduate design could benefit from transformation, and also areas of strength in the existing design which could be built on. A number of change management theories, notably that proposed by Dannemiller and Jacobs and popularised by Beckard, are applied to the process of transition to delivery of the new course design. The existing, soon to be superseded, range of degrees included a brief introduction to action research within the first year of their studies. As part of the redesign the course team developed a common narrative which the individual components of the course set out to support. Reflecting the changing and uncertain nature of the sort of employment that graduates would seek, part of this narrative was that students should use the course as a springboard to develop their own ideas and to find things out for themselves. To achieve this it became apparent that research skills needed to be incorporated into the course and to be introduced at various stages during students' learning, and the paper discusses the approaches that have been adopted.

Keywords: teaching research, course redesign, undergraduate teaching, action research

1. Introduction and background

The Higher Education Statistics Agency reports (HESA, 2018) that the category of 'business and administrative studies' represents the most popular subject area in British universities, accounting for approximately one student in seven. Not only is it popular, but it is a diverse discipline with rapidly changing requirements. The market for business courses is continually evolving and for many universities the introduction of a new degree in the field of business and management is a significant step.

Because business and management is such a diverse discipline, there is a considerable variation in the approaches taken by different degree courses, especially at the undergraduate level. Part of this diversity concerns the place of research methods within such a degree. To a superficial observer, research methods might not have an important place in an undergraduate business management degree, focused on understanding cases and theories around sub-disciplines such as finance, marketing, and strategy. But business management students need to acquire problem-solving, analysis, and critical thinking skills and the ability to apply a research mindset if valuable for all of these. The Chartered Management Institute (2014) placed considerable emphasis on experiential learning to equip management graduates to work in a future uncertain world, and connected the benefits of experiential learning directly to the demand from employers for analytical and interpersonal skills.

This paper is set in the context of a major redesign of a set of Business and Management undergraduate degrees and the consequent need to review the place of research methods in the curriculum. In that sense, it is a work in progress, and while the team designing the course is committed to applying action research to educational development (Carr and Kemmis, 2005), there are limits to what evaluation can be carried out until the first cohort to take the new degree, starting their studies in September 2018, graduate in another three years' time. At the time of writing there has been extremely positive feedback from a number of stakeholders, in particular potential students and advisors from within business, and the course team are understandably very proud of this, while also recognising the magnitude of the challenge entailed in ensuring that the new structure meets its expectations.

In this paper the introduction of the new degree structure is conceptualised as a process of change management, and is discussed in the light of frameworks which are widely used to evaluate organisational change in higher education and elsewhere. Course redesign is a complex process involving numerous stakeholders. This paper is concerned only with one aspect of the course – the provision of an introduction to research – and beyond

noting that this is easily overlooked in development of an undergraduate course, other aspects of the course design are outside its scope.

Within the current degree structure, research methods are included but their position within the curriculum could be regarded as precarious. Some students, depending which options they took at the start of their degree, have the opportunity to work within a team on a small action research project within their first few weeks at university. They are taken through a simplified form of the sort of methodological choices – how to gain access, how to collect data, and so on – which would apply to a typical research project and applied it to a small-scale study such as analysis of a local café. In their final year, students carry out a significant project on a subject of their choice, resulting in a report of typically 10,000 words including an element of research. Some students thrive on this but others find it a chore, and struggle to make it relevant to their future careers.

Above all else, the position of these activities became precarious because of the difficulty of securing commitment from both students and staff. This was particularly true of the final year project. Many students welcomed the opportunity to apply their learning from their degree course to a piece of independent work. But others saw it as a chore, and still others saw it as a chance to do a piece of work with limited relevance to their degree and little element of research, especially because if they had previous experience of research within their studies, it was from two years before they embarked on their final project. Moreover it proved difficult to obtain commitment to supervision from academics. Some, with little exposure to the undergraduate programme, feared that this could be a lesser endeavour than other areas of teaching although others reported being extremely impressed with the standard of undergraduates. One professor, working in the field of responsible management, declared himself ‘blown away’ by the capabilities of the final year undergraduates whose projects he supervised.

2. Initiating the change

Before discussing the role of research methods in more depth, it is worth reviewing the process that led up to the redesign of the undergraduate degree, and also worth noting that the paucity of research methods in parts of the existing degree structure was highlighted at an early stage in planning the redesign.

During the period following 2008 – notable because of the financial crisis during that year characterised most strongly by the failure of Lehmann Brothers (Peston, 2008) – there was a steady increase in the number of students taking the business school’s undergraduate Business Management courses. In 2010/11 there were 135 final year students, this being the cohort who had mostly started their three-year degrees in 2008, compared to 300 final year students graduating in 2016/7. Subsequent cohorts have been slightly smaller, reflecting a modest swing among applicants away from Business Management degrees and more towards specialised Finance degrees, but also intensified competition and uncertainty surrounding the higher education sector as a whole. Nevertheless this is a considerable increase which has brought challenges in how to scale teaching approaches. One of many examples of these is that the small first year research project mentioned above, framed as an opportunity for students to acquire a taste of action research, had originally been conceived as a task for teams within a highly cohesive cohort of up to 50 students. Student feedback consistently pointed to this activity being highly attractive to students in the post-2008 environment: trust in business institutions had been diminished and applicants were well disposed towards an undergraduate environment where they would be trained to take an analytical, critical approach to business issues. Yet it proved a challenge to implement this and to teach basic action research with a larger cohort.

So the business school had clearly discovered a formula which caught applicants’ imagination in the post-2008 business environment. The falling-off in numbers after the cohort graduating in 2016/7 created a prompt for change, and there are resonances with Kotter’s (1995, cited by Appelbaum et al, 2012) argument that the first stage of a change process should be to create a sense of urgency. While Appelbaum et al are critical of aspects of Kotter’s approach as being over-prescriptive and not based on rigorous scholarship, they acknowledge the values of his stages in a process of change although they question whether every stage is necessary in every case. The redesign closely followed Kotter’s first few stages, (1) to create a sense of urgency, (2) to create a guiding coalition, and (3) to develop a vision and strategy, a process which in this case quite reasonably prompted robust debate among members of the guiding coalition as to what the vision and strategy should be.

In responding to the sense of urgency members of the course team (who worked alongside senior faculty members to create a guiding coalition) raised some concerns. One was the need to create a course which met the needs of an (unpredictable) near future as effectively as the previous course design had met the needs of the immediate post-2008 years. Implicit in this was the need to make a choice, as part of the vision and strategy, as to whether to present the new degree as a highly distinctive and differentiated product or whether to set out to emulate the best practice already in place elsewhere. Another concern, vigorously expressed by some members of the course team and perceived as a significant reputational risk, was that ill-advised revision could result in changing aspects of the course which were valued, popular, and effective while leaving unaltered aspects of the course where staff or students had expressed dissatisfaction.

Dannemiller and Jacobs (1992) argue that the conditions for change can be represented by the equation:

$$D \times V \times F > R$$

Where D represents dissatisfaction, V a vision of what is possible, F a set of first steps, and R resistance to change. The process of course redesign started at a stage where D and R were both tangible, but V and F were practically non-existent and in line with the analysis suggested by the equation, there was almost no incentive to change. When the first concrete steps towards a revised degree were shared with staff and students, with the consequence that V and F became tangible components, it became apparent that some resistance to change came from an attachment to components in the existing degree that were genuinely valued, and were appropriate to the emerging business environment. The small-scale research exercise within the first year clearly fell into this category.

At the same time one contribution to dissatisfaction was a sense that the final year project provided an uneven experience, which suited a few students very well but for others felt either like a formality, or an exercise which was potentially interesting but hampered by students having received insufficient preparation.

So in the early design stage of the new degree the components where students learned about research methods fell into the categories of resistance to change and of dissatisfaction, not a propitious situation for the redesign process.

3. Incorporating research

Once the overall architecture of the revised course had been determined, some of the course team's efforts were devoted to creating a coherent narrative which could be used to guide detailed design, and also to frame promotional material on the university's website and in the prospectus. The emphasis on a strong coherent narrative stemmed from the importance of 'principled reflective practice' as a component within a design science (Laurillard, 2012: 6).

One of the key influences for the course team at this stage was the notion promoted by Johansen (2012) of creating 'maker instinct' among managers in a future uncertain world. Johansen deftly moves between the concept of the maker of a physical artefact, such as somebody who builds steam engines as a hobby, and the maker of novel organisational structures, arguing that both types of maker draw on the same instincts. But applying his message to an undergraduate Business Management course implies that the ability to be creative, to be original, and to carry out research is fundamental for graduates entering contemporary businesses. The idea of maker instinct was adduced by the course team determined to create an environment which would prepare participants to 'make their own future'.

If graduates from the revised degree are to enter the workforce with maker instinct, it became apparent that they would need to be proficient in research skills. O'Donovan (2010) notes the variety of teaching and learning methods needed to do justice to the range of disciplines within business and management, but also identifies as a theme the importance of prompting participants in a course to carry out their own activities, using the course content as a starting point and relating it to their interests.

So the next stage in course design included a process of determining where research methods could be included. The revised structure included a stronger emphasis than its predecessor on providing students, early in the course, with a grounding in subjects such as organisational behaviour, economics, marketing, and accounting.

While this undoubtedly satisfies a need for students to attain a particular level of understanding in these areas, and gives them marketable knowledge which would help them, for example when applying for internships, it leaves little time to introduce general management concepts and even less time to practise research. Nevertheless it has proved possible to incorporate research skills into the revised course from the very start.

In the first term the students will devote some of their time to an introduction to critical thinking. Within this they will come across a range of management research texts, and should become familiar with the language associated with research. They will learn how to recognise sources of bias, and how to identify where alternative writers on a subject have similar perspectives but use different terminology. They will learn where alternative writers have different, possibly conflicting, perspectives, and will discover why this occurs and how to rationalise these differences. This will be taught in a highly participative manner with students working in small groups and with limited opportunities to get through the material without contributing.

In the second term the students will then have the opportunity to carry out their own research. This will partly replicate the existing small-scale action research project, and will be framed in a similar way as at present, as preparation for problem-solving challenges which students can expect to encounter once they are working. But they will encounter it with a stronger sense, compared to their predecessors, of what research outputs should look like and of how they should be able to present their findings.

There is still a concern that students will have some simple research experience in their first year, but will then not retain the knowledge and ability enough for that to be of use when they carry out their individual projects in the final year. But there are opportunities within the design of the second year to address this. For one thing, the flipped classroom approach (Long et al, 2017) has been adopted in places and students will be expected to carry out an element of individual inquiry as a preparation to participate in this. For another, alternative pathways will be provided within some subjects and these offer the chance for students who feel they have an inclination and enthusiasm for research to pursue this.

In the final year the requirement for students to undertake a project remains, but it is linked closely to a research methods module which students must take for academic credit. This will offer an opportunity for students to build up their enthusiasm for research and to discover from an informed position what they can pursue as an individual research project. Reviewing the shortcomings of the current approach to individual projects it is apparent that students are hampered through being encouraged to choose a subject from a standpoint of little knowledge of what constitutes research – this is true even of those who carried out a first year small-scale project, few of whom have retained enough understanding of research to carry through to their final year project.

Tying the final year project to a taught research methods module also offers opportunities for different types of project that offer relevance in different forms. The top-level specification – that it should be an extended written piece of work which draws on students' learning from their course and addresses a topic that interests them – accommodates plenty of scope for particular formats and particular sources of data. Within the existing format some students have been working closely with businesses and used their experiences as primary data. The intention is to expand the possibilities for students to carry out final year project research in different settings.

4. Continuing development

One other way in which students will be involved is by ensuring that the course team's existing commitment to action research is expanded and developed. Participatory action research (Walker and Loots, 2017) offers scope for students, and indeed for a wider community, to be involved in the development of the course. Inevitably in a heavily revised course there will be a need to evaluate and modify content, and the involvement of students in this will foster a sense of ownership and also offer another avenue for them to carry out something with an element of research. Participatory action research provides an opportunity for course development to be situated as a force for broader, beneficial change. At this stage it is worth reflecting on reasons for the success of the previous generation of Business Management courses in the period immediately following the 2008 crisis, which was characterised by a renewed interest in corporate governance and ethics and a sense that an ability to apply critical judgement to the choices facing organisations was a particularly desirable attribute for graduates. While the business environment has evolved, the course team from the start saw a strong ethical

dimension, and a commitment to managing in a style which recognises and values social benefits, as signature attributes for the business school and ones which needed to be tangible within the new structure.

It is worth revisiting Kotter's approach to change, and more specifically Appelbaum et al's (2012) critique of it in relation to step 8, which is to anchor new approaches into the corporate culture. This creates challenges in embedding the norms associated with the delivery of a new course in the everyday activities of faculty members: it should become assumed that particular values and approaches are followed, but at the same time these should not be restrictive and not stifle creativity. But in a research-active environment this also creates opportunities for faculty members to draw connections between research and undergraduate teaching, and for them to generate a climate where undergraduate students gain a sense of what research means.

A cause of dissatisfaction and a contributor to staff members' lack of enthusiasm for the undergraduate course was that, over the years, staff research interests had drifted away from some of the areas covered within the course. The redesign offered new opportunities for faculty members at the business school to share their research with undergraduates, and this is yet another way in which the research activities can be more closely integrated into the undergraduate course.

5. Concluding thoughts

To reiterate, it is too early to carry out any evaluation of the research component of the new course. In a vocational course, and also one built around the rhetoric of students and graduates being enabled to make their own future, the principal measure of success will be through the achievements of graduates in the future. Application of frameworks, notably that promoted by Dannemiller and Jacobs (1992) to the change process has proved valuable in identifying the deficiencies of the existing courses in this area. Interestingly this framework also highlights the importance of taking first steps towards change, along with the need to value strengths which are already established and to ensure that these are not lost in the change. Nevertheless the application of action research (Carr and Kemmis, 2005) depends on a continuing critical approach and a preparedness to improve a course through a series of continuing interventions. In the spirit of action research, the course design has already been informed by careful consideration of what has been successful in the predecessor course (such as the commitment to responsible and ethical management, the inclusion of options within which students are encouraged to go beyond a set curriculum, and the early exposure to research techniques) and also honest reflection on what could be improved (such as the framing and guidance offered for the project taken by students during their final year). As part of the future evaluation of the redesign, it will be necessary to reflect on whether changes have boosted student learning and even student satisfaction in any measurable way, and also to consider whether the aim of enabling graduates from the course to make their own future is in any sense being achieved.

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Network Governance Construction in a Cross-Cultural Setting: The Role of the Contract

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Abstract: Several studies on network governance mechanisms have recognized a significant role to contract and accounting measures, as formal mechanisms, and have assigned a central role to trust, as a social mechanism of control. Focusing our attention to business networks in which firms of different countries are embedded, we are interested to better understand how the formal and social governance mechanisms are related. Business networks whose partners come from different countries are cross-cultural contexts where the roles assigned to social governance mechanisms may differ among the partners. In studying such networks, we focus on the network governance construction process, recognizing the contract as the main coordination and control mechanism for stabilizing interfirm relationships and network organizations. This paper aims to examine the process that might lead to the formulation of a contract between firms, viewed as one of the basic mechanisms of governance in a cross-national network organization. This process is described comparing two different theories: the Actor Network Theory (ANT) and the Pragmatic Constructivism (PC). ANT explains how the difference in the parties' interests was a key point in problematizing the introduction of the contract. However, ANT does not offer sufficient reasons to explain why the translation fails in a cross-national network organization, where different national values may be relevant. Then we use the PC to explain a missed integration between national values, considering a contract a way of thinking. Adopting the above theoretical perspectives, a case study is accomplished referring to a process aimed to construct a cross-cultural network between an Italian, an Albanian and a Kosovar firm operating in the artistic lightening system business. The evidence showed that the presence of trust can be an obstacle as is the case for other informal mechanisms like national cultures and values. A negative nexus is highlighted between informal and formal mechanisms of governance. This nexus has been complicated by the interdependence between the two kinds of relations comprised in the informal business network under study.

Keywords: actor-network theory, pragmatic constructivism, cross-cultural, actors, values

1. Introduction

Several contributions have recognized the relevance of using informal social systems and formal contractual relationship in network governance coordination (Chua and Mahama, 2007; Håkansson and Lind, 2004; Mahama and Chua, 2016; Mouritsen and Thrane, 2006; Van Veen-Dirks and Verdaasdonk, 2009), highlighting that they could be substitutive or complementary (Argyres and Mayer, 200; Faems et al., 2008). Focusing on the role of contract as a formal mechanism, contributions have underlined how the contract can lead the partners to reach greater efficiency and reduce costs by clarifying activities and by mitigating potential opportunism (Nooteboom, 1996; Zaheer and Harris, 2005). While, social mechanisms, as trust, could lead the increase of commitment between partners (Child and Mollering, 2003).

In general, these mechanisms may activate such learning processes between partners, making the relationship more durable and encouraging interactions and promotion of each other's interests (Johanson and Mattsson, 1987).

Contributions on control mechanisms have typically adopted a structural approach to explain the existence of forms of governance rather than a process approach to explain how the mechanisms of governance work in constituting the action that contribute to network governance construction (Mouritsen and Thrane, 2006).

Acknowledged this gap, in what follows we attempt to explore the process that might lead to the formulation of a contract, viewed as a mechanisms of governance in a cross-national network organization. In doing so, we interpret the network governance construction taking advantage of two theoretical views: the critical and pragmatic ones. Focusing on this issue, we try to better analyse how firms of different countries are embedded in networks. Our aim is to better understand how the formal and social governance mechanisms are related.

To examine the process that might lead to the formulation of a contract between firms, we firstly considered it as a process of translation (Callon, 1984). Thus, through the Actor Network Theory (ANT) we highlighted the

reasons for problematization and, thereby, the identities of the actors to be interested and enrolled. In this view, the contract is viewed as an inscription that is able to mobilize all the actors' interests as it comes out from a successful process of translation. This interpretation well explained how the difference in the parties' interests acted in problematizing the introduction of the contract, but it does not offered any reason why the translation could fail, as in a cross-national network, where different national values may be relevant.

Since the failed translation may be due to a missed integration between national values, we consider a further theoretical perspective that can contribute to the explanation of the phenomenon: the pragmatic constructivism (PC) (Nørreklit, et al, 2017, 2007, 2010). Viewed through the lens of pragmatic constructivism, a contract is a way of thinking that defines future possible behaviours within the parties' conveniences and interests. The defined possibilities are not illusionary if they are based on business facts and the related problems to be solved by applying rules that have to be interpreted and understood by the parties according to the same meanings.

Adopting these two theoretical perspectives, a case study is accomplished referring to an ongoing process aimed to construct a cross-cultural network between an Italian, an Albanian and a Kosovar firm operating in the artistic lightening systems business. The evidence has shown that the presence of trust can be an obstacle as is the case for other informal mechanisms like national cultures and values. Thus a negative nexus is highlighted between informal and formal mechanism of governance. This nexus has been complicated by the interdependence between the two kinds of relations comprised in the informal business network under study. Furthermore, case evidence shows the inability of ANT to provide answers to questions starting with why, while PC contributes to deeply the motives leading actors to make actions that succeed. This leads us to notice that the ANT and PC lenses could be complementary in offering a richer understanding of phenomena.

This paper is organized as it follows. Section 2 presents the theoretical background, section 3 illustrates the research problem and the objective of the paper, on the formal and informal mechanisms used in the cross-cultural network governance focusing on the role of the contract in the network governance construction. Section 4 outlines the research methodology and illustrates the findings emerging from the analysis of the case study, section 5 shows the interpretation of the empirical evidence from the ANT and PC perspectives. Finally, the research conclusions are presented.

2. Theoretical background

In 1997, Candace Jones, William S. Hesterly and Stephen P. Borgatti, in their paper on a general theory of network governance, published on *Academy of Management Review*, Vo. 12, No. 4, recognized that many industries were using network governance coordination characterized by informal social systems and formal contractual relationship between firms. As they explained, such mechanisms were combined to coordinate products and services in uncertain and competitive environments. Jones et al (1997) was the starting point for further studies, even in the management accounting area, that have recognized the co-presence of social and formal mechanisms for both coordination of networked firms' activities and control exercised at both the business and the network levels (Chua and Mahama, 2007; Mahama and Chua, 2016; Mouritsen and Thrane, 2006; Van Veen-Dirks and Verdaasdonk, 2009). In particular, Van der Meer-Kooistra and Scapens's (2008) dealt with the governance of lateral relations, where, after defining four features of lateral relations, namely exchange of knowledge, co-presence of cooperation and competition, combination of flexibility and standardization, continuous shift in the leadership role, adopted a theory called "minimal structure" in order to express the continuous need for balance between firmness and flexibility in such relationships. Four types of structures, economic, institutional, social and technical, were proposed and discussed. Even if the later study focused on lateral relations, rather than network organizations, its arguments are quite consistent with Jones et al.'s (1997), namely that network governance is a configuration of informal-social and formal mechanisms directed to coordinate and control networked firms' activities.

3. The research problem and objective

Among the network governance mechanisms, a significant role has been recognized to contract and accounting measures, as formal mechanisms, while a central role has been assigned to trust, as a social mechanism of control and uncertainty reduction. This issue has been differently argued by management accounting researchers that have highlighted how such formal and social mechanisms could be substitutive or complementary (Van der Meer-Kooistra and Vosselman, 2000; Tomkins, 2001; Dekker, 2004; Vosselman and Van der Meer-Kooistra, 2009; Minnaar et al, 2017). Focusing our attention to networks in which firms of different

countries are embedded (Scheytt, 2003), we are interested to better understand how the formal and social governance mechanisms are related. In fact, business networks whose partners come from different countries are cross-cultural contexts where the roles assigned to social governance mechanisms may differ among the partners. In studying such cross-cultural networks, we focus on the process leading to the construction of network governance.

Within cross-cultural networks, the study of network governance construction needs to be problematized in the particular case of a “shared network governance” (Antivachis and Angelis, 2015), as in the related decentralized network the likelihood of each single relation to be established and maintained may be related to other relations: those comprised in the same network. Moreover, the construction of network governance in a decentralized network needs to be examined considering the introduction of governance mechanisms that help to stabilize the network. In line with Minnaar et al (2017), we recognize the contract as the main coordination and control mechanism for stabilizing interfirm relationships and network organizations.

This paper is aimed to examine the process that might lead to the formulation of a contract between firms, viewed as one of the basic mechanism of governance in a cross-national network organization. This process is considered as a process of translation (Callon, 1984), which highlights the reasons for problematization and, thereby, the identities of the actors to be interested and enrolled. Then, once formulated, a contract is viewed as an inscription that is able to mobilize all the actors’ interests as it comes out from a successful process of translation.

This theoretical approach succeeds only partially to describe this phenomenon. While the Actor Network Theory (ANT) well explains how the difference in the parties’ interests was a key point in problematizing the introduction of the contract in each of the two kinds of relationships and also in considering the interdependence of the different translations, it does not offer any reason why the translation fails in a cross-national network organization, where different national values may be relevant.

Since the failed translation may be due to a missed integration between national values, we consider a further theoretical perspective that can contribute to the explanation of the phenomenon: the pragmatic constructivism (Nørreklit, et al, 2017, 2007, 2010). It is a recent research paradigm which is intended to define the ontological conditions under which a way of thinking or even a theoretical model can become reality. These ontological conditions are seen in the integration of facts, possibilities, values and communication. Viewed through the lens of pragmatic constructivism, a contract is a way of thinking that defines future possible behaviours within the parties’ conveniences and interests. The defined possibilities are not illusionary if they are based on business facts and the related problems to be solved by applying rules that have to be interpreted and understood by the parties according to the same meanings.

4. The research methodology and the empirical evidence

Adopting the above-described theoretical perspectives, a narrative case study is accomplished referring to a process aimed to construct a cross-cultural business network between an Italian, an Albanian and a Kosovar firm operating in the artistic lightening system business.

Recognizing the relevance of studying not only the results of what things happened but also their making, and following a retrospective analysis aimed to make sense from some theoretical lenses, we adopt a narrative approach. This approach required to provide access to people’s identity, personality and the meaning people ascribe to specific situations (Gabriel, 1998). This methodology is also related to a hermeneutic understanding (Gadamer, 1989) which emphasizes the processes of interpretation and understanding in a social context (Schuetz, 1927). However, using this method does not mean that the exploration is merely a linguistic endeavour. Following Wittgenstein (1958), language is expressive of forms of life while, at the same time, forming our knowledge of the world.

The data on which the empirical evidence is based consist of a narrative that was constructed involving the entrepreneur of the Italian partner, one of his co-workers who collaborated to the research project as assistant researcher, and one of the authors of the present paper. The reason for the collaboration of the research assistant was the writing of her master thesis. The latter was aimed to explain the process of introducing a contract in a supply network adopting the perspective of ANT. This was why the dynamics reported could not

be considered as an objective story but is a narrative influenced by the theoretical lens adopted. Moreover, being the aim of the project to form an ANT interpretation of the phenomenon of interest, the narrator had to be familiar with ANT categories. This induced the researcher to rely on the narration constructed by the research assistant. The latter was not extraneous to the story but had an active part in all the dynamics. She had been recruited by the Italian entrepreneur who, speaking Italian, had to satisfy his need for a consultant who can communicate with the main representatives of foreign partners. The position of the assistant researcher gave her a privileged access to all documents that had to be written in English to be proposed to the partners or, when received from the partners, had to be translated into Italian. Moreover, the assistant researcher could play the role of a participant observer. She took an active part in all the meetings of the actors, for the presentation of proposals and negotiations. The research assistant constructed her narration by gathering data from interviewing the entrepreneur about his points of view on the dynamics of the partnership. He was interviewed three times, following an informal and retrospective approach, relying on interviewee's perceptions of events.

The data collection lasted 9 months approximately. The observations began in May 2014, six months before the research assistant was aware of her thesis assignment. The interviews and the documentary analyses started when the research assistant initiated her thesis. Thus, the narration was co-constructed by the research assistant with the entrepreneur, on the one hand, and with her supervisor, on the other, who is one of the authors of the present paper and helped the research assistant to construct a narrative ANT based (Czarniawska-Joerges, 1998). While the story ended in January 2015, the data collection of the original project ended in July 2015 and produced the narrative reported in the following section.

In January 2018, we reinterpreted the narrative according to the aims of the present paper. So, drawing on both ANT and PC perspectives, narrative data were analysed to interpret how the process of network governance construction occurred (Scheytt et al, 2003).

The case refers to an Italian individual firm called I-Light (pseudonym), which deals with the artistic lighting of churches, museums and conference rooms, consulting and design of lightening systems. I-Light participated to a voluntary project for the renovation of an Albanian Cathedral, promoted by the bishops of an Italian and an Albanian diocese. While the project was in progress, the Albanian bishop contacted the owner of I-Light to propose him a cooperation with an Albanian, local firm, called A-Light (pseudonym), which was a small sized firm involved as a volunteer in the project. A-Light became interested to cooperate with I-light for an activity of electrical system installation. A-Light was interested to contact I-Light in order to acquire Italian electrical materials, considered of high quality. In agreeing to the A-Light proposal, I-Light acted as intermediary between its own suppliers and A-Light, helping the latter to increase its competences. A training activity was carried out between I-Light and A-Light which was experienced through the joint cooperation of the two firms in further projects of construction and renovation, thanks to which I-Light entered the Albanian market while A-light owner and co-workers were able to develop competences and skills in line with the European standards. During these projects, the cooperation and the training activity between the two firms have involved some of the I-Light suppliers: those considered by the I-Light owner as the most relevant business partners. Further developments came out when another renovation project was acquired for a cathedral of a diocese in Kosovo. In this project the works were carried out by a Kosovar firm called K-Light (pseudonym), which was well known in the Balkanian industry of production and installation of electrical panels. Given the preceding involvement of the latter firm, I-Light was required only to provide materials and consultancy for lighting design, and it involved its Italian suppliers too. The cooperation was fruitful and balanced between I-Light and each of the companies. Then, after a couple of years, I-Light was willing to stabilize the network by formalizing some contracts, involving its suppliers and both the Albanian and Kosovar firms. At that time, the business network was of an informal kind and reflected the different stories of the relations between: 1) I-Light and its suppliers, 2) I-Light and A-Light, and 3) I-Light and K-Light. The three just mentioned relations were direct relations, while the indirect relations between the two foreign firms and the I-Light's Italian suppliers were mediated by I-Light. The latter, according to the mechanism that it designed and experienced during the projects, received from each of the two Balkanian firms requests for project quotations; once accepted, I-Light ordered the materials to the suppliers and these sent them to the two companies and invoiced directly to them. I-Light guaranteed for the solvency of the two Balkanian buyers.

According to the above description, the informal inter-firm relations developed during the experience of the Albanian and Kosovar projects were characterized by trust in the three forms conceptualized by Sako (1992),

namely contractual, competence and goodwill trust. Given that, the intent of I-Light to stabilize all the relationships in a unitary network had to be pursued through the formalization of two kinds of contracts: one between I-Light and each of the two Balkanian companies, which in fact required two distinct contracts; one between I-Light and each its suppliers, which, again, required as many different contracts as the number of suppliers.

5. Theoretical discussion and interpretation

Two processes of translation are described for each of the two kinds of contracts. Each process highlights the reasons for problematization and, thereby, the identities of the actors, human and not, to be interested and enrolled. Interpreting the phenomena as translation processes, what has emerged is a set of factors that explain only in part the failures of the two translations. Firstly, the interdependence between the two translation processes, and thus that the failure of one entails the failure of the other. This interdependence reflects the interdependence between the relations that I-Light had developed with each of the Balkanian firms and the relations developed by I-Light and its suppliers: the quality of one is conditioned by the other. Second, the proposal of a formal contract was perceived by A-Light to be unnecessary, given the Albanian habit to do business by engaging and respecting informal agreements. A formal contract was indeed perceived by the Albanian customer of I-Light as redundant given the level of trust already developed in their relationship. A-Light, thus, considered the contract as an inspection instrument that was not consistent with the reciprocal trust the partners had developed. On the other hand, K-light, the Kosovar customer of I-Light, given its bargaining power, higher than the Albanian firm, was more interested in engaging in a direct relationship with one of I-Light suppliers, which it contacted for this. But the latter expressed to be in partnership with I-Light only, not being yet ready to start a direct relationship with a foreign partner, and informed I-Light of this.

As the main findings coming out from the case evidence, we notice how trust was an obstacle in the formalization of a contract, as the latter was considered redundant given the trust level already developed. This reveals a negative nexus between social and formal mechanisms for governance in a cross-national business network. Moreover, another relevant role in the Albanian episode was played by a difference between the Italian and Albanian national cultures. The different habits in doing business were another reason that explained the different perceptions of the proposed contracts by the Italian firm and its Albanian partner. Moreover, besides the relationship level, further explanations were found considering the difference among the interests of the parties at the network level. Different were, in fact, the interests of the Kosovar customer and the I-Light's Italian supplier. While the former was interested in engaging directly with the Italian supplier so as to enter the Italian supply electrical market, the latter was not interested in starting a direct relationship with a foreign partner.

As previously argued, the phenomena described in the case evidence were only in part explained through the categories of the ANT. The latter well explained how the difference in the parties' interests was a key point in problematizing the introduction of the contract in each of the two kinds of relationships and also in considering the interdependence of the two translations. However, ANT does not offer any reason why both the translations failed. The reason had to be found out in the different Italian and Albanian ways to do business, which is related to the different national values and to their missed integration in this case. It is a reason out of the ANT categories.

The theory that can complement ANT explanation has to highlight the role of different values in the two processes leading to sign up a contract. Then we use pragmatic constructivism (PC) since it better analyze how different national cultures could affect the network governance construction process. If there are different or opposite values between the parties, then there is no convergence to formalize a contract. This is what can be drawn from the case evidence applying pragmatic constructivism: the values of the Italian and Albanian parties were opposite as they were based on two national cultures that deal differently with doing business.

6. Concluding remarks

The study has examined the process that might lead to the formulation of a contract as a formal mechanism of network governance when the firms embedded come from different national cultures. The case evidence has shown that the presence of trust does not necessarily play a central role and that it can be an obstacle as is the case for other informal mechanisms like national culture and values. Thus, a negative nexus is highlighted

between informal and formal mechanisms of governance. This nexus has been complicated by the interdependence between the two main kinds of relations comprised in the informal business network.

The theoretical interpretation and discussion of the case evidence has highlighted the partial explanation of the phenomenon offered by ANT lens and so the opportunity of the integration provided by PC. ANT, with its categories of translation and network, explains the interdependence between the two processes directed to formulate the two kinds of contracts. This points out that the failure of the constitution of a formal network governance may be due to the failure of only one relation. This emerges in the relation between I-Light and K-Light, whose interests were different, being the former interested in stabilizing the whole business network through the introduction of a formal contract governance, the latter being interested in entering the Italian supply market of electrical materials. Because of this divergence in interests, I-Light was not acknowledged by K-Light as a spokesman for their relations and, given the interdependence between the two translations, it failed as enrolling actor for the whole business network.

The failure due to the relation between I-Light and A-Light was not sufficiently explained from the ANT lens, which does not comprise the category of value. The difference in the Italian and Albanian habits to conduct a business is an argument out of the ANT scope, which is not focused on the potential determinants of action internal to the actors, nor is it focused on future possibilities because both categories are not empirically observable. Differently, based on an interpretive approach, the PC draws from an interpretation of the actor's intents in relation to its social context. This allows to define the actor's values that drive their choices from future possibilities of actions that are coherent with the facts observed from the past. Red through a PC lens, a contract is not just an inscription that can mobilize actors' interests. Rather, it is viewed as a way of thinking that has to be commonly accepted by all the actors involved. It has to be the exit of a process of integration that makes the common narrative agreed upon by all the actors. The difference in the national values between the Italian and Albanian partners was relevant to interrupt the integration process since its initial phase. This point is an exemplification of the inability of ANT to provide answers to questions starting with why. ANT, indeed, limits its focus on questions starting with what, who and how, following a so called "flat approach" that offers a detailed description of dynamics involving collectives. PC differs as it is intended to enrich our understanding of the motives leading actors to make actions that succeed. PC follows a pragmatic approach that explains how, what and why an action succeeds.

From the two theoretical interpretation of the narrative reported earlier we notice that the ANT and PC lenses are complementary, as they did not suggest opposite interpretations of the narrative. Rather, they suggest interpretations that can be combined and can offer a richer understanding of a phenomenon. Given the usefulness of this combined use of both the perspectives, a more deep examination of their philosophical foundations could be a subject of future lines of inquiry.

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Establishing Typologies for Diverging Career Paths: A Comparison of two Methods

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Abstract: Discussions on policy and management initiatives to facilitate individuals throughout working careers take place without sufficient insight into how career paths are changing, how these changes are related to a modernization of life course biographies, and whether this leads to increased labour market transitions. This paper asks how new, flexible labour market patterns can best be analyzed using an empirical, quantitative approach. The data used are from the career module of the Panel Study of Belgian Households (PSBH). This module, completed by almost 4500 respondents consists of retrospective questions tracing lengthy and even entire working life histories. To establish any changes in career patterns over such extended periods of time, we compare two evolving methodologies: Optimal Matching Analysis (OMA) and Latent Class Regression Analysis (LCA). The analyses demonstrate that both methods show promising potential in discerning working life typologies and analyzing sequence trajectories. However, particularities of the methods demonstrate that not all research questions are suitable for each method. The OMA methodology is appropriate when the analysis concentrates on the labour market statuses and is well equipped to make clear and interpretable differentiations if there is relative stability in career paths but not if careers become less stable. Latent Class has the strength of adopting covariates in the clustering allowing for more historically connected types than the other methodology. The clustering is denser and the technique allows for more detailed model fitting controls than OMA. However, when incorporating covariates in a typology, the possibilities of using the typology in later, causal, analyses is somewhat reduced. In this paper career patterns were clustered but it is clear that this kind of analysis is appropriate for the longitudinal study of organizations as well.

Keywords: careers, life course, optimal matching analysis, sequence analysis, cluster analysis

1. Introduction

The latest resurgence of interest for life course frameworks for career research (Eliason, Mortimer, and Vuolo, 2015; Robette, Bry, and Lelièvre, 2015) is, for the most part based on the assumption that career patterns are changing due to influences of modern life course biographies. In this manner, deviating from a standard career path is increasingly becoming an option for individuals to combine paid labour with other important life domains. These career detours emerge in diverse labour forms such as part-time jobs, temporary working hour reductions, and labour force time-outs, and are used by individuals to alleviate conflicting time demands throughout careers, especially during the rush hour of working life. Although the classic career path of steady, full-time employment is still the standard, there are grounds for assuming that an increase in the number of career types is occurring under influence of the de-standardization of life course biographies. Are standard full-time working careers becoming less the norm? Is there evidence of an increase in career types exhibiting more transitions from, to, and within different states of activity in the labour market? And who benefits from these transitions? (Pavlopoulos et al, 2014). This paper does not aim to search directly for answers to these questions. Instead, we take one step back in the research cycle to assess just what the appropriate instrument is to answer these questions. Pavalko, (2015) finds the new methods of sequence analyses essential to applying life course frameworks. According to Hoffman (2015), studies which focus on temporary variations are more short-term oriented. Looking into within person change, and this is the focus of our research, has a long-term focus. The aim of this paper is to evaluate two developing exploratory methods to cluster an individual career path. With the increased availability of longitudinal data, the search for appropriate techniques to analyze long data series has intensified. In career research, longitudinal data can give insight into the development of careers. With the resulting typologies, further analyses can throw light on the life course analysis of career trajectories.

We use the Belgian labour market as a case study for two reasons. First, because the Belgian labour market has a long history of women's labour participation and life course-oriented labour market policy, and secondly because of a unique dataset surveyed among Belgian households covering career histories of more than 4400

individuals. Using this dataset, two techniques are compared: Optimal Matching Analysis (OMA) and Latent Class (LCA) regression analysis. The choice for these two methods is because of the increase in their range of applications (Halpin, 2010; Bray, Lanza and Xianming, 2014).

The organization of this paper is as follows. In section 2 the data are introduced. Section 3 provides a description of the two methods of analysis. In section 4, the typologies resulting from the analyses using the two methods are compared. In section 5 the typologies are analyzed using a cohort perspective for insight into whether the established career types are new or career paths on the decline. Section 6 discusses the implications and the last section (7) summarizes the findings and draws conclusions.

2. The PSBH career module data

The data used for this research is from the Panel Study on Belgian Households (PSBH), a survey originating in 1992 with annual waves following the original 4439 randomly selected households counting 11000 individual members. The survey is conducted using face-to-face interviews. Respondents are adults in private households (16 years or older). All of Belgium is covered with an achieved sample size of 4439 households and a response rate between 85 and 93 percent. The sampling frame is the Postcode Address File of the National Registration Office.

In the 2002 wave of the panel, a special module on careers was included. It was completed by 4453 respondents answering questions on the entire career path starting with the moment that their initial schooling was completed or terminated to their retirement from active labour participation. The PSBH is sampled from the entire Belgian population known to the postal registry, which means that the population is broader than only the population of working age. There are obvious drawbacks to using retrospective data, especially when the survey questions are covering such lengthy periods of time (Manzoni et al, 2010). However, the career module is designed using questions that carefully guide respondents to register their periods of labour participation, inactivity, unemployment, schooling, etc., using major life course events as their historical markers (i.e. marriage, birth of children, etc.).

3. Two exploratory techniques for the analysis of sequences

We start with a general description of the techniques we compare. The aim is to give the reader a non-technical introduction to the philosophy behind the technique and a broad idea of how to use the technique with career sequences.

3.1 Using Optimal Matching Analysis (OMA) to capture career patterns

The first method for analyzing career patterns is Optimal Matching Analysis (OMA) which has its roots in molecular biology and more specifically DNA research. Optimal Matching Algorithms were used to recognize patterns in the DNA and protein sequences. The technique calculates for each pair of sequences how much the second sequence differs from the first. A predefined maximum number of mutations are established whereby those sequences requiring more than that maximum number fall into a new category. The adaptation for the social sciences was pioneered by Abbott (Abbott and Hrycak, 1990).

In terms of our analysis, the employment status of a respondent measured at each point in time forms one sequence that is analyzed as a career path. This is a logical approach to the data because we would like to determine whether there is observable evidence of changing career patterns. A transition is a move from one labour market state to another. Persons who are studying and have not yet entered the labour market are not included. Only one labour market status is possible per year assessed by registering the labour market status for which the most time during that year is spent.

The dependent variable employment status is a nominal variable with nine categories: unemployment, unpaid activity, inactivity due to sickness or handicap, study/training, new part-time job, part-time job, new full-time job, full-time job, and pension.

The OMA technique is based on a number of assumptions that are inherent in the structure of the data. A timeline is assumed with multiple points of measurement t_1, t_2, \dots, t_n . The variable X is measured at every point in time, which results in a range of observations. In this manner, a sequence of observations of variable X at time

t is made. This range represents the course or career path for that respondent over the points of measurement of the variable.

The distance between sequence one (respondent 1) and sequence two (respondent 2) is calculated using a transformation measure. This shows the 'cost' of transforming sequence 1 into sequence 2. The transformation is made by inserting, deleting, or substituting elements. Each step entails transformation costs with a deletion or an insertion equalling 1 and a substitution equalling 2. The lower the transformation costs, the more similar the sequences are. This results in a distance or dissimilarity matrix. The matrix is used to establish when the maximum distance has been reached. Once the distance matrix is calculated, the sequences are organized into career typologies using cluster analysis, grouping similar cases (Chan, 1995).

3.2 Latent class analysis for identifying career patterns

Unlike the previous method, Latent Class regression Analysis is from the family of latent structure models (Vermunt, 2004). Latent means that the analysis is directed to look for similarities that are not obvious or immediately discernible. For instance, in much the same way that a factor analysis can establish underlying dimensions that group similar survey questions, latent class establishes underlying similarities in scores, with the aid of covariates to identify like groups.

There are no assumptions concerning the measurement level; both indicator and latent variables can be nominal (Vermunt, 2004). This enables multivariate regression analysis using a nominal dependent variable. This is also important for discerning career patterns as no hierarchy is entered in the model concerning career paths. Determining the correct number of classes in the model is essential because using too many classes makes for an unstable model, while too few classes does injustice to the variety in the data. This is achieved with the help of the log-likelihood values, the BIC (Basic Information Criterion) values and the number of parameters in the estimated models. It is also important to keep an eye on the classification errors which show the rate of incorrect predictions. Latent Class analysis allows for two types of control variables to be added to the model, predictors or explanatory variables, and covariates for descriptive distributions. The dependent variable is the nominal variable; labour market status with seven categories: schooling, unemployment, nonparticipation, disability, pension, full-time work, and part-time work.

Drawing on our theoretical model, a number of assumptions are now entered in the model. Especially important is how labour patterns are influenced during particular life course stages. Included in the model as an explanatory variable (predictor) is the variable age entered with three categories to reflect major life course stages: younger than 30 years of age, 30 to 49 years of age (time squeeze), and fifty and older. Further, two variables are added as inactive (non-explanatory) covariates to distinguish how personal characteristics are distributed over the classes: gender, cohort. A total of 4453 cases are included in the analysis. The log-likelihood (LL) decreases as the number of classes increase. Two parameters are essential in discerning the best number of latent classes for the model. The first is the BIC (Basic Information Criterion) a parameter derived from the log-likelihood. The second is the classification error that shows the error rate for predicting the class for each respondent. It is necessary to attain a balance between the simplest model and the model that allows for the greatest variety. As long as the BIC value decreases and the classification error does not get too high, increasing the number of classes is justified.

4. Typologies

After this general introduction of the techniques, we now present the results of the analyses. Both techniques lead to a typological description of the career trajectories of the respondents. The software merely produces a clustering of careers in types, clusters or classes. As researchers, we had the task to interpret the clusters and name them.

It becomes clear that the techniques do not lead to the same number of clusters. The OMA leads to an optimum of 17 clusters for which we heavily leaned on our theoretical model. OMA does not cope well with duration. Some cases were directed to a different cluster simply due to longer durations in labour market states. Whereas based on the content of their career path they belonged in another cluster. This is where the theoretical framework was essential for achieving an optimum of clusters. The LCA solution produced 11 classes. From Table 1 we omitted the class "Students". This class was present in both techniques, clustering young respondents who had not yet entered the labour market. Since our aim was to compare career trajectories, we decided not to

include them in further analyses. A second remark concerns the total N in the LCA typology. The OMA typology has been estimated using weighted panel data. The LCA typology shows un-weighted results.

Table 1 Overview of OMA and LCA career-typologies and univariate distribution

OMA	%	N	LCA	%	n
Stable entrant	7.71	329	Standard career	28.74	1280
Less stable entrant	7.43	317	Early retirement	26.78	1193
Job hopper	4.12	176	Redundancy	8.10	361
Stable full-time	19.99	853	Homemaker	6.96	310
Transitional full-time	11.86	506	The bridge	6.15	274
Stable part-time	2.18	93	Part-time career	6.10	272
Unstable part-time	9.44	91	Career of unemployment	4.80	214
Stable nonparticipation	9.44	403	Merry widow	4.32	192
Unstable nonparticipation	1.41	60	Midlife career	3.29	147
Unemployment	1.19	51	Burn-out	2.41	107
Sickness or handicap	1.71	73	Multi-tasking	2.34	104
Atypical career	4.40	188			
Insecure career (unemployment)	2.04	87			
Standard career	10.10	431			
Transitional full-time career – retirement	5.65	241			
Atypical longer career - retirement	0.94	40			
Total	100	3939	Total	100	4453

OMA typology

The career module includes respondents who began their career as far back as 1931 making a maximum number of 72 measurements possible (1931-2002). There are also respondents who have only just begun their careers with no more than one or two employment status measurements. A total of 4268 respondents have been included in the analysis resulting in a total of 16 identifiable patterns, which again can be reduced to six major content steered grouping types: [the students (1), the short full-time career (2,3,4), the employment career (5,6,7,8), the career breakers (9,10,11,12) and the completed careers (13,14,15,16)]. To simplify the description, each of the 16 career types has been numbered.

LCA typology

The program establishes classes in the analysis in a particular order, and class size gets progressively smaller as the class number rises. The numbers assigned by the program will not be changed. The first task at hand is distinguishing the relevant career types resulting from the analysis using the 11-class model results. Different from the first two methodologies, latent class allows for the introduction of an age variable. In the table each of the eleven classes are shown with the most common labour market status per age category. By entering an age category as an explanatory variable into the analysis, it is possible to capture life course patterns during the career path that give a more dynamic view of how labour market patterns evolve during careers and throughout life course stages.

5. Comparison of OMA and LCA as career clustering techniques

In the second part of this article, we look more closely to the results of the methods. The aim of the subsequent analyses is attaining insight in the applicability of the techniques in career research. Technically, there is no superiority question vis-à-vis on either of the techniques. Both have been tested extensively and they both have their weaknesses and technical particularities (see previous). We want to compare the results with future analyses in mind. The central research question then becomes: If these typologies are the basis for subsequent analyses, which one is preferable for what kind of analysis?

In order to answer this question, we check the historical reality of life course related processes (individualization, emancipation) against the typologies. If a typology is being used in a life course perspective, in what way does it manage to capture already defined historical trends? We use three main developments (Lewis, 2006) to evaluate the typologies against:

- The breadwinner model dominated from 1950 until the late eighties
- Women re-enter the Belgian labour market in the seventies
- Part-time regulations are introduced on the Belgian labour market in the nineties used more by female employees.

Each of these trends has been described recurrently in the literature (Cunningham, 2008; Jansen et al, 2009). We translate these trends in three empirical hypotheses that need to become visible in the data:

- 1. Older male cohorts should show non-transitional full-time labour. Older female cohorts should show non-transitional non-participation.
- 2. Female cohorts born between 1950-1959 should be the first to show a labour market (re)entrance.
- 3. Male and female cohorts born between 1960-1969 and later should be more prominently present in career types characterized by part-time labour. This should be more so for women than for men.

5.1 OMA career types by gender and cohort

The aim of the subsequent analysis is to verify the three central hypotheses on the descriptive results in Table 1. We start with the classic patterns: the male-breadwinner model whereby men have continual full-time careers and a majority of women exhibit a predominance of nonparticipation. We find an underrepresentation of women in cluster 4 (stable full-time) and cluster 5 (transitional full-time). Here, more men demonstrate stable or transitional full-time career patterns. Also the completed standard career is more often male dominated (15.2 compared to 7.2 %). If we look at the division by cohorts, it is clear that the dominance of the breadwinner model is situated in the oldest three cohorts. Men in these cohorts consistently show high percentages in the stable completed or the stable full-time careers (those not retired). Women are predominant in the stable nonparticipation category. About 20 percent of the oldest two female cohorts show a stable (completed) standard career. Although the career patterns clearly show the breadwinner model, it was not all encompassing for the oldest cohorts.

Table 2 OMA career typology: female and male career patterns by birth cohort (percentages)

	Type	Total	<1930	1930-1939	1940-1949	1950-1959	1960-1969	>1970	N
Female									
	<i>Short full-time careers</i>								
1	Stable entrant	8.0	0.0	0.0	0.0	0.3	2.2	48.2	169
2	Less stable entrant	7.8	0.0	0.0	0.0	3.0	17.0	21.9	164
3	Job hoppers	6.0	0.0	0.0	0.3	3.5	17.1	8.9	126
	<i>Longer labour careers</i>								
4	Stable full-time	16.2	9.4	5.6	23.8	34.5	16.7	1.6	342
5	Transitional full-time	7.6	0.2	5.9	8.4	16.3	10.2	0.5	160
6	Stable part-time	4.2	0.9	3.5	4.1	5.1	8.4	0.6	88
7	Unstable part-time	4.3	0.5	4.7	8.2	8.1	3.6	0.2	90
	<i>Career breakers</i>								
8	Stable nonparticipation	19.0	44.9	39.5	26.2	11.4	4.3	0.2	400
9	Unstable nonparticipation	2.8	2.9	4.0	6.0	3.2	1.4	0.1	59
10	Unemployment	1.4	0.0	0.3	0.7	1.1	2.2	3.6	30
11	Sickness or handicap	1.8	0.7	3.6	4.8	1.6	0.6	0.2	37
	<i>Atypical career paths</i>								
12	Atypical career path	7.0	0.0	0.6	2.7	6.6	14.6	12.8	148
13	Insecure career (unemployment)	2.3	0.2	0.6	4.5	5.0	1.7	1.2	49
	<i>Completed careers</i>								
14	Standard career	7.2	20.8	22.3	7.7	0.0	0.0	0.0	152
15	Transitional full-time – pension	2.8	9.5	7.2	2.5	0.3	0.0	0.0	59
16	Atypical longer career – pension	1.7	10.0	2.1	0.0	0.0	0.0	0.0	37
	Total (N females)		309	290	302	408	474	326	2109
Male									
	<i>Short full-time careers</i>								
1	Stable entrant	8.8	0.0	0.0	0.0	0.4	1.0	57.2	161
2	Less stable entrant	8.3	0.0	0.0	0.0	1.5	23.6	18.7	152
3	Job hoppers	2.8	0.0	0.0	0.3	0.7	8.7	4.3	51

	Type	Total	<1930	1930-1939	1940-1949	1950-1959	1960-1969	>1970	N
	<i>Longer labour careers</i>								
4	Stable full-time	27.9	3.3	6.9	41.4	53.3	34.8	4.3	510
5	Transitional full-time	18.9	1.5	2.8	28.5	39.4	23.5	0.0	346
6	Stable part-time	0.3	0.4	0.5	0.0	0.5	0.3	0.0	5
7	Unstable part-time	0.1	0.0	0.0	0.0	0.3	0.0	0.0	1
	<i>Career breakers</i>								
8	Stable nonparticipation	0.1	0.0	0.0	0.2	0.0	0.5	0.0	2
9	Unstable nonparticipation	0.1	0.0	0.0	0.0	0.0	0.3	0.0	1
10	Unemployment	1.2	0.6	0.0	0.0	0.3	0.7	5.9	22
11	Sickness or handicap	2.0	1.0	4.5	5.2	1.6	0.2	0.4	36
	<i>Atypical career paths</i>								
12	Atypical career path	2.2	0.0	0.0	0.0	0.5	4.7	6.9	40
13	Insecure career (unemployment)	2.1	0.0	2.0	5.1	1.1	1.8	2.3	38
	<i>Completed careers</i>								
14	Standard career	15.2	60.5	46.3	10.8	0.5	0.0	0.0	279
15	Transitional full-time – pension	9.9	31.4	37.0	8.5	0.0	0.0	0.0	182
16	Atypical longer career – pension	0.2	1.4	0.0	0.0	0.0	0.0	0.0	3
	Total (N males)		230	227	301	392	408	271	1829

The second hypothesis is the female re-entry in the labour market. We hypothesized this evolution should be clearly visible from the 1950-59 cohort onwards. It is difficult to interpret this hypothesis since the 1940-49 cohort starts to retire at the moment of the data collection (2002). There seems a clear break between the female 1940-49 cohort and the previous cohort (5.6 to 23.8 %). However, the completed stable career cluster is exhibiting the opposite shift (22.3 to 7.7 %). If we combine both patterns, we find one third of the Belgian women from the 1940-49 and 1930-39 cohorts that were already participating in the labour market. If we then look at the 1950-59 cohort, we observe an increase in participation to 34.5 percent in the stable career patterns. In addition, we distinguish a sharp increase in the transitional full-time cluster. The OMA typology does in fact capture the re-entry of women in the labour market. This re-entry is further supported by the sharp decrease of the nonparticipation group in the 1950-59 and especially the 1960-69 cohort.

Now, we look at patterns of part-time careers. If we look at male part-time working patterns, we clearly observe the quasi-total absence (0.4 % overall) in part-time regimes. Only women work part-time (about 8.5 % overall). If we look at the division of part-time labour along cohorts, we find no evidence of an increase in part-time work. Furthermore, the 1940-49 and the 1950-59 cohorts show patterns of part-time work as well. The only shift in the 1960-69 cohort is in the stability of part-time work. This is the first cohort where a large share of the women who work part-time succeed in maintaining part-time jobs for a longer period of time. A more particular trend in the 1960-69 cohort is the appearance of uncertainty. A larger share (especially of women) in this cohort demonstrates a-typical career paths. This is an indication of the introduction of periods of unemployment in the career paths. Here, we see an influence of the 1970s oil crisis and the high unemployment rates during the 1980s. The 1960-69 and the 1970 cohort is clearly experiencing this influence as demonstrated in their career patterns.

Table 3 Latent Class career typology: female and male career patterns by birth cohort (percentages)

	Type	Total	<1930	1930-	1940-	1950-	1960-	>1970	N
				1939	1949	1959	1969		
Female									
1	Standard career	19.0	5.0	5.0	30.0	40.0	40.0	40.0	443
2	Early retirement	16.0	25.0	21.0	5.0	1.0	0.0	0.0	381
3	Redundancy	7.0	2.0	5.0	9.0	9.0	11.0	19.0	172
4	Homemaker	13.0	2.0	5.0	8.0	13.0	19.0	19.0	305
5	Bridge group	9.0	31.0	30.0	20.0	7.0	3.0	1.0	204
6	Part-time career	11.0	3.0	4.0	9.0	9.0	10.0	11.0	250
7	Career of unemployment	7.0	1.0	1.0	2.0	2.0	4.0	7.0	159
8	Merry widow	8.0	4.0	5.0	8.0	8.0	7.0	0.0	185
9	Midlife career	4.0	10.0	11.0	3.0	3.0	2.0	0.0	92
10	Burn-out	2.0	16.0	9.0	2.0	3.0	2.0	3.0	56

	Type	Total	<1930	1930-	1940-	1950-	1960-	>1970	N
				1939	1949	1959	1969		
11	Multi-tasking	4.0	1.0	3.0	4.0	3.0	1.0	1.0	102
	Total (N females)		264	296	339	468	580	402	2349
Male									
1	Standard career	40.0	12.0	14.0	68.0	82.0	83.0	77.0	837
2	Early retirement	39.0	79.0	71.0	16.0	3.0	0.0	0.0	811
3	Redundancy	9.0	2.0	3.0	5.0	5.0	6.0	10.0	189
4	Homemaker	0.0	0.0	0.0	0.0	1.0	1.0	1.0	5
5	Bridge group	3.0	0.0	0.0	0.0	0.0	0.0	0.0	70
6	Part-time career	1.0	1.0	1.0	2.0	2.0	2.0	2.0	22
7	Career of unemployment	3.0	2.0	2.0	3.0	3.0	6.0	9.0	55
8	Merry widow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8
9	Midlife career	3.0	3.0	4.0	1.0	1.0	1.0	0.0	54
10	Burn-out	2.0	0.0	0.0	0.0	0.0	0.0	0.0	51
11	Multi-tasking	0.0	1.0	4.0	4.0	3.0	1.0	1.0	2
	Total (N males)		203	235	339	461	512	354	2104

5.2 Latent Class career types by gender and cohort

What can be said about the resulting typologies regarding their gender and cohort distribution? The most obvious statement concerning the gender distribution is the fact that women are so much more diverse than men in their labour market patterns. Coupling this with the information we now have regarding the cohort distribution, we can say that this phenomenon is only increasing with each new generation of women. Only two of the classes are predominantly male (1 and 2). Six classes are predominantly female (5, 6, 7, 8, 9 and 11). Three classes are more or less evenly distributed by gender (3, 4, and 10).

Regarding the first breadwinner's hypothesis we observe a clear male dominance of the first two standard careers of working full-time (class two opting for early retirement) and class one (working through to retirement age) are still very strong although, it is especially older cohorts that are dominant (particularly in early retirement) in this career type. Men work standard careers until they reach retirement age (40%), or if lucky can retire early (39%), or if unlucky are phased out (9%). Men are totally absent from the traditional career of homemaker, the merry widow, and the multi-tasking, and almost absent (only 1%) from the part-time career. LCA also distinguishes approximately 13 percent of women adhering to a traditional career of homemaker. This is not in accordance with the OMA results (which was 19%).

The second hypothesis concerns women's labour re-entry patterns. The midlife career typifies this phenomenon. The hypothesis stated that this should be evident among the 1950-1959 cohort onward. However, LCA clearly demonstrates that the mid-life career women are from the oldest cohorts. Ten and eleven percent of the oldest female cohorts rejoined the labour force in this manner. The cohorts of 1950 and later are predominantly standard full-time careers (40%). Even the 1940-1949 cohort demonstrates a tendency towards standard career types (30%).

The third hypothesis assumes a rise in part-time working patterns. This is clearly evident starting with the 1940-1949 cohort onward. Part-time is also evident in the bridge career type. Here older female cohorts implement part-time work as a way to ease into retirement. In this manner, LCA provided a valuable differentiation in part-time working patterns established in the cohort analysis. Older cohorts use part-time as bridge from work to retirement and younger female cohorts are using part-time as an essential instrument in their work-life balance, an option not available in the past.

6. Discussion

The first observation we need to make is that both techniques could handle the panel data without notable difficulties. In terms of ease of use, LCA is clearly the most accessible technique. OMA requires a two step procedure of calculating a distance matrix and using the matrix in cluster analysis. LCA involves a one-step

procedure whereby both the BIC-measure and the classification error allow for easy model comparison and selection.

OMA clearly showed highly transitional patterns in the research population. Each of the five career type groups identified by this technique revealed one or more highly transitional career paths. Because OMA assesses distance on the basis of labour market status, the stable careers are clearly differentiated from transitional careers. Furthermore, it is important to note that OMA has the tendency to appoint similar patterns that differ in length to different clusters. The five large groups of career types can be differentiated by the length of the career. The reason for this is that the deletion costs for the period that there is no labour market state is, in the case of the shorter career greater. In this manner the distances between two similar careers that only differ in length, is quite a bit more. Using our theoretical framework, we did correct for these inconsistencies by merging those clusters that were similar and only differed in length. This was only possible because a large portion of the careers is relatively stable and OMA differentiates well between stable careers.

A problem with the OMA method in layman's terms is that whether a transition is made from full-time employment to part-time employment at the beginning or at the height of a career, the costs are the same. Another problem with the OMA method is that a transition is equal to any other transition. In this manner, the transaction costs for transitions to unemployment are equal to transitions from unemployment to employment. This method does not allow for hierarchical levels or values. Another important result is the homogeneity of the clusters. Here we find a noticeable difference with the LCA methodology. OMA has more clusters than LCA but the respondents are distributed more homogeneously across the different types. The LCA typology shows a large proportion of people in the first two clusters while number decrease rapidly in the other categories. As a result the more compact typology of LCA may show a stronger typology but loses at the same time a detailed view on the data.

However, the LCA method does use a quite different technology compared to OMA. It is not a simple subtraction, addition or replacement, but LCA allows finer tuning as well as the introduction of covariates to the model. An important plus to LCA was the use of an explanatory variable for the three major life course stages. This added a dynamic dimension to the model where OMA is more static; providing results only for where a person was at that moment. LCA exposed the different labour patterns that were effectively occurring during a particular life course stage.

7. Conclusion

Both the OMA and the Latent Class established a growth in part-time work among younger, female-dominated cohorts, which establishes that part-time work is also a growing phenomenon on the Belgian labour market. Nonparticipation is decreasing as a labour market option in Belgium. The LCA established an increase in the career type of perpetual unemployment, particularly among younger females. This type of career will no doubt continue to be a part of a dynamic market economy. The persistence of the unemployment period within this career type was rather alarming. It would seem that young individuals (three quarters of this class was female) who do not make a successful entry onto the labour market are in danger of remaining unemployed for the duration of their potential working life.

The analysis of sequences has already proved to be a useful methodology to get a grip on career trajectories (Schrerer, 2001). Thus far, the OMA methodology was the most dominant in this type of analyses, despite the criticism (Levine, 2000, Wu, 2000). In this paper, we compared the OMA methodology with the LCA technique. The results show that both techniques have their merit in analyzing sequence trajectories. At the same time, particularities of the methods show that not all research questions are suitable for each method or, not all methods are appropriate for every research question. The OMA methodology is clearly appropriate when the analysis concentrates on the statuses themselves. It is because there is relative stability in career paths that OMA is so well equipped to make clear and interpretable differentiations. If careers do become less stable, OMA will not be a useful methodological tool. In conclusion, the LCA methodology starts with a different perspective on sequences. It has the strength of adopting covariates in the clustering allowing for more historically connected types than the other methodology. The clustering is denser and the technique allows for more detailed model fitting controls than OMA. But the strength can also be a weakness. When incorporating covariates in a typology, the possibilities of using the typology in later, causal, analyses is reduced. All interaction effects need to be tested within the LCA framework which lessens the opportunities to use the typology in a

different context. The classic OMA method and LCA clustering methods provide promising results in the longitudinal analysis of career trajectories. Both have a strong potential for exploratory longitudinal analysis. In this paper only career patterns were clustered but it is clear that other parts of the life course are appropriate for this kind of analysis as well as the application for the longitudinal study of organizations.

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A Feminist Ethnographer's Critical Gaze: 'Seeing' the 'Real' and Perhaps 'Letting go'!

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Abstract: The phrase “subversive potential” shapes the two fold intent of this paper. The author, a critical diversity and feminist scholar reflexively reviews her journey through a complex and challenging piece of ethnographic research in a New Zealand military context. Self-reflexivity is one strategy for quality control. The choice and use of an organisational ethnography is discussed by exploring some of the basic assumptions that underpin this methodology. It is argued, that as a methodology organisational ethnography has something meaningful to say about the ‘everyday’ in a narrative text that makes our scholarly work accessible to a wider readership.

Keywords: organisational ethnography, methodology, collaboration, emergent design

1. Introduction

Mutsaers and Trux (2015 p.332) talk of the “subversive potential” of organisational ethnography. They describe it as a methodology to escape dominant discipline-specific norms and “produce more radical innovation”. I concur and thus as a critical diversity and feminist scholar, the phrase “subversive potential” shapes the two fold intent of this paper. Firstly, to ‘set the scene’ I engage in a critical self-reflexive dialogue of a journey through a stimulating if somewhat challenging piece of ethnographic research. The case setting is a New Zealand (NZ) military context. Self-reflexivity is one strategy for quality control in qualitative research (Berger 2015) that resonates with feminist and critical diversity scholars who either consciously or unconsciously make the links to their epistemological (what counts as knowledge and on what basis we make knowledge claims) and axiological (the role of values in research) predispositions. Here, I specifically reflect on being ‘in the field’ and juxtapose this, with the assumptions I held prior, during a lengthy negotiation process to gain access ‘to the field’ (Hesse-Biber 2012). The title for this paper hints at being open to shifting contexts and as researchers, our responsibility toward research participants. Hence, my reference to ‘seeing’ the ‘real’ and perhaps, ‘letting go’ of assumptions as we re-tell our field stories to different audiences, academic and practitioner (Zanoni and Van Laer 2015).

Secondly, I reflexively review my choice of organisational ethnography, using the NZDF study to illustrate the use of this methodology. Knights and Omanovic (2015) posit that if research is to have the potential for advancing organizational transformations, it requires methodologies that challenge the established norms of ‘doing’ research. Further, both critical diversity and feminist scholars (e.g. Acker, 2006; Zanoni *et al.*, 2010) argue for the need to render visible the ways that multi-demographic characteristics (e.g. gender and age) interact and produce interrelated inequalities, in a specific organisational and institutional context. Such analyses can be what McBride *et al.*, (2015) term intersectionally sensitive, which I find more appealing than tackling the methodological challenges of an explicitly intersectional approach. The “subversive potential” of organisational ethnography is especially helpful for a multi-level/multi-layer, intersectionally sensitive emergent, research design (Syed and Ozbilgin 2009). This paper is written as a narrative, first-person style that is appropriate for ethnographic research given the researcher is ‘centre stage’ among others (Mutsaers and Trux 2015).

2. Background

The case study I refer to here was one part of a wider three-year innovative interdisciplinary qualitative research undertaking. An innovative research project that captures the attention of an external funding body does not necessarily mean the research question and complex research design is understood or enticing to business organisations. It never occurred to me to approach the New Zealand Defence Force (NZDF) as a possible participant organisation. It seemed alien, bureaucratic and distant. However, when an opportunity presented itself, I took it. I had by this stage, learnt to be explicit about the value of the research and the organisation specific outcome I would deliver. I sought to ‘win over’ a group within the NZDF to ‘sponsor’ the project. The NZDF, as a public sector institution, is legally obligated to foster equal employment opportunities. Hence, the stated purpose of the research used as the starting point for negotiation was:

To better understand organisational /sector specific questions around the meanings attached to equal opportunity, diversity, equity and equality.

Extensive preparation and ten months of negotiation was time consuming but crucial. I learnt perseverance, to listen closely and 'let go' of academic jargon. After all, what I proposed had to be a collaborative project, where openness, honesty and reciprocal interactions and relationships, matter. I wanted to do a meaningful project of use to the NZDF that would also inform my wider, societal research interest (see Alvesson *et al* 2017). The final shape of the project emanated from a Ministry of Defence (2014) sponsored independent piece of quantitative research, which sought to explore the extent women are treated equitably in the NZDF (across the three services - Navy, Air Force, Army) and made a series of broad recommendations. After considerable reading and thought, I selected one recommendation: to further identify and eliminate any obvious or hidden barriers to women's progression in the NZDF hierarchy. This prompted the suggestion that the Officer ranks within the NZ Army, described as a systemic 'problem', be the target group. The negotiated purpose of the research became:

To critically examine what skills and experiences are necessary for progression, particularly in senior commissioned officer ranks, and identify how personnel can satisfy the criteria.

At that time (2015), the proportion of women in the NZDF (1,103 Regular Force and 1,252 civilian women) averaged about 15% of all Regular Force personnel. Not surprisingly, the NZ Army, had the lowest of the three services (Navy and Air Force), at 12-13% (Ministry of Defence, 2014). By definition, being female in an occupation, traditionally undertaken and dominated by men, is designated as a 'non-traditional' occupation for women (Bagilhole 2014). The 'sponsors' of the project, all female and highly educated, already knew many of the formal and informal factors that impede women. Nevertheless, this particular study was deemed important by those at the top of the military hierarchy. In light of my 'outsider' status, a willingness to engage in a shared dialogue and, do so through a critical lens, there was an expectation I could offer new insights. From the outset, the research project clearly involved men, indicated by the use of the word personnel in the negotiated purpose of the research, who, in the context of the NZ Army, I immediately positioned as privileged.

3. Problematizing assumptions

My reticence to approach the NZDF disappeared during the lengthy negotiation process. I was 'won over' by the enthusiasm of this small group of women and their determination for change. I do however, recall a hesitancy when it was suggested the NZ Army be the 'case study'. I had experienced family in the Army who, after 25 years' service, I saw as thoroughly indoctrinated by military life and dogma. One memory comes to mind: visiting a military camp and the Officers Mess, I was told to, "shut my mouth, behave and keep my opinions to myself". That was three decades ago. I was informed the contemporary NZDF was experiencing extensive structural and cultural change, a move symbolised by the inclusive catch-phrase, a 'Force for New Zealand'. Such inclusivity had seen diversity initiatives implemented such as the 2012, LGBT rights focused 'OverWatch' programme, then in 2015, 'Operation Respect'. Moreover, women could now be part of combat units. Such changes did not necessarily mean women or men were gender aware or understood the difference between gender and biologically defined, sex (Egnell 2016). When I thought of the NZ Army, I struggled to shift beyond an organisation whose core task is left to the whim of politicians, traditionally, to fight wars. As such, militarisation has led to a deeply masculinist culture that supports the existing patriarchal system (Egnell 2016). These thoughts, however inaccurate and unhelpful, forced me to consider, honestly, if I was the right person to work closely with this service group. For those trained in a more positivistic frame, this may seem a bit of a bizarre revelation. Yet, as Campbell and Lassiter (2014 p.11) note, "ethnography necessarily asks us to engage actual, living people whose experiences could be either familiar or foreign to us, whose opinions we might share or abhor, and whose agendas we may or may not be able to embrace". In the end, I was drawn to this complex and fascinating research object (Carreiras and Caetano 2016). I was an 'outsider' with all its incumbent insecurities, working with an 'inside' group on a project seeking to facilitate change from within. I concur with Gabriel (2015 p.333) who comments, "Consciously reflexive researchers are aware that in undertaking serious research they embark on a journey whose end will see them emerge as different subjects".

4. Organisational ethnography

Why organisational ethnography? As a research method and more broadly as a methodology and approach to writing I find the following description answers this question:

Simultaneously fieldwork, headwork and text work. Consequently, management and organizational researchers are now ever more aware of the fact that ethnographic works are offering multiple possibilities for theorizing what is going on in organizations, and are able to develop rich insights related to the lived and cultural experience of organizing (Rouleau et al., 2014 pgs.3-4).

Here I draw on Campbell and Lassiter (2014, pgs. 4-10) who outline a useful list of some of the basic assumptions that underpin contemporary ethnography. Ethnography is positioned as, “as personal as it gets, as collaborative, as a hermeneutic, interpretive affair, as creative and constitutive, as grappling with the complex idea of culture and finally, as mostly art”. Looking at these assumptions, the legacy of social or cultural anthropology’s long association with ethnography is evident. Contemporary organisational ethnography differs in that it is more about what is familiar (not some exotic, unknown place), known participants (not an unfamiliar indigenous community) with the researcher interested in localised organisational spaces and cultures (see Gill *et al* 2014; Ybema *et al* 2009). To this extent, ethnography is “as personal as it gets” as what an ethnographer actually does in the field, “is not much different from everyday encounters, only better documented” (Mutsaers and Trux 2015, p.320). The analogy of “everyday encounters” hints that anything in the research setting can potentially, be taken into consideration to help better understand how things work and prompt theoretical ideas (Watson and Watson 2012, p. 685). Given this, one characteristic of ethnography is its “emergent design” (Campbell and Lassiter 2014, p.32).

The notion of “emergent design” requires the researcher to be non-directive and to simply allow the research process to unfold. If my experience over the wider research project is commonplace, fieldwork is exhilarating, scary and distinct: that is, each ‘case’ fieldwork experience is different (see Zaroni and Van Laer 2015). Here the “creative and constitutive” elements come into play, which as Campbell and Lassiter (2014) highlight, is important to consider if contemplating doing an organisational ethnography. If you desire absolute control over the research process, I would suggest ethnography is not for you. I cannot emphasize enough a preparedness to “embrace human shifts [ethnography is with and about people] and complexities head-on rather than trying to reduce, sidestep or ignore them” (Campbell and Lassiter 2014, p.33). The ‘scary’ part, is how fieldwork makes us vividly aware of our vulnerability (e.g. in an ‘alien’ military culture) and dependence on ‘other’ collaborators (e.g. sponsors of the research) as we navigate a complex web of relationships.

It is interesting to consider the different ways immersion ‘in the field’ can occur for those who might be reticent about organisational ethnography. The imagery of classical ethnography of spending extended periods of time ‘in the field’ as a participant observer, is for many reasons, unrealistic. Beyond the personal constraints (work and/or family commitments), to be an ‘outsider’ and negotiate access to contemporary business organisations for lengthy periods of time, can be difficult (confidentiality, trust, questioning ‘why’). In the case setting I use here, immersion involved two, day visits to the NZDF headquarters (high security building) and one exploratory, day visit to an army camp. I then found myself required ‘to stay in the field’. This involved 10 days where I travelled between three different locations. Included in this were four days in an isolated military camp staying in the Officers mess. In this location I experienced a variety of communal eating arrangements, I learnt of the regimental histories, occupational career trajectories, officer training and the politics of promotion regimes, was told stories of the recent restructures, witnessed the protocols around parades and was encouraged to join in all the activities including fitness sessions and sport. Little of this was planned or expected. I was there to do a series of interviews. But, all of these ‘cultural’ lived experiences alongside the many casual conversations were noted in my constant companion, a research diary. Immersion does occur and it can be equally ‘rich’, just in a different way (see Campbell and Lassiter 2014; Mutsaers and Trux 2015).

4.1 Emergent research design

To do an organisational ethnography well, requires a high level of collaboration. It is a methodology, shaped by context-specific questions (Fine et al 2009). Some research projects may not initially look like an ethnography. Above, I have outlined the negotiated context specific purpose of this illustrative case, the starting point for which was framed around a wider research agenda. A preparatory process (e.g. discussions, publically available strategy documents, military newsletters) saw three subsidiary questions devised, each targeting a specific group of male and female participants differentiated by rank – early career (Junior Officer Ranks); mid-level Officer Ranks (Major – Warrant Officer) and, the senior officer ranks (Lieutenant Colonel and above). The ‘sponsors’ of the research were receptive to in-depth conversational style interviews, as the key data collection mechanism. Methods, as we know, need to be conducive to not only achieving our research aims but also

understood by informants (I use the word informants – I was no expert in this context, a point I openly acknowledged). Shadowing is an example of a one-on-one organisational ethnography method (see Gill et al 2014) that in this context, while part of what instructors do training Officer cadets, would not have been seen as productive in meeting the purpose of the research. Interviews give informants control over what they say. Indeed, I found a number of interviewees took the chance to send a message on a topic they had strong opinions on. The option to review, reflect and amend the transcript of their digitally recorded interview, further migrates any misunderstandings. Interviews demand listening skills but for an ethnography, a researcher needs to be effective at talking. I use a very conversational style; rarely stick to a schedule as I am interested in eliciting rich data not only about the question/topic under investigation but the stories that surround these. Where little ‘gems’ of information occur I note these in my research diary. I did indicate to the ‘sponsors’ I would make use of a research diary, indicating that from my perspective, the research was more ethnographic in scope.

Timing can be important when doing an organisational ethnography. In this illustrative case, the ‘volunteers’ from the Junior Officer ranks were to come from cadets at the end of a 12 month Officer Cadet Commissioning Course. Once finished, this group dispersed. At another location, I was to interview ‘volunteers’ in the mid-level Officer ranks (there doing/taking courses) with more travel required to interview ‘busy’ senior NZ Army staff. Call it ‘military precision’ but I had no choice around timing. In one instance, due to a series of unexpected events I had to instigate a focus group discussion (instead of four individual interviews). This small example, shows how organisational ethnography can facilitate multiple research methods (including shadowing mentioned above) hence the notions of “emergent design” and being “creative” when needed (Campbell and Lassiter 2014, p.32). This does not mean haphazard or random. It means being adaptable to the local context of the study. I digress as thus far, I have not mentioned the vagaries of university ethics procedures which can make these ‘unexpected’ shifts and/or opportunities challenging. Delays for institutional permission can mean opportunities get missed. To counter the uncertainties of working ‘in the field’ I sought approval to use multiple qualitative methods (and all the associated paperwork) when seeking institutional ethics approval for the wider research agenda. Relief, as this focus group discussion was insightful and did, from my perspective, produce some little ‘gems’. Clearly, to do the interviews I had to have a platform of knowledge. Key documents were made available. These included an outline of the syllabus for the NZ Commissioning Course and the 2014, Land Professional Military Education Framework (LPME) where the competency groups/formal outcomes, key transition points and expectations by rank, are outlined. I had to get ‘up to speed’ quickly with military jargon and concepts. Again, timing was important. Here, the phrase ‘steroids on wheels’ comes to mind.

4.2 Knowledge contributions

The key point is, none of this would have been possible without collaboration and being open to what was ‘thrown at me’ and, a lot was. Reciprocity is therefore a crucial element in doing an organisational ethnography. A collaborative project means that informants, in this case, the NZ Army, must get something out of the research. The ‘sponsors’ may have a personal interest in an ethnographic narrative, but this outcome was not what was agreed. To address their expectations, I had to deliver a report in a timely manner. As one would expect of a military organisation, results were what mattered with a succinct set of recommendations. The 30 page report was an important knowledge contribution of the research. Although we need to be mindful of anonymity and confidentiality in the reporting of all qualitative material, writing a report specific to one organisation, can be tricky. The NZ Army is small, the Officer class more-so, everyone knows everyone. Anyone reading the report could possibly identify ‘who said what’. This is where the ability for informants to review the interview transcripts is critical. Data, be it interview excerpts, focus group discussions, observations, archival material and other pertinent information, were organised thematically. The subjective element was always present in how I interpreted what I read, heard and, observed. While ‘ethnographer selectivity’ is unavoidable (Watson and Watson 2015) the context-specific questions facilitate that selection (Fine et al 2009). Here, I return to that important question for anyone considering organisation ethnography, collaboration and reciprocity fosters a raft of ethical questions and obligations: hence, am I the right person to work closely with this group?

Readers may have noted my reticence to draw attention to the negative features of organisational ethnography seen in the literature. I have indicated, I am firmly in the qualitative research ‘camp’ having used a variety of so-called marginalised methods, such as autoethnography and memory-work. The ‘emergent design’ of organisational ethnography, does not faze me. Perhaps my ‘older’ profile and extensive work experience prior to entering academia, helps. There are always sceptics, a lot of which I see as a remnant of the so-called quantitative – qualitative divide. Certainly in Business and Management research it can be difficult to abide with

prescribed templates and the brevity rules of journal publications (e. g. Rouleau et al 2014; Zanoni and Van Laer 2015).

5. The aftermath

Research texts talk of data saturation. Ethnography has a reputation for data saturation because of the lengthy timelines to complete a study and the possible use of a multitude of data collection methods (Fusch and Ness 2015). In this instance, I did not 'feel' overwhelmed with data. More importantly, it is the types of data collected, the ideal being both depth and breadth. Multiple analyses reveal the layers, intricacies, detail and nuances. Having experienced using a raft of qualitative methods, the form data takes, is determined by the method. This point highlights that methods, whether planned or emergent, are not passive in the outcome they yield (Fine and Weis 1996). In the NZDF case for example, the collective, focus group discussion provided some insights that did not emerge through the individual, in-depth interviews. The first knowledge contribution, the context-specific report, was primarily based on the interview data. Importantly, this first stage of analysis lays a good foundation for scholarly publication. However, this assumes that as part of the negotiation and ethics processes, approval is given for the data to be used for this purpose. How we then use the insights from different types of data to publish for a particular academic audience depends on our purpose and axiological predispositions. I agree that "the origin of an article lies in a hunch" (Zanoni and Van Laer 2015, p.345), the little 'gems' I mention through the text. However, like many in Business Schools, a "hunch" has to translate into a scholarly publication in the 'publish or perish' environment we inhabit. In recognising this reality, research publications should be accessible and have something meaningful to say (Alvesson et al 2017) that does not get "lost in translation when re-telling our stories to an academic audience" (Zanoni and Van Laer 2015, p.344). I do at times, take comfort knowing that it would be a rarity for any of the informants/participants to actually delve into academic journals.

The narrative, story-telling style of writing makes much of this scholarly work, accessible. The learning and types of data collected, opens up a lot of scope or "subversive potential" (Mutsaers and Trux 2015, p.332) particularly the ability to give 'voice' to marginalised groups. There are different ways I might use the types of data from the NZDF case. It is a methodology that is especially helpful to illustrate multi-level research and analysis (Watson and Watson 2012). One example is Syed and Ozbilgin's (2009) three-level, relational framework, developed in response to a call for more multi-level approaches in organisation diversity research. Here, individual interview data could be combined with textual analysis of documents (macro-societal), research diary notes and observation (meso-organisation) to better understand the relational nature of systemic injustice to develop realistic responses and suggested actions for change (Porter and Hilde 2015). Thinking of the NZDF case, an organisational hierarchical linear career trajectory and leader development shaped the research design. This lends itself to a possible 'class' analysis (Officer Class – levels within that grouping). At the micro-individual level, an intersectionally sensitive approach (McBride *et al* 2014) to analyse the interview data, age, gender and ethnicity, are three differentiating categories that loom large.

A further potential 'twist', again using the NZDF case, is to consider how in the wider environment, militaristic language remains threaded through descriptions of leaders and leadership (see Grint 2010). Spicer (2011 p. 137) demonstrates this with the metaphor "leaders as commanders", a style that he concludes "appears alive and well in contemporary organisations". With this in mind, organisational ethnography can be used on multiple organisation sites. Mutsaers and Trux (2015) show how using two data sets, one Dutch, one Finnish, it is possible to do a comparative analysis of two organisational ethnographic projects addressing a common theme. This opens the potential for networked research projects across different nation states.

Finally, I make mention of a further method that can be used in the aftermath of an organisational ethnography, autoethnography. This method blends the traditions of autobiography and ethnography with science and art and holds appeal to scholars from multiple disciplines who have shaped its form in different ways (Ellis and Bochner 2000). This paper could have been written in an autoethnographic style. Autoethnography offers researchers in business, management, leadership and diversity, a method where field notes can be incorporated into a narrative text to allow for a more reflexivity about the basic assumptions that underpin our research (Porter and Hilde 2015).

6. Concluding comments

My purpose in writing this paper is two-fold: to reflexively review my choice of organisational ethnography as a methodology and in doing so, engage in a critical self-reflexive dialogue of a journey through a complex but fascinating piece of organisational ethnographic research. The research case I talk off involved collaboration with the NZDF. The NZ Army, was chosen by the ‘sponsors’ of the project because it was known to be the most resistant to change. Hence, organisation ethnography is a methodology, shaped by context-specific questions (Fine et al 2009). The need to understand the ‘everyday happenings’ of organisational life forces us to seriously consider, if, we are the right people/person to work closely with this group/organisation. Here I reiterate the following, “ethnography necessarily asks us to engage actual, living people whose experiences could be either familiar or foreign to us, whose opinions we might share or abhor, and whose agendas we may or may not be able to embrace” (Campbell and Lassiter 2014, p.11). Through the case illustration the reader will have gleaned how ‘doing’ a contemporary organisational ethnography is “as personal as it gets, necessitates collaboration, is a hermeneutic, interpretive affair, is creative and constitutive, grapples with the complex idea of culture and finally, is mostly art” (Campbell and Lassiter 2014, pgs. 4-10). Thus, the journey I undertook did see me emerge with a more balanced perspective of the Military. I was better informed, I did ‘let go’ of assumptions and had to be mindful of my theoretical predispositions when delivering the first, and important knowledge contribution of this organisational ethnographic research, a substantive report to this discerning practitioner (professional) audience. It was well received. To end, I come back to the point made by Alvesson *et al.* (2017) about having something meaningful to say. Publications show that organisational ethnography is meaningful research, it does have something to say about the ‘everyday’ in a narrative text that makes our scholarly enterprise, accessible to a wider readership.

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Beyond Dimension-Reduction: Exploratory Factor Analysis for First Indications of Temporal Attitude Shifts

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Abstract: Greatly increased user-friendliness of confirmatory factor analysis (CFA) suggests we re-visit the value of exploratory factor analyses (EFA), as EFA used to be far easier than CFA and was thus oft-used even for 'instrumentation with dimensionality well-published.' This paper focuses on the pedagogical value of illustrating EFA's usefulness, even where replications of prominently-published measurement studies are concerned - - e.g., applying EFA to questionnaire responses where mind-sets are likely to be changing across time. Such cultural-temporal changes, for example, partially-motivated the development of the Modern (vs. Traditional) Racism Scale (MRS, see McConahay, 1983; Morrison & Kiss, 2017). But the pedagogical value of engaging with EFA in contexts of cultural time-shifts or temporal-perturbations may, with greater contemporary prevalence, be demonstrated in methods classrooms, by consideration of temporal effects on the New Environmental Paradigm (NEP) Scale, a measure of eco-orientation (Dunlap, Van Liere, Mertig and Jones, 2000). It can be represented as measuring five "facets of an ecological worldview: the reality of limits to growth, anti-anthropocentrism, the fragility of nature's balance, rejection of exemptionalism, and the possibility of an ecocrisis" (Dunlap, 2000, p. 432). They had a reasonably large sample (N1 = 667) and some analyses derived from a reasonable degree of unidimensionality around a pro-nature stance. But our own sample, also moderately large (N2 = 408) sees a decade-plus shift in its dimensionality, specifically one far less likely to have emerged via a CFA using this instrument's proposed five facets or its potential unidimensionality. Our sample's Scree, Bartlett ($p < .001$) and KMO (.883) indicated suitability for EFA, and yielded clear indications that Dunlap's scale is multidimensional (...despite our unidimensional item-to-total relations, alongside Dunlap's, producing column vectors correlated at .706, $k = 15$ questions, between the N1 = 667 and N2 = 408 samples). Via our EFA, seen here is a potentially dangerous 'technology-salvation' or eco-delusional factor (e.g., Dunlap's item: "Human ingenuity will insure that we do NOT make Earth un-livable."). Argued here is that methods classrooms can benefit from seeing how EFA can highlight potential temporal shifts (e.g., developed nations sensing future dominance of zero-emission vehicles, coal alternatives, cloud-whitening, etc.).

Keywords: environmentalism, metrics-pedagogy, time-shifted dimensionality of questionnaires

1. Introduction

Greatly increased user-friendliness of confirmatory factor analysis (CFA) suggests we re-visit the value of exploratory factor analyses (EFA), as EFA used to be far easier than CFA and was thus oft-used even for '*instrumentation with dimensionality well-published.*' This paper focuses on the pedagogical value of illustrating EFA's usefulness, even where replications of prominently-published measurement studies are concerned - - e.g., applying EFA to questionnaire responses where mind-sets are likely to be changing across time. Such cultural-temporal changes, for example, partially-motivated the development of the Modern (vs. Traditional) Racism Scale (MRS, see McConahay, 1983; Morrison & Kiss, 2017). But the pedagogical value of engaging with EFA in contexts of cultural time-shifts or temporal-perturbations may, with greater contemporary relevance, be demonstrated in methods classrooms, by consideration of temporal effects on the New Environmental Paradigm (NEP) Scale, a measure of eco-orientation (Dunlap, Van Liere, Mertig and Jones, 2000).

1.1 Context

Gaining an understanding of why people act in environmentally-conscious ways and visit protected areas can be very important for nature reserves. This ECRM 2018 *methods-pedagogy* paper is based on a co-operative education project (...a very common capstone research project requirement for completing degrees in business, commerce, or management). It was a case study examining how to connect people emotionally to a New Zealand eco-sanctuary hosting this researcher's internship semester. In this instance, the contributing factors to an emotional connection have been analysed by reviewing literature, distributing surveys and conducting interviews. Therefore, the research has been related to different target groups like visitors and annual-pass members to identify the factors that contribute to achieving an emotional attachment to nature. Subsequently studied, then, were the best ways to convert these attachments into beneficial actions, e.g., sales, donations, interaction online, etc.

1.2 Emotional attachment to nature

Previous studies revealed various theories on affiliation with nature. In the following, this research will focus on selected significant parameters for emotional attachment. These are seen herein to be pro-environmental behaviour, place attachment, the biophilia hypothesis, voluntourism in conservation areas and anthropomorphism. Admittedly, it may seem odd to include eco-voluntourist behaviour and pro-ecobehaviour in this list, but as explained below, these behaviours are likely to increase emotional commitment to nature.

1.2.1 Pro-environmental behaviour

Environmental behaviour has historically been an important factor and condition for connecting with nature. According to Grove (2002), "the idea of regional environmental degradation or control was not new; indeed the word "conservancy" was first adopted in Britain in the 14th century with relation to the control of whole river basins" (p.50). The history of environmentalism was influenced by a notable number of scientists, conservationists and naturalists. In recent centuries, this apparently started with John Muir, regarded as the father of the international conservation movement in the 19th century, and through to Al Gore. Former US Vice-President Gore significantly influenced today's environmental concerns with his book "An Inconvenient Truth" (2006) about global warming. He argued, somewhat unsuccessfully, that pro-environmental behaviour is more important than ever. According to Bamberg and Möser (2006), "pro-environmental behaviour is probably best viewed as a mixture of self-interest (e.g., to pursue a strategy that minimises one's own health risk) and of concern for other people, the next generation, other species, or whole ecosystems" (p.15). Consequently, an emotional connection to wildlife can have impacts on the behaviour of a person. However, Newsome, Dowling and Moore (2005) argued that, "while emotional response was necessary since it was an important determinant of behaviour, alone it was not sufficient" (p.88). Newsome et al. (2005) emphasized that it would be important to have a direct wildlife experience for connecting with nature. Therefore, conservation areas like this eco-sanctuary often attempt to have good conditions for achieving emotional attachments by providing a personal nature experience linked with related wildlife activities (e.g., wildlife tours and wildlife watching). These direct experiences have a greater impact than just reading about environmental problems. Teisl and O'Brien (2005) did research on the topic if outdoor recreation is associated with environmental behaviour. The results showed that appreciative wildlife activities like wildlife watching and nature photography increase both interest and environmental concern. Moreover, these parameters contribute to helping people become members of eco-sanctuaries or donate money. As a consequence, a connection to nature as well as pro-environmental behaviour can lead to financial support for conservation areas. Bamberg and Möser (2006) agreed that there are other significant factors and stated that, "the awareness of and the knowledge about environmental problems are probably important cognitive preconditions for developing moral norms" (p.15). Kollmuss and Agyeman (2002), on the contrary, claimed that this environmental knowledge alone would not be sufficient: "We see environmental knowledge, values and attitudes, together with emotional involvement as making up a complex we call 'pro-environmental consciousness'" (p.256). However, Nord, Luloff and Bridger (1998), argued that socioeconomic criteria like age, sex and residence could have more influence on the relation to nature. Consequently, opinions on this issue differ. Clark, Kotchen and Moore (2003) concluded that, economists "tend to examine the influence of external conditions, such as income, price, and socio-economic characteristics, upon behavior" (p.237) and "psychologists, on the other hand, concentrate on linking internal, or psychological, variables to behavior" (Clark et al., 2003, p.237). Both perspectives have merit, and should be regarded.

1.2.2 Place attachment

Newsome, Dowling and Moore (2005) stated that the human need to spent time in nature would be another important parameter for emotional attachment. However, at the individual level, this factor is often closely connected to certain places of nature. This, in turn, leads to place attachment which is "the extent to which a person values or identifies with a particular setting" (Moore and Scott, 2003, p.877). The Scottish Natural Heritage Commissioned Report (2010) detected that "familiarity with particular places (for example a local nature reserve) leads to higher levels of affinity and environmentally responsible behaviour and that direct experience, especially with friends and family, engenders affinity, care and commitment to the natural heritage" (p.12). However, White, Virden and Van Riper (2008) reported that, "the longer visitors have been coming to the site, the more negatively they evaluate social and environmental conditions, specifically, depreciative behavior, environmental impacts, and recreational conflict" (p.655). Yet, Wickham and Graefe (2002) claimed that place attachment to an area can be increased by fulfilling two important dimensions of place attachment "known as place dependence (functional meaning) and place identity (emotional or symbolic attachment to an

area)" (p.356). As a consequence, conservation areas like this eco-sanctuary could arguably increase the emotional connection by providing both dimensions. Indeed, Smith, Siderelis and Moore (2010) underlined that, "place identity is likely to be the dominant factor in predicting future recreation use" (p.636). However, Moore and Scott (2003) argued that, "the most powerful predictor . . . was personal commitment to the activity that users were pursuing" (p.877). Hammit, Backlund and Bixler (2004) added that: "However, the interrelationship between attachment to a recreation place, and to a recreation activity, can be quite complex. Attachment and commitment to a place may not be the same as commitments and attachment to an activity" (p.373-374). Therefore, adequate management is an important factor regarding place attachment. Cole and Hall (2009) claimed that, "providing opportunities for high quality visitor experiences is an important management objective in wilderness areas" (p.24). But also the "emotional, symbolic, and spiritual values that place attachment represents have become significant in resource management" (Budruk, Wilhem Stanis, Schneider and Heisey, 2008, p.530). However, with regard to the management of conservation areas, it is necessary to protect the natural environment and to provide recreation opportunities at the same time. Therefore, sustainability is a significant subject as regards tourism in conservation areas, as well as place attachment. With regard to this issue, Hunter discussed that concepts of sustainable development "are merely couched in the language of 'balance', i.e., finding the right balance between the need for development and the need for environmental protection" (Hunter, 2002, pp.10-11). But, according to him, finding this balance is very infrequent and there are often conflicts (Hunter, 2002). Consequently, nature reserves have to deal with a conflict between conservation and tourism. This might also be an important factor for visitors or members and has to be considered regarding the achievement of an emotional (place) attachment.

1.2.3 Biophilia hypothesis

With regard to connections between human beings and nature as well as animals, Edward O. Wilson (famously identified by the Nobel and Swedish academies as a world-leading ecologist) published the biophilia hypothesis in 1984. E. O. Wilson stated that there is a connection between humans and the surrounding living nature or environs "because of the particular way we affiliate with other organisms. They are the matrix in which the human mind originated and is permanently rooted, and they offer the challenge and freedom innately sought" (p.139). Therefore, he presumes that human beings have an affinity with nature. He concluded: "To the extent that each person can feel like a naturalist, the old excitement of the untrammled world will be regained" (Wilson, 1984, p.139). As a consequence, this affiliation with nature can lead to sustainable behaviour. Moreover, the outcome of this factor is the feeling of responsibility and the desire to save the natural heritage and to rescue endangered species. This effect, in turn, can be a benefit for conservation areas like the eco-sanctuary studied and featured in this ECRM18 paper. Van den Born, Lenders, De Groot and Huijsman (2001) compiled data of quantitative research in this field and detected that "70-90% of the population recognize the right of nature to exist even if not useful to humans in any way" (p.65). Furthermore, Van den Born et al. (2001) did their own research in this context and identified the most important values of nature as the value for human health, its intrinsic value and its value for future generations. Moreover, they reported that 72% of the respondents [consistent with some time-tested indigenous notions re: sustainable fisheries] "preferred the statement 'humans are part of nature and hence should bear responsibility for it'" (Van den Born et al., 2001, p.72).

1.2.4 Voluntourism in conservation areas

Further research studies concentrate on voluntourism as a major motive. Voluntourism is a growing form of travel which is a combination of volunteering and tourism. Hence, it provides benefits to both sides: the tourist or rather the volunteer and the host organisation. Mutual help has always been part of human behaviour. It already played a crucial role for rural communities and helped them to survive. Therefore, the history of volunteering is long and in the course of time various charitable organisations in different areas and diverse forms of volunteering developed. Conservation volunteering can be one form of it. Lynch (2009) defined that, "conservation volunteering can range from preserving wildlife, and 'protecting the environment from destructive' change, to developing more sustainable ways of living and reducing pollution" (p.2, emphasis added). This motivation can be important in achieving external support (e.g. time and/or money et cetera) for conservation areas like this presently-considered eco-sanctuary. Moreover, volunteering can intensify the emotional connection to the nature-reserve akin to Cognitive Dissonance Theory (Festinger, et al, 2010; e.g., the horrid but apparently valid adage: turning an enemy into a friend by tricking your enemy into doing you a series of favors, after which one has difficulty thinking ill of you, since s/he keeps doing you favors, etc., a plausible explanation for the multi-lingual use of the sexual metaphor 'making-love'). Thus, those patrons of eco-

sanctuaries favouring the latter via their freely-offered favours of donations, docent-duties, paying membership dues annually, etc., will likely experience increased levels of dedication to their eco-sanctuary, even if unsure exactly why. However, Dekker and Halman (2003) stated that surveys showed “in discussion with volunteers it often proves difficult to distinguish different types of motivations” (p.4) for volunteering. Therefore, there might be some difficulties in identifying the parameters that contribute to an emotional attachment.

To the degree that eco-sanctuaries in exotic locales, like New Zealand, Australia, Patagonia, Africa, etc., engage volunteers (or so-called voluntourists) in docent or light-maintenance duties, especially if alongside indigenous or long-standing locals, then there is a rich literature in this voluntourism arena that might also be consulted. Where such volunteers are visitors to a culture foreign or exotic to them, it may be wise to consider Guttentag’s (2009) findings, whereby such voluntourism can have negative impacts such as:

A neglect of locals’ desires, caused by a lack of local involvement; a hindering of work progress and the completion of unsatisfactory work, caused by volunteers’ lack of skills; a decrease in employment opportunities and a promotion of dependency, caused by the presence of volunteer labour; a reinforcement of conceptualizations of the ‘other’ and rationalisations of poverty, caused by the intercultural experience; and an instigation of cultural changes, caused by demonstration effects and the actions of short-term missionaries. (p.537)

As a consequence, these possible negative impacts should possibly be considered with regard to voluntourism in some eco-conservation areas.

1.2.5 Anthropomorphism

Previous studies have indicated that anthropomorphism is another important factor with regard to emotional attachment to wildlife. The word “anthropomorphic” tends to “characterize animal behaviour that is like human behaviour in certain salient ways” (Mitchell, Thompson and Miles, 1997, p.4). As a consequence, people develop an emotional connection to animals because they feel bonded with them. Moreover, Epley, Waytz, Akalis and Cacioppo (2008) claimed that there were various reasons for anthropomorphism, for instance, “when lacking social connections with other humans, people may compensate by creating humans out of non-human agents” (p.146). Newsome, Dowling and Moore (2005) stated with regard to affiliation with animals that, “quality and consequences of our relationship with other animals has direct and important implications for wildlife tourism because of its role in defining our interest in, and our feelings, concerns, and behaviour[s] toward them” (p.87). Therefore, animals can be a considerable emotional factor with regard to conservation areas such as this presently-considered eco-sanctuary. Newsome et al. (2005) added that a relationship to animals even generates positive side effects such as “decrease in depression, stress level, irritable behaviour, and loneliness, and an increase in self-esteem, social interaction and group harmony” (p.87). These effects, in turn, strengthen the emotional connection to the animals as well as the attachment to the nature reserves they are living in.

2. Exploratory versus confirmatory factor analysis

Much has been written on the advantages of using Confirmatory Factor Analysis (CFA) versus Exploratory Factor Analysis (EFA) - - especially where one is applying dimension reduction algorithms to datasets yielded from the use of well-studied and notably-published tests or questionnaires (e.g., Thompson, 2004). Hurley, et al (1997) efficiently cited articles from:

.....major organizational research journals (Brannick, 1995; Stone-Romero, Weaver and Glenar, 1995) concluding that the use of CFA is steadily increasing while the use of EFA is declining. The merits of exploratory and confirmatory factor analysis have long been debated and have resulted in some extremely energetic exchanges on both research methods and structural equation modeling networks. Further, the Journal of Organizational Behavior highlighted this debate with a three piece exchange on covariance structure modeling in May of 1995 (Brannick, 1995; Kelloway, 1995; Williams, 1995). These exchanges have been useful to researchers in deciding which type of factor analysis to use. In general, proponents of CFA believe that researchers need to have a strong theory underlying their measurement model before analyzing data (Williams, 1995). CFA is often used in data analysis to examine the expected causal connections between variables. Supporters of EFA believe that CFA is overapplied and used in

inappropriate situations. Despite the rhetoric to the contrary, some researchers believe that CFA is still being used with little theoretical foundation, and that reviewers may be requiring CFA where a simpler alternative would be as or more appropriate (Brannick, 1995). EFA is often considered to be more appropriate than CFA in the early stages of scale development because CFA does not show how well your items load on the non-hypothesized factors (Kelloway, 1995).

This above excerpt from Hurley, et al (1997) is timely now, because here, just a couple of decades later, we live in a world where visual “drag-and-drop” syntax programming (via the graphical user interfaces in AMOS, etc.) makes CFA, and its outcome-interpretations, arguably easier than EFA. This was clearly not the case in 1997, as expressed above via the words: “...reviewers may be requiring CFA where a *simpler alternative* [emphasis added] would be as or more appropriate” (Brannick, 1995, cited in Hurley, et al, 1997).

Thus, the concern addressed in the methods-pedagogy aspect of this paper is around a different potential benefit achieved, or not, via one’s choice to use EFA versus CFA. As the latter is arguably easier and yet has continued to enjoy an image of enhanced respectability and rigor, some interesting findings might be missed by CFA, but highlighted by EFA. This is exactly what was revealed in Audier & Atkins (2016). A related advantage of EFA was also mentioned in the above excerpt: “...CFA does not show how well your items load on the non-hypothesized factors” (Kelloway, 1995, cited in Hurley, et al, 1997). The reasons around factors being non-hypothesized and/or just-not-expected will vary. In Audier & Atkins’ (2016) study of staff at a moderately-large but private hospital, an unexpected (and extra) factor emerged due to lack of relevant theory. In hindsight, it was, all the same, logical, and has prompted consideration of a new theory and a research stream to test it. But in their case, the outcomes may be somewhat idiosyncratic (i.e., a personality-situation interaction effect inside the individual differences paradigm - - and possibly one far more common in life-and-death work environs as characterized in their study, e.g., questions for measuring shared views of ‘*role-clarity*’ between oneself and one’s boss or measuring one’s perceived ‘*autonomy-at-work*’ manifested as if measuring the same construct - - one as yet un-named!). But, for the present paper, set in the context of one’s emotional attachment to nature, the suspected issue-at-hand is likely to be far less circumscribed than that in Audier & Atkins (2016). It may be an essentially global phenomenon, at least in developed (...or so-called ‘OECD’ nations). Discussion of this previously non-hypothesized factor, and its potential pedagogical value in business-methods classrooms, is better placed after a summary of the methods and findings associated with this ‘*emotional attachment to nature*’ business-degree internship.

3. Methods

This business-degree capstone internship study is structured exactly the same as a typical masters degree thesis, and of typical length (9,000 to 12,500 word research report and a scholarly 2,000 to 3,000 word reflective report). As is typical of these, it also used a mix of qualitative and quantitative methods. This present paper draws from these, but with primary emphasis on the use of a previously-published and well-studied questionnaire: the New Environmental Paradigm (NEP) Scale, a measure of eco-orientation (Dunlap, et al, 2000). It was our use of EFA (...on the dataset produced from using the NEP...) that yielded a factor we had not hypothesized.

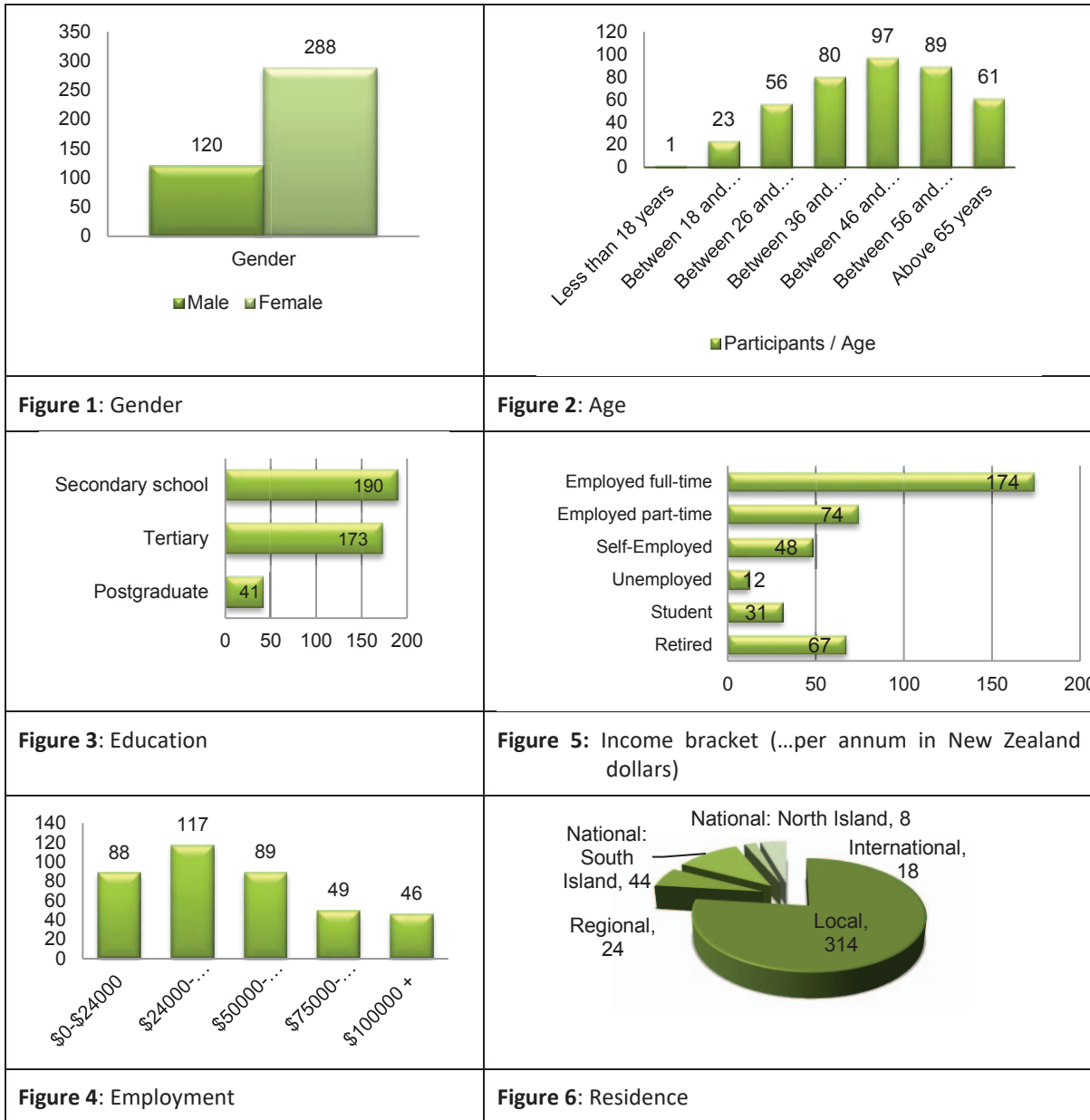
Fifteen items from the NEP were merged with a variety of item-types for an online survey, as described below.

3.1 Sample participants

408 online-respondents (...a mix of prior visitors and annual-pass holders and members of this Tourism-Marketing internship-hosting New Zealand-based eco-sanctuary). An emailed invitation to participate in this senior internship-student’s study went out to 1410 of these prior visitors and members. The respondents’ collective demographics are illustrated below (see Figures 1 to 6.)

3.2 Instrumentation

As mentioned, 15 questions from the Dunlap, et al (2000) NEP scale were included in an online survey that measured, sometimes qualitatively, eco-sanctuary related attitudes coupled with the above demographics. These 15 NEP items, and their previously Dunlap-reported outcomes, are shown in Table 3.2.1 (...note that SA = Strongly Agree, SWA = Somewhat Agree, U = Unsure, SWD = Somewhat Disagree, and SD = Strongly Disagree).



3.3 Procedure

The invitations, sent out by the eco-sanctuary to their email list for members, annual pass-holders, and prior visitors, included a SurveyMonkey hyperlink leading to our data collection instrument (described above). Data capture occurred well inside a single month, and analyses followed immediately (see below).

4. Results

Of greatest relevant to this paper and its business methods-pedagogy argumentation is the factor analysis, in this case, EFA, applied to the twenty Likert-scale items, including, of course, the 15 items from the NEP. The prerequisite omnibus testing outcomes for EFA (e.g., Bartlett's Test of Sphericity, Kaiser-Meyer-Olkin Measure of Sampling Adequacy, and a Scree plot) are shown in Table 2 and Figure 7 below.

Table 1: Dunlap’s published results

Do you agree or disagree that:	SA ^a	SWA	U	SWD	SD	(N)	r ₁₄
1) We are approaching the limit of the number of people the earth can support	42.4%	32.4%	16.9%	7.8%	0.5%	(408)	0.59
2) Humans have the right to modify the natural environment to suit their needs	1.5%	21.8%	14.0%	43.6%	19.1%	(408)	-0.57
3) When humans interfere with nature it often produces disastrous consequences	39.2%	39.5%	8.8%	8.3%	4.2%	(408)	0.46
4) Human ingenuity will insure that we do NOT make the earth unlivable	3.4%	28.2%	35.5%	21.3%	11.5%	(408)	-0.46
5) Humans are severely abusing the environment	49.0%	35.0%	5.4%	6.1%	4.4%	(408)	0.54
6) The earth has plenty of natural resources if we just learn how to develop them	9.6%	30.4%	15.7%	29.2%	15.2%	(408)	-0.44
7) Plants and animals have as much right as humans to exist	66.9%	25.0%	3.2%	4.7%	0.2%	(408)	0.46
8) The balance of nature is strong enough to cope with the impacts of modern industrial nations	1.2%	5.6%	15.2%	32.6%	45.3%	(408)	-0.64
9) Despite our special abilities humans are still subject to the laws of nature	53.9%	38.2%	4.7%	1.7%	1.5%	(408)	0.37
10) The so-called “ecological crisis” facing humankind has been greatly exaggerated	2.2%	9.8%	12.3%	29.2%	46.6%	(408)	-0.66
11) The earth is like a spaceship with very limited room and resources	33.8%	39.0%	14.2%	11.0%	2.0%	(408)	0.55
12) Humans were meant to rule over the rest of nature	1.2%	6.6%	5.6%	29.2%	57.4%	(408)	-0.55
13) The balance of nature is very delicate and easily upset	43.6%	39.2%	9.3%	6.4%	1.5%	(408)	0.46
14) Humans will eventually learn enough about how nature works to be able to control it	0.2%	10.0%	27.7%	35.5%	26.5%	(408)	-0.56
15) If things continue on their present course, we will soon experience a major ecological catastrophe	40.0%	34.3%	17.6%	7.1%	1.0%	(408)	0.70

Table 2: Prerequisite KMO and Bartlett’s test outcomes

KMO and Bartlett’s Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.883
Bartlett’s Test of Sphericity	Approx. Chi-Square	2137.078
	df	190
	Sig.	.000

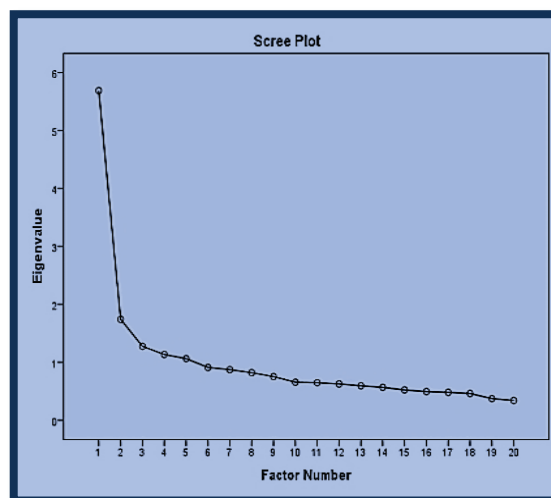


Figure 7: Scree plot

While we were not able to cleanly tease out five sub-factors in what appeared to be almost a unidimensional measure of ‘adopting the new environmental paradigm’ - - we did see evidence of an interesting two-factor solution. These two factors correlated, in a raw sense, at $r = -.489$ (see Table 3). Principal Axis Factoring, allowing oblique rotation outcomes (PAF/direct oblimin), was used, as we wanted to focus on common factor variance, and we wanted to avoid constraints on the degree to which these factors needed to be orthogonal (Pedhazur & Schmelkin, 1991).

Table 3: Factor correlation matrix.

Factor Correlation Matrix		
Factor	1	2
1	1.000	-.489
2	-.489	1.000

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

The outcome most interpretable to us is shown in Table 5 below. While it was not an outcome central to this research-internship’s purpose, nor of notable interest to the host eco-sanctuary, it does provide a potential business-methods classroom example of decade-plus temporal changes in questionnaire factor structures. That said, per outcomes seen in Table 4, after removing the intentional negative valences, the NEP’s fifteen item-total correlations are not hugely dissimilar, but hardly identical either. Treating these summary item-level statistics as, in turn, yet another pair of column vectors, suggests they share only about half their across-item variance in common.

5. Conclusion and recommendations

As referred to earlier, the pedagogical value of engaging with EFA in contexts of cultural time-shifts or temporal perturbations may, with greater contemporary prevalence, be demonstrated in business-methods classrooms, by consideration of temporal effects on the Dunlap, et al (2000) New Environmental Paradigm (NEP) Scale, as a measure of eco-orientation. Arguably, the NEP can be represented as measuring five “facets of an ecological worldview: the reality of limits to growth, anti-anthropocentrism, the fragility of nature’s balance, rejection of exemptionalism, and the possibility of an ecocrisis” (Dunlap, 2000, p. 432).

Table 4: Comparison of NEP item-total correlations across the Dunlap and New Zealand samples

	A	B	C	D	E	F
1						
2		r i-t Dunlap et al.		r i-t Own Survey		
3	Item 1		0.43	0.59		
4	Item 2		0.35	0.57		r= 0.70600433
5	Item 3		0.42	0.46		
6	Item 4		0.38	0.46		
7	Item 5		0.53	0.54		
8	Item 6		0.34	0.44		
9	Item 7		0.46	0.46		
10	Item 8		0.53	0.64		
11	Item 9		0.33	0.37		
12	Item 10		0.62	0.66		
13	Item 11		0.51	0.55		
14	Item 12		0.51	0.55		
15	Item 13		0.48	0.46		
16	Item 14		0.35	0.56		
17	Item 15		0.62	0.7		
18						

The original authors had a reasonably large sample ($N_1 = 667$) and some analyses derived from a reasonable degree of unidimensionality around a pro-nature stance. But our own sample, also moderately large ($N_2 = 408$) sees a decade-plus shift in its dimensionality, specifically one far less likely to have emerged via a CFA using this instrument’s proposed five facets or its potential unidimensionality. Our sample’s Scree, Bartlett ($p < .001$) and KMO (.883) indicated suitability for EFA, and yielded clear indications that Dunlap’s scale is multidimensional (...despite our unidimensional item-to-total correlations, alongside Dunlap’s, producing column vectors correlated at .706, $k = 15$ questions between the $N_1 = 667$ and $N_2 = 408$ samples). Via our EFA (Table 5), seen here is a potentially dangerous ‘technology-salvation’ or *eco-delusional* factor (e.g., Dunlap’s item: “Human ingenuity will insure that we do NOT make Earth un-livable.”).

Thus, argued here is that business-methods classrooms can benefit from seeing how EFA can highlight potential temporal shifts (e.g., developed nations sensing future dominance of zero-emission vehicles, coal alternatives, *very-low-cost* cloud-whitening, roof-top whitening, etc.). Just in the past few months, the world is witnessing an exponential growth in the number of zero-emission (as in zero carbon-emitting) vehicles, with another one recently launched into orbit via the test-launch of a rocket booster designed to facilitate a re-occupation of the Moon and new human explorations, and potential colonization, of the planet Mars (SpaceX, 2018).

Paradoxically, humanity’s reach is being extended by non-human, or pilot-less, cargo-carrying vehicles, and also human passenger-carrying, but still robotic, vehicles (e.g., terrestrial, aquatic, air-based, and space-based)....increasingly these are *zero-to-very-low* emissions vehicles. These realities will provide yet further reasons to expect that EFA will reveal dimensionalities in ecologically-related tests or questionnaires, and even the mere student-consideration of these in business-methods classrooms should intensify student intrigue in this arena.

Table 5: Two factor solution when applying PAF/do form of EFA to our NEP data

Pattern Matrix ^a		
	Factor	
	1	2
You are concerned about environmental changes - 5	.823	
You think sustainable behaviour/development is important - 5	.675	
You feel responsible for the environment - 5	.654	
You are aware of environmental problems - 4	.627	
15) If things continue on their present course, we will soon experience a major ecological catastrophe - 5	.484	-.311
You practice environmental behaviour at home - 5	.466	
5) Humans are severely abusing the environment - 5	.426	
3) When humans interfere with nature it often produces disastrous consequences - 5	.393	
13) The balance of nature is very delicate and easily upset - 5	.393	
11) The earth is like a spaceship with very limited room and resources - 5	.322	
7) Plants and animals have as much right as humans to exist - 5	.305	
9) Despite our special abilities humans are still subject to the laws of nature - 5		
14) Humans will eventually learn enough about how nature works to be able to control it - 5		.636
4) Human ingenuity will insure that we do NOT make the earth unlivable - 5		.513
8) The balance of nature is strong enough to cope with the impacts of modern industrial nations - 5		.499
2) Humans have the right to modify the natural environment to suit their needs - 5		.487
6) The earth has plenty of natural resources if we just learn how to develop them - 5		.483
12) Humans were meant to rule over the rest of nature - 5		.449
10) The so-called "ecological crisis" facing humankind has been greatly exaggerated - 5	-.352	.405
1) We are approaching the limit of the number of people the earth can support - 5		-.348

Extraction Method: Principal Axis Factoring.
 Rotation Method: Oblimin with Kaiser Normalization.^a

a. Rotation converged in 7 iterations.

In 2000, when the improved NEP was published, it was plausible to use items like: “Human ingenuity will prevent catastrophic climate change” as measures of anti-eco or anti-Green thinking. By 2016, that would be unreliable, as a growing number of young scientists are clued into the arguments and efforts of Prof. Salter and the CEO of SpaceX and Tesla (all are progresses mentioned above) - - thus, these items might still be identifying anti-Greens, but they might also be identifying respondents aware of the most recent advances in planetary engineering, coupled with the emerging awareness that species extinctions have always been happening, with or without us, and will continue either way (Marris, 2018). At present, one can only speculate how much overlap there is in these 2 types of respondents - - e.g., hopefully most of the clued-in respondents still want most of the efforts agreed to via Paris or Kyoto (climate accords) to still proceed, not driven by climate change, but instead for remedying other biosphere-level damage humans are causing to crucial food-chains, etc. Increasingly convincing arguments from computational geo-physics and the quarter-century-plus mature field of planetary engineering will be affecting the mind-sets of our newest business and management undergrads (e.g., Earthlings can likely cool this planet with emerging technologies whether humanity is at ‘peak oil’ or ‘peak coal’ or ‘peak meat’ or not, e.g., Flynn, 2016; Salter, Stevenson, & Tsiamis, 2014, etc.). Argued here is that understandings of the attitudinal psychometrics of online questionnaires can improve via engagement with these very modern, contemporary, landscapes.

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Shrek, Saunders and the Onion Myth: Using Myths, Metaphors and Storytelling

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Abstract: Do we know our (research) onions? Onions have layers, as researchers we need to peel the research onion to its core, to uncover layers of meaning which enable us to understand the phenomenon we are seeking to understand. The metaphor of the onion, immortalized by Shrek (amongst others) and in our research world by Saunders, is well known. This paper takes the layers of the onion as a metaphor for collecting and making meaning from visual/ verbal metaphors, and stories. Research methods, based on the collection of stories, can sometimes be perceived as tangential or superfluous (Kendall J and Kendall K, 2012). Additionally, research using story telling often falls into three specific domains 1) is the story an accurate portrayal of all the events? 2) is the story an accurate account of what was experienced by the actors? 3) Is the story a driver for change and improvement? This research explores all three domains, adapting Campbells' (1964) and Youngs' (2004) typology of myths. Our Sphere Model (Farquharson L, Sinha T, Clarke S, 2018) provides a canvas to capture verbal and visual stories from those experiencing and leading change within Higher Education. The stories are captured through populating the Sphere canvas, through focus groups (camp fires), interviews (testimony) and artefacts such as postcards and graphic maps. We seek to capture the following myth descriptions of describe, explain, validate and direct (Young, 2004) to create a typography of organisational stories. (Adapted from Kendall J and Kendall K, 2012). We will be taking a positive psychology view of this work, to learn from what works as opposed to what hinders (deficit approach). The outcome of the paper shows how we will move this research method forward.

Keywords: appreciative inquiry, organisational change, world café, story-telling, participative action based research

1. Introduction

The purpose of this paper is to explain and provide the context for the development of a refreshed model to support effective organizational change within a Higher Education Institution (HEI). The 'Sphere Model' for supporting organizational change within Higher Education (HE), is based on an appreciative inquiry approach to analyse the impact of change on staff and leadership within HE, and to codify the key drivers of what leads to a 'good day in Higher Education', in the context of change management.

Organisational change can be characterized in several ways.

- By exploring the factors driving the change, or
- Exploring how the change comes about, be it emergent or planned change (Bamford and Forrester, 2003).

This paper focuses on the later, how to design, develop and lead effective, planned change within HE. Whilst there is a vast array of literature, providing theoretical underpinning of the many theories and change models, it has been recognized that existing models of change are not readily adaptable for application with Higher Education (Gornitzka, 1999). There are a number of factors which are helpful when contextualising for the HE sector, one of these is the distribution of power and authority, which in HEI is often distributed across a number of areas.

If we consider the founding principle of appreciative research or inquiry (AI), we look to what already works within an organization rather than focusing on the problem. This radical shift from deficit-based approaches to change management, to an appreciative-based approach to change, supports the discovery and the narration of the organization's 'life-giving- stories' (Cooperider and Srivastva 1987). Appreciative Inquiry is a positive approach which turns the attention to what is working well within an organisation, and enables the researcher to codify these strengths and build on them. This is not to say the deficit based / problem solving approach is not valid. The reductionist view of research, indeed the essence of classic scientific method has many benefits.

However, for this work for the AI approach is deemed more appropriate, to determine 'what helps make a great / good day within an HEI undergoing change'. The 4D model (Cooperrider and Whitney, 1999) of conducting an appreciative inquiry will be adapted. Using a participatory action-based research method, this has been tested using a 'World Café' type event. The 4D model is a learning cycle, in conjunction with the world café approach, participants are invited to take part in listening and building on colleagues' stories, the DISCOVERY phase presents what is going well.

This strengths based approach has also been championed by Marcus Buckingham. Participants find they have more in common than expected, which builds the foundations for the next stage of the cycle – DREAM. This is where participants co create their desired future, thinking of new scenarios and outcomes. Participants then DESIGN the new propositions, as attractively as possible, and enact the propositions in the DESTINY phase.

2. Appreciative inquiry: The 4D model

The 4 D Model

- 1. Discovery
- 2. Dream
- 3. Design
- 4. Destiny

2.1 Discovery – unpeeling the first layer

The Discovery stage of the model provides the impetus to ask an affirmatively framed question to capture narratives, stories (myths and legend), to begin the process of unpeeling of the first layers of the onion. What is happening in HE context for staff that works, what is already bringing life to the organization and as we continue to peel these layers and start to dream what could be, we will be taking the first steps to designing the Sphere model for change in Higher Education.

World Café – Transformational Change within an HEI context

World Café used as a focus group to gain insight from staff employed in a variety of roles from across a number of HEIs. The design of the café will be explained here the data and research outcomes will be published in the final paper. The theme of the World Café (WC), was 'transformational change' within a HEI context, and invited a number of staff involved in supporting change from across a number of institutions to attend and take part in an exploration of their experiences of change within HE. One of the questions was positively framed; **'what happens on a great day in higher education?'** The remaining questions were more traditional and deficit based, for example, 'what are the problems you encounter...?' Around 45 people took part and were asked to participate in a question set by each table host, and after a period of time to move to another table, until they had visited and contributed to the discussion on each table.

The World Café method is flexible and can be adapted in order to facilitate a large group dialogue. The authors will draw on seven integrated design principles (Brown and Isaacs, 2005).

- Set the context, the reason for bringing people together
- Create a hospitable space, and welcome
- Small group rounds, supported by a table host and a central time keeper
- Each round is prefixed by a question, set by or called out by the table host
- Harvesting and sharing of insights, each group/table will feedback key thoughts or results.
- Listening together for Patterns and Insights
- Share collective discoveries.

The full data collection and analysis will be undertaken after a number of other similar events have taken place. The initial outcomes and reaction to the question for the majority of participants immediately initiated storytelling and descriptive recounting of what happened on a good day. This led to the sharing of specific

examples of projects, initiatives and organizational norms, ceremonies and community activity which were considered to be a force for good.

The discoveries could be themed as follows: -

- activity which brought the staff and students together, engendered a sense of fulfilment to staff
- responding to a positively framed question tended to increase the focus on the student outcomes rather than the impact of change activity on staff;
- face to face interaction often resulted in a good result in terms of getting other staff to 'buy-in' to changes;
- a day free of minor annoyances was productive and conducive to high stake conversations.

The Dream phase begins, once the organisation has collected data and discovers what "gives life", what is the best of what is (Cooperrider, Stavros, Whitney, 2008), in this case, what is a good day in Higher Education. Story telling based on what is giving life, is encouraged to support organisational efforts towards doing more of what is already working. Appreciative inquiry and storytelling can counteract the adversarial undercurrents often presenting in Higher Education (Farquharson, Clarke, Diaz and Collins, 2016). Sharing affirmative stories can create a compelling vision and sense of community within organizations. This aligns with Young's approach to use story telling as a method of directing action (2004).

3. Designing our research method

Our developmental research method will be described using Saunders et al (2007) Research Onion. Leading us through the stages to develop an experimental yet robust approach to our research method.

The stages of the research method development include: Philosophy, approach, strategy, time horizon and data collection method.

Outlining the research philosophy for the study is the sharing of beliefs underpinning the researchers' view of the nature of reality being studied. This enables the assumptions made by the researchers to be made visible. The ontological framework leading this research falls into the 'interpretivism and constructionism' view meaning that the phenomena being studied and meaning derived is created by each researcher / observer / group. The use of storytelling, visual maps, metaphors and using these methods to explore transformation in higher education is rich with possibilities. We do not make assumptions that we all have the same view of reality rather that examining our different interpretations and the nuances of our participants provides a rich knowledge landscape from different perspectives.

Our research approach is 'deductive' in that we are using stories and metaphors of specific transformation in Higher Education to inform our general model for positive transformation in Higher Education. We are using the business model canvas (Osterwalder and Pigneur, 2010) as our starting point / theoretical base; we are looking for patterns and testing our ideas from the research data gathered. We are gathering qualitative data from stories collection, campfires (focus groups) and visual story boards.

Our research strategy is participatory action-based research, as a practical approach drawing on the communities of practices of the researchers. In this endeavor we are observing and collecting stories of good practice of transformation in Higher education in order to inform our Sphere model, which aims to share good practice across the sector, through the communities of practices who have contributed to building the model. This form of research is practical and useful for practitioners, in order for them to observe, reflect and inform their professional practice (Wiles et al, 2011).

The research process is built around a 'multi method' (Saunders et al, 2007) in that a wide selection of methods are used as and when appropriate (Bryman, 2012). The multi method approach enables flexibility and emergence of multiple data sets, which are then analysed using qualitative or quantitative techniques, depending on the validity and usefulness of the data set.

The time horizon for this work is longitudinal, historical experiences and stories will be collected, and waypoints will be added over the time of the study to show evolution and the results of the sphere model on practice. This fits well with the idea of the researcher as reflective practitioner.

Data collection is a key facet of the process; validity and reliability of the results are an important requisite for high quality research outputs. The primary data will be collected through the following mechanisms – world café events, camp fire focus groups, testimonies and interviews, and visual artefacts. (Flick, 2011). Our secondary data is collected from our systematic literature review.

Our research design concludes with the population of our sphere framework, to test our assumptions and gather evidence as to the usefulness of our approach to facilitate positive transformation in Higher Education. The choices here relate to whether our research design is explanatory, descriptive and exploratory. The outputs will be descriptive in this phase, leading to further research where we can explain the phenomenon under investigation. Using our preferred method of Appreciative Inquiry we will use the following framework as our research methodology.

<p style="text-align: center;">4 Destiny:</p> <p>Actioning the scenarios, following reality checks and building the sphere model to enable appreciative inquiry diagnostics. Testing and developing our propositions.</p>	<p style="text-align: center;">1 Discovery:</p> <p>Participants start to tell their stories, exploring their current situation regarding transformation in their HEI. Asking 'what does a great day in Higher Education look like?' Surfacing what is working well. Collecting the data and populating the sphere model through storyboards, camp fires (focus groups), HEI scripts (interviews), visual artefacts (posters, postcards) and the world café.</p>
<p style="text-align: center;">3 Design:</p> <p>Developing scenarios for the future, based on metaphors and peeling the layers of the HE onion.</p>	<p style="text-align: center;">2 Dream:</p> <p>HOW we capture the Visioning – even better if... The camp fire approach – focus groups and interviews, building the community of practice knowledge landscape of what HE could and should be. Developing stories, narratives and story boards of a 'perfect day in HE'.</p>

4. Applying the approach to 'leading change in higher education'

The theoretical base of operational excellence and lean were used to develop our framework for leading change in higher education. The framework shows the key dimensions needed to help HEIs cope with and embed a culture of continuous improvement. Stronger foundations are needed for HEIs, the environment in the UK is challenging, with funding, student numbers, the Teaching Excellence Framework, the National Student Survey driving Strategic Change within the sector. However, we argue that for change to be positive and sustainable, the foundations for HEIs in terms of People, Process and Culture need to be explored and explicitly stated. The appreciative inquiry:-

- is the story an accurate portrayal of all the events?
- is the story an accurate account of what was experienced by the actors?
- Is the story a driver for change and improvement?

Whether you are an academic or part of a professional services team, it appears from our study that the explicit expectations for different roles are not available. We have generic job descriptions for academic and professional services roles, however, much of the work is implicit and not specifically outlined. From our work, we have developed the following propositions to act as foundations for the model:

- 1 Higher Education benefits from embedding continuous improvement within the organisational DNA
- 2 the lenses of people, process and culture are helpful constructs in developing our HEI model canvas
- 3 successful change management and improvement interventions include aspects of positive psychology, drawing on emotions, behaviours and sense of well being.
- 4 successful improvement methodologies are built on the following theoretical bases: systems thinking, positive psychology, change and project management, quality management, lean and six sigma, leadership and followship, performance measures, creativity and problem solving.
- 5 specific improvement methodologies do not exist explicitly for the Higher Education Sector.
- 6 the authors believe the following are missing from current improvement and change methodologies in HE: reward and recognition, gender differences, mental load, standard work and operating guidelines, RACI (responsibility, accountability, consult, inform) silos between academics and professional services.

- 7 we acknowledge the development of lean - manufacturing to service to public to higher education which is predominantly a knowledge based organisation - individualistic vs teams approach to lean and continuous improvement. Drawing on the need for a humanistic approach to improvement - respect for people, continuous improvement and eradication of waste. Sense making and creating meaning.

Improvement methods, often adapted within Higher Education, such as, classical forms of lean has tended to focus on the 'hard' aspects of process, eradication of waste and team based problem solving. There is a feeling in the lean literature that the focus on change management and the 'softer skills' of leadership, negotiation, reward and recognition and emotions need to become more prominent.

Our proposed framework is shown below: SPHERE MODEL

People: capability, continuity, communications, kindness, gender, perceptions, leadership and fellowship

People & Process: Overburden, encouraging more of what already works

Culture: Commitment, credibility, continuous improvement, day to day focus on internal organization as opposed to the customer experience.

People & Culture: Gender, engagement, power and behaviour

Process: Consistency, unevenness, creativity, control, foundations,

Process and Culture: Waste reduction (classic and service)

People process and culture: Impact, RACI, well-being, humanization, celebration.

5. Discussion

The paper has outlined our preliminary research design using Appreciative Inquiry as its core. The paper is using this method to explore the propositions of a sphere model – which is being developed to provide a robust framework for enabling strategic transformation and continuous improvement with Higher Education. The sphere model will be tested and scrutinised using Merediths' (1998) 'Theory Testing' approach. Analysing impact of and on staff and leadership within Higher Education. The Sphere model seeks to uncover the layers of meaning in order to understand the phenomenon of transformation in Higher Education. This is in order to embed good practice across the sector. The development of the research design is iterative, using the appreciative inquiry model and systems thinking to explore complex, dynamic and fast moving problematical situations.

The core of story-telling, metaphors, myths and hero(ines) are a primary tool for data gathering and analysis. The data analysis of stories using grounded theory and the identification of themes will provide confirmation (or otherwise) for the propositions outlined above. The enabling technology for the capturing of the data includes recording, rich pictures, mindmap notes, artefacts in terms of post its and world café outputs. Using CATWOE to explore different world views and key relationships within the phenomenon under investigation. This also explore the interpersonal skills needed within our leadership teams and colleagues for meaningful and positive transformation in higher education.

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Index Construction Methodology Using Training Sample Based on Pairwise Comparisons

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Abstract: Most of index construction techniques combine measured features presenting different components of the index. To obtain the correct weights of the features is a matter of great importance. Widely used principal component analysis allows us to do without training sample. It settles the weight of the feature according to its variability. But this method works only with correlated features. Indicators with more or less independent components need either expert-defined weights or a training sample. We propose construction of such a sample on the base of the direct index estimation by experts. To prevent considerable bias it is reasonable to use an expert panel and convert processed information of all the experts into the training sample. Though the sense of the index is considered to be clear for the experts and the objects in the sample are also well known for them, the experts can give information about the index value for each object in qualitative rather than quantitative form even if they are asked to present it in numerical scale. That is why we propose using pairwise comparisons instead, and the number of objects involved of about a dozen or some more looks reasonable. While elements of the pairwise comparisons matrix are assigned in expert-friendly Likert scale, the eigenvector of this matrix as well as the results of its future processing with corresponding estimations of other experts is a source of data in quasi-numerical scale. We present the results of application our methodology for alternative assessing of some widely used indices.

Keywords: aggregate index, qualitative data, quantitative data, eigenvector, Likert scale

1. Introduction

Indices become more and more important for different applications in modern world. There are different reasons to create new indices. Growth of amount of information causes the necessity of its keeping and presentation in parsimonious way and aggregation of dozens different features in a scalar indicator becomes usual practice. Another kind of index applications concerns measuring of not directly measurable characteristics on the base of expert opinions. Aggregation of different kinds of information presented in different scales is highly important issue which needs the methodological support.

Expert estimates in data for index construction may cause the subjective bias with respect to the indices based on measuring results. But is a set of measured features used in aggregation process relevant? Are all the substantial features available? The answer to these questions is not clear in advance for the particular index. That is why sometimes it is better to return to the very beginning in index construction and start with the initial sense of the index trying to estimate it as a whole. It prevents possible bias of different nature and to make the results more objective we can use opinions of different experts.

We should also bear in mind the restricted ability of the expert to give sufficient amount of information. It is convenient for any of them to give answers to relatively simple independent questions. The pairwise comparisons seem to be one of the best formats for this purpose. Further processing of this kind of data can be helpful in calibration of the index and may be used for generalization of the model based on that training sample to other objects of the population.

2. Literature and data sources review

Index construction methodology is considered from different perspectives, but the main idea behind most indices is providing measurement of the immediately non-measurable characteristics of the objects. Different ways of characteristic measurement are discussed in the literature. The first one is focused on construction of indicators that aggregate partial features of the characteristic. It is able to convey information on many parameters succinctly (Balica, 2012). Such aggregate indicators are useful tools because they present results for wide audience in clear and friendly format such as scores or rankings (Kenney et al., 2012). That helps to provide common understanding of supranational concerns and overcome socio-political barriers of decision making (Preston et al., 2011). Features aggregation from multiple sources may be used to maintain sufficient precision

and reliability under the influence of measurement error, but sometimes the indicator aggregation tends to amplify the effect of measurement errors (Kaufmann and Kraay, 2008).

Another technique to obtain a value of a characteristic is the expert estimation. Expert estimates are especially useful for measuring complex concepts that require specific knowledge and evaluative judgments and for measuring phenomena for which alternative sources of information are scarce (Schedler 2012). They have wide-range applications such as evaluations of human rights and democracy (Landman and Carvalho, 2010), electoral systems (Bowler et al., 2005), the quality of public administration (Dahlström et al., 2011). Expert surveys are widely used in the Corruption Perceptions Index, Freedom House's estimates of political rights, civil liberties and democracy. Expert estimates may concern either the index as a whole or sub-indices or even particular features to be aggregated in the index. The implicit and explicit assumptions within the framework of existing aggregate indices do not always take place and, particularly, aggregate indicators cannot rule out the possibility of omitting important variables (Oman and Arndt, 2006). The loss of individual indicators during the aggregation process can lead to mistaken conclusions (Kenney et al., 2012). The mechanism of determining the constituent variables is the biggest limitation of aggregate indicators (Lohani and Todino, 1984).

Principle component analysis (PCA) is widely used as a tool for aggregation data in construction of most social and economic indices, e.g. Social-Economic Status or Well-Being Index (Hargreaves et al. 2007; Vincent 2013), Wealth Index calculated by the Demographic and Health Surveys Program. PCA was used for construction of indices for decision of various local problems like determination of socioeconomic conditions of biogas users in Nepal (Devkota, 2014), estimation of health service readiness based on the Tanzanian Service Provision Assessment Survey (Jackson et al., 2015) and many others. The methodology of PCA is widely discussed in scientific society that is why a lot of manuals on the topic are available. Among the authoritative sources, OECD's Handbook on Constructing Composite Indicators might be outlined (OECD, 2008). As an alternative to the PCA, the weights for different sub-indexes may be defined on the base of expert estimates. The practical manuals on how to apply this method are published by many analytical corporations. MSCI Value Weighted Indexes Methodology, FTSE Indexes Construction and Methodology, Methodology Guide for NYSE are in the open access. With the help of this approach, Financial Conditions Index (Hatzius, 2010), the Employment Cost Index (Ruser, 2001) and a bunch of other economic-related indexes are calculated.

While the mechanism of determining the constituent variables remains the biggest limitation of aggregate indicators (Lohani & Todino, 1984), the well-known but less used regression estimation of sub-index weights can be applied (Aivazian and Borodkin, 2006). This technique is feasible when the final index values are known for at least a part of objects, and application of expert opinions estimation of the index as a whole to get the needed information about values of the dependent variable might be fruitful.

3. Methodology of the study

To avoid possible bias because of the distortion in the process of the features aggregation we can rely on the expert opinion and calculate the overall value of the indicator. In turn, to prevent the subjective expert bias we can aggregate information of expert panel.

For estimation of the aggregate indicator values for a group of objects, we propose to use the method of pairwise comparisons. All experts are suggested to make pairwise comparisons of k objects and assign to each pair a mark within the range from $-m$ to m , where m is a positive natural value. Let us consider the procedure of pairwise comparison of p objects in p by p matrix of the expert estimates in $(2m + 1)$ -point Likert scale which includes a neutral point for approximately equal objects in a comparison, a few positive values to present different level of preference of the particular object with respect to the competitive object in the sense of the considered indicator and the same number of negative values to present the level of preference of the competitors with respect to the analyzed object. In the case of five-point Likert scale, an element \tilde{a}_{ij} of the pairwise comparisons matrix \tilde{A} looks as follows:

$\tilde{a}_{ij} = 2$ means that the i -th object is much more preferable than the j -th one;

$\tilde{a}_{ij} = 1$ means that the i -th object is just more preferable than the j -th one;

$\tilde{a}_{ij} = 0$ means that i -th and j -th objects are equal in measure;
 $\tilde{a}_{ij} = -1$ means that the i -th object is just less preferable than the j -th one;
 $\tilde{a}_{ij} = -2$ means that the i -th object is much less preferable than the j -th one,
 where $i, j = 1, 2, \dots, k$.

The matrix $\tilde{A} = \{\tilde{a}_{ij}\}$ is skew symmetric, the number of independent elements in it is equal to the number of needed pairwise comparisons $k(k-1)/2$ for k objects. All the rows and columns of the matrix \tilde{A} after correct measuring should be correlated enough that allows us to reduce the dimensionality of the space spanned to the columns of the corresponding matrix and make this space unidimensional without essential loss of information. To obtain the eigenvector corresponding to the most eigenvalue we should first transform the matrix of pairwise comparisons from convenient initial form into non-negative form by adding m to each element

$$a_{ij} = \tilde{a}_{ij} + m.$$

So the trace of such a matrix $A = \{a_{ij}\}$ will be mk that is equal to the sum of all k eigenvalues, and if the maximum eigenvalue is close to mk then the pairwise comparisons are not too controversial. At the same time, the corresponding eigenvector is more informative than just a vector of sums of elements in rows because it uses all the in-depth information about the objects comparisons. Matrix of pairwise comparisons in its non-negative form provides possibility of calculate its maximum eigenvalue λ and corresponding eigenvector p due to the Frobenius-Perron theorem. The iteration procedure may be organized

$$p^{(t)} = Ap^{(t-1)}, \quad p^{(t)} = \frac{1}{\lambda^{(t)}} p^{(t-1)}, \quad \lambda^{(t)} = \sum_{i=1}^k p_i^{(t-1)}$$

with the initial value of the eigenvector at the step $t = 0$: $p^{(0)} = (m, m, \dots, m)^T$.

The iteration procedure will stop when there are not substantial changes in elements of vector $p^{(t)}$ in comparison with the elements of this vector at the previous step $p^{(t-1)}$.

According to the estimated maximum eigenvalue we could estimate the share of saved information from the matrix of pairwise comparison in a unidimensional vector

$$\eta = \lambda_{\max} / (mk).$$

After normalization to one of the traditional grade scales, the elements of the eigenvector can be used as a measured values of the overall index for the objects used in its construction. But to avoid possible expert bias, it is reasonable first to aggregate data of different experts. So the corresponding estimates of the eigenvectors should be calculated for the matrices of pairwise comparisons of the same set of objects produced by all ν experts of the expert panel. As a result the matrix P of dimensionality k by q can be organized, its columns are the corresponding eigenvectors. For this matrix we can apply the singular value decomposition (SVD) technique.

Rectangular matrix P may be presented as a product of left singular matrix U , rectangular diagonal matrix Σ , and right singular matrix V

$$P = U\Sigma V^T,$$

where the columns of U are the eigenvectors of PP^T , and the squares of the matrix Σ diagonal elements are the corresponding eigenvalues of PP^T . In turn, the columns of V are the eigenvectors of $P^T P$, and the squares of the matrix Σ diagonal elements are the corresponding eigenvalues of $P^T P$.

In truncated form that corresponds to the case of highly correlated columns in matrix P , we can restrict the matrices U and V by the only first vector in each of them. This kind of factorization after normalization gives us the aggregate values of the estimated index and a vector of experts' opinions weights used in this aggregation.

The values of the overall index for k objects can be used to create a regression model which allows us to estimate the values of the index for all other objects.

4. Modelling results

The expert panels for different indices estimates were formed from undergraduate students of 4th year.

In the first example for constructing the Index of Economic Freedom we used a set of 12 countries: Russia, USA, Mexico, Spain, Greece, France, Germany, Japan, China, Australia, Sweden and Canada. The sample included countries with different level of economic freedom. These countries were a training sample for future analysis. From individuals estimations by pairwise comparisons using five-point Likert scale we went to the group assessment to obtain more extended overview of ranking the set of countries. The expert estimations are presented in table 1.

Table 1: Initial matrix of individual expert assessment of the Index of Economic Freedom, 2016 year

Country	Expert 1	Expert 2	Expert 3	Expert 4
<i>Russia</i>	0,705	0,552	0,889	1,048
<i>USA</i>	1,687	1,796	1,721	1,813
<i>Mexico</i>	0,850	0,951	1,229	0,990
<i>Spain</i>	1,140	1,011	1,585	1,550
<i>Greece</i>	0,859	0,924	1,066	0,934
<i>France</i>	1,136	1,313	1,396	1,395
<i>Germany</i>	1,872	1,806	2,016	1,695
<i>Japan</i>	1,672	1,905	1,839	1,688
<i>China</i>	0,392	0,674	1,014	1,062
<i>Australia</i>	2,459	2,315	2,144	2,464
<i>Sweden</i>	2,057	2,296	2,371	2,494
<i>Canada</i>	2,715	2,592	2,534	2,466

Source: Own elaboration

The share of saved information from the matrix of individual expert assessment in a unidimensional vector was $\eta = 0,992$. Hence, we have the high level of expert opinions coordination. Along with the rating of the countries we estimated the characteristics of the experts. We calculated coordination of expert estimates and a degree of conformism for each of experts. The weights of expert estimates in the final score were 0,240, 0,246, 0,257, and 0,257 correspondently. The score for each country in the training sample is presented in Table 2 where rating of economic freedom published by Wall Street Journal for the same set of countries was added for a comparison.

Table 2: Expert assessment of the Index of Economic Freedom for the training sample of countries and the Wall Street ranking, 2016 year

Country	Final score	Wall Street Journal ranking
Canada	0,1369	Australia
Australia	0,1247	Canada
Sweden	0,1228	USA
Germany	0,0983	Germany
Japan	0,0945	Japan
USA	0,0934	Sweden
Spain	0,0706	Spain
France	0,0698	Mexico
Mexico	0,0536	France

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Country	Final score	Wall Street Journal ranking
Greece	0,0504	Greece
Russia	0,0427	China
China	0,0422	Russia

Source: Own elaboration and The Wall Street Journal data

Expert predictions are rather close to the real ranking except USA which was underestimated and Sweden which was overestimated. Experts also reversed Canada and Australia, Mexico and France and Russia and China.

Index of economic freedom includes a great variety of variables and estimations. But we could choose the most important ones that are used in its construction. Data were taken from the site of organizer of the survey so they were officially used in 2016. The variables are

- X1 - population, million people,
- X2 - GDP, Billion USD,
- X3 - GDP growth rate, %,
- X4 - five-year GDP growth rate, %,
- X5 - GDP per capita, thousand USD,
- X6 - unemployment rate, %,
- X7 - inflation rate, %,
- X8 - foreign direct investments, millionUSD,
- X9 - public debt, % of GDP.

After standardization using Z-scores and preliminary correlation analysis, we excluded factors Z1 and Z8 as they have the highest correlation with other factors. The rest factors are all significant in the regression model (see Table 3). The determination coefficient for this model $R^2 = 0,98$.

Table 3: Summary of the regression model for the Index of Economic Freedom

Variable	Coefficient	Standard deviation	t-statistic	P-value
C	0,083	0,002	40,38	0,0000
Z2	-0,027	0,003	-7,94	0,0002
Z3	0,034	0,004	7,94	0,0002
Z5	0,038	0,002	14,29	0,0000
Z7	0,012	0,002	4,27	0,0052
Z9	0,015	0,003	4,71	0,0032

Source: Own elaboration

To generalize the results on other countries we tested the regression model on 7 new countries: Brazil, Italy, Norway, Belarus, Latvia, Netherlands, and New Zealand. The results are presented in the Table 4.

Table 4: Regression estimates of the Index of Economic Freedom

Region	Index of Innovation Development
Russia	0,0427
United States	0,0934
Mexico	0,0536
Spain	0,0706
Greece	0,0504
France	0,0698
Germany	0,0983
Japan	0,0945
China	0,0422
Australia	0,1247
Sweden	0,1228
Canada	0,1369
Brazil	0,0004*

Region	Index of Innovation Development
Italy	0,0583*
Norway	0,1723*
Belarus	0,0927*
Latvia	0,0585*
Netherlands	0,1010*
New Zealand	0,1086*

* Index values for countries not included in the training sample

Source: Own elaboration

The second example presents the results of Index of Innovation Development estimates for the regions of Russian Federation. As a training sample we used 12 regions: Moscow, Republic of Tatarstan, Sverdlovsk region, Krasnoyarsk region, Khabarovsk region, Tver region, Komi Republic, Murmansk region, the Republic of Buryatia, Udmurtia region, the Republic of Dagestan, Altai region. These regions are evidently of the different level of innovation development. As information basis for the first step of analysis we used opinions of 5 experts in the format of pairwise comparisons matrix. The results of the initial information processing are presented in the Table 5.

Table 5: Initial matrix of individual expert assessment of the Index of Innovation Development

Region	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Komi Republic	0,0470	0,0380	0,0318	0,0289	0,0318
Altai region	0,0124	0,0055	0,0071	0,0049	0,0059
Sverdlovsk region	0,1436	0,1728	0,1576	0,1740	0,1514
Khabarovsk region	0,0866	0,0764	0,0688	0,0748	0,0765
Moscow	0,2108	0,2355	0,2489	0,2578	0,2716
Murmansk region	0,0362	0,0192	0,0245	0,0198	0,0229
Tver region	0,0712	0,0550	0,0540	0,0559	0,0595
Krasnoyarsk region	0,1129	0,1216	0,1231	0,1230	0,1259
The Republic of Buryatia	0,0455	0,0188	0,0240	0,0176	0,0194
Republic of Tatarstan	0,1893	0,2460	0,2459	0,2377	0,2258
Udmurtia region	0,0142	0,0066	0,0085	0,0042	0,0049
The Republic of Dagestan	0,0303	0,0045	0,0058	0,0015	0,0043

Source: Own elaboration

The weights of expert estimates in the final score were 0,195, 0,210, 0,197, 0,200, and 0,198 correspondently. The score for each region in the training sample is presented in Table 6 where we add the rating of Innovation Development published by National Research University Higher School of economics for the same set of regions was added.

Table 6: Expert assessment of the Index of Innovation Development for the training sample of regions and the National Research University Higher School of Economics ranking

Region	Final score	Ranking on HSE Index of Innovation Development
Moscow	0,2431	Moscow
Republic of Tatarstan	0,2273	Republic of Tatarstan
Sverdlovsk region	0,1592	Sverdlovsk region
Krasnoyarsk region	0,1209	Krasnoyarsk region
Khabarovsk region	0,0771	Khabarovsk region
Tver region	0,0596	Tver region
Komi Republic	0,0361	Komi Republic
The Republic of Buryatia	0,0260	Murmansk region
Murmansk region	0,0250	The Republic of Buryatia

Region	Final score	Ranking on HSE Index of Innovation Development
The Republic of Dagestan	0,0102	Udmurtia region
Udmurtia region	0,0080	The Republic of Dagestan
Altai region	0,0074	Altai region

Source: Own elaboration and data of the Institute of Statistical Studies and Economics of Knowledge (ISSEK) of National Research University Higher School of Economics

For creation of the regression model we used a set of independent variables: higher education level (X1), households with personal computer and Internet access (X2), personnel engaged in research and development (X3), innovation activity of enterprises (X4), GRP per capita (X5). The resulting regression with coefficient of determination $R^2 = 0,80$ is as follows:

$$I_{\text{EXPERT}} = 0,047 - 0,00046 * X1 - 0,0032 * X2 - 4,1E-08 * X3 + 0,013 * X4 + 4,45E-07 * X5.$$

Application of the regression model to the training sample and 7 additional regions gives the results presented in the table 7.

Table 7: Regression estimates of the Index of Innovation Development

Region	Index of Innovation Development
Moscow	0,1149
Republic of Tatarstan	0,0910
Sverdlovsk region	0,0660
Krasnoyarsk region	0,0474
Khabarovsk region	0,0567
Tver region	0,0168
Komi Republic	0,0518
Murmansk region	0,0135
The Republic of Buryatia	0,0374
Udmurtia region	0,0357
The Republic of Dagestan	0,0210
Altai region	0,0337
Sakha Republic	0,0832*
Krasnodar region	0,0211*
Republic of Bashkortostan	0,0479*
Tula region	0,0396*
Pskov region	0,0144*
Irkutsk region	0,0294*
Sakhalin region	0,1783*

* Index values for regions not included in the training sample

Source: Own elaboration

The method with training sample defined by even not very experienced experts gives the results that are close to the existing ranking of the objects.

5. Conclusions

Index construction methods use different techniques for features aggregation. Their application depends on the kind of information to be presented in the index format. The most complicated are indices for estimation of non-measurable by ordinary tools phenomena, and combination of different sources of information including expert opinions looks natural in this context. The experience in index construction by different institutions is great enough. It provides possibility to compare the results of the particular methodology application and the existing indices.

The combination of expert opinions and the results of immediate measuring can be realized in different ways. For most complicated indices it is reasonable to use expert estimation at the top level of the hierarchy to avoid cumulating of the bias at the lower level of measurement. In turn, the expert opinions of the index as a whole should be organized properly with respect to the respondents. Pairwise comparisons are quite comfortable and potentially provide the necessary amount of information about the objects. Because of the fast growth of the

number of comparisons with the number of objects increase, it is reasonable to include about a dozen or some more objects in the initial model. That is enough for using the results of such estimates after corresponding processing as a training sample for regression model to calculate index values for other objects.

The results of approbation of these methodology for estimation of existing indices such as the Index of Economic Freedom at the countries level or the Index of Innovation Development at the regions level show quite applicable results even in the case of pairwise comparisons made by enough skilled but not very experienced experts.

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From Soviet Cybernetics to Western-Oriented Design Science: A Business Informatics Community in Transition

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Abstract: Research in Business Informatics or Management Information Systems in the Czech Republic has been increasingly influenced by the design science methodology adopted from Western Europe and the USA during the past decade. This methodology offers a portfolio of methods that can be used in design science research (DSR) projects. Having engineering roots, DSR strives to balance research rigour and research relevance. This paper presents the tradition of design type of research in Czechoslovakia and the Czech Republic; the tradition, which was originally based purely on Soviet cybernetics and systems approaches, yet which is currently morphing into more a Western-oriented DSR-type of tradition. Based on our analysis of almost 70 doctoral dissertations from the field of Business Informatics, the use of design type of research in the Czech Republic is discussed. Our finding is that most dissertations analysed were focused on this type of research (86%), and empirical evaluations of the proposed solutions were carried out only infrequently by 2010. We offer an explanation that the tradition of social and behavioural empirical research in Czechoslovakia was terminated in the 1950's, and this type of research was generally not supported, given the dominance of Soviet cybernetics and systems approaches from 1950s onwards. We further speculate that the influence of Soviet cybernetics altogether with the very poor state of social and behavioural research in communist Czechoslovakia notably influenced approaches to artifact design in Business Informatics, just as these two factors have influenced next generations of Czech scholars in this area. It can be argued that the Eastern and Western approaches to the artifact design are still encountered in the Czech academic space in parallel. However, in the last decade there has been a renaissance of empirical research in the field of Business Informatics, while clearly giving preference to the use of design science methodology.

Keywords: artifact, Czech Republic, design science research, higher education, information systems, methodology, Soviet cybernetics, systems approaches

1. Introduction

This contribution presents an original perspective on the historical development and paradigm change in the field of information systems development in the Czech Republic (formerly Czechoslovakia). This difference in approaches arose during the Cold War era (1947-1989), when the world was divided into the Eastern Bloc (the East) and the Western Bloc (the West). This article discusses the change from Eastern to Western approaches to Business Informatics and related progress in the Czech Republic, which started belatedly, more than 20 years after the Velvet Revolution (1989). In this respect, the paper demonstrates a renaissance of empirical approaches (behavioural and social research), which are used in the evaluation of the designed artifacts in the area of Business Informatics or Management Information Systems (MIS) research.

The aim of the article is to explain the aloofness of the academic community to adopting Western methodological approaches in the discipline of Business Informatics. This on-going process mainly concerns restoring empirical approaches used in the evaluation of the designed artifacts according to design science research (DSR), which were previously not used in the design of artifacts in the Eastern Bloc. By sharing these initial findings, we increase the understanding of the diversity in the Business Informatics disciplinary landscape (see Heinrich & Riedl, 2013). Specifically, we show, how the Czech Business Informatics community has been absorbing the Western influence since 1989.

The development of the design-oriented approach begins in Europe in the period of reconstruction after World War II. But it was only in the 1950's that there emerged a systematic effort to make design-oriented approaches part of the scientific discourse both in the Eastern and the Western Bloc. Designed artifact should bring new (or better) solutions and value for their users. There are a number of definitions of the artifact (Dresch et al, 2015), among them the following two: "Artifact is artificial thing that can be characterized in terms of functions, goals, and adaptation" (Simon, 1996, p. 28). "Artifacts can be viewed as the symbolic representation or physical instantiation of design concepts" (Gill & Hevner, 2011, p. 238). An artifact can also be a system of partial artifacts. This article understands the terms system and artifact as interchangeable, as both cases concern designing the artificial.

2. Western approaches to design

This section very briefly introduces selected schools of thought that had a significant influence on Western approaches to the design in the area of Information Systems. This is a historical perspective on the development of approaches to the study of processes connected to the design of systems or artifacts. The purpose of this overview is to show the richness of ideas in contrast with Eastern approaches (Section 3). Such socio-technical and engineering approaches were selected, whose ideas were later reflected in the area of Business Informatics and in the methodological approach to artifact design used after 2000 in DSR. For a more detailed discussion of these perspectives, the following sources can be recommended (Barley & Kunda, 1992; Mumford, 2006; Dresch et al, 2015).

2.1 Socio-technical design

In the West, the beginnings of analysis and design that take into account not only the technical, but also the social components and their mutual interaction are connected with the Tavistock Institute in the UK. Shortly after World War II, research started here, running from the later part of the 1940's and in the 1950's, that used the psychological and sociological perspective (Mumford, 2006). The goal of the first researches, focused on manufacturing and production industries in the UK, was to determine whether work in selected areas of industry (e.g., coal or textiles) can be more humanized. This view contrasted with the deterministic and mechanistic views that dominated industry and industrial management – e.g. principles of scientific management (Taylor, 1911). This concerned mainly the analytical approach to research, the purpose of which was to study the organization of work. The term “socio-technical system” was first introduced in 1960 (Baxter & Sommerville, 2011).

The 1970's and 1980's brought the development of socio-technical systems design, and the methods that could be used for this purpose. The development in this period was motivated by the lack of workers, and companies' effort to retain their current employees (Baxter & Sommerville, 2011). There emerged a number of methods in various areas of human activity, but most often they were focused on implementing computers into organizational context. Among the best known is ETHICS (Mumford, 1996), but the socio-technical approach influenced many other methods as well – e.g. Soft Systems Methodology (Checkland, 1981) or later Human-Centred Design (ISO, 2010). The 1990's were a period when socio-technical approaches were replaced by Lean Production and Business Process Re-Engineering (Baxter & Sommerville, 2011), which also dominated in the area of information technology and systems. There was another renaissance around 2000, when a number of socio-technical theories emerged in the area of Information Systems – e.g. Biographies of Artifacts (Pollock et al, 2003), Sociomateriality (Orlikowski & Scott, 2008) or Social Informatics (Kling, 2007).

Socio-technical principles had a strong influence on Business Informatics, including the approaches to IS design. “The most important thing that socio-technical design can contribute is its value system. This tells us that although technology and organizational structures may change, the rights and needs of the employee must be given as high a priority as those of the non-human parts of the system” (Mumford, 2006, p. 338). Socio-technical systems design has its roots in Europe, but the results, e.g. the application of the ETHICS method, were used also in the USA (Baxter & Sommerville, 2011).

2.2 Engineering design

In 1969, a book called *The Sciences of the Artificial* was published in the USA (Simon, 1996). This book dealt with the issue of creating the artificial – studying how humans create, whether it be in the form of a design (e.g. a technical drawing) or the management of an organization (e.g. the results of an organization's work) (Simon, 1996). The book served as a starting point for the newly established field of design research. In this book, Herbert A. Simon understands activities connected to design research as “sciences of the artificial” or “the science of design”. Design research focuses mainly on the process of constructing a general or situated artifact, which means that it deals with the specific problems of adapting a general or situated artifact (the designer's role in the design). The result is a knowledge base about the method of designing the artifact. The relevance of the solution is significant, but it is the market (practice) that determines whether the designed artifact is successful. The term design research thus refers to a broad field of study that lies between art, psychology, sociology, and engineering (Bayazit, 2004).

In the 1930's there already was an effort to introduce objective and rational elements into design, that is, maximum advantage for people and minimal material and operation costs (energy). In the 1960's, this direction

transformed into the system theory of design engineering. Design engineering (Eder & Hosnedl, 2008) not only gathers a knowledge base about how human-made artifacts are created by designers, but on the basis of this experience then creates methods and recommended procedures that are generally applicable in engineering – see e.g. (Hubka, 1976). Design science is later defined on these principles, trying to find rigorous methods for the construction of human-made artifacts. The use of this methodology (and its methods) increases the chance of the artifact's success in practice. Design science focuses on the knowledge that is necessary for design, and it offers rigorous methods, techniques, and constructs for design and evaluation.

From the perspective of Business Informatics, it can be said that the aim of design science is to introduce the principles or methods for solving a specific problem during the design of a new artifact (Dresch et al, 2015, p. 48). Among the internationally renowned scientists and founders of this field is the Czechoslovak scientist in the field of system sciences and (engineering) design science Vladimir Hubka (Hubka & Eder, 1996; Hubka & Eder, 1988), who emigrated to the West in 1968.

2.3 The emergence of design science research

The engineering and socio-technical approach to the empirical study of the design and application of a human-made artifact in a specific context are essential also for the field of Information Systems (Business Informatics), in which DSR was created on the basis of these ideas. This field takes the best from the Western tradition: (1) it is firmly grounded in empirical research (artifact evaluation) and (2) it builds a knowledge base about the method of design (learning through creating), which can then be used for enriching design theories and creating new methods applicable in future designs. All that serves the purpose of supporting the designer and ensuring that the realized design will be relevant for users and based on rigorous methods of development.

In the field of Information Systems can be found two views of DSR. The first understands it as a framework (Gericke, 2009, p. 41) that unites two areas: design science and design research. The second view understands it as a methodological approach to the design of artifacts that serve for a specific human purpose (Dresch et al, 2015). A common problem when reading various literature is an emphasis entirely on design science, which brings with it a “scientific” approach (see e.g. Dresch et al, 2015, pp. 67-97; Hevner & Chatterjee, 2010). In these views, DSR is either design research based on design science (Hevner et al.), or a natural development of the science of the artificial, a part of which is design science (Dresch et al.). Unfortunately, these perspectives from the field of Information Systems do not take into account the mutual effect of the two domains (design science and design research), as described in other sources (Bayazit, 2004; Gericke, 2009).

Design research focuses mainly on the construction process of a general or situated artifact, which means that it deals with the specific problems of adapting a general or situated artifact on the level of design and designer. A major problem of this research is the varied research procedures that have a high degree of relevance (solve a problem) in the defined area, but on the other hand lack rigorousness (e.g. statistical significance or using exactly defined procedures) or scientificity. For instance, behavioural research in social sciences, such as management, bases its conclusions mainly on scientific significance, and it is therefore rigorous, but not necessarily relevant. Design science, on the other hand, tries to find rigorous (generally acceptable) methods for constructing and researching the artificial, as a contrast to researching the natural – the goal of such research is to design methods that would be applicable to future designs.

DSR tries to combine a high standard of rigorousness (exactly defined procedures, measurability of outputs) with a high level of relevance (the ability to solve a problem in practice) in the area of Information Systems.

DSR in the area of Information Systems is a complementary methodological framework to the behavioural MIS research. It tries to strike a balance between the scientific and the practical, that is, to be not only a practical but also a rigorous discipline. An important feature of DSR, as opposed to design research, is learning through creating – constructing an artifact.

3. Eastern approaches to design

The previous section summarized the rich development of approaches to the design of systems or artifacts in the West – from the mechanistic approaches (Taylor, 1911) through the socio-technical and engineering approaches (Mumford, 2006; Eder & Hosnedl, 2008) to DSR in the area of Information Systems (Dresch et al, 2015). In the Eastern Bloc, however, the possibilities of research were considerably limited, since even science

was closely connected with the ideology of Marxism-Leninism (Umpleby, 1987). In order to give an overview regarding the situation in the Eastern Bloc, this section covers three basic topics. First, we explain the nature of the Eastern political context (Section 3.1). Consequently, we give some background regarding the lacking role of empirical research in this region (Section 3.2). Finally, we briefly present the development in Czechoslovakia and Czech Republic after 1989.

3.1 The political context and its impact on scientific disciplines

Following the communist take-over in 1948, the previously established tradition of behavioural research in social sciences was forcibly interrupted in Czechoslovakia. (As for the interesting development in Czechoslovak applied sociology prior 1948, see, for example, the story of one among first empirical application-oriented research projects, which was conducted in Bařov during early 1940s – Nespov, 2015.) This historical development also significantly impacted application-oriented people-centric scientific fields, which were basically expelled from academia (Nespov, 2014). The last students of sociology in Czechoslovakia graduated in 1952, and this discipline then became “an ‘abandoned’ field of studies” (Musil, 2011, p. 373) for another decade.

In engineering areas focusing on the design of artificial systems and their management became part of system sciences and cybernetics from the late 1950’s onwards. Although cybernetics was greatly criticised in the early 1950’s as a “bourgeois pseudo-science” (this label shared with sociology), by the end of the 1950’s it was accepted, as it was made consistent with dialectic materialism (the philosophical approach of Marxism). In 1960’s, Cybernetics emerged with full power as a discipline of its own right in Czechoslovakia. Cybernetics was then structured into the Theoretical, Technical, and Applied subfields (Berg, 1960). In that regard, Cybernetics became an umbrella concept for theoretical, engineering, and application-oriented informatics (= computing) disciplines respectively. By mid-1970s the autonomous disciplines of Systems Engineering and Automated Management Systems emerged analogously (Smutny & Dolezel, 2017). These two disciplines could be roughly characterized as disciplinary siblings and contemporaries of Applied Cybernetics.

Cybernetics was useful for the Soviet regime of that time in building the foundations of the “science of governing (or managing)” (in Russian: *nauchnoe upravlenie*) socialist organizations and society (Vidmer, 1981). Speaking about this area, it is quite hard to provide a concise description in only a few lines. The reason is that this science was basically a product of Soviet ideology and, as such, it did not have a close-enough Western equivalent. Speaking about the related terminology in English, one can also experience significant difficulties:

“The word upravlenie itself has no precise English-language equivalent. Depending on context or nuance, it can refer to steering, regulation, management, control, administration, governance, or even managing one’s own feelings.” (Vidmer, 1981, p. 4)

In addition to this, one should perceive the whole scientific area of academic *upravlenie* of 1970’s and 1980’s as highly fragmented, little mutually consistent, and significantly influenced by power struggles between various sub-disciplines or thought schools (Vidmer, 1981). Although there also was an empirical, prescription-oriented stream of research in *upravlenie* (e.g., the work of Popov, 1981), one can hardly consider it as the prevailing one. By contrast, one of the major thought schools in *upravlenie* was coined by Soviet cyberneticians. This school held a prominent position in the area of *upravlenie* due to the catchiness of the cybernetics discourse in the East (Gerovitch, 2004).

The area of *upravlenie* was notably influenced by the Taylorist school of thought adopted from the West (Taylor, 1911). Although the ideological attitude in the Soviet Union to Taylor’s ideas had been reserved or even critical at first, Lenin eventually accepted these ideas in 1918 and was even actively promoting them later on (Bailes, 1977). This turn was used several decades later for legitimizing cybernetics in the Soviet Union, namely by a rhetorical interconnection of the rational and technical grounding of cybernetics with Lenin’s teachings (Gerovitch, 2004).

3.2 The marginal role of empirical research

In general, the Eastern Bloc emphasized theory that conformed to the ideology, and suppressed empirical research, mainly on the level of studying organizations and society. This conflict is apparent, for example, when looking closer on the relationship between sociology and historical materialism, which was introduced also to Czechoslovak universities after 1948 (Musil, 2011; Skovajsa & Balon, 2017). The area of design used deterministic approaches and the mechanistic perspective of cybernetics. On the one hand, there was the communist party’s

effort to govern and manage the entire society (Podkolzin, 1968, p. 111) and, on the other hand, there was an assumption that, in order to achieve that, it should suffice to design a logical organization of social and technological components into the correct solutions (e.g. designing an organizational structure, designing the implementation of computers in organizations etc.). A major problem of this approach was that it ignored the fact that the reality frequently was dramatically different, because the empirical research that would check the designed solution was not carried out (it could contradict the ideologically-based theory). This contrast between the design and the reality of a contextually situated artifact was soon recognized in the West, and socio-technical analysis then became an important topic also in the area of Information Systems (Mumford, 2006; Kling, 2007). However, the mechanistic concept of Soviet cybernetics was used in the East until the 1990's. In this regard it can be said that Eastern approaches got partly stuck on the level of the mechanistic understanding of the world according to Taylor (1911), which was compatible with Soviet cybernetics.

Alongside cybernetics, system approaches and systems engineering were used mainly from the 1970's onwards (Zeman & Javurek, 1979). These disciplines then offered certain thought tools for "softening" the strongly mechanistically conceived theories of the design and management of information systems. In the area of systems engineering, there was emerging the social variable in the description of systems, but the concept was still considerably simplistic and mathematical (Vlcek, 2003) without the feedback of empirical reflection. Perhaps the softest understanding was brought by system approaches closely connected to practice. System approaches were not built on a mathematical (mechanistic) apparatus and were to serve for discussion, to sort the thoughts and share "best practices". This practical viewpoint became, in a sense, the key substitution of the "real" empirical research in technology as known in the West. System thinking (Mildeova & Dalihod, 2017) as a part of systems approaches did not cause any ideological obstacles, because all its phenomena could be interpreted in the perspectives complying with the ideology of Marxism-Leninism.

The discipline of Management Information Systems as such did not exist in the Eastern Bloc. However, a popular and closely related area was titled Automated Management Systems (AMS) (Isajev, 2009). This discipline was imported from the Soviet Union to other countries of the Eastern Bloc in the 1970's (Smutny & Dolezel, 2017). AMS was as an application-oriented "informatics" discipline focused on various sectors of industry and a number of other areas, namely on electrical engineering, chemistry, mining, economics, agriculture, and building industry. In agreement with the ideology of that time, AMS became a unifying concept covering several computer-supported areas. These were technology management, technological control (regulation), organizational management, and macro-level production management.

That also means that the AMS concept did not much differentiate between technology-based closed systems and people-based open systems, though these two classes of systems were seen as fundamentally different from the Western viewpoint. This extraordinary broadness of the umbrella concept of AMS was primarily due to the underlying assumptions behind the philosophy of *upravlénie* as studied in the East (see Section 3.1).

3.3 The big change

Following the transition events of 1989 (now known as the Velvet Revolution), there were significant changes implemented in the academic regimes during 1990s. Importantly, many Western approaches and research ideas came to Czechoslovakia, or the Czech Republic and Slovak Republic, only after 1989. In 1990s, many AMS academic programs morphed into academic programs of Applied Informatics (for economic schools and universities) or Engineering Informatics (for technical schools and universities).

Speaking about the situation in the Czech Republic, however, the development was rather specific. The firmly rooted tradition of Soviet cybernetics, AMS and the like, and the very poor state of social and behavioural sciences in the 1970's and 1980's negatively influenced IT and IS research approaches, where artifact design has traditionally dominated. Broadly speaking, this development also has significantly impacted at least two generations of Czech scholars active in the field of AMS/Applied Informatics/Business Informatics from ca. 1970s to 2010. Regarding the mentioned negative influence, we see a primary cause in the uneasy incorporation of Western ideas and approaches into the existing knowledge frameworks of scholars who grew up on ideology-driven Soviet cybernetics and system sciences. The Western and the Eastern theoretical approaches therefore became often intertwined on an individual level. By many, perhaps, the inherent values of Western science and empirism-driven "quest for truth" were understood as a bare complement to their existing knowledge frameworks acquired during the Soviet era.

Only after 2010, with a new generation of young Czech researchers slowly taking over, there has been a renaissance of empirical approaches in the academic areas of Business Administration/Management and Information Systems in the Czech Republic. This shift is primarily due to the increasing influence of global research communities. With regards to that, we see two important drivers. First, personal aspirations of the young scholars seem to play an important role. Second, certain local institutional forces cause that there is an increasing demand for research and publication quality in relation to doctoral defences and staff promotions in Business Informatics (see also Heinrich & Riedl, 2013). These trends are illustrated below on the example of a gradual change in the methodology of doctoral dissertations in the field of Business Informatics (formally still titled Applied Informatics) at the University of Economics, Prague. The university is a major research-oriented institution active in the field of Business and Economics in the Czech Republic (and Central and Eastern Europe in general). It is our argument that this analysis can thus serve as a good illustration of the important changes that have happened in this geographic region during the past two decades.

4. An illustrative example of the transition from the eastern to the western design approaches

Our illustrative analysis was carried out of all dissertations that were defended in the doctoral programme Business Informatics (formally still titled Applied Informatics) at the University of Economics, Prague (Czech Republic) between 2007 and 2017. The analysis concerned a total of 69 dissertations, 59 of which focused on artifact design. The character of the remaining dissertations was that of either comparative studies or theoretical reviews. Figure 1 shows (broken line) the share of dissertations focused on artifact design in the individual years in the total number of defended dissertations. The figure also shows (solid line) the percentage of design-oriented dissertations that reference some design method (e.g. from design science methodology).

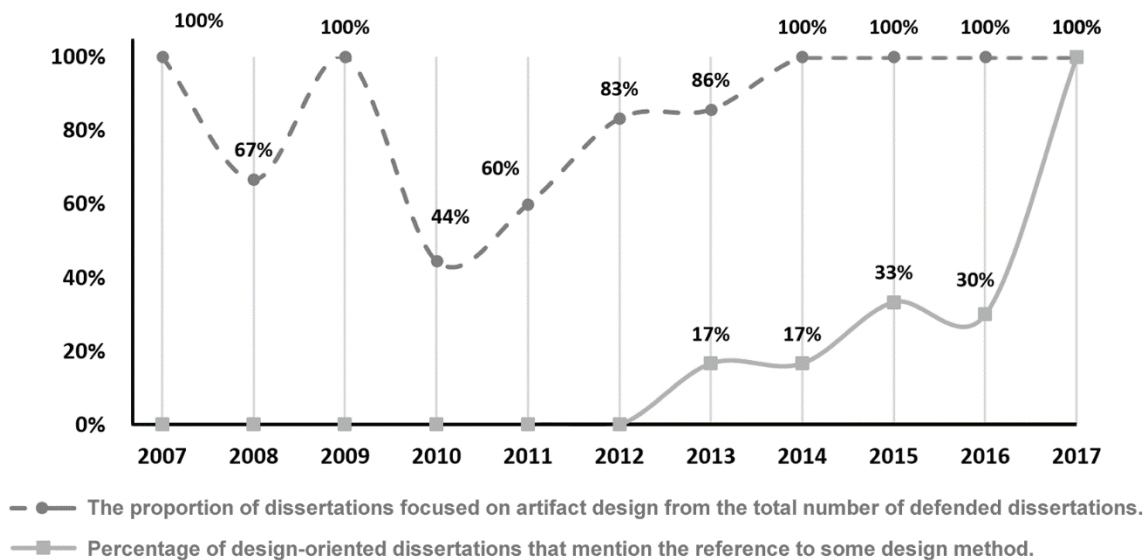


Figure 1: Design-oriented dissertations and the rise of design science methodology

Broken line in Figure 2 shows the proportion of dissertations which, as part of artifact design, also carried out an evaluation of the proposed solution using quantitative and/or qualitative methods, from the total number of design-oriented dissertations. Solid line in Figure 2 shows the percentage of dissertations that carried out pre-research using quantitative and qualitative methods in order to better define the problem context. As can be seen, most dissertations relied on literature research, on the basis of which the problem was defined.

As far as the type of the designed artifact is concerned, the prevailing types were methodology (29%), model (25%), method (24%), and framework (15%). The less frequent types were architecture, classification, metrics, and language, the occurrence of which was rather low. In terms of the method of evaluating the artifact, more than a half of the dissertations used case study (53%) – which included a number of data collection methods, using both quantitative and qualitative methods. Data-based experiments were also used frequently (22%) – e.g. real datasets from companies. Less frequent was performing (ex ante) evaluation using interviews (13%), questionnaire survey (9%) or simulation (2%).

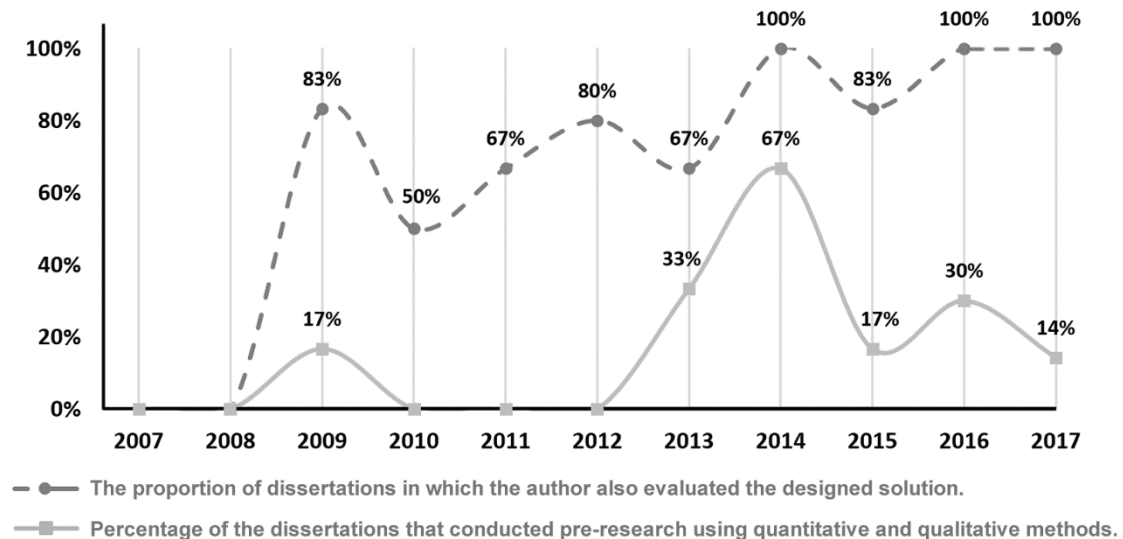


Figure 2: Using of behavioural and social research in design-oriented dissertations

5. Discussion and conclusion

As is apparent from the illustrative example, mainly around the year 2010 there is observable a renaissance of empirical approaches, which are used not only in the evaluation of a designed artifact, but also in pre-research. In 2007 and 2008, none of the design-oriented dissertations evaluated the artifact – it was only important that the design made sense in the theoretical context of the respective area. Also regarding older dissertations, it can be expected that evaluation was rare. Moreover, the evaluations of artifacts before 2012 tended to be rather superficial and often limited only to an observation that the implementation of an artifact in a company was carried out successfully. It is only after 2012 that there appear dissertations with properly elaborated case studies or more detailed interviews with people from practice. It can also be seen in Figure 1 that the year 2012 brought the first dissertations that refer to some design method in their methodology.

As was already mentioned in Section 3, the absence of empirical approaches in the field of informatics (formerly AMS and Applied Cybernetics) in what was then Czechoslovakia also affected later approaches to research in the 1990's and 2000's. Academics only supplemented their theoretical knowledge bases with Western theories, but they did not start to build their own research programs using an empirical approach based on the application of quantitative and/or qualitative methods in the area of design, as it has been common in the West. On the contrary, they held onto their largely theoretical concepts of system approaches. Artifact design was, on the one hand, based on theoretical knowledge bases in a given area (e.g. business informatics), but the usefulness of implementing an artifact in real conditions was not confirmed. This fact is also obvious in various publications of previous scholar generation (e.g., Rosicky, 2008; Adamec, 2008), in which “research” in the field of Business Informatics was in fact a “consideration” of how a defined problem could or should be solved, without using relevant empirical research before or after designing a solution. Critically stated, these scholars were indirectly confirming an observation articulated by Western management consultants already in 1920's. In that time, Americans observed that Russians are “long on management theory but short on applications in practice [, and execution of related empirical research]” (Wren, 1980, p. 4).

However, it is satisfactory to see that in 2017, according to Figure 1, all the defended dissertations in our sample built on the methods of design science methodology. This fact is also reflected in the Czech community of researchers, who actively explore design-oriented research and the empirical approaches connected with it. On the one hand, this late-comer nature of the methodological rigour in Czech Business Informatics is in a sharp contrast with the present and past reality of the North American MIS community rooted in behavioural sciences. On the other hand, the late arrival of methodological rigour does not seem to be unique for the Czech Business Informatics community. A similar development was observed in the German-speaking community one decade or so ago. Prior ca. 2005, “methodological and epistemological issues remain[ed] implicit in the majority of German IS publications” (Heinrich in Niehaves, 2007, p. 93).

To conclude, the Czech Business Informatics community is still looking for a respectable position among international academic communities. At first sight, the progress achieved during the past three decades may, perhaps, seem somewhat insufficient. However, when one considers the distinct roots of Czech Business Informatics as presented in this paper, a different picture will emerge. This picture rather resembles the destiny of mythical Phoenix, who needs to obtain *new life by arising from the ashes of its predecessor*. With that picture in mind, the observed pace of progress gives much more sense.

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Redefining Corporate Reputation Using Inter Battery Factor Analysis

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Abstract: This paper explicates a quantitative method for defining and evaluating a dynamic, context-specific construct, using corporate reputation as the illustrative example. There is much published research that has established an association between corporate reputation and firm performance. Despite this, the definition of what constitutes corporate reputation is evidently nonobvious. Consequently the measurement of corporate reputation has also been the subject of much research. The challenge is exacerbated by the fact that the dimensions of reputation may well be inconsistent across stakeholder groups. Moreover, the association between reputation and organisational outcomes is not necessarily consistent or even stable over time. Herzberg's two-factor theory of job satisfaction is potentially a useful analogy for corporate reputation. Motivators can be viewed as those factors that enhance corporate reputation if they are present but do not lessen reputation if they are lacking. Conversely, hygiene factors are those factors that may damage corporate reputation if they are present but do not improve reputation if they are absent. The relevance is that perceptions of motivators and hygiene factors of corporate reputation can potentially and often do change with a single significant event and are therefore extraordinarily dynamic. Inter-battery factor analysis is a quantitative method originally developed by Tucker (1958) to establish the stability of factors over different batteries of survey or psychometric items evaluating comparable underlying constructs. In this paper, it is shown how inter-battery factor analysis can be applied to evaluate the relationship between perceptions of corporate reputation items and specific organisational or behavioural outcomes. The implication is that a dynamic, context specific definition and evaluation of corporate reputation can be derived, including the relative weightings of the composite elements. The uniqueness of this method is that it does not rely on assumptions or an a priori definition of corporate reputation. In longitudinal research designs the method can be used to track the dynamic nature of the underlying construct. In addition the method can be used to evaluate how stakeholders may perceive corporate reputation differently. This method could be used to define and evaluate other dynamic, context-specific constructs such as employee engagement, job satisfaction, customer loyalty, and others.

Keywords: inter-battery factor analysis, dynamic research constructs, corporate reputation, longitudinal research design, stakeholder analysis

1. Introduction

Honesta fama melior pecunia est (Publilius Syrus, ~100 BCE) - A good reputation is more valuable than money

There can surely be no single activity associated with research as much as analysis. Indeed, in common usage, the words are often used interchangeably. There is a general understanding that analysis comprises decomposing or breaking down a complex situation into its fundamental elements and component parts. Arguably as important for comprehensive analysis is the description or uncovering of the structure and interrelationships through which these constituents are associated.

Research in business and management is no exception. Management is a process of controlling resources, human and otherwise, in order to achieve desired outcomes. As such, understanding the complex interrelatedness of people and assets (both tangible and intangible) that make up an organisation are essential prerequisites to effective decision making.

The objective of this study is to explore the utility of applying the relatively underutilised inter-battery factor analysis to describe and uncover the structure and interrelationships between stakeholder perceptions and their behaviours. The study will focus on the reputation of a specific organisation, using self-reported perceptions of the stakeholders and their intended supportive behaviours as the illustrative data.

2. Theoretical framework

2.1 Definition of reputation

The academic literature lacks a consistent definition of reputation (Agarwal, Osiyevskyy et al. 2015). For example, Gotsi and Wilson (2001) cite a variety of definitions, primarily from the marketing literature, while Chun (2005) addresses the confusion over the use of this relatively common term. The meaning of reputation

evidently varies across management disciplines, research paradigms, contexts and stakeholders (Walker 2010), although generic measurement instrument have been developed (e.g. Fombrun, Gardberg et al. 2000). The generally accepted multidimensionality of reputation (Walker 2010, Agarwal, Osiyevskyy et al. 2015) only adds to the complexity of the definition, and a number of alternative models and formulations have been proposed.

Agarwal, Osiyevskyy et al. (2015) suggest that corporate reputation, being based on both historical experiences and engagements plus future expectations, is a stable construct. There is, however, a plethora of research and examples (e.g. Breitinger and Bonardi 2017) of events that have resulted in reputational damage. Their finding the reputational damage is a result of social processes and not necessarily objective realities speaks to some unpredictability and instability of reputation. Of course there is also much research and practice in the field of reputation management and enhancement which, being based on consistent and reliable firm behaviour over time (Breitinger and Bonardi 2017) is likely to be acquired less rapidly than reputational damage.

2.2 Organisational outcomes of reputation

There have been a many empirical studies that evaluate the relationship between corporate reputation and financial performance, and De la Fuente Sabaté and De Quevedo Puente (2003) provide an extensive review of the literature. Roberts and Dowling (2002) not only confirmed previous findings but also found that the sustainability of financial performance was related to firms' reputations.

Reputation is associated not only with financial performance, but also with behaviours of stakeholders (Newburry 2010). In particular, a positive association has been found between a firm's reputation and behaviours that are supportive of the firm, such as intention to purchase the firm's products or services, giving the firm the benefit of doubt, and word-of-mouth recommendations (Ponzi, Fombrun et al. 2011).

Although reputation as perceived by external stakeholders (e.g. customers) and internal stakeholders (e.g. employees) have been found to be interlinked (Davies, Chun et al. 2004), it has also been found that gaps between the stakeholders can be associated with potential crises. The challenges of measuring the perspectives of different stakeholders, where the perceptions may vary both quantitatively and qualitatively, have also been noted.

2.3 Constructs related to reputation

Gotsi and Wilson (2001) examined the relationship between corporate reputation and corporate image, and found them to be interrelated, although the relationship between them was dynamic. This is consistent with the earlier discussion of the stability of the reputation construct.

Various definitions of reputation use personification of the firm as a metaphor. Extending the metaphor to the evaluation and measurement of reputation is a common indirect, projective technique (Davies, Chun et al. 2004). Thus there is a degree of similarity between corporate reputation and what has been referred to a corporate character (Moore 2005).

3. Method of analysis

3.1 Theoretical model of reputation

The fundamental premise on which this analysis is based is that operationalisation and management of corporate reputation are essential because there are important, influential and relevant stakeholder behaviours that are associated with perceptions; perceptions can be influenced and, through reputation, so can stakeholder behaviour.

On that basis, a theoretical multidimensional model of reputation, consistent with Agarwal, Osiyevskyy et al. (2015) is proposed in Figure 1. In this model, reputation is depicted as the conjoining factors linking perceptions and behavioural intentions.

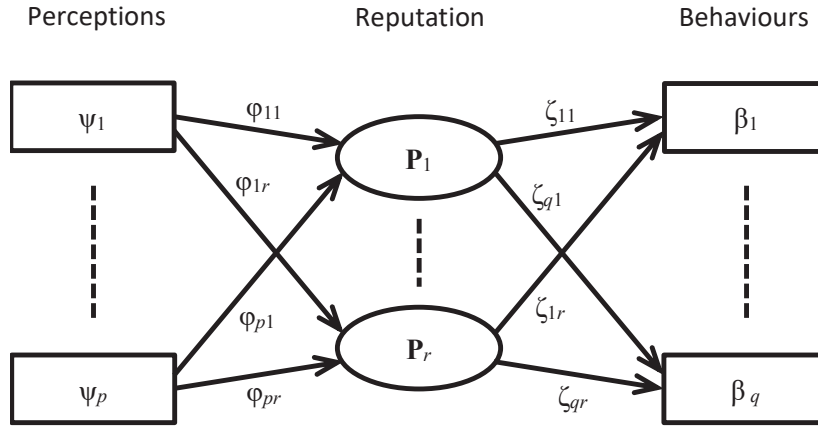


Figure 1: Theoretical model of reputation

In Figure 1:

- p = Number of perception items,
- q = Number of behavioural intention items,
- r = Number of reputation dimensions ($r \leq \min[p, q]$),
- Ψ_i = i 'th perception item,
- Φ_{ij} = Influence of the i 'th perception item on the j 'th dimension of reputation,
- P_i = i 'th dimension of reputation,
- ζ_{ij} = Influence of the i 'th dimension of reputation on the j 'th behavioural intention, and
- β_i = i 'th behavioural intention item.

3.2 Inter-Battery factor analysis

Inter-battery factor analysis (Tucker 1958) analyses the cross correlation matrix between two multivariate datasets, thereby isolating the structure of the between-dataset relationships, excluding the within-dataset relationships. Applying inter-battery factor analysis allows for reputation to be a multidimensional construct, although it transpires that in this study it manifests unidimensionally.

The following notation is used in the exposition that follows:

- n = Sample size,
- Ψ = Matrix ($n \times p$) of responses to perception items,
- \mathbf{B} = Matrix ($n \times q$) of responses to behavioural intention items,
- Φ = Matrix ($p \times r$) of perception loadings, comprising elements ψ_{ij} for $i = 1$ to p and $j = 1$ to r ,
- \mathbf{Z} = Matrix ($q \times r$) of behavioural intention loadings, comprising elements ζ_{ij} for $i = 1$ to q and $j = 1$ to r ,
- $\mathbf{R}_{\Psi\mathbf{B}}$ = Cross-correlation matrix between Ψ and \mathbf{B} ,
- Λ = Vector of eigenvalues of $(\mathbf{R}_{\Psi\mathbf{B}}' \cdot \mathbf{R}_{\Psi\mathbf{B}})$, and
- \mathbf{N} = Matrix ($r \times p$) of eigenvectors of $(\mathbf{R}_{\Psi\mathbf{B}}' \cdot \mathbf{R}_{\Psi\mathbf{B}})$ corresponding to Λ .

Now, given the responses of n participants to the perception and behavioural intention items (Ψ and \mathbf{B} respectively), the weightings of perception items on the dimensions of reputation, and the weightings of the dimensions of reputation on the behaviour items can be estimated as follows:

- The number of dimensions of reputation, $r \geq 1$, is determined by examining the vector of eigenvalues, Λ .
- The matrix of loadings of the dimension(s) of reputation on the behavioural intention items, $\mathbf{Z} = \mathbf{N}'$.
- The weightings of the dimension(s) of reputation on the behaviour items are found by squaring each element of \mathbf{Z} .
- The matrix of loadings of perception items onto the dimensions of reputation, $\Phi = (\mathbf{R}_{\Psi\mathbf{B}} \cdot \mathbf{Z} \cdot \Lambda^{-1})'$.
- The weightings of perception items on the dimension of reputation are found by squaring each element of Φ .

In order to evaluate the internal consistency of the weights across successive waves, the Cronbach's coefficient alpha is calculated. As the weights are absolute measures, there is no justification for standardising the variables,

and therefore the raw coefficient alpha is calculated. A high value of coefficient alpha will indicate that the calculated weights are measuring the same underlying construct, albeit over a period of time.

3.3 Sampling and data collection

The data for this study was collected over seven consecutive annual surveys of individual external stakeholders and internal stakeholders (employees) of a large information and communication technology company. Sample sizes are tabulated in Table 1.

Table 1: Sample sizes for reputation study

Stakeholder category	Stakeholder group	Sample size
External	Residential clients	500
	Users of alternative service providers	380
Internal	Employees	600

Data was collected by means of telephonic interviews. Twelve perception items drawn from items used in the development of the Reputation Quotient (Gardberg and Fombrun 2002) and seven behavioural intention items representing supportive behaviours (Newbury 2010, Ponzi, Fombrun et al. 2011) have been included in the analysis. Data was analysed separately for external and internal stakeholders, for each of the seven years for over which data had been collected.

4. Results

4.1 Dimensionality of reputation

In common with many multivariate techniques the dimensionality of reputation is determined by the relative magnitude of successive eigenvalues (Hair, Black et al. 2006) which in this method are derived from the cross-correlation matrix. The eigenvalues of the cross-correlation matrices for employees and for external stakeholders, for successive waves W1 to W7, are presented in Table 2.

Table 2: Eigenvalues of cross-correlation matrices

	External stakeholders							Employees						
	W1	W2	W3	W4	W5	W6	W7	W1	W2	W3	W4	W5	W6	W7
1	24.31	25.86	21.70	24.35	22.32	30.45	27.51	23.86	18.67	17.93	18.87	21.28	18.34	24.61
2	0.05	0.14	0.10	0.22	0.44	0.04	0.06	0.05	0.09	0.05	0.09	0.55	0.14	0.13
3	0.01	0.02	0.05	0.02	0.01	0.02	0.02	0.01	0.05	0.03	0.02	0.02	0.02	0.03
4	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

It is clear that, for both external stakeholders and employees, the first eigenvalue is consistently substantially greater than the eigenvalues that follow. This indicates that in the current context, reputation is a single dimensional construct, and a more parsimonious operational model of reputation is appropriate. This is illustrated in Figure 2.

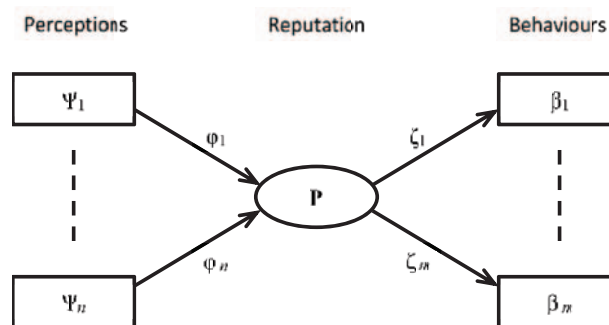


Figure 2: Operational model of reputation

4.2 External stakeholders perceptions and behavioural intentions

The inter-battery factor analysis of the external stakeholders’ responses yields the weighting of each perception item on the single reputation dimension. The perception items can be categorised based on an evaluation of the weightings of the items onto reputation over the seven waves of the study. This is shown in Table 3.

Table 3: Categorisation of weightings of perception items onto reputation for external stakeholders

Items with least influence	Items with moderate influence	Items with greatest influence
Offers high quality products and services [<i>High quality</i>] Is an innovative company [<i>Innovative</i>] Offers products and services that are good value for money [<i>Value for money</i>] Is customer-focused [<i>Customer focus</i>]	Is a well-organized company [<i>Well organized</i>] Is open and transparent about the way the company operates [<i>Transparent</i>] Offers equal opportunities in the workplace [<i>Equal opportunity</i>] Behaves ethically [<i>Ethical behaviour</i>]	Acts responsibly to protect the environment [<i>Environment</i>] Shows strong prospects for future growth [<i>Future growth</i>] Is an appealing place to work -- it treats its employees well [<i>Appealing workplace</i>] Top management can be trusted to manage the company effectively [<i>Can be trusted</i>]
Note: Variable names are given in italics in parentheses.		

The weightings of the perception items onto reputation over the seven waves of the study are illustrated in Figure 3. It is evident that although the weightings do not remain constant, there is nevertheless a degree of consistency from one wave of the study to the next. If the weightings of the perceptions onto reputation were substantially different from one wave to the next, that would cast doubt on the validity and reliability of the results. That the weightings do not remain constant from one wave to the next is to be expected, as reputation evolves both quantitatively and qualitatively over time.

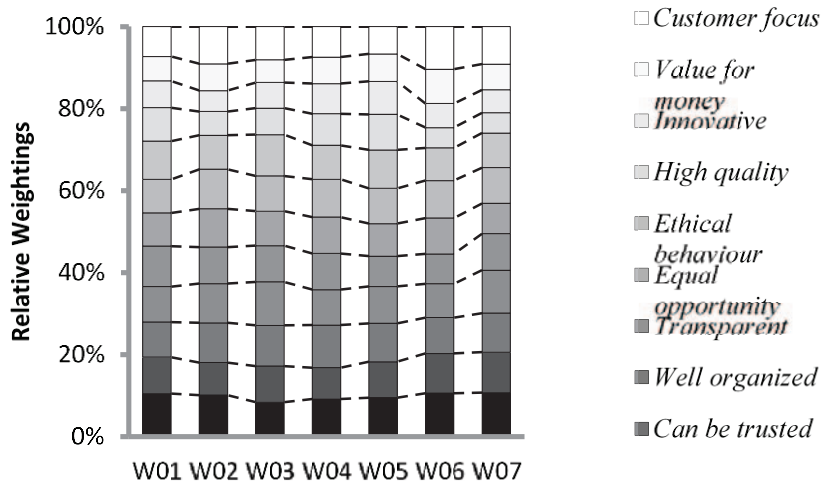


Figure 3: Relative weightings of perception items onto reputation over time for external stakeholders

The Cronbach's coefficient alpha for the weightings of perceptions onto reputation over the seven waves of the study was 0.898, indicating that, over time, the same underlying construct is indeed being measured.

The behavioural intention items have been categorised based on the weightings of reputation onto those items, over the seven waves of the study. This categorisation is shown in Table 4.

Table 4: Categorisation of behavioural intentions of external stakeholders based on weightings of reputation

Items influenced the least	Items moderately influenced	Items influenced the most
If the company was faced with a product or service problem, I would trust them to do the right thing [<i>Do the right thing</i>] I would give the benefit of the doubt to the company if the company was facing a crisis [<i>Benefit of doubt</i>]	I would say something positive about the company [<i>Something positive</i>] If I had the opportunity, I would recommend the company as a good place to work [<i>Recommend employer</i>]	I would recommend the products / services of the company [<i>Recommend products</i>] If I had the opportunity, I would invest in the company [<i>Would invest</i>] If I had the opportunity, I would recommend the company as an investment [<i>Recommend investing</i>]
Note: Variable names are given in italics in parentheses.		

The Cronbach's alpha for the weightings of reputation onto behavioural intentions over the seven waves of the study was 0.907. This too, indicates that the weightings of reputation on behavioural intentions are relatively stable over time, which is further illustrated in Figure 4.

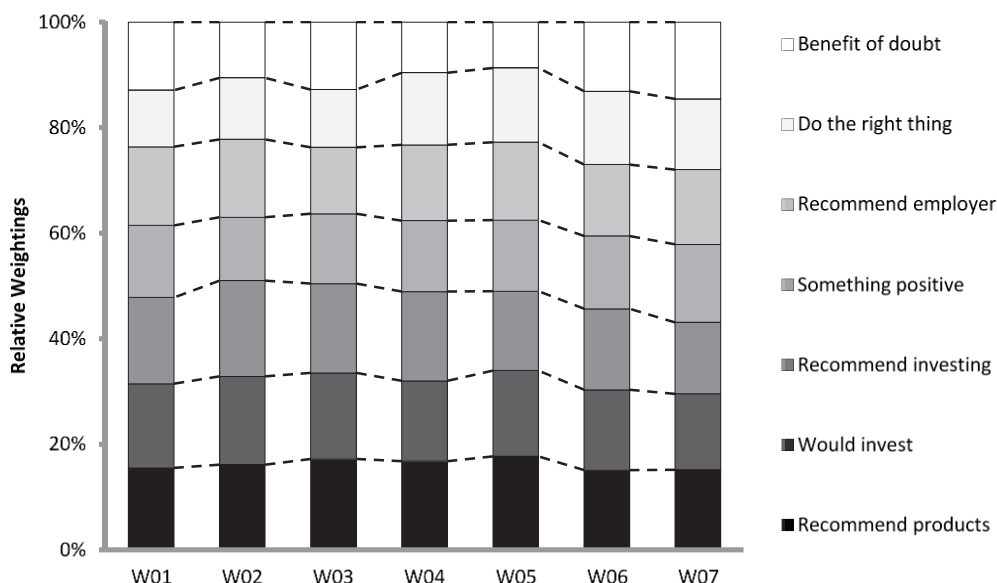


Figure 4: Relative influence of reputation onto behavioural intentions over time for external stakeholders

4.3 Employees' perceptions and behavioural intentions

The inter-battery factor analysis of the employee responses yields the weighting of each perception item on the single reputation dimension. The perceptions have been classified into those that generally have the greatest influence on reputation, those that have moderate influence, and those that have the least influence. The results are given in Table 5.

Table 5: Classification of perception items based on weightings onto reputation

Items with least influence	Items with moderate influence	Items with greatest influence
Shows strong prospects for future growth [<i>Future growth</i>]	Acts responsibly to protect the environment [<i>Environment</i>]	Is an appealing place to work -- it treats its employees well. [<i>Appealing workplace</i>]
Is a well-organized company [<i>Well organized</i>]	Top management can be trusted to manage the company effectively [<i>Can be trusted</i>]	Offers equal opportunities in the workplace [<i>Equal opportunity</i>]
Is an innovative company [<i>Innovative</i>]	Is open and transparent about the way the company operates [<i>Transparent</i>]	Behaves ethically [<i>Ethical behaviour</i>]
Offers products and services that are good value for money [<i>Value for money</i>]	Offers high quality products and services [<i>High quality</i>]	Is customer-focused [<i>Customer focus</i>]

Note: Variable names are given in italics in parentheses.

For employees, the Cronbach's alpha for the weightings of the perception items onto reputation over the seven waves was 0.878 confirming that there is internal consistency of the measurement of the underlying dimension of reputation. The degree of consistency of the weightings of the perception items onto reputation over the seven waves is illustrated in Figure 5.

The inter-battery factor analysis also yields the weightings of the single reputation dimension onto the behavioural intention items, which have been classified into those that generally been influenced the most by reputation, those had moderate influence by reputation, and those that have been influenced the least. The results are given in Table 6.

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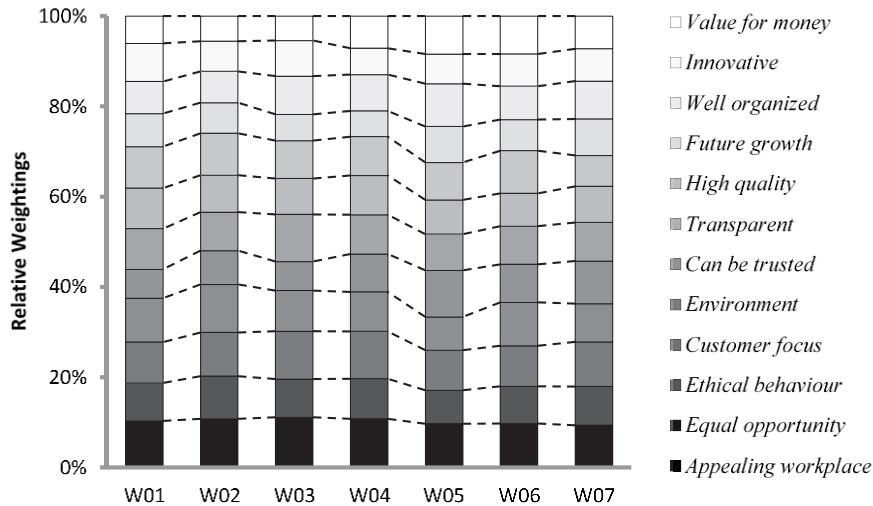


Figure 5: Relative weightings of perception items onto reputation over time for employees

Table 6: Classification of behavioural intention items based on weightings of reputation for employees

Items influenced the least	Items moderately influenced	Items influenced the most
I would say something positive about the company [<i>Something positive</i>] I would recommend the products/services of the company [<i>Recommend products</i>]	If the company was faced with a product or service problem, I would trust them to do the right thing [<i>Do the right thing</i>] If I had the opportunity, I would invest in the company [<i>Would invest</i>] I would give the benefit of the doubt to the company if the company was facing a crisis [<i>Benefit of doubt</i>]	If I had the opportunity, I would recommend the company as an investment [<i>Recommend investing</i>] If I had the opportunity, I would recommend the company as a good place to work [<i>Recommend employer</i>]
Note: Variable names are given in italics in parentheses.		

The Cronbach's alpha for the weightings reputation onto the behavioural intention items over the seven waves was 0.883 indicating the internal consistency over successive waves of the study. Figure 6 illustrates this consistency, with the notable exception of "I would say something positive about the company" in wave three. This anomaly would need to be interrogated, but it is plausible that an incident occurred within the organisation that resulted in employees' intention to say something positive about the company being unrelated to their prevailing perceptions. (This should not be misunderstood to be an unwillingness of employees to say something positive about the company, but merely that their propensity to say something positive was independent of their current perceptions.)

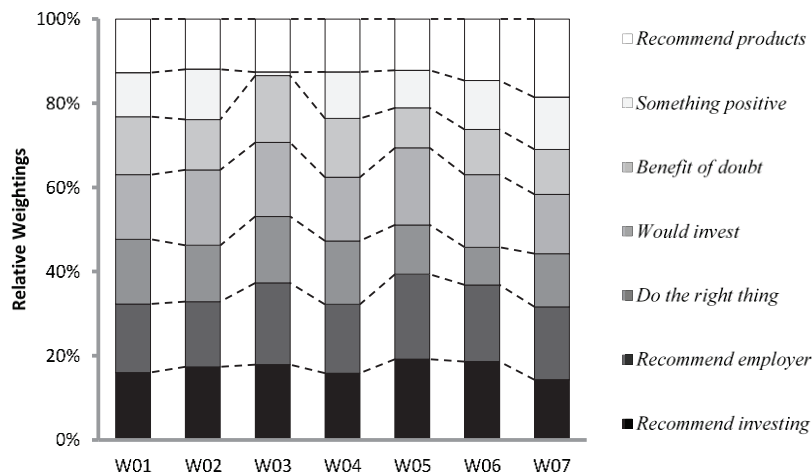


Figure 6: Relative influence of reputation onto behavioural intentions over time for employees

4.4 Comparison of external stakeholders versus employees

In the following section, the weightings derived from external stakeholders are compared with those derived from employees, specifically for the most recent wave of the study. Figure 7 illustrates the relationship between the weightings of the perception items onto reputation for wave seven of external stakeholders and employees.

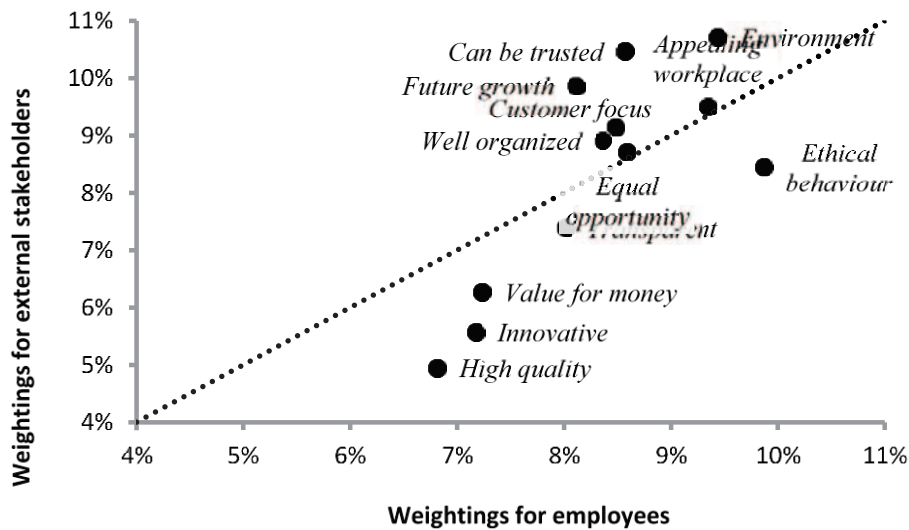


Figure 7: Comparison of weightings of perceptions for employees versus external stakeholders

It can be seen that the items with the greatest weightings on reputation for employees are “Behaves ethically” (9.9%), “Acts responsibly to protect the environment” (9.4%) and “Is an appealing place to work” (9.3%). By contrast, the items with the greatest weightings for external stakeholders are “Acts responsibly to protect the environment” (10.7%), “Top management can be trusted to manage the company effectively” (10.5%), “Shows strong prospects for future growth” (9.9%) and “Is an appealing place to work” (9.5%).

Those items below the diagonal line in Figure 7 (i.e. “Is an innovative company”, “Offers products and services that are good value for money”, “Offers high quality products and services” and “Behaves ethically”) have a greater weighting for employees than for external stakeholders. Conversely, “Acts responsibly to protect the environment”, “Top management can be trusted to manage the company effectively”, and “Shows strong prospects for future growth” are above the diagonal line and have a greater weighting on reputation for external stakeholders than for employers. This implies that the reputation construct for external stakeholders differs from that of employees.

Figure 8 illustrates the relationship between the weightings of reputation onto behavioural intentions for wave seven of external stakeholders and employees.

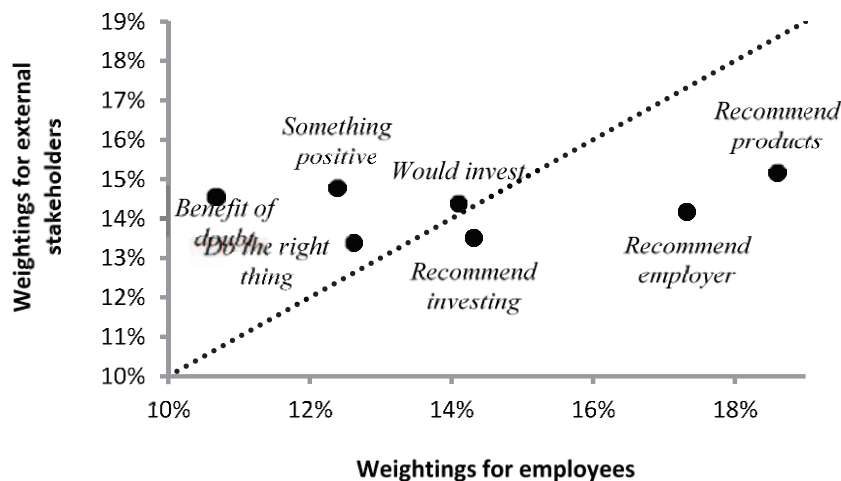


Figure 8: Comparison of weightings onto behavioural intentions for employees versus external stakeholders

It is clear that for employees, the behavioural intentions most influenced by reputation are “I would recommend the products/services of the company” (18.6%), “If I had the opportunity, I would recommend the company as a good place to work” (17.3%) and “If I had the opportunity, I would recommend the company as an investment” (14.3%). All three of these behavioural intentions are weighted more strongly for employees than for external stakeholders, and it is noteworthy that all three items embody a distinct element of advocacy. This further substantiates the earlier suggestion that the reputation construct for external stakeholders differs from that of employees.

5. Discussion

5.1 Evolution of reputation and its impact on behaviour

The most notable contribution of this study is that using inter-battery factor analysis enables reputation to be evaluated, monitored and tracked qualitatively, in addition to quantitatively. The technique does not require an *a priori* definition or determination of what constitutes reputation. Instead, the drivers, definition and resultant behaviours become apparent and are quantified through the analysis. While Herzberg’s two-factor theory of job satisfaction has not been without controversy (Brockman 1971) the “motivator-hygiene concept” is surely applicable to corporate reputation. For example, an innovative organisation may initiate unprecedented activities, products or services, thereby enhancing their reputation on the basis of new criteria (i.e. motivators). Conversely, there may be criteria that are unimportant to organisations’ reputation until a crisis draws stakeholders’ attention to an issue (i.e. hygiene factor) after which that becomes an important determinant of reputation. Inter-battery factor analysis will enable the identification, description and evaluation of the evolution or bifurcation of reputation over time and in varying contexts. Similarly, the method will identify and quantify the behaviours or behavioural intentions that are consequent upon reputation over time and in varying contexts.

5.2 Redefinition of reputation for internal stakeholders

The earlier result that the weightings of perceptions onto the reputation construct are different for external stakeholders and employees has important implication for the validity of the results. It could be argued that the perception items the weight more strongly on reputation for employees than external stakeholders (i.e. “Is an innovative company”, “Offers products and services that are good value for money”, “Offers high quality products and services” and “Behaves ethically”) are based on first-hand experience, inside knowledge, or privileged information. This is consistent with the findings of Walker (2010) regarding different perceptions of stakeholder groups, and it may not even be valid to refer to the conjoining factor for employees as “reputation”. Corporate character (Moore 2005) embodies the tension between the internal activities of a firm and its external relationships and obligations, and is potentially a more appropriate description the conjoining factor identified in this study.

6. Recommendations

6.1 Behavioural intentions and actions

A limitation of the research is that the data comprised self-reported behavioural intentions. These intentions have been used as a sufficiently valid and reliable proxy for actual behaviours and action. However, there is clearly no guarantee that respondents’ stated behavioural intentions will translate into actions. Therefore, despite the practical methodological challenges, it would be beneficial to reputation research to collect data for this analysis regarding actual or observed behaviours, rather than self-reported intentions.

6.2 Mitigation of common method bias

As discussed, both the perception data and behaviour intention data were self-reported by means of a telephonic survey. Therefore there is likely to be a degree of common method bias in the results (Podsakoff, MacKenzie et al. 2003). It is therefore recommended that the data collection and analysis be reviewed for mitigation of common method biases.

6.3 Conjoining perceptions and behaviour in other contexts

Corporate reputation has been used to illustrate the use of inter-battery factor analysis to identification and evaluation of factor that conjoins stakeholder perceptions and their supportive behaviours or behavioural intentions. There is no reason to limit the application of the method only to corporate reputation. It is therefore recommended that management researchers and business practitioners adopt inter-battery factor analysis to diagnose conjoining dimensions linking perceptions and behaviour in other contexts and circumstances. Examples may include perceptions of organisation culture and employee engagement, perceptions of management integrity and ethical behaviour among employees, perceptions of competition and innovation, and perceptions of technology and adoption intentions.

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Pragmatic Constructivism and Inter-Organisational Decision Making

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Abstract: This paper is about the use of management accounting information for inter organizational decision making. We propose that the framework outlined by Nørreklit et al. (2017) is suitable for the study of this topic and to contribute to inter organisational decision making literature. There is a need for developing inter-organisational decision-making models (Dekker, 2016) and making such models match the complexities of practical reality (Nørreklit et al, 2017). This reality involves a high degree of information uncertainty and a coalition of decision participants. Drawing on Pragmatic Paradigm (Nørreklit et al 2006, 2007; Nørreklit 2011; Nørreklit, 2017) Nørreklit et al (2017) outline a framework for the study of organisational decision making by employing the case study research method. These authors use the conceptual fundamentals of Pragmatic Constructivism whose main components of reality construction are: 1. Actorship and authorship 2. Four dimensions of reality (facts, possibilities, values and communication) 3. Constructing causality to integrate the four dimensions above Integrative learning theory of truth – knowledge about reality construction 4. The paper discusses proposes broad research areas for each component above. It then focuses on to the first component of ‘actorship and authorship’. It explains the main stages that constitute to co-authoring process. It continues to identify potential areas for research with clear intended contribution for both theory of inter-organisational decision making and practice of boundary spanners. The paper concludes that the use of the pragmatic constructivist framework could provide an appropriate tool to show that actorship and co-authorship are essential elements of inter organizational decision making and they need to be studied further.

Keywords: inter organizational decision making, boundary spanners, pragmatic constructivism, actors, reality construction

1. Introduction

There is a growing interest in management and accounting research for better understanding of the boundaries between intra-organisational and inter-organisational control practices (Anderson and Dekker, 2015; Anderson and Sedatole, 2003; Dekker, 2016). Recent reviews of this literature indicate that academic research appears to have neglected the role of managers and employees assigned to take active roles in charge of in inter-organisational decision-making activities (Dekker, 2016, p87). This role remains to be a crucial aspect of success in inter-organisational alliances (Taylor, 2005). These managers and employees with inter-organizational responsibilities are generally called ‘boundary spanners’ (BS) or ‘alliance staff’. These individuals are expected to serve the interests of multiple organisations which have varied interests. Therefore, the BSs are expected to act not only in the interests of their own organization, but also in the interests of the organisations that they are in partnership. Research evidence in management accounting is limited in the area of on inter-organisational relationship and its dynamics in influencing and being influenced by the behaviour of boundary spanners.

BSs are described as the individuals responsible for the management of inter-organisational relationships by representing their own organisation in decision making done with other boundary spanners at partner organisations (Zaheer et al, 1998). Previous studies have not studied examined how BSs translate protect their own organisations’ interests in decision-making or in making use of relevant management and accounting data or control practices. Instead, most of the studies remain at the organisational level of analysis of inter-organisational contracts and aligning of management control processes (Anderson et al, 2014; Dekker, 2004). Focusing on BSs necessitates an individual level of analysis that this paper aims to address with the use of ‘actor reality construction’ process of Pragmatic Constructivism (PC) (Nørreklit et al, 2011). A recent framework of PC and its concepts as suggested by Nørreklit et al (2017b) is used in the paper to study of BSs in the inter-organisational decision making (IODM).

2. Pragmatic constructivism and boundary spanners

Nørreklit, ed. (2017) describes ways and methods to help actors develop successful organisational activities by paying special attention to management and accounting as well as the way these are used together for reality construction. The contributors to this edited book propose the study of actor-centered models of measuring and managing practice performance. Their work on Pragmatic Constructivism (PC) is considered an emerging paradigm in accounting research (Nørreklit et al 2011). Its distinctive feature is the focus on actors’ construction of valid accounting practices that are used in creating managerial and organizational reality.

PC is concerned with research methodologies and with what makes things work in a dynamic, material and social organisational context, i.e. with what creates sound practice performance. It focuses on one hand on the social construction of reality within organisations that are enabled by people (Jakobsen et al., 2011) and on the other hand, the PC approach places a heavy emphasis on the pragmatic viewpoint, i.e. the social construction of reality to achieve practical purposes. The realities of individual actors and actor groups within organisations are constructed through four “dimensions”, facts, possibilities, value and communication, that altogether constitute the pragmatic truth of actors’ realities (Nørreklit et al., 2010).

There is a need for developing organisational decision-making models and making them match the complexities of practical reality (Nørreklit et al, 2017b). This reality involves a high degree of information uncertainty and a coalition of decision participants. Drawing on Pragmatic Paradigm (Nørreklit et al 2006, 2007; Nørreklit 2011; Nørreklit, 2017) Nørreklit et al (2017b) outline a framework for the study of organisational decision making by employing the case study research method. These authors use the conceptual fundamentals of PC whose main components of reality construction are:

- 1. Actorship and authorship
- 2. Four dimensions of reality (facts, possibilities, values and communication)
- 3. Constructing causality to integrate the four dimensions above
- 4. Integrative learning theory of truth – knowledge about reality construction

Nørreklit et al (2017b) explain the advantages of this approach compared to other conventional approaches to contemporary accounting and management research. They propose that these components provide a more comprehensive approach to decision making where actors are expected to build reality based on practicalities, creativity, reflexivity and effectiveness. A review of literature by Dekker (2016) notes that extant frameworks of management control do not suffice in the study of BSs and IODM (p.87). This view is supported by other scholars. (Caglio & Ditillo, 2008; Anderson et al, 2015), indicating a need to develop frameworks for IODM.

We propose that Nørreklit et al.’s (2017b) model of decision making boundary would be suitable to apply in the study of BSs and IODM. The review of the literature on boundary spanners and Dekker’s (2016) work point to the need to develop relevant and comprehensive models for the study of the attitudes and decision dynamics of boundary spanners in IODM. We therefore chose two components from Nørreklit et al.’s (2017b) framework, to study the reality construction of boundary spanners in IODM.

This paper adds to the body of knowledge on constructing and communicating facts among several actors and actor groups across organisational boundaries (Jakobsen et al., 2011; Nørreklit et al., 2010; Laine et al, 2016; Trenca, 2016; Guven-Uslu, 2017). Previous studies of this literature focus primarily on the second and third component of the PC framework. By employing all four components and their inter-connections, this paper extends the literature to suggest that the complete PC framework could provide a useful model for studies of IODM and the role of BSs in network decision making.

In the first part of this paper, some possible research questions are developed through an amalgamating between the four components of the above framework and some of the research questions raised by Dekker (2016). Then in the second part, the first component of PC framework is discussed in detail. Actorship and authorship is the first component of PC framework and it appears to be a very important aspect of IODM literature. By focusing on one of the components the paper aims to clarify how the PC framework could be used for research and practice. It aims to do that by showing how the approach could be used to enable organisations improve the effectiveness of BSs.

The research questions that this research poses are listed below for each of the four components of reality construction of the PC framework below.

2.1 Actorship and authorship

Organisational selection and staffing choices of boundary spanners are critical in achieving successful inter-organisational relations. Taylor (2005) brings to the fore the importance of key personnel and the necessity of congeniality among boundary spanners. BSs are individuals described as having skill sets suitable for the task of

working in networks. Some recent studies emphasize the criticality of boundary spanners' skills in mobilising, synchronising and coordinating joint activities (Wilson and Barbat, 2015; Zhang et al, 2015).

The actorship and co-authorship component of PC helps to investigate, understand and theorise dynamics and directions of inter-organisational relations among the actors involved. Agency is key for the understanding of the decision-making process. PC provides a rich theoretical backbone for the analysis of boundary spanners' actions, reflexive interactions and processes of decision making amongst co-authors.

The first component of the framework helps to address the following broad research question:

Q1: How do actorship and co-authorship take place in inter-organisational decision making?

In section 3 below, this first broad question is discussed in detail with reference to IODM literature and potential contribution for both theory and practice of BSs are identified.

2.2 The four dimensions of reality

To be able to address the first research question fully, one needs to turn to the second component of the framework which provides the four dimensions: facts, possibilities, values and communication. The facts' dimension is one of the most pertinent issues in inter-organisational management accounting. How can organisations align the behaviour of different boundary spanners, so that these organisations' intentions are aligned with these of all organisations involved? How could facts be presented and used, so that they help achieve the objectives of all different organisations involved? Boundary spanners then need to pursue multiple goals to generate a management control practice that support the alignment of their interests not only with these of their own organisation, but also with these of the other organisations concerned. Thus, the first sub-question is the following:

Q2a: How do boundary spanners choose the relevant management accounting information and control processes in inter-organisational decision making?

The possibilities dimension is closely linked the facts dimension because each boundary spanner brings to the decision-making process their own expertise, observation and experiences responsible for their subjective views of the factual possibilities presented. Therefore the second sub-question is:

Q2b: How do the boundary spanners suggest alternative possibilities for a particular decision?

The values dimension provides a range of values exhibited by boundary spanners in inter-organisational settings. The inter-organisational action needs to be defined within this range. Besides, a mutually agreeable value or a set of values needs to be present. Otherwise, it would be impossible for BSs to achieve an organised action, i.e. to decide on a mutually agreeable action. The third sub-question is:

Q2c: How do boundary spanners agree on mutual values and participate in organised action?

The fourth communication dimension integrates the other three through communicative expression as the medium of a pragmatic integration. This goes hand-in-hand with the construction of causality between the four dimensions like in the third component of the framework. The question is:

Q2d: How does communication takes place among boundary spanners?

2.3 Integration of dimensions of reality

The specific integration of the four dimensions in PC is called 'topos'. (the plural is 'topoi'). As PC argues, organisations are not run by a single topos, but by a set of 'topoi'. We therefore should search for a topos or a set of topoi in IODM. In the case where different aspects of decision making are represented by a set of topoi, the investigation would entail searching for integration among the topoi and the role of BSs. This integration between topoi and BSs' roles is called by Nørreklit et al (2016b) 'practical coherence' i.e. cooperation among integrated units. This 'practical coherence' appears to be an essential aspect of IODM and is worthy of exploring in this study. The third research question therefore would be:

Q3: Is there an inter-organisational topos or a set of topoi? If there is a set of topoi, then are these integrated? Are practical coherence, consistency and complementarity displayed?

2.4 Learning theory, pro-active vs. pragmatic truth

The fourth component of the framework is the highly detailed and complex representation of knowledge about the business reality of the actors. To address constructivism in a realist manner, PC offers an integrative learning theory of truth through the interplay of 'pro-active' vs. 'pragmatic' truth. This helps to address any validity problems surrounding the particular circumstances of inter-organisational interactions. As the actors cannot be certain about future actions or lack thereof and about the accomplishment of desired objectives, proactive truth can exist at the point of decision making. A gap then emerges between the expected proactive truth and the actual pragmatic truth. Given the diversity and complexity of expectations in inter-organisational contexts, it could be argued that a gap between the two truths is inevitable. Therefore, the research sub-questions would be:

Q4a: How do the boundary spanners agree on mutual expectations and design expected outcomes?

Q4b: How do the boundary spanners react when the actual outcome is revealed?

Q4c: How do the boundary spanners address the gap between expected and actual outcomes?

A limited number of studies indicates that the learning aspect of inter-organisational studies in management accounting calls for further and more structured approaches (Dekker and van den Abbeele, 2010).

Below we turn to the first component and explain how it could be beneficial for research and practice in relation to BSs and their role in IODM.

3. Actorship and authorship

PC has a stakeholder approach in relation to actorship. Management control is achieved through integration of perspectives of different stakeholders. It conceptualizes the conditions for successful action. For successful action to become reality, a social process takes place. In that process, individual efforts of actors are interconnected to co-authorise a complex set of functioning practical and coherent acts. Actorship and co-authorship are interwoven. As actors, individuals control their activities according to their own judgement and in so doing, they intentionally co-create realities of the organization. Being an actor and co-creating an emerging reality is intrinsically motivating and a drive to enhance the qualities of work and performance. (Norreklit, 2011)

To study an actor-based organizational reality, PC proposes to decompose coauthorship into three integration processes. These are subjectification, externalization and objectification (Arbner and Bjerke, 1997, 175-178)

At the first stage, each actor brings to the situation their expertise, observation and experience from previous engagements, all of which represent his subjective view of factual possibilities ('possibilities' is part of second component of PC explained above). Through interaction with other actors, a process of 'externalisation' occurs in which various understandings of factual possibilities are discussed and challenged individually and against one another. This is part of the communication process through which coauthoring appears to emerge ('communication' is part of second components of PC framework explained above) During the coauthoring process, individual actors' understanding of the situation is advanced through dialogue and reflection. Systematic observation of facts forms a basis for the actors' observations and reflections. They enter into a continuous learning process, develop a knowledge system and a suitable language to communicate these.

These detailed actor-based understandings of organizational reality of PC could provide a useful analytical frame to study the actions of BSs in particular settings.

For example, communication of BSs within and across partner firms is evidenced to have a significant impact on IODM processes and inter-firm activities. (Wilson and Barbat 2015; Zhang et al, 2015) These studies however did not study existing subjective viewpoints of BSs and how these affect their interaction. PC provides such an analysis, through subjectivisation, externalization and objectivisation. This analytical framework helps to study to what extent existing accounting or business knowledge is influential as opposed to that acquired during the IODM process. It could also be possible to compare the relative importance of these as well as the actor's involvement in the process of co-authoring.

Another example is the study by Chen et al (2009) examining how each partner organization relies upon different types of control such as output controls (e.g. goal setting, performance evaluation and executive rewards) process controls (rules, regulation, structure etc) and social controls (e.g. training, joint task forces, socialisation of managers). These studies have a firm level focus and do not report extensively on control system characteristics in inter organizational settings. Study of actorship and authorship in IODM from a control processes perspective would contribute to this aspect. It would be possible to study which types of controls were influential on BSs and for their successful collaboration.

It could be possible to investigate the process of setting these controls from co authoring perspective to see the impact of that on management processes. The study of actorship and in particular authorship would help to address the pertinent question of ‘which organisation’s objectives would BSs behaviour need to be aligned?’ Dekker (2016) refers to this as the ‘hatter’s problem’; how to design a hat that fits to different organisations that the BSs represent? How does the co authoring take place to align the boundary spanners with the interest of the alliance as well as those of the partner firms?

PC provides a highly detailed framework to address above questions that are current and relevant in IODM literature. The answers to these questions could potentially offer some suggestions for BSs who are experiencing similar circumstances in inter organizational settings.

4. Conclusions and discussion

This study concludes that PC and the four key themes of Nørreklit et al’s (2017b) framework provide a useful paradigm for the study of boundary spanners and IODM. Boundary spanners were defined as actors with inter-organisational commissioning roles and responsibilities. This paper provided a comprehensive, realistic and practice-oriented set of concepts to study the attitudes of boundary spanners. In the literature, it was observed that the first and last components of the framework – the authorship and learning theories – were highly neglected in prior studies of IODM. This paper looked at the first component of PC, that is ‘actorship and co-authorship’ in more detail. It gave examples from recent studies to show that PC framework could be used to contribute to particular areas of the literature. Answers to the questions about actorship and authorship could provide useful insights for BSs who are experiencing similar situations to perform more effectively. The four dimension of reality construction (facts, possibilities, values and communication) attracted the attention of scholars and produced several useful studies in relation to boundaries, networks and decision making – (Laine et al, 2016; Trenca, 2016; Guven-Uslu, 2017). These four dimensions provide a useful approach for the study of decision making and for doing in-depth analyses of BSs, their actions and perceptions. Combining these with the other two components of the framework makes possible the study of organisational inter-relations and which dimensions of reality influence and are influenced by the other two components of the framework (actorship and learning theory of truth). This type of research has a potential to bring more clarity on and lift the ambiguities surrounding the use of accounting information in explaining how and why accounting is used for decision-making. This way it is possible to make contribution to the literature on IODM in these areas where there is limited evidence about BSs.

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A Practical Application of Total Systems Intervention and Critical Systems Heuristics: Towards Improvement of Business Intelligence Business Requirements

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Abstract: This paper argues that critical social theory research can add significant value when applied in information systems fields. It extends beyond explaining, predicting and understanding existing phenomena; researchers enter a problem context and intervene to improve it. It can be particularly valuable to improve success of organisational information systems. They often fail due to underlying cultural/organisational issues, rather than technical infeasibility—these can be better examined and rectified when researchers immerse themselves in the researched context and introduce small, incremental changes, whilst observing the effect and success thereof. It is, however, crucial that a critical social theory research endeavour be planned meticulously; it must be structured according to a suitable research methodology. Also, the researcher must holistically interpret the problem, and the problem context, before introducing changes. Actions must be grounded in a relevant philosophical framework, and executed by means of an appropriate methodology that supports theoretical assumptions about the problem and context. The researcher that works in this paradigm has a dual goal—he/she aims to resolve a practical problem, whilst also creating new theoretical knowledge relevant to the broader research community. In this paper, the researcher introduces research paradigms, and paradigm shifts that give rise to new paradigms. She gives a brief literature review of the critical social theory research paradigm, argues that it is particularly suitable for information systems research aimed at improving design/development/use of organisational information systems, and proposes a philosophical framework for such research. A brief overview of successful critical social theory research is given. It focused on improving requirements elicitation of a software (business intelligence) artefact; the critical systems thinking paradigm underpinned the research philosophically. First, she applied a critical systems methodology, i.e. total systems intervention, to achieve methodological pluralism—the aim was to identify an alternative requirements elicitation approach and apply it in conjunction with a traditional development approach. Then, she applied critical systems heuristics to elicit richer business requirements. Finally, she reflected upon the research; the classic critical systems heuristics boundary questions were contextualised for a business intelligence context.

Keywords: critical social theory research, interventionist research, business requirements and information systems adoption, total systems intervention, critical systems heuristics, critical systems thinking

1. Introduction

The purpose of research is to explore phenomena and produce new knowledge. Research must be properly planned and executed to ensure that this purpose is achieved. Research is therefore always conducted within a specific (suitable) paradigm. The type of phenomenon being explored, and the fundamental worldview of the researcher, influences paradigm choice; it dictates how phenomena are observed and analysed, so as to create germane new knowledge. Research paradigms originated with the onset of the scientific revolutions. They have been evolving, slowly but surely, ever since—new paradigms develop gradually over time by means of “non-cumulative developmental episodes” and a paradigm shift follows when an “accepted model or pattern” is replaced by a new/incompatible worldview (Kuhn, 1962). A paradigm shift does not render older paradigms invalid. It merely introduces new/different ways whereby research can also be conducted.

A research paradigm is based on an underlying worldview, and demarcated by ontological and epistemological assumptions. Ontological assumptions determine, for example, whether the empirical world is viewed to be objective, i.e. reality exists independent of humans and human knowledge thereof, or subjective, i.e. reality exists through the action of humans that create/recreate it (Orlikowski and Baroudi, 1991). Epistemological assumptions define the processes to be applied to create, acquire, express and communicate knowledge (Scotland, 2012). The positivistic research paradigm was the first (traditional) research paradigm that stemmed from the scientific revolutions. Positivism is based on a mechanistic worldview and prescribes that phenomena be examined and explained through predictable formulas and laws—it still serves phenomena with physical regularities well and is used extensively for scientific research (Louth, 2011).

A paradigm shift occurred when an alternative approach was required for more unpredictable, context-dependent fields such as human/social sciences. The interpretive paradigm was accepted in the late 1800s for research aimed at understanding fellow men and human works (Brown, 1976). More recently, scholars started

to argue that research must extend beyond the scope of explaining, predicting and understanding existing phenomena—researchers must enter research contexts and intervene to improve it. Therefore, a new research paradigm emerged. It is based on the idea that “thinking about the world and having experiences in it cannot properly be separated...experiences are interpreted by, but also serve to create, ideas and concepts which in turn make sense of (new) experience” (Checkland and Holwell, 1998). Such interventionist research is conducted in the critical social theory (CST) paradigm.

2. The critical social theory research paradigm

Critical researchers “have a cause” that they want to understand *and* improve upon (McGrath, 2005). The CST researcher “enters into the very constitution of the phenomena it studies” and endeavours to expose “deep-seated, structural contradictions with social systems...transform these alienating and restrictive social conditions”; he/she attempts to reveal the “historical, ideological, and contradictory nature of existing social practices”, and ultimately free those subjected to societal oppression (Orlikowski and Baroudi, 1991). The CST researcher wishes to understand so that he/she can intervene, improve and emancipate, rather than merely examine, explain or predict. CST researchers endeavour to identify oppressing structures causing specific problematical social contexts; intervene to remove/relieve oppressing structures, so as to emancipate affected individuals; and ultimately transform and improve that specific (bounded) society through intervention and emancipation (Delanty, 2011, Wynn and Williams, 2012). They have a dual goal: develop a solution to a practical problem *and* theoretical knowledge for a research community interested in the broader problem context, represented by the problem (Mathiassen et al., 2012).

Alvesson and Willmott (1992) argue that, to fully realise the ideals of the CST paradigm, it is necessary that “social structures...be radically changed so that they actively support and facilitate, rather than selectively and instrumentally exploit, expansion of purposiveness, creativity, and rationality”. Radical emancipatory change is not necessarily practically achievable in large organisational contexts within a relatively short space of time; hence, they introduce “*microemancipation*”, which focuses on concrete activities serving as vehicles for liberation where “processes of emancipation are understood to be uncertain, contradictory, ambiguous, and precarious”. So, they do not portray the emancipatory idea as one large grandiose project, but rather as a group of smaller projects—each smaller project is “limited in terms of space, time, and success” and bounded environments can be identified and improved upon incrementally.

The ontological position of CST is critical realism (Delanty, 2011). It combines the philosophical concepts critical naturalism and transcendental realism (Harvey, 2002). Critical naturalism accepts that different types of knowledge (physical, social and conceptual) exist; these differ in terms of ontology and epistemology and therefore research that involves different types of knowledge benefits from methodological pluralism (Mingers et al., 2013). Critical naturalism presumes an essential unity of method between natural and social sciences, so that justice be done to all methods of scientific inquiry (Bhaskar, 1975, Bhaskar, 2005). Transcendental realism presumes that reality exists “out there”, independent of human knowledge and the ability of humans to perceive knowledge (Bhaskar, 1975, Bhaskar, 2005). Reality is thus perceived as an “open system...beyond our ability to control directly” (Wynn and Williams, 2012).

The epistemological assumption of critical realism is “mediated knowledge”, i.e. “value aware and theoretically informed, derived from multiple value-aware perceptions of a single independent reality” (Wynn and Williams, 2012). Knowledge is socially constructed and influenced by societal power relations (Scotland, 2012). People can only experience a portion at a time (Wynn and Williams, 2012). Still, totality must be acknowledged; researchers must remain cognisant of “other” influences impacting upon phenomena—organisations must be studied within the broader environment and not “in isolation of the industry, society, and nation within which they operate, and which they in part constitute” (Orlikowski and Baroudi, 1991). Systems thinking ideas advocating totality in bounded environments/ideas are thus often applied in CST research.

3. Motivation to apply suitably grounded CST research to improve organisational IS

The positivistic research paradigm still dominates IS research (Orlikowski and Baroudi, 1991). However, supremacy thereof has been challenged (Pauca-Caceres and Wright, 2011). Over-reliance on positivism “has limited what aspects of information systems phenomena we have studied, and how we have studied them” (Orlikowski and Baroudi, 1991). Interpretive research is a “valuable approach to studying IS in organizations, or more strongly...better...than positivism for this purpose” (Walsham, 1995). It yields “deep insights into

information systems phenomena” (Klein and Myers, 1999). Still, it fails to: examine external conditions giving rise to meaningful experiences; explain unintended consequences of actions impacting upon social reality; address structural conflicts; and explain historical change, whereas “a major goal...is to...impact on information systems practice; that is, the findings...are intended to inform and improve the development and use of information systems in organizations” (Orlikowski and Baroudi, 1991).

Social issues related to IS use/integration, and users’ organisational contexts, often lead to rejection of robust IS (Naur and Randell, 1969, Checkland and Holwell, 1998, Avison and Fitzgerald, 2006, Clegg and Shaw, 2008). To identify/resolve causal factors, and develop new knowledge, researchers should submerge themselves into these organisational contexts. Few authors, e.g. Bentley et al. (2013), Myers and Klein (2011), Baskerville (1999), Warren and Adman (1999), Checkland and Holwell (1998), and Baskerville and Wood-Harper (1996) documented efforts; the value thereof is evident. So, critical IS research is emergent and “recent years have seen the growth of IS research that consciously takes a critical perspective” (Richardson and Robinson, 2007).

It is imperative that “critical IS research strives to promote self-awareness and enable the assumptions that underpin management goals to be made explicit” (Brooke, 2002). The researcher must understand the broader research context and develop theoretical assumptions about the specific problem situation (Baskerville, 1999). He/she can then make an informed and theoretically justified choice in choosing an appropriate philosophical framework to ground the research (Checkland and Holwell, 1998). CST IS researchers have drawn from various philosophical foundations; e.g. Myers and Klein (2011) reviewed research that used the philosophical lineage of Foucault’s theory of disciplinary power, Bourdieu’s concepts of habitus and forms of capital, Bourdieu’s practice theory, and Habermas’ critical theory. However, it is mostly associated with Habermas’ theory (Brooke, 2002, Richardson and Robinson, 2007).

Failures of organisational IS are often attributed to lack of understanding that developers have of business requirements in terms of IS’ social/organisational dimension; traditional requirements elicitation approaches fail to enable rational, consensual reflection regarding the social/organisational dimension; consequently, good artefacts are unsuitable for the organisational context, and rejected (Leffingwell, 1997, Sawyer et al., 1997, Checkland and Holwell, 1998, Warren and Adman, 1999, Avison and Fitzgerald, 2006, Clegg and Shaw, 2008). Understanding requirements from a social/organisational perspective also, improves adoption, but—it requires practical discourse and rational, consensual communication practices. Habermas’ theory, concerned with rational and practical discourse, aims to emancipate the oppressed from societal repression through communicative practices (Mingers, 1980). It is thus relevant to philosophically ground such CST IS research.

4. Action research to structure and operationalise CST

Action research (AR) is a suitable methodology to apply from a CST perspective. AR is an interactive form of knowledge development—it is cyclical, practical, participatory and focuses on change/intervention (Checkland and Holwell, 1998). Such AR entails a methodology (M), which embodies a philosophical theory as the intellectual framework of ideas (F), applied to resolve an identified area of concern (A). The philosophical underpinnings of the methodology must support the problem’s (social) context. The researcher should reflect on and record learnings in terms of all the research elements, i.e. F, M, and A; he/she may adjust elements F and/or M for impending cycles, so as to resolve A. This is illustrated in Figure 1.

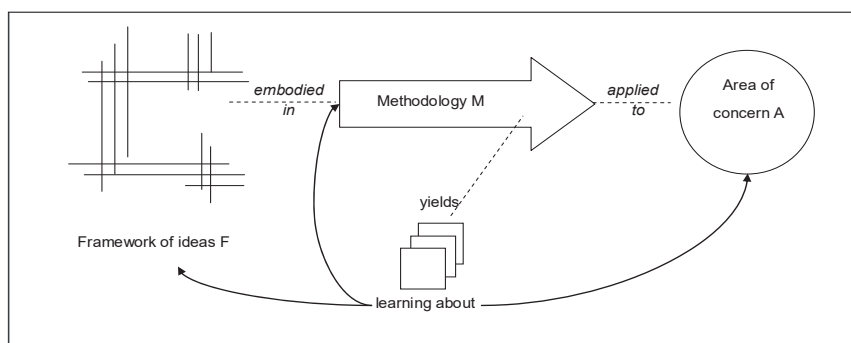


Figure 1: FMA framework (adapted from Checkland and Holwell (1998))

When a CST methodology—such as this AR approach—is applied to a problem (e.g. in an organisation), the problem must still be representative of a broader research theme, so as to also ensure development of theoretical knowledge that is valuable to a research community (Mathiassen et al., 2012). The researcher must holistically interpret the problem situation and develop theoretical assumptions about the problem context (Baskerville, 1999). The methodology (M) should support these assumptions in that it should be theoretically grounded in the suitable philosophical framework (F) (Checkland and Holwell, 1998).

The AR process is cyclical in terms of both action and reflection; it aims to “build on the past, take place in the present with a view to shaping the future” (Shani et al., 2012). The researcher “tries to make sense of the accumulating experience”, reflects on prior stages and declares it in terms of an improved/alternative F and/or M to better (an/or incrementally) resolve A (Checkland and Holwell, 1998). The AR process may be repeated several times until the problem is resolved and new knowledge developed and/or the methodology and/or the underlying framework is sufficiently improved. During the AR cycles the researcher gains insight and learns about all these research elements.

5. A practical application of CST AR research to improve upon a failing IS artefact

The researcher oversaw development of a business intelligence (BI) artefact; it was to replace one that was not serving organisational goals anymore. This practical problem relates to a broader research theme, i.e. improve BI adoption (as a specific type of IS)—literature reports high BI failure rates (Hwang and Hongjiang, 2007, Gartner, 2011, Dresner Advisory Services, 2012). The roots of BI failure are deeper than technical development of these artefacts since “in many of the information systems failures that have occurred, the conclusion has been placed squarely on human and organizational factors rather than technical ones” (Avison and Fitzgerald, 2006); artefacts are often “technically appropriate but culturally/ organizationally infeasible or fail to meet user needs” (Clegg and Shaw, 2008). Business’ request was initially mere automation of manual components embedded in historical software, and the addition of a data warehouse (DW), rather than new/improved functionality. The researcher approached it from a CST research perspective. To plan the research, she had to take on a dual focus: firstly, find a practical solution (i.e. a successful BI system); and secondly, develop new knowledge to improve BI adoption rates in general.

5.1 The problematical social context

Management perceived an “old” IS/BI artefact to be technically ineffective. They requested automation of the manual components embedded in historical software, and warehousing of corporate data in a central DW, to enable standardised enterprise-wide BI reporting. Automation and simplistic functionality requests are often used to motivate development of new IS; it then becomes the basis of the business requirements specification and the main input into the design/development process. However, requirements must reflect organisational improvement to ensure *tangible* organisational improvement through implementation of IS and ensure that they are not rejected by users due to social/organisational infeasibility (Newman and Lamming, 1995, Avison and Fitzgerald, 2003, Inmon, 2005, Avison and Fitzgerald, 2006, Clegg and Shaw, 2008).

To attest the theoretical validity of assertions above, the researcher reviewed literature on failed IS (and DW/BI). Literature confirms that ineffective traditional requirements gathering approaches are often to blame for cultural infeasibility and rejection of technically good IS (Sawyer et al., 1997, Gardner, 1998, Inmon, 2005, Avison and Fitzgerald, 2006, Córdoba, 2007, Ezell and Crowther, 2007, Clegg and Shaw, 2008, Keating et al., 2008, Green et al., 2010, Dawson and Van Belle, 2013, Maté et al., 2014, Davey and Parker, 2015). Traditional elicitation techniques, e.g. interviews, workshops/meetings and surveys, presume that requirements can be conceptually discovered from users, and that users *know exactly what they want and need*. It captures most requirements; yet, it fails to incorporate the innate social/organisational dimension that (unknowingly) shapes user expectations (Inmon, 2005, Avison and Fitzgerald, 2006). Traditional approaches yield detailed requirements definitions/specifications (Sommerville, 2011). However, definitions/specifications are, in practice, rarely described in terms of dynamic organisational goals to be supported by the new artefact.

The researcher also scrutinised the approach followed by the organisation that requested the new artefact, to determine whether it supports findings from the literature—the status quo was to apply a traditional business requirements analysis approach as follows: A business analyst facilitates a workshop to gather requirements from selected business representatives. According to the documented procedure of the Company (2014) users must define requirements in terms of categories, i.e. “functional”, “non-functional”, “reporting”, “technical” and

“general”, whilst ensuring that each requirement is based on a “rationale”, i.e. a “reason or logical basis to account for the business requirement”. Requirements are written “in terms of what they are with no regard as to how they will be implemented or supported technologically” to ensure that they “describe the necessary system capabilities of the solution”. Users are not guided in terms of *what* to include as requirements; still, it is expected that “requirements be comprised of...data; processes; and interfaces”. The IS artefact/system is then developed using a suitable sequential development approach similar to the software development lifecycle (SDLC), as described by Royce (1970), or an agile development approach as described, for example, by Beck et al. (2001a) and Beck et al. (2001b).

5.2 The philosophical framework

The researcher presented management with the interpretation of the problem as discussed in Section 5.1, and suggested that an alternative CST research approach be followed to gather business requirements for this artefact so as to ensure cultural/organisational feasibility, organisational improvement and user acceptance. She also explained that the work of Habermas has been applied successfully, and is suitable, as a philosophical foundation (Brooke, 2002, Richardson and Robinson, 2007). The ideas of Habermas are quite complex; hence, they have been operationalised by critical systems methodologies such as total systems intervention (TSI) and critical systems heuristics (CSH): TSI facilitates methodological pluralism (Flood and Jackson, 1991); CSH aids reflective discourse (Ulrich, 1983).

Hirschheim and Klein (1994) argue that IS designers/developers must embrace emancipatory principles to develop user-centric IS artefacts. For example, design/development processes involve different phases with different focuses—business requirements elicitation entail the discovery of user-centric requirements, whilst a technical artefact, according to the user requirements, must be developed. Methodological pluralism can therefore be beneficial so that a suitable (theoretically informed and justified) methodology can be applied to elicit suitable user-centric requirements that embrace the cultural/organisational dimension; the technical artefact can then still be developed according to any suitable development methodology. For this purpose, the researcher proposed that the TSI methodology be used to identify a requirements elicitation methodology. TSI enables problem solvers to address different phases of an intervention with appropriate and theoretically justified problem solving methodologies that suit the problem context (Mingers and White, 2010).

5.3 Application of TSI to identify a business requirements elicitation methodology

The TSI methodology prescribes that a metaphorical analysis be done for the organisation, so as to identify metaphors representative of the organisational/cultural context. Metaphors are coupled with methodologies that are proposed as suitable for problem solving in that specific organisational context. Refer to Flood (1995) and Flood and Jackson (1991) for detailed descriptions of TSI’s metaphors and methodologies. A metaphorical analysis surfaced two metaphors (socio-culture and socio-political); four methodologies (strategic assumption and surfacing testing, interactive planning, soft systems methodology and CSH) were proposed as options to guide the requirements analysis. After reflection on the suitability of these, CSH was found to be most suitable; it represents an emancipatory “discursive framework for promoting reflective (i.e. transparent and self-critical) practice” (Ulrich, 2013). Refer to Venter and Goede (2017a) for a detailed account of the TSI application.

5.4 Application of CSH to elicit business requirements

Next, CSH was applied to elicit user-centric requirements. CSH comprises boundary questions aimed at determining an actual (as-is) scenario versus an ideal (to-be) scenario—what should be done by whom to plan for socially legitimate improvement. Refer to Ulrich (1983) for a detailed description of CSH. Application thereof surfaced nine *new* requirements (when compared to the initial request as per Section 5.1). E.g., it highlighted flaws in the underlying business process and embedded metrics. Accordingly, the development project was extended from a pure automation/warehousing project to a full-fledged business improvement project. Richer requirements were incorporated that guided development of a new (improved) artefact. Refer to Venter and Goede (2017b) for a detailed account of the CSH application.

6. Reflection on FMA and specification of learning

This research resulted in a user-accepted artefact. A survey indicated that it achieved its intended purpose—it was “easy to use” and “a major improvement” that “increases productivity”. Also, new theoretical knowledge was created—TSI and CSH were applied in novel ways and for purposes not originally intended. Application of

CSH yielded success by surfacing new/richer business requirements. Philosophical notions of CSH, i.e. practical reflective discourse and (micro)emancipation, were achieved. Philosophical notion of TSI, i.e. methodological pluralism, were achieved when an unusual requirements elicitation approach was successfully identified and applied in combination with a traditional development approach.

The CSH methodology was applied successfully to gather business requirements; this approach can be now be applied to similar projects to elicit richer, user-centric requirements. Upon reflection, the researcher realised significant time was spent to clarify CSH questions—participants required explanations of the purposes and intents of the boundary questions before they could respond in the context of business requirements for the artefact. They were unfamiliar with CSH and, for example, terminology used in the questions have different (limiting) meanings when applied in a DW/BI context. So, a next AR cycle commenced—CSH's boundary questions were contextualised for a DW/BI context. A third outcome of this research, i.e. a novel approach whereby to elicit future DW/BI requirements, was developed—it consists of questions to be applied to guide gathering of user-centric DW/BI requirements. Refer to Venter (2018) for a detailed account of the CSH contextualisation, and a narrative of the set of boundary questions.

7. Discussion

A CST researcher aims to understand so as to intervene, improve and emancipate. The researcher followed AR, as a method well-positioned to perform CST research, to intervene in an organisational context and improve a specific problematical social context. The researcher identified causal factors of software, and more specifically business intelligence system, failures. By holistically interpreting the problem context, she was able to identify a suitable philosophical foundation for this research intervention. The underlying philosophy guided the choice of methodology applied, i.e. TSI, to surface an alternative requirements elicitation approach, as well as the application of a suitable methodology, i.e. CSH, to elicit richer requirements. CSH facilitated systemic critical reflection and practical discourse amongst involved and affected stakeholders—they were empowered to surface appropriate (richer) business requirements. TSI facilitated methodological pluralism—in the end, CSH was successfully combined with a traditional development approach. The intervention resulted, on a practical level, in an improved and user-accepted BI artefact. The cyclical nature of AR enabled further reflection on the research. So, a third cycle commenced; she contextualised the classic CSH boundary questions and developed a set of specific boundary questions for use a BI business requirements elicitation context. The research therefore also resulted in new knowledge.

8. Conclusions

The researcher had a dual goal, as is the case with CST research. First, she aimed to solve a practical instance of an identified area of concern. This was done successfully. By entering the organisation, as a business analyst to elicit business requirements for a BI artefact, she was able to immerse herself into the research context and intervene from 'inside', rather than merely understand and consult from the 'outside'. She was able to better understand the practical problem at hand and plan suitable intervention actions to resolve the problem. Furthermore, by holistically interpreting the problem context from an academic perspective also, she was able to choose a suitable philosophical foundation to underpin the intervention and thereby propose and motivate the use of an alternative, non-conventional method to complement a traditional (familiar) development approach. So, the practical goal of this research was achieved when the alternative requirements elicitation process resulted in a richer set of requirements, and ultimately in an artefact that was accepted by the users.

Second, from an academic perspective, it can be concluded that the application of TSI achieved one of its philosophical notions, i.e. methodological pluralism. TSI was also applied in a 'new' context, i.e. one that it was not originally designed for. The application of CSH also achieved its philosophical notions of systemic and critical reflection. CSH was also successfully applied in a context that it was not originally developed for. The researcher therefore concludes that the philosophical framework that was chosen for this interventionist research was suitable and added value; it facilitated a successful research endeavour. She also developed new knowledge for the broader research (and practice-based) community. New boundary questions was developed specifically for a BI context; BI analysts, without prior knowledge of CST and/or CSH, can now apply the contextualised boundary intuitively to elicit BI business requirements.

9. Summary

This interventionist research was in accordance with Checkland and Holwell (1998) who argue that, in CST research, the researcher learns about all the elements of research. This paper shows that organisational IS, such as DW/BI, benefit from CST research. Emancipation does not have to be a grandiose enterprise-wide project; it can entail small, incremental changes that relieves oppressing structures in bounded societies. CST research must be grounded in a suitable philosophical framework, which must support the social context and theoretical assumptions of an identified practical problem, as well as its associated broader research theme. The research that is briefly presented in this paper provides an example of CST research where the researcher grounded the research in a suitable framework that corresponded well with the identified area of concern and the associated broader research theme. The outcome was a successful artefact, as well as a new, novel approach to be applied in future to similar organisational IS development projects, to ensure that that a technical artefact, that also suit the organisation's social/cultural context, can be developed.

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Competition and the Fragility of P/L Insurance Markets

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Abstract: This study investigates the impact of market competition on the stability of global insurance markets. We calculate the P-R H-statistic to gauge the ability of an insurer adjusting its outputs in response to changes of input prices, and use it as a proxy measure of firm's market power to replace traditional market structure measures. We test whether high market competition can curb firm's profitability and hence drive insurers to be fragile, or it can conversely impel insurers to operate in a more efficient manner and hence stabilizes the markets. By using the split population model (SPM), we find that P-R H-statistic is positively correlated with insurers' survival time to crisis, and hence supports the competition-stability relationship.

Keywords: split population model, P-R H-statistic, property-liability insurance, market competition

1. Introduction

Understanding the impact of market competition on financial institutions, e.g., banks and insurers, is important because it can substantially affect firm's profitability and solvency. Two competing hypotheses are frequently tested. The first hypothesis posits that a low degree of market competition reduces collusion costs among firms, and thus firms can gain profits by using monopolistic pricing. This is known as the structure-conduct-performance (SCP) hypothesis, which predicts a positive relationship between market competition and product prices (or firm profitability). The second hypothesis, in contrast, posits that more efficient firms can operate at lower costs, and hence gain larger market shares by selling products at lower prices and hence increase their profitability. This is known as the efficiency-structure (ES) hypothesis, predicting a positive relationship between firm efficiency, rather than competitive power, and firm profitability.

It is noteworthy that nearly all extant insurance studies use structure-based variables, e.g., concentration ratio (CR) or Herfindall-Hirschman Index (HHI), as the proxy of market competition or market power and then investigate its impact on firm performance. However, a concern of using structure variables is that market structure may not perfectly reflect firm's market power. Claessens and Laeven (2004) find that structure measures, such as CR and HHI, are poor indicators of market competition using data from the banking industry. Instead, Panzar and Rosse (1987) propose a more direct measure of market power that is constructed by estimating the ability of a bank (or an insurer) to adjust its outputs in response to changes of input prices. This non-structural measure for market competition proposed by Panzar and Rosse (1987) is often noted as the H-statistic (or P-R H statistic). Panzar and Rosse (1987) also show that, conceptually, the P-R H statistic can be empirically evaluated through firms' product function. A characteristic of P-R H statistic is that it encompasses important information associated with market contestability and revenue behavior in which traditional structure variables do not consist. Besides, an advantage of using the P-R H statistic is that it relies on firm-level information rather than the market-level information as traditional structure variables. As such, it can be viewed as a direct and highly effective measure of firm's competitive power. Several banking studies (Claessens and Laeven, 2004; Bikker et al. 2007; Yildirim and Philippatos, 2007) have unveiled that the relationship between the P-R H statistic and traditional structure measures (CR and HHI) are fragile. This implies that they encompass distinctive information pertaining to firm competitive power. As such, it is not surprised that using concentration variables (CR and HHI) and P-R H-statistic to investigate the competition-performance relationship may yield inconsistent results. We anticipate that using P-R H statistic to verify the competition-performance relationship can give rise to a more reliable result.

Even though using non-structure competition measures is not new in the banking literature, very few insurance studies employ the P-R H statistic to examine the competition-performance relationship, or they do not focus on the U.S. P-L insurance industry. If the structure variables are poor indicators of market competition in the banking industry, this may plausibly explain the conflicting results in prior insurance studies that investigate the competition-performance relationship. For example, the studies by Bajtelsmit and Bouzouit (1998), Cummins and Weiss (1999), Pope and Ma (2008) tend to support the SCP hypothesis while studies by Weiss (1974), Choi and Weiss (2005) do not.

As far as the market stability/fragility is concerned, most prior banking/insurance studies using the logit/probit model or the hazard/survival model, e.g., the Cox model (Lee and Urrutia, 1996, Schaeck et. al., 2009), to assess firm's ruin probability/survival time (i.e., stability/fragility). However, a concern of using the logit model or the Cox hazard model is that they implicitly assume that all firms must ultimately fail. This assumption is largely deviated from the fact and hence may give rise to substantial empirical bias. Lee and Urrutia (1996) discover that more significant explanatory variables are often found when using the hazard (Cox) model in comparison with using the logit model even though their predicting powers are similar. Unlike prior studies, we employ a more efficient survival model, namely, the split-population survival time model (SPM) originally proposed by Schmidt and Witte (1989), to investigate the relationship between market competition and market stability. Instead of assuming all firms must eventually fail, the SPM permits a cohort of insurers can be perpetually survived. This makes the SPM more realistic and hence conceptually is expected to produce more reliable results. The SPM to date is rarely applied in the insurance literature.

The remainder of the paper is organized as follow. We present an exposition of our econometric approach, including calculation of the H-statistic, in section2. Section 3 provides an overview on the data set and summary statistics. We report the main results and a variety of robustness tests in Section 4. Section 5 offers concluding remarks.

2. Data and methodology

2.1 Using Panzar-Rosses H Statistic to measure market power

By solving the optimal decisions of a profit-maximizing firm at the equilibrium output level under different degree of market competition that are characterized by different freedom degrees of the market entry and exit, Panzar and Rosses (1987) show that the H-statistic can be derived from the reduced-form revenue function. Panzar and Rosses (1987) contend that, in comparison with structure measures, the H statistics is an intuitive and direct measure of market competition because it directly evaluates the capability of a firm to adjust its equilibrium revenues as input prices shift. To estimate the H statistic, the reduced forms of firm's revenue are first derived to assess the degree of market competition in terms of the comparative statics of the elasticity of firm's revenue to input prices.

Panzar and Rosses (1987) showed that the H statistic can be expressed in terms of the sum of the elasticity of firm's revenue with respect to the prices of k inputs.

$$H = \sum_{j=1}^k \frac{\partial R}{\partial w_j} \frac{w_j}{R}$$

where w_i is the price of input i and R is the firm's equilibrium revenue. Panzar and Rosses (1987) show that the H-statistic approaches to one when the market is perfectly competitive in that all firms can freely assess the market. In this perfectly competitive scenario, an increase of input price raises the average operating cost, consequently, it drives firms to increase their outputs and revenue. In a perfectly competitive economy, the marginal percentage change of revenue exactly equals to the sum of the percentage changes of input prices because the demand curve is perfectly elastic to price changes. In contrast, in a monopolistic economy, firms control their outputs when input prices are increasing and hence lead into a decline in revenues. A characteristic of the monopolistic economy is that firms curb their outputs in order to maximize their profits because the demand curve appears to be inelastic due to the fact that the barrier of market entrance is high. As a result, the H statistic is negative in a monopolistic market. Panzar and Rosses (1987) also show that the market is monopolistically competitive if the H-statistic falls between zero and one. In this case, the percentage change of revenue is imperfectly (positively) correlated with the percentage changes of input prices if the free market entrance/exit condition sustains. The H-statistic under various scenarios of market competition is summarized as follows:

$$\begin{cases} H = 1 & \text{Perfect Competition} \\ H < 0 & \text{Monopolic Market} \\ 0 < H < 1 & \text{Monopolistic Competition} \end{cases}$$

Empirically Estimating P-R H-Statistic:

Following Kasman and Turgutlu (2008), we use several input/output prices for insurers to estimate their H-statistic, a better measure of market power. The reduced-form of the revenue equations for a given country can be written as below:

$$\ln GPW_{it} = \alpha + \beta_1 \ln PL_{it} + \beta_2 \ln PBS_{it} + \beta_3 \ln FC_{it} + \beta_4 \ln TA_{it} + \varepsilon_{it}$$

where GPW_{it} is the gross premium written for the it h insurer at year t . PL_{it} is the ratio of personnel commission expenses to total assets used to proxy the labor price. PBS_{it} is the ratio of business administrative expenses to total assets used to proxy the input price of business service. FC_{it} is the three-year moving average of firm's return-of-equity (ROE) used to proxy for the cost of financial capital. Kasman and Turgutlu (2008) show that the P-R H-statistic can be obtained by aggregating the coefficients of all input prices, i.e., $H = \beta_1 + \beta_2 + \beta_3$. In order to compare with prior studies that examined the impact of competition in the insurance industry, we also calculate the traditional Herfindale market concentration index as below,

$$HHI_{jt} = \sum_{i=1}^n (\text{market_share}_{ijt})^2$$

where $\text{market_share}_{ijt}$ is the ratio of the written premium of insurer i at year t over the total industry written premium for country j .

2.2 Using Split-population Survival Model (SPM) to estimate survival rate/time

Many prior studies (e.g. Pope and Ma, 2008) use the natural logarithm of the Z-score, estimating the distance for a firm to insolvency in terms of the standard deviation, to proxy the magnitude of insolvency risk. A high Z-score indicates a low probability of insolvency in which firm's return is far above from wiping out firm's equity. Even Z-score can plausibly reflect the likelihood/probability of insolvency, it does not manifest the survival time of a firm between crises. Hence, it is of interest to know if greater competition can lengthen or shorten the survival time from a crisis to the next crisis. If greater competition increases firm's survival time, it can therefore stabilize the market. Differ from prior researches; we employ the split-population time model (SPM) that simultaneously estimating the survival probability and survival time to investigate this empirical question.

The SPM proposed by Schmidt and Witte (1989) estimate the survival time and the survival rate model concurrently and more importantly, without the need of assuming all firms must eventually fail. Hence, the SPM conceptually can generate more reliable results than either traditional logit/probit model or the hazard (Cox) model, or both. In this study, we use the method of Gaussian Maximum Likelihood Classifier to estimate parameters relevant to survival time and probability in the SPM, i.e. $\alpha, \beta, \delta, \lambda, p$, where $\lambda = e^{\beta'X}$ is the parameter associated with survival time of an insurer and $\delta = 1/(1 + e^{\alpha'X})$ is the parameter associated with the probability of the insurer's failure. Hence, there are two sets of coefficients that associate with the survival probability and the survival time (α and β), respectively can be found in the SPM. It is also possible that the SPM may produce conflicting results. However, we should make conclusions based upon the results of the SPM because of its greater consistency and efficiency. To elaborate the SPM, assuming the survival function $S(t)$ follows a log-logistic distribution with parameters λ and p , i.e.,

$$S(t) = \frac{1}{1 + (\lambda t)^p} = \frac{1}{1 + ((e^{\beta'X})t)^p}$$

The hazard rate of an insurer can be written as:

$$h(t) = \frac{f(t)}{1 - F(t)} = \frac{f(t)}{S(t)} = \frac{\lambda p (\lambda t)^{p-1}}{1 + (\lambda t)^p} = \frac{e^{\beta'X} p (e^{\beta'X} t)^{p-1}}{1 + ((e^{\beta'X})t)^p}$$

or in a linear form

$$\begin{aligned} \ln h(t) &= \ln \left[\frac{f(t)}{S(t)} \right] = \ln \left[\frac{\lambda P (\lambda t)^{P-1}}{1 + (\lambda t)^P} \right] = \ln \left[\frac{e^{\beta'X} P (e^{\beta'X} t)^{P-1}}{1 + ((e^{\beta'X}) t)^P} \right] \\ \ln h(t) &= \ln \left[e^{\beta'X} P (e^{\beta'X} t)^{P-1} \right] - \ln \left[1 + ((e^{\beta'X}) t)^P \right] \\ \ln h(t) &= \beta'X + \ln P + (P - 1)(\beta'X + \ln t) - \ln \left[1 + ((e^{\beta'X}) t)^P \right] \end{aligned}$$

where $f(t)$ and $F(t)$ denote the probability density function and the cumulative probability function of firm's failure, respectively. Let X denotes a vector of explanatory variables that are relevant to firm's survival probability and survival time. In this study, we use the firm-year data from 27 countries over the period of 1995-2007. The crisis duration of a country used to measure survival time is defined as the years remained from our sample period since the latest crisis.

2.3 Explanatory variables and empirical models

To compare their effect on firm survival rate/time, we include traditional structural HHI and the non-structural P-R H statistic concurrently (Model (1)). The "competition-fragility" hypothesis posits that greater market competition curtails insurers' profits and consequently deteriorates firms' financial strength if firms cannot take prompt actions to improve their operating efficiency against the increasing competition. In this case, we predict the P-R H statistic (HHI) is positively (negatively) correlated with insurers' survival rate/time. In contrast, the 'competition-stability' hypothesis posits that, a high degree of competition can impel insurers to operate in a more efficient manner, and hence strengthens insurers' survival probability. Following Pope and Ma (2008) and will discuss later, we also examine whether the relationship between competition and stability/fragility differs between countries characterized by different degrees of liberalization.

In contrast, the efficiency structure (ES) hypothesis posits that efficient firms are more competitive in the market because they can operate at lower costs and hence have higher survival rate/time. Choi and Weiss (2005) corroborate that operating efficiency gives a positive impact on insurers' profit. To estimate insurer's efficiency, the output elements we use include incurred losses and investment incomes while input elements include the number of employee, debts and equity. The input prices include labor price, administrative cost and financial capital. We use the data envelop method (DEA) to estimate the cost efficiency (CE) and scale efficiency (SE), respectively.

It is important to control the influences of several relevant firm characteristics on insurer survival rate/time. First, larger insurers tend to have a greater efficiency of diversification and hence can attain the target safety level by using lower capital. We use the logarithm of firm assets ($\ln(TA)$) to control for the effect of economic scale. Next, we use the growth rate of premium written ($\ln(GPWGWR)$) to control for the liquidity risk from insurance contracts, the market growth rate ($\ln(MKGPWGWR)$) to control for the effect of business risk, the reinsurance ratio ($REINSR$) to control for the credit risk from reinsurers, the debt ratio ($LEVG$) to control for the financial leverage risk, and the loss ratio ($LOSSR$) to control for the underwriting risk, the GDP ($\ln(GDP)$) to control for the impact of macroeconomic condition on firm risk. Finally, we add year-dummy (1998-2009) to control for the unobservable macroeconomic impacts. Our primary empirical model hence is written as,

$$\begin{aligned} failure\ (time)_{ijt} &= \beta_0 + \beta_1 PRH_{ijt} + \beta_2 HHI_{ijt} + \beta_3 (PRH_{ijt} \times HHI_{ijt}) + \beta_4 \ln(TA_{ijt}) \\ &\quad + \beta_5 LEVG_{ijt} + \beta_6 REINSR_{ijt} + \beta_7 LOSSR_{ijt} + \beta_8 CE_{ijt} + \beta_9 SE_{ijt} \\ &\quad + \beta_{10} \ln(GPWGWR_{ijt}) + \beta_{11} \ln(MKGPWGWR_{ijt}) + \beta_{12} \ln(GDP_{ijt}) \\ &\quad + \sum_k \delta_k DYR_k + \varepsilon_{ijt} \end{aligned}$$

The Impact of Liberalization

Another research objective of this study is to examine whether the liberalization policy adopted by a county can play a role in affecting the interdependence between market competition and market stability. Prior research finds that deregulation and liberalization can exacerbate the contestability of banks by increasing the systemic risk. However, Barth et al., (2004) find that the banking system with high entry barriers or/and activity constraints tend to have lower market stability. Pope and Ma (2008) investigate whether the liberalization policy can impact the competitive structure of a country and hence influence insurers' profitability. Our empirical model to examine the role of liberalization in the competition-fragility relationship is given by

$$\begin{aligned}
 failure\ (time)_{ijt} = & \beta_0 + \beta_1 PRH_{ijt} + \beta_2 HHI_{ijt} + \beta_3 (PRH_{ijt} \times HHI_{ijt}) + \beta_4 LIBER_{ijt} \\
 & + \beta_5 (LIBER_{ijt} \times PRH_{ijt}) + \beta_6 (LIBER_{ijt} \times HHI_{ijt}) \\
 & + \beta_7 (LIBER_{ijt} \times PRH_{ijt} \times HHI_{ijt}) + \beta_8 \ln(TA_{ijt}) \\
 & + \beta_9 LEVG_{ijt} + \beta_{10} REINSR_{ijt} + \beta_{11} LOSSR_{ijt} + \beta_{12} CE_{ijt} + \beta_{13} SE_{ijt} \\
 & + \beta_{14} \ln(GPWGWR_{ijt}) + \beta_{15} \ln(MKGPWGWR_{ijt}) + \beta_{16} \ln(GDP_{ijt}) \\
 & + \sum \delta_k DYR_k + \varepsilon_{ijt}
 \end{aligned} \tag{2}$$

The dummy variables used to assess the degree of liberalization (*LIBER*) indicates if foreign insurers are allowed to enter the domestic market,

3. Empirical results

3.1 Concentration, competition and insurer survival rate/time

To examine the impact of market competition on insurer survival rate/time, differ from prior studies, we employ the split population model (SPM) without the assumption that insurers must eventually fail. It is noteworthy that the SPM simultaneously estimates two sets of coefficients, in that one is associated with survival rate, and another is associated with survival time. Tables 1 reports main empirical results in which Model 1 includes the H-statistic, Model 2 uses structural concentration ratio (HHI), and Model 3 include both of them because their information contents pertaining to market competition are not confounded. In Model 4, we add the interaction term of the H-statistic and the HHI to reflect the potential nonlinear effect. The positive (negative) coefficients of the interaction terms in the survival rate/time equations imply greater market competition (H-statistic) may expand (restrain) the impact of market concentration (HHI) on survival rate/time.

The results unveil that the coefficients of H-statistic are significantly positive in the survival time equation, suggesting that greater competitive power of an insurer can increase its survival time to a crisis. It supports the view that greater competition (in terms of H statistic) can stabilize insurance system. This result is robust even after controlling for the partial effect of traditional competition measure (HHI), which has also substantial positive effect on insurer survival time (Model 3). A possible explanation is for the positive HHI-survival time relationship is that some larger insurers in a highly concentrated environment are "too big to fail" firms and can receive bailout from government before systematic distress. The coefficients of P-R H-statistic and HHI remain significantly positive after adding their interaction terms. While market power (H-statistic) has a significant positive impact on the survival time, we find that, surprisingly, traditional concentration measure (HHI) does not. This implies that HHI may not be a good proxy of market competition if the competition-stability/fragility hypothesis is true. Moreover, we find that both P-R H statistic and HHI give no impact on insurer's survival rate. This may be due to the fact that survival time, in general, comprises more information than survival rate regressing to firm's survivability.

3.2 Do the liberalization impact the competition-stability relationship?

We also examine whether the regulatory and institutional environment can influence the impact of market competition on insurer's survival rate/time. Three proxies reflecting the degree of liberalization by a country are used in our model. *LIBER* is the dummy variable indicates if the country permits foreign insurers to enter). We also add the interaction term of P-R H and HHI to examine if they can affect the impact of market power on insurer stability.

Table 1: Empirical results of the impact of market competition on insurer survival rate/time using the split population model

* indicates the 10% significance level, ** indicates the 5% significance level , *** indicates the 1% significance level. The values in parentheses are standard errors.

Variables	Model (1)		Model (2)		Model (3)		Model (4)	
	Survival α	Survival β	Survival α	Survival β	Survival α	Survival β	Survival α	Survival β
	Estimates (1)	Estimates (2)	Estimates. (3)	Estimates. (4)	Estimates (5)	Estimates (6)	Estimates (7)	Estimates (8)
<i>Intercept</i>	-3.812 ***		-3.350 ***		-3.372 ***		-3.327 ***	
	(0.782)		(0.892)		(0.915)		(0.908)	
<i>PRH</i>	0.112	0.168 *			0.035	0.224 ***	0.052	0.321 ***
	(0.156)	(0.081)			(0.165)	(0.082)	(0.229)	(0.099)
<i>HHI</i>			-0.934	1.027	-1.283	1.503 ***	-0.405	2.159 ***
			(1.418)	(0.589)	(1.432)	(0.578)	(1.795)	(0.667)
<i>PRH*HHI</i>							-1.780	-0.929
							(1.871)	(0.522)
<i>ln(TA)</i>	-0.159 ***	0.059	-0.178 ***	0.060	-0.149 ***	0.052	-0.144 ***	0.052
	(0.053)	(0.025)	(0.053)	(0.024)	(0.053)	(0.025)	(0.053)	(0.025)
<i>LEVG</i>	5.176 ***	-1.157 ***	5.264 ***	-1.206 ***	5.117 ***	-1.093 ***	5.109 ***	-1.038 ***
	(0.575)	(0.249)	(0.573)	(0.249)	(0.574)	(0.249)	(0.576)	(0.25)
<i>REINSR</i>	-0.437	0.390 ***	-0.365	0.370 ***	-0.424	0.391 ***	-0.442	0.378 ***
	(0.312)	(0.142)	(0.309)	(0.143)	(0.311)	(0.141)	(0.311)	(0.141)
<i>LOSSR</i>	1.258 ***	0.031	1.309 ***	-0.013	1.266 ***	0.020	1.227 ***	0.036
	(0.337)	(0.149)	(0.335)	(0.149)	(0.337)	(0.148)	(0.337)	(0.148)
<i>CE</i>	-1.829 ***	0.769 ***	-1.766 ***	0.800 ***	-1.832 ***	0.760 ***	-1.903 ***	0.711 ***
	(0.332)	(0.146)	(0.331)	(0.147)	(0.332)	(0.145)	(0.336)	(0.147)
<i>SE</i>	-0.838	0.450 ***	-0.669	0.507 ***	-0.826	0.421	-0.890	0.389
	(0.362)	(0.172)	(0.357)	(0.174)	(0.359)	(0.171)	(0.361)	(0.172)
<i>ln(GPWGWR)</i>	-68.513 ***	-19.375	-67.684 ***	-19.782	-68.844 ***	-20.136	-69.823 ***	-19.797
	(21.745)	(9.395)	(21.712)	(9.417)	(21.851)	(9.385)	(22.066)	(9.377)
<i>ln(MKGPWGWR)</i>	1.855 ***	0.035	1.859 ***	0.067	1.643 ***	0.117	1.669 ***	0.101
	(0.355)	(0.162)	(0.353)	(0.162)	(0.348)	(0.163)	(0.347)	(0.163)
<i>ln(GDP)</i>	-0.299 ***	-0.091 ***	-0.348 ***	-0.034	-0.326 ***	-0.057	-0.332 ***	-0.064
	(0.071)	(0.033)	(0.081)	(0.035)	(0.081)	(0.035)	(0.081)	(0.036)
<i>Scale</i>		1.931 ***		2.064 ***		2.054 ***		2.062 ***
		(0.129)		(0.138)		(0.135)		(0.135)
<i>Shape</i>		0.349 ***		0.350 ***		0.348 ***		0.347 ***
		(0.01)		(0.01)		(0.01)		(0.01)
<i>Year Effect</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Global test LR	2170.4 ***		2160.6 ***		2177.8 ***		2184.4 ***	
Pseudo R ²	0.2788		0.277		0.280		0.281	
-2 Log Likelihood	5615.6		5625.4		5608.2		5601.6	

After including the dummy variables indicating the degree of liberalization, we find that the P-R H-statistic and HHI concentration ratio are still positively correlated with the survival time to crisis. Besides, all liberalization dummies are negatively correlated with insurer's survival rate. The interaction terms of H-statistic/(HHI) and all liberalization variables are negatively correlated with insurer's survival time to crisis. This suggests that a high degree of liberalization make insurance market more fragile in a highly competitive environment. Hence, the adoption of liberalization policy may weaken the competition-stability relationship in the P/L insurance industry. Regulators need to be cautious in adopting liberalization even if it may reduce insurers' liquidity risk.

Table 2: Results of impacts of permitting foreign insurers entry on insurer survival rate/time using the split population model

* indicates the 1% significance level, ** indicates the 5% significance level, *** indicates the 10% significance level. The values in parentheses are standard errors.

Variable	Model (1)		Model (2)		Model (3)		Model (4)	
	Survival α	Survival β	Survival α	Survival β	Survival α	Survival β	Survival α	Survival β
	Estimates (1)	Estimates (2)	Estimates (3)	Estimates (4)	Estimates (5)	Estimates (6)	Estimates (7)	Estimates (8)
<i>Intercept</i>	-3.456 *** (0.794)		-3.071 *** (0.9)		-3.137 *** (0.935)		-3.269 *** (0.91)	
<i>PRH</i>	0.048 (0.175)	0.248 *** (0.084)			-0.018 (0.184)	0.296 *** (0.084)	-0.038 (0.245)	0.406 *** (0.098)
<i>HHI</i>			-0.558 (1.473)	1.162 (0.605)	-0.703 (1.492)	1.725 *** (0.582)	0.253 (1.883)	2.472 *** (0.687)
<i>PRH*HHI</i>							-1.661 (2.09)	-1.138 (0.554)
<i>LIBER</i>	-2.631 *** (0.497)	0.367 (0.237)	-2.000 *** (0.513)	-0.386 (0.236)	-2.908 *** (0.711)	0.323 (0.353)	-2.906 *** (0.747)	0.825 (0.814)
<i>PRH*FENTRY</i>	1.230 (0.582)	-0.965 *** (0.272)			1.320 (0.6)	-0.941 *** (0.273)	1.299 (0.795)	-1.553 (0.853)
<i>HHI*FENTRY</i>			1.924 (4.139)	0.930 (1.939)	2.265 (4.446)	-0.018 (2.332)	1.034 (7.245)	-4.238 (6.836)
<i>ln(TA)</i>	-0.115 (0.054)	0.060 (0.025)	-0.131 (0.053)	0.061 (0.025)	-0.106 (0.054)	0.053 (0.025)	-0.098 (0.054)	0.053 (0.025)
<i>LEVG</i>	5.295 *** (0.577)	-1.025 *** (0.249)	5.373 *** (0.571)	-1.122 *** (0.247)	5.205 *** (0.575)	-0.953 *** (0.249)	5.159 *** (0.578)	-0.882 *** (0.252)
<i>REINSR</i>	-0.218 (0.32)	0.440 *** (0.143)	-0.077 (0.314)	0.385 *** (0.144)	-0.194 (0.319)	0.431 *** (0.142)	-0.197 (0.318)	0.414 *** (0.141)
<i>LOSSR</i>	1.386 *** (0.342)	0.012 (0.149)	1.340 *** (0.334)	0.011 (0.148)	1.362 *** (0.342)	0.015 (0.149)	1.313 *** (0.341)	0.036 (0.149)
<i>CE</i>	-2.005 *** (0.339)	0.716 *** (0.148)	-1.965 *** (0.337)	0.766 *** (0.148)	-2.028 *** (0.339)	0.701 *** (0.147)	-2.052 *** (0.344)	0.641 *** (0.149)
<i>SE</i>	-0.912 (0.37)	0.401 (0.173)	-0.751 (0.362)	0.509 *** (0.175)	-0.874 (0.367)	0.359 (0.171)	-0.882 (0.369)	0.310 (0.172)
<i>ln(GPWGWR)</i>	-64.220 *** (22.371)	-21.113 (9.54)	-63.026 *** (22.161)	-21.324 (9.579)	-64.986 *** (22.444)	-21.265 (9.546)	-66.437 *** (22.506)	-21.111 (9.467)
<i>ln(MKGPWGWR)</i>	1.985 *** (0.37)	0.070 (0.163)	2.034 *** (0.363)	0.097 (0.164)	1.793 *** (0.363)	0.152 (0.164)	1.799 *** (0.362)	0.136 (0.165)
<i>ln(GDP)</i>	-0.409 *** (0.074)	-0.118 *** (0.033)	-0.457 *** (0.082)	-0.047 (0.035)	-0.419 *** (0.083)	-0.078 (0.036)	-0.405 *** (0.084)	-0.087 (0.036)
<i>scale</i>		1.883 *** (0.129)		2.039 *** (0.139)		2.024 *** (0.135)		2.024 *** (0.134)
<i>shape</i>		0.348 *** (0.01)		0.350 *** (0.01)		0.347 *** (0.01)		0.346 *** (0.01)
Year Effect	Yes		Yes		Yes		Yes	
Global LR test	2315.8 ***		2295.4 ***		2326.5 ***		2333.8 ***	
Pseudo R ²	0.297		0.295		0.299		0.300	
-2 Log Likelihood	5470.2		5490.6		5459.5		5452.2	

4. Conclusion

The increasing volatility of the insurance industry has been a concern for regulators. While economists and policymakers continue to engage in seeking strategies to stabilize markets, this study answers an important empirical question, to what extent market competition can impact the stability/fragility of the U.S. P/L insurance industry. Differ from prior studies mostly using structure variables, such as concentration ratios, to proxy of market competition/power, this study instead uses the P-R H-statistic, a non-structural measure reflecting the ability of an insurer to modify its output price in response to changes of input prices, as the proxy of firm's competitive power. We verify if a high degree of market competition can lower the insurers' profitability and

consequently can lead to a fragile insurance industry, or it may conversely impel insurers to operate in a more efficient paradigm and consequently stabilize the market.

Our empirical results reveal that greater competitive power (H-statistic) of an insurer can increase its survival time. Moreover, we find that traditional competitive measure (HHI) also has positive impact on insurer survival time to crisis through a different channel. P-R H-statistic and market structure encompass distinct information concerning market competition. Our results supporting the competition-stability hypothesis is robust under different economic conditions, different measures of survival time and insurer risk. Hence, our results support the competition-stability hypothesis. The policy implication of this study is that regulators should pay more attentions on the ability of insurers to adjust their output rather than simply monitoring market structure when regulating insurers. Lastly, we examine whether the liberalization policies can impact the competition-stability relationship. The empirical result suggests that the liberalization policies, including permitting foreign insurers to enter the market, permitting foreign/outside shareholders to hold large shares in insurance firms can reduce insurers' survival rate/survival time to crisis. The impact of liberalization on market stability is also greater in a highly competitive environment.

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Presenting Empirical Research Results and Discussing Research Findings in Business and Public Administration

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Abstract: A good research report or dissertation or thesis is a function of how well it articulates its research findings. In turn, a good discussion of findings is partly determined by how well the empirical research results are presented. Further, a good presentation of empirical research results and, consequently, the discussion of research findings are a function of well-articulated (i.) research strategy, design, procedure and methods; (ii) theoretical and conceptual framework, and; (iii.) overall research conceptualisation. However, in business and public administration research, there is evidence of more guidance during, and emphasis on, the first three components of a research process. These are (i.) the 'introduction to the research' component in which the research is conceptualised; (ii) the 'literature review' component in which the research problem and knowledge gap is detailed and the theoretical and conceptual frameworks developed, and; (iii.) the 'research strategy, design, procedure and methods' component. The assumption could be that when articulating the first three components, the research student or novice should have as well picked up skills and confidence sufficient enough to present empirical research results and discuss research findings and, therefore, to handle the last one-third of a research undertaking with minimum supervision. To the contrary, examiners reports of our research students¹ as well as examining research reports of research students in other similar institutions shows otherwise. Therefore, using information compiled from supervisory interactions, discussions with colleagues, and examiners' reports, this paper proposes a structured approach and checklist that one can use when presenting empirical research results and discussing research findings. In doing so, we differentiate the meaning of 'presenting' versus 'discussing' as well as 'results' versus 'findings' in relation to the empirical part of a research undertaking. Further, we draw in the importance of 'comparing' empirical research results and research findings with what other similar studies found as a way of making the empirical research undertaking comprehensive and critical. In all, we propose that one should explicitly (i.) present empirical research results then (ii.) compare with contemporary empirical research results of other similar past and current studies before (iii.) discussing or interpreting the research findings using established frameworks and own opinion. Of course this proposal only helps us kick-start the process before content takes the driving seat to finally shape these two components of a research report.

Keywords: empirical research, presenting research results, discussing research findings, key attributes of a good research report

1. Background

Resulting from absence of an explicit framework for dealing with the empirical part of a research undertaking, this paper discusses and proposes some considerations when presenting empirical research results and discussing research findings. As always, we narrow our target to business and public administration and management research to avoid being too ambitious. That is not to say these principles do not apply to other than business and public administration and management research.

Obviously, by the time one is due to present empirical research results and discuss research findings, they would have interrogated at least half to two-thirds of a research undertaking including the supposed most difficult component, that is, the conceptual framework or the literature review which is approximately 25 per cent of the physical research report but feeding into approximately 75 per cent of the research report content. This is in addition to two more components, that is, the 'introduction to the research report' that conceptualised the research or the 'what' research to pursue and 'why' as well as the 'research strategy, design, procedure and methods' component. Therefore, there is a realistic but false assumption that a research student would have picked up skills and garnered confidence to present empirical research results and discuss the research findings, thereof, with minimum supervision. This is why most research-supervisory interactions seem to be more intense at the beginning but tap off towards the end. Unfortunately, this has a negative impact as shown by examiners' and supervisors' assessments. We are not by any chance disputing that such could be a function of supervisor negligence and more importantly absence of an explicit framework for dealing with the empirical part of a research undertaking.

¹ WITS Graduate Schools of Governance and to some extent WITS Graduate School of Business Administration

With this in mind, this paper attends to the question, ‘how can we effectively and efficiently present empirical research results and discuss research findings comprehensively and critically?’ Further, this knowledge should also help us link the research questions or hypotheses or propositions that the respective research is pursuing to (i.) the discussion of the key attributes and variables, (ii.) the actual questions posed to the research respondents, and (iii.) the frameworks meant to interpret the empirical findings. Obviously, attending to this implies touching on how this discussion impacts on the other components of a research undertaking and reporting more so the first (the introduction to the research) and last (the summary, conclusion, and recommendations) components. Our suggestions are underpinned by the cognitive and constructivism learning theories described in Driscoll (2000), Gredler (2001), and Siemens (2014) who implicitly argue that the research process like learning should be a guided experience but whose product is knowledge construction.

Following on from the above, we used information compiled from supervisory interactions, discussions with colleagues, and examiners’ reports to propose a structured approach and checklist that one should consider when presenting empirical research results and discussing research findings. We gather from our discussions and interrogations of examiners’ remarks that a good research report is largely determined by how well it discusses its research findings. In turn, a good discussion of research findings is partly determined by how well the empirical research results are presented. Finally, of course, well presented empirical research results and discussed research findings depend on well determined and interrogated (i.) research strategy, design, procedure and methods; (ii.) theoretical and conceptual framework, and; (iii.) research conceptualisation. To propose a cognitive approach to presenting empirical research results and discussing research findings, interrogate the concepts of ‘presenting’ versus ‘discussing’ as well as ‘results’ versus ‘findings’ in relation to the empirical part of a research. Further, we draw in the importance of ‘comparing’ empirical results and findings to provide for comprehensivity and criticality. In sum, for this part of the research undertaking and process to be comprehensive and critical we should explicitly (i.) present empirical research results; (ii.) compare the empirical research results with what similar past and current studies have found, and (iii.) discuss the research findings using well established interpretive frameworks. Of course the process of approaching these two components of a research report or dissertation or thesis should consequently be superseded by the content under interrogation. In the next section, we contextualise the subject of this paper by first reviewing the six components of a research report while Section 3—key attributes of a ‘good’ research report or dissertation or thesis—interrogates the expected quality of the research undertaking and its reporting, thereof. Lastly, Section 4 provides for how one should present empirical research results and discuss research findings before we summarise and conclude this paper in Section 5.

2. Revisiting the main components of a research report to contextualise this article

Wotela (2016, 2017a) has presented and argued for six independent but interlinked components of a business and public administration and management research report—that is, (i.) the introduction to the research; (ii.) the conceptual framework; (iii.) the research strategy, design, procedure and methods; (iv.) the presentation of the research results; (v.) the discussion of the research findings; and (vi.) the summary, conclusion, and recommendations. He then describes the function of each component beginning with the ‘*introduction to the research*’ component whose purpose is to pitch, justify, and delimit the research in the context of its key research terms and concepts. The highlight of this component is the research problem statement, the research purpose statement, and the research questions or research hypotheses or research propositions—collectively these provide for conceptualisation of the ‘what’ and ‘why’ of the intended research. The focus of the second component, the *conceptual framework* (Ravitch and Riggan 2012; Kumar 2014) traditionally called the literature review, broadly identifies and discusses the concepts and terms presented and applied in other components of the research report (Remenyi, Williams, Money *et al.* 1998) making it the largest physically (approximately 25 per cent of the research report) and purposively because it feeds into approximately 75 per cent of the research report content. The ‘*research strategy, design, procedure and methods*’ component describes, commits, and discusses with justification the research strategy, the research design, the research procedure and methods, reliability and validity measures before spelling out the limitations of the selected research strategy, design, procedure and methods. Obviously, this relates to the empirical part of the research undertaking and its reporting. Wotela (2017b) interrogates the ‘what’, ‘why’, and ‘how’ of this component detailing the tools and options employed by the research to collect, process, and analyse empirical evidence including information or data processing and analysis.

The focus of this paper is on the fourth and fifth components—that is, ‘*presentation of the research results*’ and ‘*discussion of the research findings*’. According to Wotela (2016, 2017a), the fourth component presents the products of empirical research information (qualitative) or data (quantitative) collection, processing, and analysis. Ideally, it should be limited to responding to the research questions or testing the research hypotheses or proving the research propositions presented in the first component. For purposes of comprehensivity and criticality, one should also compare and point out the similarities and differences of the empirical results of the research under study with what other similar studies have found. Both presentation of empirical results and comparison with other studies should be restricted to description without interpretation or discussion so that the empirical attribute is preserved and emphasised. One should then interpret and discuss the research findings in the fifth component. Like the ‘presentation of the research results’ component, this component should be limited to responding to the research questions or testing the research hypotheses or proving the research propositions. One should take on board the linkage between all the components of a research report which should be apparent and explicit in the research write-up. More specifically, the third component—research strategy, design, procedure and methods—provides for the requirements of the ‘presentation of the research results’ component. In turn, the fourth component—presentation of the research results—provides the empirical research results that are subjected to a somewhat subjective interpretation and discussion in the ‘discussion of the research findings’ component using frameworks interrogated in the conceptual framework (second component of the research report).

According to Wotela (2016, 2017), the last component—‘*summary, conclusion, and recommendations*’—summarises the research and presents the overall conclusions drawn. Like the first component, the last component pitches conclusive highlights of the other five components of a research report. Thereafter, the last component presents the limitations of the research undertaking as well as offers some practical recommendations and suggests future research. Before discussing what is required to effectively and efficiently present empirical research results and discuss the research findings, thereof, let us describe key attributes of a ‘good’ research report.

3. Key attributes of a ‘good’ business and public administration and management research report

For this section, we subjected 31 examiners’ reports (numbered from Report 01 to Report 31) of business and public administration and management research reports, dissertations, and theses to a thematic-summativ-content analysis. We had divided the examiners’ reports into four groups according to the final grade allocated to the research report. The first group comprised four examiners’ reports (Reports 01-04) on research reports whose final mark was less than 50 per cent while the second group of fourteen examiners’ reports (Reports 05-18) for those that got 51 through 64 per cent. The third group comprised 8 examiners’ reports (Reports 19-26) on research reports whose final mark was from 65 through 74 per cent while the last group of 5 (Reports 27-31) was for those that got above 74 per cent. Table 1 shows the 13 words implicit in these research assessment reports that need interrogation for us to propose key attributes of a ‘good’ business and public administration and management research report. We arranged these words in this order beginning with ‘context’ then component and ending with ‘critical’ after a prolonged interrogation of each of these words and what the examiner wanted to communicate. We have discussed this in more detail elsewhere² but fundamentally we are suggesting that the basic ingredient in a business and public administration research report is the ‘context’ and the ultimate ingredients are ‘comprehensivity’ and ‘criticality’.

The common concern of examiners’ of research reports whose final mark was less than 50 per cent was lack of a structure. Clearly, such reports failed to demonstrate that they followed a particular process or outline and, therefore, some key research components were either missing or not linking up. Repetitions are also quite notable in these reports. So it is common to find comments such as ‘clearly the student did not know what [s/he] is talking about’ (Report 02) Further, such reports lack an explicit context—that is, the reports hardly contextualised the research in its physical space or its academic home, if not both. Physical space contextualisation implies that, before anything else, the region or institution or department or unit applicable to the research should be fully and carefully described before the research problem is introduced. This allows for gauging parts of the research problem that are relevant and irrelevant to the research problem understudy and thereafter the decisions on how to pursue such a research. Similarly, one can pursue a research from a

² Sourcing, [selecting], summarising, [selecting], and synthesising literature in business and public administration research

particular academic angle. For example, savings can be pursued from an economic point of view or from a public policy point of view or from a development point-of-view. This needs to be explicit in the approach and certainly described so that the research has an academic context. These limitations affected the other attributes of a ‘good’ business and public administration and management research report or made it practically impossible to assess them.

Table 1: Showing key words found in assessment reports of business and public administration research reports, dissertations or theses

51-64 per cent	65-74 per cent	More than 74 per cent
Structure	Structure	Structure
Process	Process	Process
Component	Component	Component
Element	Element	Element
Context	Context	Context
Content	Content	Content
Argument	Argument	Argument
Facts	Facts	Facts
Debates	Debates	Debates
	Comprehensive	Comprehensive
	Explicit/Implicit	Explicit/Implicit
		Critical
		Discussion of research findings

From the foregoing, we gather that for a research report to get at least a pass should follow a particular process (cognitive) just like in coursework and should explicitly fall within a particular structure such as the one described in Section 2. All the components (independent parts of the whole, in this case, the research undertaking and its write-up) and elements (fundamental parts of a research undertaking and its write-up) should not only be present but should be interlinked. For example, according to Report 07, ‘had it not being for the acceptable structure and inclusion of all key aspects of a research [report], I would have failed this research’. Most of all for this band, there should be an attempt to contextualise the research either in its physical space or academically, if not both. For example, according to Report 16, ‘in as much as this approach is acceptable in marketing, most economic students are discouraged from using stepwise regression’. Similarly, ‘...there is doubt that this argument is true in general but it applies more to developed countries but certainly not emerging economies’ (Report 09). In addition, to stretch to at least 64 per cent, the research report should demonstrate knowledge of the content fundamental to the research by way of capturing the key arguments, facts, and debates preferably those advanced by key figures. In sum, as Table 1 shows under the column (51-64 per cent), there are five fundamental attributes that will get a business and public administration and management research report above 50 per cent and an addition 4 attributes that will get it to 64 per cent.

Table 1 (column under 65-74 per cent) shows that there are two more attributes—that is, a comprehensive and explicit discussion—that will get a business and public administration and management research report to 65 through 74 per cent. The former simply implies that all that should be included is actually ‘tactfully’ discussed without littering the report with unnecessary information ending up in a very long report but without a focus. Almost all the examiners’ reports are full of suggestions that the student should have mentioned or discussed or highlighted this or that. Further, as we articulate in another article detailing this topic, most sources of our literature (documents and respondents) do not directly respond to our research needs and questions. Similar as our literature sources should be obviously identical to our research because this may signal that we do not have a unique research topic to pursue. That is certainly a positive that comes with a big negative. The discussions in the literature sources are implicit which make no sense if we directly transfer them into our research report write-up. Part of the research training is one’s ability to convert implicit messages in out literature sources into an explicit discussion in our research write-up. Report 10 captures this with the comment, ‘where is your voice [in this write-up]?’³ Therefore, one has to have the ability to translate this otherwise implicit information to explicit information when writing up.

³ This is similar to my colleague’s (Dr. Gillian Godsell) point-of-emphasis with first year doctoral students, ‘... you need to find your voice in this academic jungle?’

Lastly, for a business and public administration and management research report to go above 74 per cent, it should be also be critical and carry an outstanding discussion of findings (in addition to presenting empirical results—see Table 1 (column under more than 74 per cent). Most examiner's report alluded to student research report not being critical. For example, Report 24 states, 'while this is topical research at the moment, the student was not critical enough for us to learn something new'. Similarly, according to Report 26, 'had this report being critical enough it would have earned a distinction'. However, the meaning of this concept in academia and research in particular remains elusive even common English definitions are not helpful. Implying from the examiners' reports, they meant the ability of the author to state not only the positives but the limitations and in some cases the ability to devise ways of mitigating the limitations. For example, Report 29 praises the author for supplementing the use of cluster analysis that does not allow for determining causal relationships between variables with the use of regression analysis. Relatedly, another Report (31) notes that the student garnered more points because of their ability to balance facts and debates in their arguments. Lastly, criticality may imply the student's ability to either comment on or extrapolate their discussion and arguments to another context. For example, Reports 27, states that 'the student was excellent in describing adaptations required to apply the study to other places ...'.

Over and above, all the five examiners' reports in this category had positives on the way the students discussed their research findings. At first, it was difficult to provide an attribute for this comment. However, after interrogating this comment further, we realised that it provides for the research report author to show their intellectual abilities by using frameworks for interpreting research findings discussed in the second component of the research undertaking to voice out explicit subjective opinions of what the empirical results mean. This part allows for one's well-stitched enshrined in academic literature and extrapolated from both the empirical results and interpretive frameworks. On reflection, the 'discussion of research findings' component is the best place in the whole research report for one to stand out and going beyond supervisory instructions to offer an opinion about the research they have just undertaken. This is actually the terminal component before one summarises and concludes a research undertaking and, therefore, it provides for displaying the quality of the overall research undertaking and reporting. One should rise to the occasion since they have all the information and knowledge to extrapolate the meaning of their research. From this information, we argue that a good research report depends on how well it explains its research findings. Let us now use these key attributes of a 'good' research report to propose how to effectively and efficiently present empirical research results and discuss the research findings.

4. Presenting empirical research results and discussing research findings

Though not typical in all the 31 examiners' reports, one examiner recommended that research reports should not conflate the concepts of 'presenting' versus 'discussing' as well as 'results' versus 'findings' as is the case in most research reports. By definition, 'presenting' implies showing the empirical products (results) as is of *collecting, processing, and analysing* data or information. Intuitively, empirical research results should comprise information generated from *collecting, processing, and analysing* research quantitative data or qualitative information. On the other hand, 'discussing' implies *interpreting* (subjective or otherwise) the meaning of the empirical products to reach a sound conclusion. Research findings comprise knowledge or the meaning of something. From the foregoing simplistic descriptions, we gather that presenting and results are void of opinion instead they are summarised responses as collected from the respondents, processed as well as analysed as provided for in research methodology and there should be minimal, if any, additions from the researcher. However, over and above empirical research results as well as an interpretive framework (theoretical or otherwise), research findings require the opinion of the researcher to interpret what they actually mean. Therefore, one should explicitly and separately 'present empirical research results' and then 'discuss research findings' to serve the two distinct but interlinked purposes.

There are two notable concerns from examiners' reports with regards 'presenting empirical research results'. First, they did not have kind words for qualitative strategy research reports whose empirical results are presented in the form of 'question-and-answer' statements of individual responses instead of thematically. The text-box below is an example of how the examiner of Report 03 suggested the student should report the qualitative research strategy results. In essence, presenting empirical research results in the form of 'question-and-answer' statements of individual responses implies the information gathered was unprocessed and unanalysed by the author. In most cases, such an approach does not even respond to the posed research questions. Relatedly, but typical of quantitative research reports, is presenting frequency distribution of results

and sometimes cross-tabulations without testing the posed research hypotheses. Second, they did not like research reports that include opinions or seemingly interpret the empirical research results when they should be merely presenting empirical research results void of any interpretation at this stage. More explicitly, and as stated earlier, ‘presenting empirical research results’ should be limited to either responding to the research questions or testing the research hypotheses or proving the research propositions to realise our research purpose and hence address our research problem.

With regards to Question X, almost all the respondents know about The majority who responded to this question are of the view that ... is [researcher’s synthesised view from all the responses]. For example, Respondent_3 thinks that ‘[exact quotation from Respondent 3]’. Similarly, Respondent_2 suggests that ‘[exact quotation from Respondent 2]’. However, there are divergent views as well. One camp seems to suggest that ... is [researcher’s synthesised view from all the responses]. This view is much more apparent in with Respondent_1 who elaborates that ... is but ‘[exact quotation from Respondent 1]’. The second camp is of the view that ... is [researcher’s synthesised view from all the responses]. For example, Respondent_4 argues that ‘[exact quotation from Respondent 4]’. The last camp seems to be neither here nor there with their emphasis that ... is [researcher’s synthesised view from all the responses]. This is a view most notable in Respondent_2 who emphasises that ‘[exact quotation from Respondent 2]’.

Similarly, there are two notable concerns from the examiners’ reports with regards ‘discussing research findings’. The first is the habit of merely recasting the empirical research results without interpreting the meaning of the empirical research results. Such an undesired approach is void of the researcher’s literature supported opinion. The second is the interpretation or rather providing the meaning of the empirical research results but without support from literature. Discussing research findings implies interpreting and discussing the presented empirical research results using interpretive frameworks and other established literature. The arrows in Figure 1 showing the different components of a research report suggest that the researcher should have an opinion on what the results mean to make them findings and such an opinion should be supported by literature preferably the interpretive frameworks, that is, model, theory, or construct. From the examiners’ reports, it seems this is the deal-breaker component and should be written to allow the reader to get the researchers insight on the subject they have just researched on. There is a need for the researcher to project their voice but allow for frameworks to support the suggested opinions to extrapolate beyond the presented empirical research results.

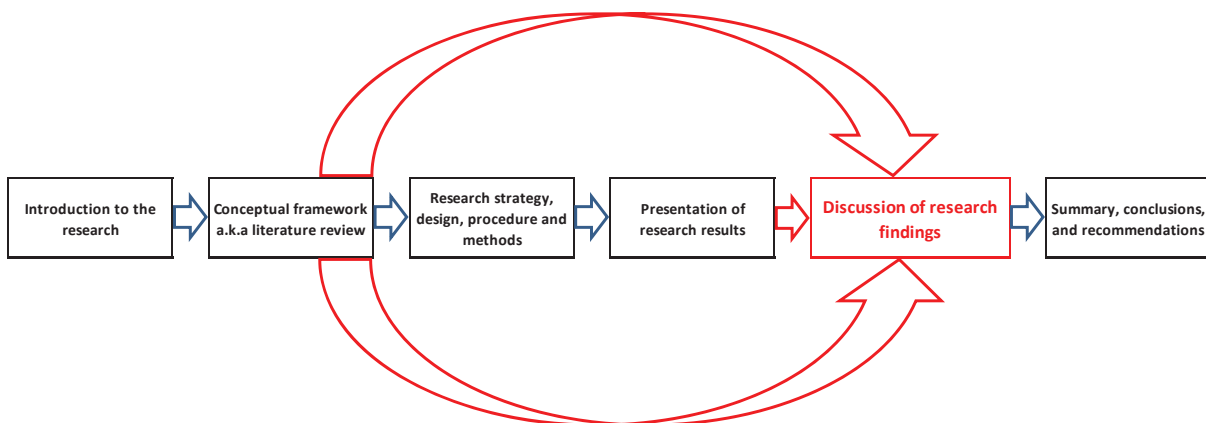


Figure 1: Showing that the discussion of findings should be the opinion of the researcher on what the empirical research results mean but underpinned by established interpretive frameworks (models, theories, and constructs) proposed and detailed in the conceptual framework (second component)

Other than explicit ‘presentation of empirical research results’ and ‘discussion of research findings’, we should also make a concerted effort to compare the empirical research results and research findings to other similar studies. This provides for comprehensivity and criticality we have discussed in Section 3. However, caution should be exercised when comparing empirical research results because a notable number (10) of examiners’ reports indicate that they are not comfort with interpreting the empirical results at this stage. For example, Examiner’s Report 08 complained that ‘... it seems the student was already in discussion mode instead of just presenting the results’. This implies that whilst there is a need to compare empirical research results with what others found, research reports should not proceed to discussing or interpreting the empirical results. Rather

they should just state that ‘this is similar to what Author X (20XX) found or is different from what Author Y (19YY) found in their research’. Another way of going round this is creating another sub-section for comparing empirical research results of the incumbent report with those of similar research studies.

Lastly, examiners’ reports have implied comments that signal the need for a concerted effort to link materials in other sections and chapters of the research report to the ‘presentation of empirical research results’ as well as ‘discussion of research findings’ components. The text-box below is an example of how one can achieve this.

Considering the research questions or hypotheses or propositions presented in Chapter 1, we have provided for a research framework in Chapter 2 that articulates in more detail the research problem within the physical context, the research knowledge gap, the attributes or variables of interest within the academic context, and the appropriate frameworks for interpreting the empirical research results. Following on the proposals we present and justify in the research framework, we have detailed the research strategy, design, procedure and methods in Chapter 3 implemented to collect, collate, process, and analyse empirical research data or information whose results we present here before summoning the proposed frameworks to interpret and discuss the research findings. In answering the posed research questions, we hope to realise our research purpose and hence address our research problem articulated in Chapter 1. These research questions or hypotheses or propositions required us to interrogate their appropriate attributes or variables in Chapter 2 and to collect empirical evidence on these attributes or variables we asked the following questions ... in our interview schedule or questionnaire that is appended to this report.

5. Summary, conclusions, and recommendations

This contribution arose from a lack of explicit clarity on how business and public administration students should present their empirical research results and discuss or rather interpret their research findings. We make a point that a good research report or dissertation or thesis depends on how well one discusses or interprets the research findings. However, a good discussion of research findings depends on (i.) how well one has presented the empirical research results, (ii.) the researcher’s ability to provide an informed opinion on what these results actually mean with support from (iii) appropriate and well detailed interpretive framework. Further, a good presentation of research results and discussion of research findings follows on well-articulated (i.) research strategy, design, procedure and methods; (ii) theoretical and conceptual frameworks, and; (iii.) research conceptualisation. We used information compiled from examiners’ reports to propose a structured approach and checklist one should consider when presenting empirical research results and discussing research findings. We have emphasised that we should explicitly distinguish ‘presenting’ from ‘discussing’ and ‘results’ from ‘findings’. In both cases, the former terms should be reserved for the empirical part of a research undertaking and the latter terms for the subjective interpretation of the research results arising from established frameworks. Further, we propose that both the empirical research results and the research findings should be compared with the presentations and discussions of other similar studies. Lastly, researchers should ensure that materials in all components (chapters and sections) of a research report are interlinked but void of repetition. As always this any proposed approach and check is merely there to kick-start the process but the content we are dealing with should finally determine the final shape and outlook.

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Making Closed-Off Worlds and Solutions Explicit During Research: A Methodological Concern

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Abstract: As a norm of today's scientific society, which have been a little criticised, researchers usually do not report unsuccessful works or tested research pathways and worldviews that did not work. But what about worldviews and solutions that are gradually being closed-off in minds of researchers to reach a prospective promising solution or worldview to a problem? The present paper tries to shed light on this based on two recent research projects. Although the issue is related to the field of knowledge management and tacit form of knowledge, and to the new Mode of knowledge production as theorized by Gibbons, it is practically studied here as a research methodological or research design concern. Based on the Urmia lake restoration research project and the research project for designing a participatory learning ecosystem in Golbaf town of Iran, it was found that there are serious worldviews and solutions being closed-off during the research, only through which the researchers were able to reach prospective final solutions. In line with scientific norms, these closed-off worldviews (approaches) and solutions were not documented, communicated or disseminated. The research group retrospectively found that this was a reason for serious problems in fragmentation of ethnography results and solutions provided, in miscommunication with stakeholders, in misunderstanding of the problem by stakeholders other than researchers, and in transferring the implicit knowledge to next researchers and projects. The evidences imply that a scientific work should include both approved and closed-off worldviews and solutions, since both are advantageous the same and that it would also prevent biases and leads to better management of tacit knowledge. Thus, it is suggested to have documentation and communication of closed-off worlds incorporated into research designs. Currently, our researchers are going to add weekly/ monthly informal documentation of closed-off worldviews and solutions into their knowledge management agenda. This is going to be utilized by our interventionist researchers to gain a deeper second order of knowledge of the research process and mindset change, in regular discussions, in communications with stakeholders and in dissemination of results.

Keywords: ethnography, participant observation, closed-off worlds, continuity of research process, solution-oriented S&T projects

1. Introduction

In solution-oriented S&T projects, ethnography has started paving the way for a better understanding of problems and for a more socio-cultural, inclusive and sustainable solution. Solution-oriented S&T projects adopting participant observation have shown several methodological sensibilities compared with classic or non-solution-oriented ethnography research projects. One sensibility that the authors have been faced with during a recent wicked solution-oriented S&T problem utilising ethnography was worldviews and solutions being closed off in the minds of researchers during the research process. Such closing off is not usually documented nor communicated. Even, it is rapidly faded and forgotten in individual minds, supposedly because of its lower perceived importance compared with confirmed solutions. It should be noted that research on silence and closing off within research organisations and learning is sparse. At a more abstract level, this is related to notion of tacitness, collective remembering and new conceptualisation of science (Blackman and Sadler-Smith, 2009; Reese and Fivush, 2008). It should also be noted that the topic of closed-off (silenced) worlds has recently been opened up in the literature of ethnography (Law and Ruppert, 2013). But in contrast with the present paper, that does not do anything with research design and methodology.

Closing some worlds (solutions, paradigms or mindset) usually occurs implicitly and gradually in the minds of researchers (observers and ethnographers) with no traces in the output of a documented research or project or even in the final mindset of researchers at the end. Closed-off worlds are a type of tacit knowledge and we know that tacit knowledge in general have a problematic nature with respect to both detecting it and representing it (Eraut, 2000). It is also in close relation with the debate on surfacing practical knowledge and professional tacit knowledge (Hess, 1998; Star, 1991).

The present paper addresses such closing-off based on empirical evidences from two recent cases. In the Urmia lake restoration research project, The Research Institute for Science, Technology and Industry Policy (RISTIP)

started ethnography in 2015. At the end, the employer put a great objection on the table. Why ethnography results are not well connected with solutions proposed? After several retrospection discussions, the researchers found that in fact we cannot directly confirm the superiority of the suggested solutions. But, it is the many closed-off solutions and worldviews to such wicked problem that led us to these viable solutions. Of course, the closing-off was based on defensible grounds, but it was not made explicit, documented or communicated with the employer during the research. So, we two had different worldviews at the end since those closed-off solutions and worldviews were not actually being closed off in the mind of the employer. It drove us to some methodological concerns, i.e. a need for codifying and documentation of closed-off worlds during research, purported fragmentation of participant observation's results and solutions developed, and new formats needed for sharing and dissemination of closed-off worlds.

The study of Urmia lake restoration research programme was then verified by another ongoing case in the RISTIP research institute, namely setting up a participatory learning ecosystem in Golbaf town of Iran as part of a larger sustainable regional development programme. The two cases showed that a considerable part of contribution of a research could be not just voicing good solutions but silencing some bad ones which could lead to further problematic, unsustainable or non-inclusive situations. In fact, in a broader sense, every research contains some closing-off of worldviews and solutions. Unfortunately, it was seen that such a valuable closing-off occurs just in the mind of researchers for the sake of a limited number of straightforward solutions to be proposed to the employer and society, and of course in alignment with scientific norms.

2. An ethnography case: Restoration of Urmia lake

Urmia lake is an endorheic salt lake in Iran that once upon a time was the largest saltwater lake on Earth at its largest extent. The lake "has shrunk to 10% of its former size due to damming of the rivers that flow into it, and the pumping of groundwater from the surrounding area" ("Lake Urmia - Wikipedia," n.d.). In July 2014, Iran President approved a recovery project, from which a part was dedicated to ethnography of the pilot region of Hasanloo in the neighborhood of the lake. The Research Institute for Science, Technology and Industry Policy (RISTIP) started the ethnography in 2015, not just for knowing the problem but, to enrich and sustain the suggested solutions with socio-cultural facts of the region and multiple viewpoints of stakeholders. The high-level employer is Urmia Lake Restoration National Committee.

After a year, the employer urged the research institute to more explicitly interconnect the ethnography phase's results with the socio-technical solutions provided. Further group contemplation and discussion revealed that in fact there is much interconnectedness between the two phases of the research but just in the mind of the researchers. In fact, four-fold methodological concerns were identified:

- There was a shift in the mindset and prospective solutions of the employer from the onset, but which was not documented or made explicit. So, it was difficult to prove them this gradual mind shift.
- There was also a shift in the mindset and hypothesised solutions of the researchers, but which again was not documented or made explicit. Even, the researchers were not able to consistently remember their older mindsets and the mind changes during the last year such that different accounts and doubts have been found during their storytelling.
- It was postulated that the claimed fragmentation between the ethnography outcome and the solution development phase was due to the weak documentation during the research.
- But, it was not the lack of documentation at the whole which caused such fragmentation. More exactly, the shortcoming was interestingly attributed to the lack of documentation of *closed-off worldviews and silenced solutions* during the research. This closing-off and silencing of tacit knowledge occurs in the mind of researchers. In fact, to reach a solution or worldview, several worldviews, approaches, presuppositions or solutions has been put aside in our minds, which have not been documented anywhere.

Table 1 depicts the instances, including worldviews and solutions, being closed-off in the mind of the researchers during the research. For example, the first row indicates that it was first thought that if there were alternative jobs available, the farmers would naturally abandon agriculture with current low income associated with it due to the water crisis. But then it was found that they actually have an income above average and which have become three-fold during the last decade at the expense of cheap and abundant water available. This was never negotiated with the employer that this mindset was closed-off. Instead, further negotiations used to revolve

around new solutions without pointing to this evidence-based closing-off in the mindset of just the researchers, which caused miscommunication problems with the employer and other stakeholders.

Table 1: Closed-off worldviews and solutions during research project of Urmia lake restoration

Presupposed worldviews (approaches) at the onset of the research, which gradually turned to be incorrect, but yet the change of mindset has not been documented and became forgotten	Related solutions closed-off during the research. But, the change of mindset has not been documented.
Regional development and employment as an underlying concern	Unemployment is not an underlying fact.
Inefficiency of the water network and the low level of economic status of the farmers as presuppositions	Income of farmers and some other stakeholders have grown by more than several times during the last decade.
Local participation and collective satisfaction as a prerequisite to solutions	Farmers were satisfied with the current income and did not want it to be changed. In fact, the disastrous situation was not believed to be their problem at all. So, no satisfaction or participation could be perceived due to conflict of interests.
Direct intervention of government justified due to the shared natural resources, No strict need to monitoring systems	Previous interventions regarding abandonment of cultivation of <i>water-guzzling crops</i> had been failed, mostly due to the lack of a monitoring system.
Generalisability of prospective solutions to other watersheds of the lake	Very low levels of generalisability due to the special nature of the region, such as lacking underground water and wells, being the focus of public interventions and funds and good economic status of farmers due to the crisis
Desirability and feasibility of a concrete step-by-step solution	Due to the wicked nature of the problem, multi-faceted solutions should be applied simultaneously to the problem, with a feedback and monitoring mechanism of the overall impact

3. A design case: Participatory learning ecosystem of Golbaf town

The second case, from which some evidences are provided to support the argument of the paper, is about the setup of a participatory learning ecosystem focused on learning by doing since 2016. This learning ecosystem has been part of a larger sustainable regional development programme in Golbaf town, Kerman province, Iran. Although the former case led us to the methodological concern of closed-off worlds, this was later investigated in this project to complement evidences.

Table 2 shows the instances, including worldviews and solutions, being closed-off in the mind of the researchers during the research and design in Golbaf town. For example, the first row indicates that initially, the researchers aimed at individuals having qualified characteristics of proactiveness, learnability, enthusiasm and having great societal concerns. But it was gradually elucidated that feeling of discrimination is a serious concern to achieve participation of the citizens. In fact, efficiency and quality should have been sacrificed by adopting a more formal, homogeneous and outsourced procedure with the approve of local government to not miss the engagement of the citizens. Such an important tacit knowledge, which could be a determining factor of success or failure of further similar projects, was not readily and explicitly available in the minds of the researchers and with no trace in the documented knowledge.

Table 2: Closed-off worldviews and solutions during designing learning ecosystem of Golbaf town

Presupposed worldviews (approaches) at the onset of the research, which gradually turned to be incorrect. But the change of mindset has not been documented and sometimes became forgotten	Related worldviews/ solutions closed-off during the research. But, the change of mindset has not been documented.
Qualification of individuals in characteristics of proactiveness, learnability, enthusiasm and having great societal concerns matters.	Feeling of discrimination among the locals is a strong moderator factor for success, such that it overrides targeted individual characteristics.
Selection of local teachers to act as nodes of local learning networks should be highly qualitatively, participatory and process-oriented.	Due to the above overriding principle of indiscrimination and the danger of losing support of the formal educational administration, local teacher selection was outsourced to the formal educational administration with a vague closed procedure.

Presupposed worldviews (approaches) at the onset of the research, which gradually turned to be incorrect. But the change of mindset has not been documented and sometimes became forgotten	Related worldviews/ solutions closed-off during the research. But, the change of mindset has not been documented.
Being funded by Resalat Bank should be voiced to acquire eligibility in view of locals regarding financial capabilities and transparency.	Bolding the bank as a funder turns the local expectations into a loan and funding system, which is contrary to the soul of the system in facilitating participatory learning by doing. So, it was decided
Gathering ideas of locals is good due to giving them self-confidence, promoting their capabilities.	Arisen from a mistrust, idea circulation events were soon labeled as stealing ideas without protecting the intellectual property rights of idea owners. Therefore, a new mechanism was set up to help them understand weaknesses and rawness of their development ideas instead of selecting winners having the best ideas.

4. Functions of explicit documentation of closed-off worlds

The two cases showed some examples of worldviews and solutions being gradually closed-off in the mind of researchers during a research. As it was shown, not documenting or not communicating the closing-off caused important tacit knowledge to be missed and to be miscommunicated with stakeholders. It should be noted that documenting and reporting closed-off worldviews and solutions, or the paths a research pave but which do not work, is not a scientific norm. To justify moving against the norm and also the costs and time associated with the implementation, there should be convincing advantageous functions attributable to documentation of closing-off and making it explicit and reported in researches. The following subsections name four main prospective functions for the proposed research strategy.

4.1 Training interventionist researchers

The two cases showed us that continuous documentation of closed-off worldviews and solutions help researchers to be a better interventionist researcher. It helped us to acquire a process-oriented view to the researches. Furthermore, we were able to better depart from the context and capture a second-order knowledge, i.e. knowledge of knowledge. Therefore, not only a researcher could analyse and publish the final results and his mindset at the end of a research, it could also gain a process-oriented second-order knowledge of the process of research. At least, as we experienced, such a new explicit form of negative knowledge (closed-off worlds) could help interviewers and interested researchers outside of the research process in accessing tacit knowledge.

4.2 Communication of gradual change of mind with stakeholders

The Urmia lake case depicted that how the worlds being gradually closed-off in the mind of researchers were not communicated to the employer and other stakeholders. This has caused a serious challenge and misunderstanding at the end of the project since employer has not yet closed off many solutions and worldviews in his mind. In fact, the suggested solutions were on the ground of many closed-off ones in the mind of researchers. But, the employer was not able to find those implicit linkages in his mind. So, a research strategy inclusive of closed-off worlds could help prevent such miscommunication and disagreement.

4.3 Preventing fragmentation of cognition phases and solution phases of research

The case of Urmia lake also illustrated that there was a fragmentation between the ethnography phase and the solution development phase. The fragmentation was partly caused by closing off many approaches and solutions to the problem on the ground of conclusive field observations. Actually, due to the wicked nature of the problem, the researchers were not able to prove the suggested solutions to the employer. But, they could confidently defend the closing-off of other solutions. In other words, the suggested solutions were viable solutions, not better ones. Such a function could be fulfilled based on the proposed research strategy, specially for wicked and complicated problems.

4.4 Preventing restudying closed-off worlds

By documenting and disseminating the closed-off worldviews and solutions during a research, future studies benefit from not consuming their time walking in a tested pathway. For example, the researchers may do not report the closing-off of the employment approach to the Urmia lake problem, but just report that monitorable

solutions within a water market are their conclusion. Then, further studies may restudy the employment option in a similar context that otherwise would not be done, and even may reach to a wrong conclusion.

5. Discussion and conclusion

The present paper tries to provide a complementary element to research strategies, i.e. making closed-off worlds explicit. By closing-off, it is meant the worldviews, approaches and solutions being gradually put aside in the mind of a researcher as tested but unworked pathways and approaches. This is totally different from silenced knowledge notion which usually refers to other modes of knowledge not currently being captured by the scientific society, e.x. practical knowledge and tacit knowledge in the mind of practitioners (Molander, 1992), and Mode 2 of knowledge (Nowotny et al., 2003). Of course, such a research strategy practically contributes to the idea of Mode 2 of Knowledge.

The two cases showed that there are important worldviews and solutions in the mind of researchers and stakeholders at the beginning of research projects which are gradually turned into unworked and are closed-off in minds. But such as closing-off is not documented anywhere nor disseminated due to scientific norms. The cases illustrated some shortcomings that may be covered by prospective functions of such research strategy, i.e. surfacing, documenting, communicating and disseminating implicitly closed-off worlds during a research. The four attributable functions include better training of interventionist researchers throughout researches, process-oriented communication with stakeholders of research, preventing fragmentation of cognition phases and solution phases of research, and preventing restudying closed-off worlds.

Currently, The Research Institute for Science, Technology and Industry Policy (RISTIP) is going to take journey on a plan of research design interwoven with knowledge management issues. While the plan is in general about devising a new mechanism of knowledge production, it specifically addresses weekly informal rapid documentation of closed-off worldviews and solutions by personal notes of researchers. How to communicate these in scholarly works, in best practices, in reports to employers and stakeholders and in media, and in what format, is our ongoing discussion. Future studies could address feasibility, resources needed, research designs empirically tested and their impacts to give a strong systematic voice to worlds and solutions gradually being closed off during researches.

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Mixed Research: What is at Interplay?

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Abstract: Scope of the paper: Choosing the right research methodology for a research project is critical and is not as easy as it seems. When selecting a research approach, it has been somehow taken for granted by most researchers that either qualitative or quantitative method should be used given the complexity that mixed methods offer. However, the complexity of today's world and the need to verify research results not just for the aim of generalizing results but for the purpose of providing tangible recommendations and policy measures, led many researchers to consider a combination of qualitative and quantitative research methods. Mixed research methods have been increasingly used in many disciplines particularly in social sciences and interdisciplinary research. Aim of the paper: The paper aims to provide a discussion of various types of mixed research; reasons for using mixed methods; instruments used; and the opportunities and challenges that these methods offer with special focus on triangulation. The discussion will include a reflection on an interdisciplinary study done related to university graduates integration within the labour market where triangulation was used as a research tool. Methodology/Research design: The research is descriptive and explanatory aiming to gain better insight on mixed methods in general and triangulation in particular.

Keywords: mixed research methods, triangulation, challenges, interdisciplinary studies

1. Introduction

To address a research question, a researcher has to define a clear research strategy, methodology and design. Research methodologies have been always known as being either qualitative aiming to understand the experiences and attitudes of people and to answer questions about “what”, “how”, or “why” or quantitative aiming to measure, quantify and generalize certain findings while answering “how many” or “how much” (Patton and Cochran, 2002). Qualitative and quantitative approaches have been differentiated based on the “type of data used (numbers or text); the logic employed (inductive or deductive); type of investigation (exploratory or confirmatory), the method of analysis (interpretive or statistical), the approach to explanation (variance theory or process theory), and the underlying paradigm (positivist or interpretive; rationalist or naturalistic)” (Bazeley, 2002). Understanding the other approach has been seen difficult somehow from the other side. Qualitative researchers regarded quantitative research as being simplistic, decontextualized, reductionist in terms of its generalization and fails to capture the meanings that actors attach to their lives. From the other hand, quantitative researchers regarded qualitative research as being too context specific, having unrepresentative samples and unjustified work from a generalization standpoint (Brannen, 2005).

Given that each method allows to understand reality from a different corner, many researchers have opted for mixed methods research or what is known as the third paradigm in research based on the rationale that combining qualitative and quantitative approaches provide better understanding of research problems than one approach alone (Creswell and Plano Clark, 2007). Accordingly, mixed methods research strategies are being increasingly used.

The paper discusses at a first stage various definitions proposed; reasons for using mixed methods; discussion of various types of mixed methods and some of the challenges encountered. It reflects in a final paragraph on one specific type – triangulation and provide a brief reflection on the use of triangulation in an interdisciplinary study done about university graduates integration within the labour market.

2. Mixed methods: A reflection on definitions

Mixed methods research refers to employing a research strategy adopting more than one type of research method (Brannen, 2005). It is mainly an approach to knowledge (theory and practice) which attempts to consider various viewpoints, perspectives and standpoints of both the qualitative and quantitative research (Johnson et al., 2007). It is often referred to as multi-strategy research (Bryman, 2001).

According to Tashakkori and Teddlie (1998), mixed methods or mixed models refers to research in which various approaches are applied at any stage or all stages throughout the research. Leech and Onwuegbuzie (2008) stated that mixed research involves collecting, analysing and interpreting quantitative and qualitative data in a study investigating the same phenomenon. As for Creswell and Plano Clark (2007), mixed research method is a

research design with philosophical expectations that guide data collection and analysis and the combination of qualitative and quantitative data in a single study or series of studies. Johnson et al. (2007), and after summarizing the perspectives from 31 “leaders” in the field, concluded that “mixed method research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration”.

Various authors provided definition of mixed methods yet one central element is common among all definitions and that is the use of both quantitative and qualitative approaches on one or more of the levels of epistemology, methodology and methods linking by that methods, methodologies and paradigms. However, it should be noted that using both qualitative and quantitative approaches in one study and one population does not mean that there is use of mixed methods.

When defining mixed methods, and according to Johnson et al. (2007), five aspects are to be considered. The first is what is being mixed; i.e. quantitative and qualitative research. The second is when and where the mixing is taking place (data collection, data analysis, data interpretation). Most of the definitions of mixed methods agree that mixing happens mainly at all levels. The third is the scope which lies on a continuum from those who defined mixed research as the collection of both quantitative and qualitative data to those who define it as involving mixing at all stages, etc. The fourth involves the “why” of mixing. The most common reasons for mixing have been identified as being: provide better and enhanced understanding and description; validate findings from another perspective; provide richer and useful answers to research questions. The fifth refers to the orientation of mixed methods. Some sees mixed methods as being a bottom-up approach where the research questions drive the mixed method approach while few regards it as a top-down approach driven by the researcher’s quest to conduct research rather than the research question.

Additionally, and according to Greene et al. (1989), five rationales are behind mixed methods. First, “triangulation” referring to convergence and corroboration of results from different approaches to research studying the same phenomenon. Second, “complementarity” looking to elaborate, enhance, clarify the results from one method with the results from the other. Third, “development” which refers to the use of the results of one method to help inform the other. Forth, “initiation” which refers to discovering contradictions allowing to reframe a research question. Fifth, “expansion” aiming to expand the range of inquiry by using different methods

3. Reasons behind mixed methods

Using mixed research methods have been seen as advantageous because each data collection methods have disadvantages. The use of multiple methods can neutralize some of the limitations of the other methods. Mixing different research approaches can strengthen the study (Green and Caracelli, 1997).

For Sieber (1973), combining qualitative and quantitative approaches to research can be effective at various levels: research design; data collection; and data analysis where one approach can assist the other respectively by providing needed representative sample members/ helping with conceptual development; providing baseline information/facilitating the data collection process; facilitating the generalization of qualitative data/clarifying; describing and validating quantitative results. Roosman and Wilson (1985) found that reasons to combine quantitative and qualitative research are mainly to enable confirmation of each approach through triangulation; to develop analysis leading to richer data; and to initiate new ways of thinking. Collins et al. (2006), on the other hand, advanced that mixed research allows participant enrichment (recruiting participant, engaging in activities, etc.); instrument fidelity (assessing the utility of instruments, creating new instruments); treatment integrity (assessing fidelity of intervention) and significance enhancement (facilitation richness of data; usefulness of findings, etc.).

Additionally and according to Brannen (2005), mixed methods research offers various opportunities. The first opportunity is seen at the level of skills enhancement. Brannen emphasises at this level that training at the level of research methodology and approaches is not similar to the practice and knowledge acquired from implementing such approaches. The second opportunity is seen at the level of lifelong learning reference training and experience. The third opportunity refers to the ability of thinking outside the box given that the attention with mixed research methods is somehow deflected away from theoretical work that is often specific

to certain disciplines. The fourth opportunity relates more to policies where mixed methods research allows “practical enquiry” answering by that to policy makers oppose to scientific research requires closer attention to methods used and types of data used in attaining conclusions.

4. Typologies of mixed methods

The four major types of mixed methods designs are triangulation design; embedded design; explanatory design and exploratory design (Creswell and Plano Clark, 2007; Creswell, 2006).

The triangulation design is the most known and popular design. It is a one-phase design known as “concurrent triangulation design” in which both qualitative and quantitative approaches are implemented at the same time with equal weight (Creswell, 2006). It refers to using both qualitative and quantitative approaches with the same weight by involving the concurrent but separate data collection and analysis of each type of data to better understand the research problem. The aim is to compare and contrast quantitative results with qualitative findings or validate quantitative data with qualitative data (Creswell, 2006) and to obtain different but complementary data on the same topic allowing better understanding of the research problem (Morse, 1991). It has four variants: the “convergence model” which is the traditional model of triangulation design; the “data transformation” where after the separate collection of each type of data, one data type is transformed into the other data type; the “validating quantitative data” where both types of data are collected within one survey instrument; and the “multilevel model” where different methods (quantitative and qualitative) are used and the findings from each level are merged together into one interpretation (Creswell, 2006). The main benefits of this design is that it makes sense to gather information from different sources whereas the main challenge is that it requires a considerable effort and expertise to put it all together (Almalki, 2016).

The embedded design, on the other hand, is also one single phase where one data sets provides secondary role in a study based essentially on the other data type. The rationale is that a single data set is not enough to answer all research questions. To answer a research question within a quantitative or qualitative study, the researcher includes qualitative or quantitative data. The mixing of different data sets is mainly done at the design level (Creswell, 2006). There are two variants of the embedded design: the “embedded experimental model” which is most commonly used where qualitative data is embedded within the quantitative, experimental design. The priority is for the quantitative, experimental approach (Creswell et al., 2003). The “correlational model” is where qualitative data is collected as part of the correlational study to help explain how the mechanism works in the correlational model. In this model, qualitative data are embedded in the quantitative design (Creswell, 2006). The main benefit of this design is that it requires less resources and less data making it easier for researchers to choose it; whereas the main challenge is the difficulty of integrating results (Almalki, 2016).

The explanatory design is a two phase mixed methods design where qualitative data is used to explain quantitative results. It starts with the collection and analysis of quantitative data followed by a collection and analysis of qualitative data where the biggest emphasis is put on quantitative methods. Two types of explanatory design are highlighted: the “follow-up explanation model” and the “participant selection model”. Both models starts with quantitative research followed by qualitative research yet each differ in the connection of the two approaches (Creswell, 2006). The former is when the researcher needs qualitative data to explain quantitative findings that need further clarification. The primary emphasis is on the quantitative aspects (Creswell et al., 2003). The latter is when the researcher needs quantitative data to identify participants for an in-depth qualitative phase. The emphasis is hence on the qualitative aspect (Creswell, 2006). The main benefit is that it is easily implemented whereas the main challenge lies in the selection of the participants in order to have reliable information (Almalki, 2016).

The exploratory design is a two-phase design where the result of the first approach (qualitative) can help inform and develop the second one (quantitative) (Greene et al., 1989). This design starts with the qualitative data to explore a phenomenon and then builds to a second on quantitative phase. The greater emphasis is hence on qualitative data (Creswell, 2006). The exploratory design has mainly two variants: the “instrument development model” where quantitative instrument is developed based on qualitative findings (Creswell, 2006); and the “taxonomy development model” where the initial qualitative stage is conducted to identify important variables; develop an emergent theory, etc. and the secondary quantitative stage tests the results in more details (Tashakkori and Teddlie, 1998). Quantitative research questions or hypotheses are hence based on qualitative findings (Morse, 1991). The main benefit of this design is that separate stages are easily implemented whereas

the challenge lies in the fact that it is time-consuming and participants might not be willing or able to participate (Almalki, 2016).

To these types three more types can be added: the “sequential transformative” where either quantitative is followed by qualitative or qualitative is followed by quantitative. Priority can be given to one method over the other or they can be equal. It is mainly done at the interpretation phase. The “concurrent nested” where there is concurrent collection of quantitative and qualitative data yet the priority is given to one method over the other. It is mainly done at the analysis level. The “concurrent transformative” where there is concurrent collection of quantitative and qualitative data. The priority is given to one method over the other or equal priority. It is mainly done at the analysis phase and can be implemented at the interpretation phase (Creswell et al., 2003).

When choosing a mixed method research, it is very important to consider the research problem, the researcher expertise in relation to quantitative and qualitative approaches, and availability of resources (time, funding resources, etc.) (Creswell, 2006). It is always recommended when working with mixed methods research to use one single design that best suits the research design.

Three aspects are to be considered when it comes to the choice of the mixed methods research: the timing, weighting and the mixing.

By “timing”, it is meant the sequence or implementation of various approaches (Greene et al., 1989). It refers to the order when data is used. Data can be used in a concurrent timing; i.e. both types of data are collected, analysed and interpreted at the same time; or in a sequential timing; i.e. data are collected, analysed and interpreted in two distinct phases (Morse, 1991).

By “weighting”, it is meant the priority accorded to each type of data (quantitative and qualitative) in answering to the study questions or what is known by “priority decision” (Morgan, 1998). Either the two methods are given an equal weight and in this case both plays equal role in addressing research problem or one method will have greater emphasis than the other method (Creswell, 2006). The choice of priority decision is based on the goals, research questions, use of procedures from research traditions and practical considerations (Morgan, 1998).

By “mixing” it is referred to how quantitative and qualitative methods are mixed. Using both methods in a research without mixing them does not refer to mixed methods research but it is rather a collection of multiple methods (Creswell, 2006). Three strategies can be identified for mixing data: merged, embedded or connected. “Merging data” is when the two data sets are explicitly integrated together either at the interpretation level or and the analysis level. “Embedding data” is when one data type is inserted into the other type. This takes place not just at the level of data but also at the level of the design. “Connecting the data” happens when one type of data leads to the need for the other type of data (Creswell, 2006).

The below table provides a summarized overview of the various mixed methods research types along with the variables of choice: timing, weighting and mixing.

Table 1: Type of mixed methods research (adapted from: Creswell, 2006)

Design type	Variants	Timing	Weighing	Mixing	Notation
Triangulation	Data transformation, convergence, multilevel, validating quantitative data.	Concurrent	Usually equal	Merge the data during the interpretation or analysis phase	QUAN + QUAL
Embedded	Embedded experimental, embedded correlational	Concurrent or sequential	Unequal	Embed one type of data within a larger design using the other type of data	QUAN (qual) or QUAL (quan)

Design type	Variants	Timing	Weighing	Mixing	Notation
Explanatory	Follow up explanations, participant selection	Sequential (quantitative followed by qualitative)	Usually quantitative	Connect the data between the two phases. It is mainly at the interpretation phase (Creswell et al., 2003)	QUAN → qual
Exploratory	Instrument development, taxonomy development	Sequential (qualitative followed by quantitative)	Usually qualitative	Connect the data between the two phases. It is mainly at the interpretation phase (Creswell et al., 2003)	QUAL → quan
Sequential Transformative	Allows the theoretical part of the researcher to guide the study and determine the order of data collection.	Sequential	Equal or Unequal	The results from both methods are integrated together at the end of the study during the interpretation phase	QUANT → QUAL or QUAL → QUANT
Concurrent Nested	The embedded approach is often addressing a different question than the primary research question.	Concurrent	Unequal	One phase of data collection in which priority is given to one approach that guides the project, while the other approach is nested into the project and provides a supporting role	QUANT + Qual or QUAL + Quant
Concurrent transformative	Guided by a theoretical perspective in the purpose or research question of the study	Concurrent	Equal or Unequal	This perspective guides all methodological choices and the purpose is to evaluate that perspective at different levels of analysis.	QUANT + QUAL Or QUANT + Qual Or QUAL + Quant

When discussing mixed methods research, Johnson et al. (2007) provides a kind of simplified schematization

Equal status is the centre of mixed methods research. This is where researchers self-identifies themselves as mixed methods researchers and believe that qualitative and quantitative data will add understandings to the studied phenomenon.

Qualitative dominant and quantitative dominant are other types of mixed methods research. In the first type, the researcher relies on the qualitative approach yet believes concurrently in the need to add quantitative data to gain more benefit from the research project. This is symbolised by QUAL + quant research. While the second

type is where the researcher relies on quantitative approach yet believes in the need and importance to add qualitative data and approach. This is symbolized by QUANT + qual research.

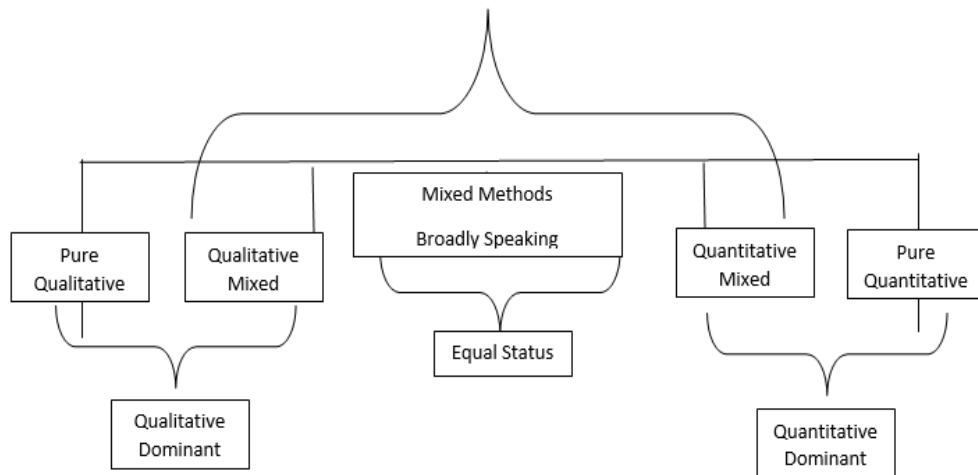


Figure 1: The three research paradigms (adapted from Johnson et al., 2007)

Morse (2003) provides more elaboration with regard to sequential and simultaneous designs. The dominant design is indicated in capital letters, simultaneity is indicated by a plus sign and sequencing by an arrow. He identifies six simultaneous designs: QUAL+ quan or QUAL + QUAN; QUAN + quan or QUAN + QUAN; QUAL + qual or QUAL + qual. As for the sequential designs; 12 designs are identified: QUAL > qual or qual > QUAL or QUAL > QUAL; QUAN > quan or quan > QUAN or QUAN > QUAN; QUAL > quan or qual > QUAN or QUAL > QUAN; QUAN > qual or quan > QUAL or QUAN > QUAL.

The most common design is quan > QUAL where less resources quantitative work is followed with highly resourced qualitative research. As for the less common design it is QUAN > qual where highly resourced quantitative research is followed by lower resourced qualitative research (check Brannen, 2005 for examples about these designs).

Brannen (2005) elaborated more on this particularly with regard to simultaneous and sequential designs. When setting the research design, there are three logics that need to be considered. The first one is the “logic of enquiry” driving the study (deductive aimed at testing hypotheses or inductive aimed at discovering certain phenomenon). The second one is the “logic of enquiry and the nature of the research question” that suggest the usefulness of mixed research methods. Here, the order of methods need to be considered (is it sequential or simultaneous; is there any preference with regard to the method to start with the enquiry, etc.). The third logic is how “dominant a particular method” is when it comes to the use of scarce resources.

5. Mixed methods research: Some of the challenges

When choosing mixed methods research, distinct challenges are faced. The most pressing challenge is deciding which type of mixed methods to use in a particular study and particularly deciding whether to give an equal priority to each method or have the research dominated by one approach (Johnson et al., 2007). A second challenge relates to the skills that a researcher might have. It is highly important for a researcher to be aware of the set of skills needed and whether they are able to cope with the demands of using mixed methods tools (Creswell and Plano Clark, 2011). Mixed methods research may pose a problem to the researcher to publish in particular if the journal is lineant towards particular type of methodology.

6. Triangulation

Triangulation has been often used a synonym for mixed methods research as it is the most known type of mixed methods. It has been defined as a “process of verification that increases validity by incorporating several viewpoints and methods” (Yeasmin and Rahman, 2012). It is “the combination of methodologies in the study of the same phenomenon” (Denzin, 1978 cited in: Johnson et al., 2007). Triangulation is mainly used when data are available; available from different sources, investigators, theories or methods. Triangulation should be particularly used, when data are available, when there are complex questions, poor quality data, divergent data, insufficient data, etc. The greater triangulation is, the greater is the confidence in the observed findings (*Ibid.*).

Various types of triangulation are identified: data triangulation (use a variety of source of study namely time, space and person); investigator triangulation (using different researchers in any stage of the research); theoretical triangulation (using multiple theories in the same study to explain the results; to support or negate findings); analysis triangulation (or data analysis triangulation – using more than two methods to analyse and validate the same set of data); and methodological triangulation (using various methods to study a research problem) (Husseini, 2009). At the level of methodological triangulation, two types have been distinguished: “within-method” triangulation and “between-methods” triangulation. The first one refers to using various approaches within the same paradigm and the other refers to using both quantitative and qualitative approaches. Within-method triangulation has been seen however with some limitations given that any weakness relevant to the paradigm used will still prevail regardless of the research design (Johnson et al., 2007; Denzin, 1978).

On the other hand, we distinguish between simultaneous and sequential triangulation (Morse, 1991). Sequential triangulation is used when the results of one method are essential for planning the next. Simultaneous triangulation refers to the concurrent use of qualitative and quantitative methods where there is limited interaction between the sources of data at the data collection stage, yet the findings complement one another at the data interpretation level (Morse, 1991).

In addition to corroboration, there are four other ways of combining results from different data analyses: “elaboration or expansion” where the use of one data type adds to the understanding being gained by another; “initiation” where the use of a first method initiate new research questions or hypotheses that can be investigated using different method; “complementarity” where each type of data enhances the other and where data analyses from the two methods are compared and generated in complementary insight to create a bigger picture; “contradictions” where qualitative and quantitative findings contradict. Exploring contradictions may lead to interrogation of the methods and to discount one method in favour of the other (Brannen, 2005).

Triangulation has variant interpretations. Triangulation is seen as “validity-checking” that is validating the interpretation of findings based on one approach by at least one another approach. This allows to reduce the chances of false conclusions and of overcoming the limitations that one approach might have (Hammersley, 2008). The second interpretation sees triangulation as “indefinite triangulation”. By that triangulation is seen as a way to generate different interpretations rather than checking the validity of data interpretations. The third interpretation sees triangulation as seeking “complementary information” where the combination of different research methods can help benefiting from the strength and minimizing the weaknesses and where the use of different methods can help compare the studied phenomenon from different perspectives. The final interpretation is where triangulation is seen as an “epistemological dialogue” where triangulation is used to enrich and complete knowledge rather than just validating results (*Ibid.*).

Bottom line, triangulation is mainly used for confirmation purposes. By that, it refers to the validation of qualitative results by quantitative studies or the validation of quantitative instruments when the phenomenon studied has little theoretical framework (Husseini, 2009).

Jick (1979) identified the following advantages of triangulation: it allows creativity particularly in collecting data; it provides more confidence about the results; it can lead to richer data; it can lead to integration of theories; and it can uncover limitations. On the other hand, the use of triangulation is not without challenges. The main challenge falls if the research is not well defined in terms of theory and concept, the result will not be satisfactory (Yeasmin and Rahman, 2012).

7. Triangulation as a tool to understand university students’ choices

In a socio-economic study done about students’ higher education choices (choice of programme and choice of higher education institutions) and the impact of these choices on the labour market integration in Lebanon, several factors were considered bearing in mind two main theories: the human capital theory and the glutting theory. Two main markets were considered that of higher education and labour market. Factors extended from age, gender, religion, family socio-economic background, parents and siblings education, social class, etc. The aims of the study were to answer to eight research questions divided into four themes and considering all needed perspectives from that of the student, to the higher education institutions to the labour market and the government. Additionally, six hypotheses were set each considering one aggregate pondering on the higher

education choices or labour market integration. The study in its nature was complex (Yeasmin and Rahman, 2012) given the variety of factors that it considered. Using one approach to research wasn't found to be of benefit to the aimed findings. To ensure more confidence in the interpretation of the findings and to gain better understanding of the Lebanese reality allowing to draw on policy and strategy recommendations for policy makers and higher education institutions (Brannen, 2005), the use of mixed methods research was seen as essential; particularly that of triangulation given that triangulation allows to validate quantitative data and it is a multilevel method suited for the studied case. The research design guided mainly this specific choice of mixed research methods type.

Both quantitative and qualitative methods were used concurrently. The study relied on both primary and secondary data to allow better understanding of the reality and interpretation of the findings. At the quantitative methods level, the main tool used for data collection was "survey". Two surveys were administrated: one for university students – to study the factors affecting their choices in terms of programme and institution; and the other for graduates – to study the period of integration within the labour market and difficulties encountered. At the qualitative methods level, in addition to statistical bulletins elaborated by official parties and official documentation, interviews were administrated and done with key stakeholders at the higher education market (ministry and higher education institutions).

Mixing of data took place at the interpretation level. Data were collected concurrently. Surveys and interviews were administrated within the same period. The survey data was entered into the SPSS. The qualitative data was analysed and codes were set and entered into a database. The two set of data were linked to allow better interpretation of the results.

The study didn't go without challenges. The main challenges were running the tools of two different methods concurrently particularly that the population size was big, and making sure that both methods are considered equally and well merged at the interpretation level.

8. Conclusion

Mixed methods are seen nowadays as essential for researchers to gain better insight on the phenomenon studied and to have better confidence in the results and findings proposed. Various types of mixed research methods are identified with three aspects to consider for each: the timing, weighting and mixing of the two methods. Choosing one type of mixed research method over the other is not of any easy task. It imposes several challenges to consider that extend from the expertise of the researcher in each of the methods to the research itself (i.e. the research design).

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Consumers Engagement Behaviour in Social Media: Do Different Brand Categories Matter?

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Abstract: Consumer engagement behaviour can differ with respect to brand-related content in social media and it can be evaluated as the result of successful brand communication. The positive and negative content created by consumers about brands in social media platforms is can be evaluated as part of company marketing communication. Our research aims to identify the differences between consumer engagement behaviour into different brand-related content in social media seeking positive impact on brand equity in different brand categories. We group consumer behaviour actions into three engagement levels (consuming, participating, and producing). The brand equity is defined by three dimensions such as awareness, associations and loyalty. We have applied moderation analysis seeking to identify the engaged consumer behaviour impact on brand equity in different brand categories. We explored the relationship between the hedonic and utilitarian style of brand posts and consumer sociability behaviour on Facebook brand pages grouped into eight brand categories such as clothing/footwear industry, supermarkets, information technology products, hospitality, architecture and engineering, personalities, places, institutions and organisations. Moderation analysis has confirmed ($p < 0.001$) positive interaction between consuming and loyalty variables when moderators are brand supermarket domains. In other cases, the interactions between brand engagement levels and brand equity dimensions were negative.

Keywords: consumer engagement behaviour, social media, brand equity, impact

1. Introduction

In recent years, a large number of practical and scientific studies seeks to analyze the phenomena of consumers engagement in social media (Barger, Peltier and Shultz, 2016). According to Oh, Roumani, Nwankpa & Hu (2017) there is a lack of studies that analyse the impact of consumer engagement behaviour on business. According Chevalier and Mayzlin (2006), negative ratings and reviews have a greater impact on sales than positive reviews. Phang, Zhang, Sutanto (2013) identified that increased consumers engagement in social media led to a favourable attitude toward consumption. Based on eMarketer (2015) statistics, in the United States, 9 companies of 10 with around 100 employees used social media for marketing purposes. But it still remains the question, what impact makes the consumers communication in the social media on brands.

The term engagement was at first analyzed in psychological sciences. Kahn (1990) was the first to use this term in the work environment to describe different employee roles and argued that consumers who receive support for their personal self-awareness tend to be more involved. However, Maslach, Schaufel and Leiter (2001) defined the engagement as a constant, positive, motivational state in the work environment.

Recent studies define the phenomenon of engagement as a process (Bowden, 2009), behaviour (van Doorn et al., 2010) or status (Brodie ir kt., 2011). Javornik and Mirelli (2013) define four trends of consumers engagement analysis: behavioural, multidimensional, psychological and social. It has been identified that behaviour consumer engagement perspective is used mostly in the social media context. Seeking to disclose the consumers engagement impact on brand equity, it was applied the behavioural perspective in this work as well.

2. The perspective of consumer engagement behaviour

The Van Doorn et al. (2010) offered consumer engagement behaviour perspective was used by Dolan, Conduit, Fahy, Goodman (2015), and Barger, Peltier, Schultz (2016). This perspective is closely related to the active role of consumers in social media (Kumar et al., 2010; Sashi, 2012).

Javornik and Mirelli (2013) state that the consumer engagement perspective includes a repurchase. Van Doorn et al. (2010) emphasize, that consumers engagement in social media goes beyond the transaction. According Kumar et al. (2010), consumer interaction with the company, regardless of whether it is moving towards a transaction or not, can be called consumer engagement.

The consumers engagement behavioural perspective include antecedents of engagement, consumers behaviour and consequences for companies, consumers (and companies). The types of engagement behaviours differ in the valence (van Doorn et al., 2010, Hollebeek & Chen, 2014). activity of contribution, engagement level (Malthouse et al., 2013; Muntinga et al., 2011; Dolan, Conduit, Fahy and Goodman, 2016).

According to Dolan et al. (2016) the concept “social media engagement behaviour” (SMEB) disclose consumers’ behaviour when the consumers are engaged in social media. Three types of the engagement are positive valence (van Doorn et al., 2010) and three of negative valence (Hollebeek & Chen, 2014). Positively valence engagement could be named as consuming, positive contribution and co-creation. Negatively valence engagement levels are detaching, negative contribution and co-destruction and disclose unfavourable brand-related behaviours during interactions (Hollebeek and Chen, 2014).

Barger, Peltier and Schultz (2016) also state that consumers behaviour in social media can be measured by their actions that consumers take on social media in response to brand-related content: commenting content, sharing content with others consumers and posting user-generated content.

Schivinski, Christodoulides and Dabrowski (2016) proposed consumers’ engagement levels such as consuming, contribution and creation. Consuming is the type of activities represents related to consumers who passively company and consumers related content. The contribution is the medium level of consumer activity, which reflects consumers' contribution to companies’ content through participation. Especially researchers pay a lot of attention to consumers such actions as "Like", share and comments. The creating dimension includes consumer creation of different types of content.

In social media consumers engagement behavioural perspective is disclosed trough active consumers role; it involves different consumer actions; it includes a permanent interaction between the consumers and the brand. In this paper, we analyze positive valence consumer engagement behaviour seeking to identify the positive impact on brand equity.

3. Consumers engagement behaviour impact on brand equity

According to Rios and Riquelme (2008), the brand equity dimensions used offline can be used in virtual space as well. Aaker (1991) suggests measuring the brand equity using such dimensions as awareness, association, perceived value, loyalty and other brand assets.

The analysis of 33 studies related to brand equity dimensions showed that the commonly used dimensions are awareness, associations and loyalty. Awareness is characterized by the depth and the breadth of awareness (Keller, 2003). Brand associations defined as thoughts of the consumer, that are directly and / or indirectly related to brand names: colours, sounds, feelings, smells, flavours, consumer situations, and etc. (Keller, 2003), while the loyalty of brand equity is the result of the brand knowledge, which is defined by awareness and image.

In social media, the brand equity is measured through consumer perceptions of the brand and a positive response to brand communication (Rios and Riquelme, 2008). Brand equity cannot be formed if consumers do not recognize and do not remember the particular brand and their associations (Rios and Riquelme, 2008).

4. Theoretical framework

There is a lack of studies seeking to identify the differences in consumer engagement behaviour on brand equity in different brand categories. Previous studies disclosed that there is the difference in consumer choice between two products by measuring the intention to buy or a preference for the focal brand in comparison with the no-name counterpart (Yoo, Donthu, Lee, 2000). Consumers communication in social media makes an impact on brand equity dimension as brand loyalty (Schivinski and Dąbrowski, 2013).

Schivinski et al. (2016) proposed consumers engagement behaviour into brand-related content scale but didn't provide any insights related with statistical significant differences between different brand categories. De Vries *et al.* (2012) used brand categories as controlled variables, seeking to identify the significant difference between such consumers’ behaviour as press of icon “Like” and comments. It was disclosed that there is no statistically significant difference between product categories, but the consumers’ engagement behaviour differ

in different brand categories. Consumers are susceptible to engage less in accessories brands compare to brands in other categories.

According to the mentioned factors, we make the assumption, that consumer engagement behaviour in social media can make an impact on brand equity dimensions and propose the following conceptual research model (see Figure 1).

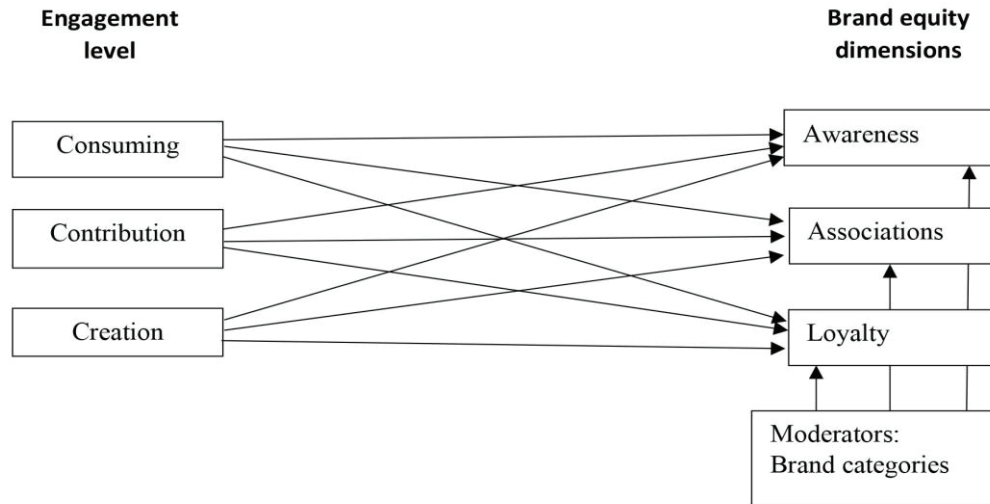


Figure 1: Conceptual research model

5. Methodology

In further analysis, we follow the general model for testing mediation and moderation effects, proposed by Fairchild and MacKinnon (2009). The moderation model tests whether the prediction of a dependent variable, Y , from an independent variable, X , differs across levels of a third variable, M .

Moderation effects are tested with multiple regression analysis. A single multilinear regression equation forms the basic moderation model:

$$Y = i_0 + \beta_1 X + \beta_2 M + \beta_3 XM + \varepsilon \quad (1)$$

here β_1 is the coefficient relating the independent variable, X , to the outcome, Y , β_2 is the coefficient relating the moderator variable, M , to the outcome Y , i_0 the intercept in the equation, and ε is the residual.

The regression coefficient for the interaction term, β_3 , provides an estimate of the moderation effect. If β_3 is statistically different from zero, there is significant moderation of the $X - Y$ relation in the data.

6. Data collection and measurement

The study used a quantitative method to explore the relationship between the consumes engagement levels and brand equity dimensions. The questionnaire link was available for eleven weeks from the 17 of July to the 30 of October of 2017 in different social media channels (i.e., Facebook, LinkedIn, Google+, Lithuanian forum Supermama.lt). The survey used a seven-item Likert scale ranging from "strongly disagree" to "strongly agree". All brands provided by the respondents were grouped into eight brand categories such as clothing/ footwear, supermarkets, information technologies, hospitality, architecture and engineering, personalities, places/organisations, online brands. It is worth's to mention, that according to the classification of economic activities of the Department of Statistics in Lithuania, the clothing/ footwear and supermarkets belongs to the same retail category. A total of 325 questionnaires were completed. The sample consisted of 52,5 % males and 47,2 % females. The biggest group of the respondents were young people, 67.4% were 18 to 24 years old. The other groups by the age were 16.5% were 25 to 35 years old, 7,5 % were 36-45 years old, 3,4 % were 46-55 years old, 3,7 % were younger than 18 years old and 1.6 % older than 55 years.

7. Results

In our analysis, we test the statistical significance of the following moderators and related variables (Table 1). The moderators are brand categories classified according to type of economic activity.

Table 1: Moderators and related variables

Hypothesis	Independent variable	Dependent variable	Moderator
H1	Consuming I read posts related to Brand X on social media sites	Awareness I easily recognize Brand X	Clothing and footwear industry
H2	Consuming I read fan pages related to Brand X on social media sites	Awareness I easily recognize Brand X	Clothing and footwear industry
H3	Contribution I initiate posts related to Brand X on social media sites	Awareness I can quickly recall the name of Brand X	Architecture and engineering industry
H4	Creation I write posts related to Brand X on blogs	Association X is an attractive Brand	Brands of education institutions, municipal authorities, places, NGO
H5	Contribution I initiate posts related to Brand X on social media sites	Association X is an interesting Brand	Brands of education institutions, municipal authorities, places, NGO
H6	Consuming I „Like“ posts related to Brand X	Loyalty I like to visit Brand X account in social media	Supermarkets
H7	Consuming I „Like“ pictures / graphics related to Brand X	Loyalty I like to visit Brand account in social media	Supermarkets
H8	Contribution I post pictures / graphics related to Brand X	Loyalty I like to visit Brand X account in social media	IT products

We assume the statistical significance $\alpha = 0.001$ and perform multilinear regression of responses Y on predictors X , M and XM (see Eq. 1). The results are presented in Figure 2. Note that the confidence limits of all interaction terms do not contain zero value. The interaction for hypothesis H6 and H7 is positive, while for other hypotheses it is negative. That means that, e.g., the followers of the Supermarket brands are more likely to visit the social account of the brand, if they pressed “Like” near the posts.

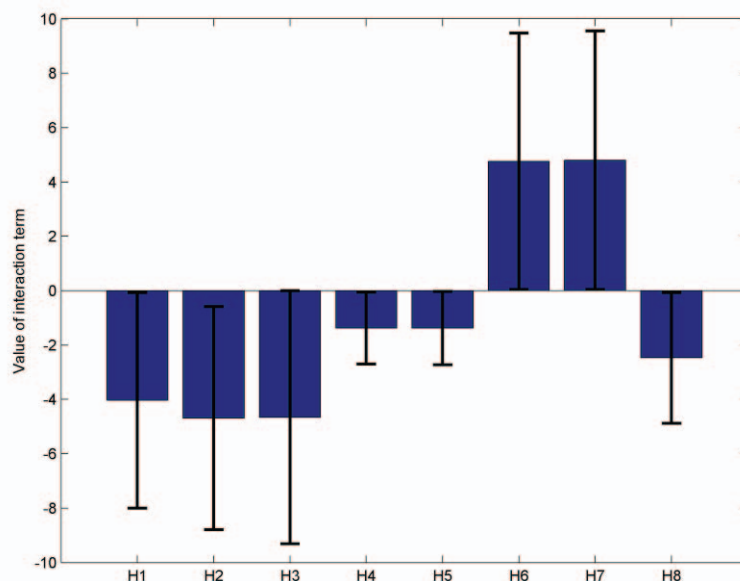


Figure 2: Interaction coefficient values (with $p=0.001$ confidence limits) of hypotheses H1-H8

Finally, we have evaluated the R2 value (coefficient of determination) of linear regression without moderation factor and with moderation factor. Moderation factor significantly increases the R2 value (see Figure 3)

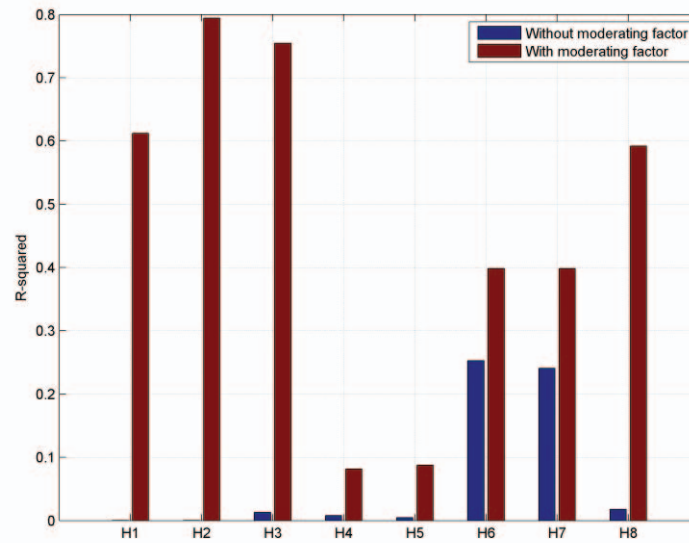


Figure 3: R2 values of regression without and with moderation factors

8. Discussion

Our results are consistent with findings of other authors, who have noted strong feelings of consumers about the supermarkets they patronize, and how it drives their loyalty beyond product purchase (Allaway et al., 2011). The phenomenon is known as 'brand love' and has a strong social role as one of its dimensions (Kang, 2015), while the use of social cues by retailers provides consumers with enhanced perceptions of human connection and the formation of emotional bonds (Wang, 2007). On the other hand, as it was already noted by Chaudhary (2018), the satisfied consumers are more affection towards hedonistic brands and symbolic utility brands rather than to the utilitarian ones, which also agrees well with our findings that show no positive interaction with the utilitarian-type of brands, such as clothing and footwear industry, or architecture and engineering industry.

9. Conclusion

In the context of social media, it is mostly used behaviour consumer engagement perspective, because this perspective discloses the active role of consumers; involve different consumer actions; includes a permanent interaction between the consumers and the brand. In this paper, we have analyzed the differences between consumer engagement behaviour into different brand-related content in social media. We grouped consumer behaviour actions into three engagement levels (consuming, participating, and producing), and defined three dimensions of brand equity as awareness, associations and loyalty. We have applied moderation analysis seeking to identify the engaged consumer behaviour impact on brand equity in different brand categories. The results of moderation analysis have confirmed statistically significant positive interaction between consuming and loyalty variables when moderators are brands from supermarket domains. In other cases, the interactions between brand engagement levels and brand equity dimensions were negative.

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PhD Research Papers

Native Narratives: Making Sense of Living in a Different Culture

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Abstract: This PhD exploratory, descriptive research, carried out in Finland, attempts to understand how non-white educated professionals, of African origin, make sense of living and working in Finland, in a culture distinct from that of their own. The research further investigates the impact of one's cultural identity on making sense of that experience. The methodology is inclusive and draws both on the conceptual roots of Narrative Analysis (NA) (Clandinin, 2007) and Interpretative Phenomenological Analysis (IPA) (Smith et al. 2012). Narrative Inquiry is located within the Deweyan ontology of experience (Dewey, 1938) and Interpretative Phenomenological Analysis (IPA) which draws its philosophical underpinnings from hermeneutics, a theory of interpretation. Both these approaches allow for an investigation into the two focal points of interest of this research: understanding and making sense of human experience (through the voices of the participants) and identity work. This research directly contributes to expanding knowledge within the postcolonial interrogative space, proposed by Jack et al. (2011) as well as Said's (1978) binary division between the West and East. Furthermore, the research gives voices to the subaltern, thus providing a deeper understanding of the meaning and the value of non-western cultural identities.

Keywords: cultural identity, experience, narrative analysis, interpretative phenomenological analysis

1. Introduction

According to Statistics Finland (2015), Finland's annual migration gain from abroad, between 2016 and 2065 will be 17,000 persons. This inevitable increase of the non-Finnish skilled labour force necessitates the re-evaluation of human resource management that fosters collaboration and cooperation among individuals with different cultural backgrounds. Therefore, the understanding of the value that different cultures bring to the host cultures is essential and remains "an unexplored dimension of organizational control" (Alvesson and Wilmott, 2002). This paper presents the findings of data analysis, undertaken as part of PhD research aimed at establishing an understanding how non-white educated professional, of African origin, make sense of living and working in Finland, in a culture distinct from that of their own. The research further investigates the impact of one's cultural identity on making sense of that experience.

2. Theoretical framework

The theoretical framework draws from critical theory (CT) and one of the philosophical approaches that stems from CT: postcolonial criticism. Postcolonial theory places emphasis on cultural identity being rooted in power and privilege (Said, 1978) where biological components (race, ethnicity, gender) confer privilege on some, thus making others marginalised. It sees cultural identity as hyphenated (Bhatia, 2002), temporal and in constant "double movement of containment and resistance" (Hall, 1993). Positioned within the narratives of the past (Hall, 1993), identity becomes diasporic (Bammer, 1998) and remains in constant dialectic entanglement of both one's indigenous roots and migratory routes (Clifford, 2001).

The research takes the theorisations of mimicry and ambivalence (Bhabha, 1984). It explores the processes and dynamics of identity and self-development drawing on a model proposed by McAdams & Cox (2010) which conceptualises the self across the life span.

3. Methodology

This research draws on the conceptual roots of narrative inquiry (NI) (Clandinin, 2007) located within the Deweyan ontology of experience (Dewey, 1938) and interpretative phenomenological analysis (IPA) which draws its philosophical underpinnings from hermeneutics, a theory of interpretation (Smith et al. 2012). Both these approaches allow for an investigation into the two focal points of interest of this research: understanding and making sense of human experience (through the voices of the participants) and identity work.

According to Smith et al. (2012) an ordinary experience becomes "an experience" of importance when a person reflects and attempts to make sense out of it. The experience, therefore can be understood via examination of the meanings that people make out of it. Further, Smith et al. (2012) posit that, when individuals face situations

in their lives that create experiences, the way these individuals make sense out of them can be influenced by many different and various aspects of understanding. Therefore, trying to interpret those understandings requires a holistic phenomenological approach to the analysis.

The focus of narrative inquiry is located not only in the individual’s experience, but also in the social, cultural and institutional narratives within which the individual’s experiences are constituted, shaped, expressed and enacted. The process of studying narratives involves listening, observing, living alongside another, writing and interpreting texts. For this study the researcher used the life-story interview, adapted from Atkinson (1998). The life-story interview approach lends itself to bringing forth the voice and spirit within a life-as-a-whole personal narrative, and is built on respect for the individual voice of the storyteller.

The qualitative rigor was ensured by adopting Gioia’s (2012) systematic inductive approach to concept development, where a first-order analysis adopted informant centric, in-vivo (Saldana, 1999) codes. The first level of analysis elicited emerging themes. In the next stage of the analysis super- and sub-ordinary themes were identified. To investigate story threads, the divided “I”, the address, language of the unsayable, and the signifiers of the unconscious the researcher used interpretive poetics (Rogers, 1999).

For the study, a purposive sample of four participants was selected. They were non-white male professionals, educated at a university level from Ghana, Kenya, and Nigeria, at the time of the interviews living and working in Finland. The average age of the participants was 48, and the average time spent in Finland was 15 years. The interviews (1.5-2 hours) were carried out between February 2016 and June 2016. All interviews took place in the participants’ homes, were tape-recorded and transcribed verbatim.

4. Findings and conclusions

The themes revealed in the interviews are located within the structure of McAdam’s (2010) three-layer theory of identity development. Table 1 shows five super-ordinate themes classified according to the cultural location of the participants.

Table 1: Super- and sub- ordinate themes

SUPER-ORDINATE THEMES				
HOME CULTURE (childhood and adolescence) ACTOR, AGENT		HOST CULTURE (adulthood) AUTHOR		
Education to BEING somebody	Strong sense of kinship and belonging	Alienation	Injustice	Sense of lost and dislocated self
SUB-ORDINATE THEMES				
Perseverance and hard work to achieve goals	Respect for familiar authority	Feeling of not being accepted	Feeling discriminated	Changing own behavior to fit in
Respect for leadership		Feeling of not being welcomed	No career development prospects	Attempts to adapt
Education prevented during colonial rule				Compromising own values

Table 2 shows the findings of the textual analysis of the narratives according to the components of interpretive poetics suggested by Rogers (1999).

Table 2: Interpretive poetics analysis

COMPONENTS	DEFINITION	EXAMPLES
<u>Story threads</u>	Identification of what is remembered, what emerges, what is not mentioned.	Very detailed descriptions of childhood memories in present tense Past returns in the stories of the present
<u>The divided “I” Form of address</u>	Acknowledgement that the subject’s discourse engages more than one voice, even if one pronoun construction is used. The address is closely related to the divided “I”. The narrator often addresses Other when telling stories.	WE when describing childhood memories in native countries THEY when referring to the native country in present tense YOU when referring to what was taught or expected of them US when referring to tribal and familial belonging

COMPONENTS	DEFINITION	EXAMPLES
		I when describing adult memories and experiences in Finland.
The unsayable	Examination of language of silence, language of negation, language of revision, and language of smokescreens	Paralinguistic utterances: long and short pauses, false starts and interruptions Repetitions of themes at different stages of life (broken chronology) Smokescreens Juxtapositions, such as freedom vs discipline and pressure of performing well at school, childhood education was fantastic vs inserting “big” pressure Comparisons between own culture to the western culture
Signifiers of the unconscious	Exploration of repeated words, sounds reoccurring in the narration gives clues of the unconscious.	<u>Concepts</u> : lack of security, lack of structures, things are not there, what is the next step for you, big pressure, transition, discontinuity, stop gap, something missing, something broken, <u>Adjectives</u> : unhealthy, hard, bad and difficult, tough, scary, challenging, fantastic, good, <u>Nouns</u> : fear, uncertainty, <u>Verbs</u> : have to, you don’t know, you have to work, you have to get there, appreciate <u>Opening and closing phrases</u> : What I remember... And that is how much I remember of her.

The analysis of the themes revealed that at the actor and agent stage (home culture) education was viewed by the participants’ parents as equivalent to achieving respected social status. This parental push towards hard study was triggered by inaccessibility of free education during their own formative years during colonial rule, when education was compulsory only for white children. Respect for parental authority developed strong sense of familial and community belonging.

The predominant themes identified during the author stage (host culture) were those of alienation, injustice and a consequent feeling of dislocation and loss of the sense of self. The feeling of alienation was triggered by the feeling of not being welcomed and accepted as an equal partner at work. This caused strong attempts to fit in, but at the cost of compromising own values. The values developed in the home cultures, during childhood were compromised or altered when clashed with the western cultural values. The participants tended to adjust or cloak their cultural values and substitute them with western values in order to fit in better in western societies and work environments. As a result, the sense of changing or losing one’s own sense of self (identity) set in. The narrative accounts reveal clear salience of colonial past.

The interpretive poetics analysis showed different positioning of close associations, or distancing depending on the time and place (*we* for collective memories of the past, *I* for their experiences in the host culture, *they* for the culture left behind). Adjectives used (negative depicting the present in the host culture and positive referring to the home culture) highlight the type of the experience.

Finally, the reoccurring stories of the past that break the chronology of the narratives suggest strong connection with the home culture and its impact on the present experiences in the host culture.

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Colliding the eye Tracking and Qualitative Methods in Assessing Online Consumer Behaviour

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Abstract: Interest in investigating consumer behavior from different perspectives and in different settings has increased. As we are living in the digitalized world, the important aspect of consumer behavior shifts to the digital platforms. Therefore, how customers response to online stimuli is the question to think about. The goal of this paper is to investigate the consumer behaviour online by applying the combination of eye tracking technology and qualitative research methods on a selected sample of university students. The controlled stimulus is the educational website. The emphasis is on the available measurements from both eye tracking data and interviews, their interconnection and interdependence. The overload of information a person receives in a day puts a pressure on creators of online and digital deliverables. We do know that human senses filter the information or visual elements, some of them reach the conscious and some of them remain unnoticed. Our study confirms that the value of eye tracking (ET) technology in explaining the consumer behaviour appears to be underestimated. Generally speaking, consumer neuroscience can significantly benefit research in the field of consumer behavior, particularly in the attempt to better understand human behavior in decision making processes. In particular, ET technology can help to the development of new products, including websites as well and adjust them to the needs of the targeted market. One of the greatest benefits of using eye tracking to improve the layout or the content on the website is that it does not involve asking or rating, but using. Moreover, considering its potential, there is a relatively small number of studies of ET but ET is already attracting the attention of marketers in areas not previously considered. In addition, our paper advocates that the deeper understanding of the ET results is achieved by applying other techniques, such as retrospective interviews. In a nutshell, we propose to digital marketers to use the combination of the eye movement measurement and the retrospective interviews when investigating the perceptions of the online content. The eye movements tell about individual's visual attention path, while the retrospective interviews let them re-live the experience.

Keywords: eye tracking, retrospective interviews, consumer behaviour, digital environment, attention, website experience

1. Introduction and the background

The amount of information a person receives nowadays goes beyond one's capacity. This overload puts a pressure on creators of online and digital deliverables. Humans filter the information and the filtering is very often related to something called competition for attention (CA), the theory that explains how objects compete to hit human's consciousness (Peschel and Orquin, 2013). This is not a surprising fact, as human senses take around 11 million bits of information every second (Pradeep, 2012). Considering the amount of the information that human receives, Ellesseily (2015) discuss that human brains get overwhelmed and therefore they do not work effectively. As she explains, this means that reducing cognitive load may be the key to reduce overwhelming even in the digital environment (Ellesseily, 2015). Consumers must have developed certain response scheme. Theorists have engaged in forming the consumer response models, both offline and online (Hanekom, Barker and Angelopulo, 2007). The traditional consumer response process starts with an exposure or cognitive level, but later studies advocate that the online consumer response commences with a pre-exposure level too (Hanekom et al, 2007). This one includes the research on visual attention. Visual attention is thoroughly examined by cognitive psychology and to process a visual scene, humans must move the attention in the visual field to track the visual information (Anderson, 2015). The visual information is the stimulus from the environment and various research fields are interested in the reaction to the different stimuli.

By observing a number of successive activities, it is possible to observe to what, to what extent a person pays attention to and what is selected; and the eye movements are one indicator of these (Bucher and Schumacher, 2006). Eye movements depend on attentional processes (Bucher and Schumacher, 2006). Nielsen and Pernice (2010) explain that everyone looks at the same direction with both eyes, so the eye tracker draws conclusions based on the average calculations of both eyes. An eye tracker collects data that allow conclusions about fixations and saccades of the eye on a given stimulus (Bucher and Schumacher, 2006).

The typical model of eye movements applied to the use of eye tracking consists of two basic concepts: fixations and saccades (Santos et al, 2015). The difference between fixations and saccades is in the behavior of the eyes. If the eyes are relatively stable and “pause on” a certain stimulus that is caught in the foveal region, the fixation occurs (Meißner and Oll, 2017). The most important measures related to fixations are the position of fixation, a number of fixation, total dwell time (how much time was spent in the areas of interest), or fixation duration. Fixation duration quantifies how long a participant’s eyes were still in a position when looking at a particular area and it generally ranges from 100 to 500 ms (Meißner and Oll, 2017). The saccade, in the other hand, includes a saccadic amplitude (saccade length) and saccadic velocity (speed of eye movements). Meißner and Oll (2017) further explain that during the saccade, a person is „blind“, because they represent rapid movements of the eyes between two consecutive fixations. Therefore, the information collecting and actual attention happens during a fixation and not during a saccade. Different combinations of fixations and saccades allow researchers to extract certain ET measurements which represent the visualization of eye movements. Some of the most used ones are hatmaps, gazeplots, areas of interest, gaze replays and other supporting measures, chosen based on the research aim and the desired outcome.

The visual impact of a website can have a significant influence on user experience and has significant implications for effective communication and delivering web-based communication message and its elements (van Schaik and Ling, 2008). Some examples of this kind of studies explored the displayed search behaviour both goal-directed and exploratory search. The overall conclusion was that looking at exploratory research routines can help explain variability in the attention people devote to a particular piece of information on a display (Janiszewski, 1998). Later on, the similar research design was applied to test whether competition for attention theory can explain users’ viewing behaviour on search result pages (Djamasbi, Hall-Phillips and Yang, 2013). However, the problem is that the characteristics of the online audience differ. They differ in many ways from the traditional consumer audience but also can differ among themselves (Hanekom et al, 2007). The latest marketing models that rely on Marketing 3.0 treat consumers as multi-dimensional human beings (Kotler, Kartajaya and Setiawan, 2010) and they are observed and analysed as they are. Supporting that, even despite all brain research, all we know about the individual minds is that minds are individual (Ornstein, 1991). Taking the online consumer characteristics into mind, different groups of online consumers might have different responses to the same online content or vice versa. However, we do not know much what are the differences between those online groups, especially when it comes to their online behavior. Therefore, this question is hard to answer only by looking at the eye movements.

1.1 Purpose of research

The value of eye tracking technology in explaining the consumer behaviour appears to be underestimated. In particular, eye tracking (ET) technology can help to develop new products, including websites as well and adjust them to the needs of the targeted market. As per dos Santos et al. (2015), ET can assist in developing communication strategy by understanding the visual behavior. One of the greatest benefits of using eye tracking to improve the layout or the content on the website is that it does not involve asking or rating, it involves using (Nielsen and Pernice, 2010). Considering its potential, there is a relatively small number of studies of eye tracking in consumer online behavior context, but eye tracking is already attracting the attention of marketers in areas not previously considered (Santos et al, 2015).

There are various benefits of using eye tracking method in consumer research, but it does not tell exactly why subjects position their eyes on the certain element and therefore they are often complemented with an additional question-based methods such as interviews (Leckner, 2012). Another disadvantage of the eye tracking that can be overcome by interview is the biases the participants look at the web page. Nielsen and Pernice (2010) explain that when customers are aware that facilitators are interested in the particular elements they might be much more careful than they would be if the page was just one out of many they happened on while navigating. The authors evaluated what is the best method to combine the eye tracking with to reduce and overcome these disadvantages. Moreover, the purpose is to suggest the right method in order to assist the dissertation research which this methodological paper is addressed to.

2. Objectives and research questions

The present study is a methodological paper that aims to show how the eye tracking cannot solely explain the online consumer behavior thoroughly and that it needs to be combined with other qualitative methods. In addition, the authors want to show that the combination of eye tracking and laddering interviews are the

optimal combination to understand the visual attention patterns and the preference towards certain content on the digital platform. The paper served as a methodology research for the dissertation work that required the optimal combination of research methods. The overall aim of the dissertation was to uncover the cognitive and emotional processes based on the consumers' visual attention in the online setting and to explain the deviation between potential exposure and the actual exposure to different types of content online: text and graphics (picture).

Therefore, the authors of the present paper conducted the pilot research prior the actual research for the dissertation to reveal the optimal combination of methods. Based on the stated objectives and the current state of the art in the consumer research with eye tracking area, the following research questions were posed:

- What is the relevant eye tracking measure for online consumer response research?
- Why is the eye tracking applicable in examining visual behavior in online consumer response?
- What are the disadvantages of the eye tracking method?
- What is the optimal combination of methods in examining the consumer visual behavior in digital settings for the dissertation goal?

3. Methodological and research approach

Initial research and the overall approach is exploratory in nature, as it does not include any hypothetical statements and it is rather qualitative. Its greater level of generality and the attempt to achieve insights in previously uncharted area (Bryman, 1989) gives it exploratory manner. Moreover, Bryman (1989) explains that in exploratory research investigator may be concerned to establish whether two or more variables are related, but may not have specific expectations about the nature of the relationship that those variables are likely to exhibit. First of all, the authors conducted a pilot eye tracking research. Furthermore, the eye tracking data were observed to understand which measures are available and what they mean in online consumer response model. Finally, the literature was examined to understand what the disadvantages of the eye tracking are and the ways to overcome them. As a result, the authors recommended the optimal complementary method to the eye tracking and come up with the novel methodological approach for the dissertation work.

3.1 Pilot experiment

The ET setup, instructions for the subjects and the procedure of the experiment for the data collection were tested on the individuals from the designated target groups (university students) in June 2017. The purpose of conducting a pilot study is to examine the feasibility of an approach that is intended to be used in a larger scale study (Leon, Davis and Kraemer, 2011). The term pilot study is used in two different ways in social science research: (1) feasibility study done on a smaller scale as a replica of the major study or as a pre-testing or 'trying out' of a particular research instrument (Van Teijlingen & Hundley, 2001). In general, the sample suggested for the eye tracking study is 30 people per group. Nielsen and Pernice (2010) suggest the minimum of 30 participants per the group of a matter in the eye tracking experiments. They explain that in order to create an effective heatmap for a given web page, they had to make sure to include eye tracking recordings from 30 users on that page (Nielsen & Pernice, 2010, p. 25). The eye tracking pioneers suggest that the sample size may vary, but the one way to overcome this is to follow canonical research in the research field and journals and follow the same number (Holmqvist et al., 2011). The dissertation goal was to examine 60 people from the population. According to Connelly (2008), extant literature suggests that a pilot study sample should be at least 10% of the sample projected for the larger parent study. Following that principle, the authors of the present study tested 7 people in the pilot study. Even though the number seem to be small, previous practice in eye tracking studies according to Nielsen and Pernice (2010) suggest that the heatmaps generated from two coherent groups obtain similar validity and reliability, despite the groups' size. The purpose of the pilot study was to articulate the design, method and procedure of the parent study, not to obtain the final results and make conclusions on the parent's study research question. Therefore, the authors accepted Connelly's (2008) suggestion of 10% pilot study sample size.

The sampling procedure was purposive and the participants were chosen from the personal contacts and networks. The purposive sampling in qualitative research allows small number of respondents. Qualitative inquiry typically focuses in depth on relatively small samples, even single cases ($n = 1$), selected purposefully (Patton, 1990). As the goal of the research was to observe the applicable methods for evaluating online

consumer response and research behavior in digital environment, the authors had to make sure to have internet savvy participants. Therefore, the chosen age cohorts were generation Y and generation Z, people born after 1980 that are perceived as internet and post-internet generations (Morton, 2002; Kleinschmit, 2015). Due to this reason, they were intentionally filtered by their age and contacted personally by researchers either face-to-face or via email.

Experiment Center 2™ was used for the design of the pilot experiment. The data was recorded with the iView X 2™ and analysed through BeGaze 2™. These are part of the eye tracking package, including eye tracking device SMI RED250 available in the HUME Lab at the Masaryk University.

Participants were comfortably seated at the desk, at a distance of approximately 60 centimeters from a computer display. There was no need for the chin rest- the setting needed to be as natural as possible. Subjects were also informed about the specific experiment tasks and procedure and given a Consent Form to sign. The experiment was designed following the diagnostic application of the eye tracking. Diagnostic role of an eye tracker means that the eye tracker provides objective and quantitative evidence of the user's visual and attentional processes (Duchowski, 2003). The participants in the present pilot experiment were asked to imagine a realistic situation. The imaginary setting was the regular day after work, where a person sits in front of the laptop to read and look at some content. The task was to read and explore the images in sequence until they see the message that indicates the experiment is over. The realistic tasks are important, because people may behave differently if they are passing through on the way to meet the goal, or check out the website for its own sake (Nielsen and Pernice, 2010).

As Van Teijlingen and Hundley (2001) conclude, one of the advantages of conducting a pilot study is that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated. These points, especially the last ones (methods and instruments), were in the focus of the present pilot study.

4. Analysis and discussion

Eye tracking data analysis for the present study is done in the SMI BeGaze™ software, which is the part of the Experiment Suite 360° (SMI Experiment Center™ and SMI BeGaze™) from SensoMotoric Instruments. The software is a platform for data collection, data measurement, and analysis. The pilot study allowed the evaluation of the available measures and how they can benefit the dissertation goals.

4.1 Eye tracking measures for attention research and its applicability

Eye Tracking (ET) seeks to associate visual attention with the cognitive and emotional responses of consumers (Santos et al, 2015). Zurawicki (2010) advocates that eye tracking technology can be applied to marketing in terms of evaluating how humans interact with computers, especially in the evaluation of web pages and online advertisements. It also can provide information on what is more relevant in terms of attention, by looking at the visual fixations. Different ET systems are able to estimate an eye's point of attachment on the computer screen and may determine precisely where the user attention is directed (Santos et al, 2015). Upon looking at the available measures obtained by the pilot study, the authors attempted to find the ones that may explain the visual attention. Thus, they come up with the set of measures that are beneficial:

- Areas of Interest (abbreviated as AOI);
- Fixations (number of fixations);
- The time that the person looked at the certain point or area (Fixation duration/length/time);
- The amount of the attention devoted to the area (Dwell time);

Areas of interest are widely used because they go beyond noticeability and show whether there was an interest in something and provides the researcher a way to measure and track attention. To obtain how much attention a call to action area (or other interesting areas) is able to maintain within the type of content (text and image), the number of fixation, fixation time and dwell time are suggested. AOI statistics can make eye-movement data easier to interpret and are used in multiple fields of research, such as user interaction, marketing research, and psychology (Hessels et al, 2016).

Eye tracking measurements are high in number, but the authors decided to use the aforementioned three in order to align it with goals and research questions of the parent study (dissertation). There are several reasons. The number of fixation is a very straightforward measurement. Normally, the differences in this number may indicate that an individual was not interested in elements with a low number of fixations compared to the ones with a high number (Bojko, 2013). In order to calculate the dwell time on an AOI (the time from when an area is entered to the time when it is exited), the eye tracker does not only generate the number of fixation but also the fixation duration, blinks and saccades that represent the time spent on things unrelated to the information processing (Bojko, 2013). Finally, the average fixation duration represents the measurement of cognitive processing and it usually ranges from 100 ms to half a second, with an average of 200-250 ms for reading and 280-330 ms for scene viewing (Bojko, 2013). To avoid confusion with dwell time, it is possible to conclude that the dwell time is an entire time spent looking at an area (all individual fixation durations), while the average fixation time is the sum of durations of fixations divided by the number of fixation in that particular AOI. The measures and their purposes are depicted in Table 1.

Table 1: Eye tracking measures used and their general interpretations

Eye tracking measure	Interpretation
Area of Interest (AOI)	Interest in an object/area and the field for attention maintenance
Number of fixations	Noticeability measurement
Dwell time	<i>Information processing; Existence and amount of interest</i>
Fixation duration/Average fixation duration	<i>Cognitive processing</i>

Source: Author (adapted from Bojko (2013))

The authors have also concluded that AOIs should be kept maximal (larger than the actual object), in order to include all fixations that belong to the object. This approach is suggested by Holmqvist and colleagues (2011).

Eye movements are tightly coupled with visual attention, which makes them valid indicators of the process (Wedel and Pieters, 2006). Moreover, the online consumer behaviour is in focus and the eye tracking can help defining the eye movements. The connection between the eye movement and behaviour hides behind the mind-eye hypothesis. Thanks to the mind-eye hypothesis, the eye movements can be interpreted and thus we can find out about the behaviour of the participants. The hypothesis states that what people are looking at and what they are thinking about tends to be the same (Nielsen and Pernice, 2010). It appears the people tend to look at the things they are thinking about because it is how the visual system works.

4.2 What is eye tracking missing and how to complement it?

The present experiment confirmed that even though the eye tracking method benefits for this type of research, it does not tell exactly why subjects position their eyes on the certain element and therefore they are often complemented with an additional question-based methods such as interviews (Leckner, 2012). Another disadvantage of the eye tracking is the biases the participants look at the web page. When customers are aware that facilitators are interested in the particular elements/ page they might be much more careful than they would be if the page was just one out of many they happened on while navigating (Nielsen and Pernice, 2010). Helle (2017) explains that crucial part of the perceptual process represents assigning meaning to what person sees. She also states that it has been argued that complex cognitive work tasks should be studied by integrating various sources of information, including eye movement data, when appropriate, with verbal reports (Helle, 2017).

Therefore, the authors noticed the chance to use retrospective interviews, more precisely laddering interviews as a type of verbal reports in the parent study research design. The need for qualitative research arose from the lack of previous research in the same setting and with the same sample. Another aspect is the need to describe the phenomena and as we are entering the questions of human behavior, using only quantitative method would not provide valid answers to the research questions. Generally speaking, the purpose of qualitative, interview-based research is to describe and clarify people's experiential life (Schultze and Avital, 2011), meaning to let them re-live the experience. One thing that distinguishes interview from other research approaches is the engagement and the real-life conversation. As Schultze & Avital (2011) explain, the participant and the

researcher engage into conversation aiming to generate deeply contextual, nuanced and authentic accounts of participants' outer and inner worlds (their experience and how they interpret it). Schultze and Avital (2011) argue that the structured interview methods (e.g. Critical Incidents, Repertory Grid, or Q-sort) in the information system (IS) research are not mutually exclusive. They furthermore highlight the three criteria that interview method should have so it generates rich data in the IS research (Schultze and Avital, 2011): (1) grounding in the participant's own experience, (2) acknowledging and valuing participants' reconstruction of their experience, and (3) providing the explicit framework as a guidance to participants through the interview to interpret their narrative. Following these criteria, the dissertation will choose laddering interview as a method, whilst leaning on the means-end chain theory in analysing decision making. Means-end chains (MEC) and the laddering technique as a way to measure them have been popular in consumer research for a long time already (Grunert and Grunert, 1995).

Retrospective laddering interviews should be conducted and serve as a secondary method. A laddering interview is very often considered as a part of the Repertory Grid method in IS (information systems). It includes a socio-cognitive lens to individuals, as well as organizational sense making which is influenced by individuals' perspectives (Tan and Hunter, 2002). Hinkle (2009) explains that Repertory Grid Interview (RGI) is applied when the goal of a study is to discover people's perceptions of products, systems, concepts or to establish comparisons between different stimuli. She also summarizes types of user perceptions that can be gathered using RGIs: acceptance of interface design through factors and social norms that are influencing it, websites perceptions, text types or design perspectives (Hinkle, 2009). Personal perspectives are personal constructs- internal ideas or theories about how the world works (Schultze and Avital, 2011). In this way, laddering technique represents the powerful way to gather rich data, because it provides the interviewer with the access to multiple layers of meaning behind participant's perception of the stimuli. Laddering is applied in gathering in-depth information about the constructs and contrasts generated during the interview. Some researchers used laddering either to collect more information regarding the construct and how it affects the stimuli or to confirm what the construct means to the participant (Young et al., 2005). Normally, a laddering interview consists of the two main phases: generating distinction between elements and laddering key distinctions to identify the participant's means-ends chain (Reynolds & Gutman, 1988). Aforementioned personal constructs comprise elements, constructs and links. Elements are subject to the scope of the investigation; Constructs are participant's interpretations of elements; and Links show how participants interpret elements relative to constructs (Schultze and Avital, 2011). The network of these, set up in a hierarchical order leads to the means-end chain. Means-end chain approach comes from the means-end chain theory that suggests that there are linkages between product attributes, consequences produced during consumption, and personal values of consumers on one hand, and decision-making processes on the other hand (Gutman, 1984). In other words, this theory explains how person's selection of a mean (product) is related and influenced by the end (personal constructs) and it should help him reach the desired state. Gutman (1984) further explains that the central aspect of the means-end chain model is that consumers choose actions that produce desired consequences and minimize undesired ones.

The conclusion in some past medical studies was that important insights can be gleaned by combining eye movements and a form of retrospective verbal reports (Helle, 2017). However, the authors suggest colliding the two approaches in online consumer behavior research. This is a rather novel combination of methods used to research the attention patterns of two generations and their memory capacities (storage of stimuli). Therefore, it represents one of the important contribution and strength of the further research. Moreover, to the best of authors' knowledge, there is no clear evidence of the combination of eye tracking and retrospective interviews in a research that compares online consumer response of two generations.

5. Conclusion and limitation

In conclusion, the current methodological study observed the disadvantages of the eye tracking method and how it can be complemented in order to provide the optimal insight into online consumer response. Based on the pilot eye tracking experiment and the research on the existing literature, the authors suggest that the optimal combination for the dissertation research is to combine the eye tracking measurements and the qualitative interviews. In a nutshell, the dissertation research should apply means- end chains and the soft laddering approach in designing the retrospective interviews based on the eye tracking data. The laddering requires questions about elements (stimuli, types of content), constructs (feelings and perceptions about the stimuli), and links and relationships among them. This will be achieved by posing "why" questions where

applicable and as deep as possible. Even though the laddering should not be strict, some authors suggest that even partial application of this method can yield valuable insights by stimulating the interviewee sense making capacity during the interview (Schultze and Avital, 2011). The combination of this particular technique with the eye tracking quantitative measures has not been recorded so far.

In the present research the quantitative value of eye tracking data is enriched with a qualitative value of retrospective interviews. Based on the previous research, it is valid to conclude that this concept is not new to the science of consumer behavior. However, the usage of laddering technique in constructing those questions give the glance into the thoughts and feelings, while at the same time providing the deeper understanding of numbers, heatmaps and fixations. An empirical research from 2010 explored the packaging attributes influence on purchase decision and collected data through eyetracking experiments and in-depth, semi-structured interviews (Housgard, Pytlík and Tzvetkova, 2010). A relatively recent study (Kumar, Maheshwari and Kumar, 2016) observed a case of a few Facebook pages of famous banks in India and performed a repertory grid interview to obtain customer preferences an eyetracking study, conducted using the keywords identified in phase one to understand the viewing patterns on Facebook pages of banking institutions. Kumar and colleagues (2016) advocate that this method provides factors that influence user acceptance of interface design. The combination of the two methods was also suggested by the research done taking repertory grid approach in researching perception of international web pages (Kačániová and Szabová, 2014). Kačániová and Szabová (2014) advocate that their research had important implications regarding the methodology itself, preferences research with further possibilities in marketing and advertising research. However, to overcome the limitations they would recommend to combine their proposed research plan with an eye tracking study. The online consumer response process (especially attention and memory) is explained through observing the physical movements of pupils and uncovering the psychological mindset through deep conversations. In conclusion, besides the novelty in the method combination, the present dissertation contributes to the methodological research by uncovering the potential of eye tracking and laddering combined.

There are few limitations of the research. The larger sample size may provide more insights into the advantages and disadvantages of the eye tracking method. Future studies should take this into consideration when conducting the pilot research. Furthermore, the research scope is limited to respond to the parent research (dissertation) goals so it was observing the combination of the methods for the online consumer response research. Future studies may test the same combination of methods in different research fields, e.g. online advertising, the perception of content or website design. The outcome of this paper can assist both theory and practice as a guide or a starting point in constructing the optimal method to assess consumer response and visual behavior.

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Interrogating Research Approaches in Business Management in South Africa: A Mixed Method Research

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Abstract: In South Africa, there seems to be an emphasis on quantitative approach as a method for conducting empirical research among business management scholars. Scepticism prevails when it comes to the use of mixed methods as a method for conducting business management research. This is evident in randomly sampled articles published in business management journals in South Africa showing what methods the researchers have used for the sampling, collection, presentation and analysis of data. While this paper is developed to fit the topic of the conference proceedings on 'Mixed Methods – a different approach?' it is also fitting for the main conference proceedings on "mixed methods". This paper interrogates methodological adoption and application of mixed methods in South African business management studies focusing on 45 articles published in 10 business management journals. The authors, therefore, looked at the extent to which these articles are showing preference towards the applying of either qualitative or quantitative methods instead of mixed methods approach in business management research projects as in itself a challenge for postgraduate and emerging researchers in the field. The quantitative approach with the adoption of a survey method fits the research question. Thus, how is the bias towards the qualitative and quantitative methods in the South African business management research enhancing the evidence of a lack in the teaching of mixed methods research approach as the different approach? This paper elaborate on the mixed methods literature, and then cross-examine the adoption challenges of sampling, collection, integrative presentation and analysis of data for mixed method application in published articles on business management research. The merits of this paper on mixed method approach is that it seeks to close the knowledge and teaching gaps in research and methodology whilst it is enhancing the combining of qualitative and qualitative approaches in business management sciences. While the principles of business scientific research remain the same mixing quantitative and qualitative methods is for purposes of illuminating the management research problems and variables. This paper recommends that in South Africa the teaching of mixed methods research approach at postgraduate business management students and practitioners greatly require attention.

Keywords: mixed methods, quantitative approach, qualitative methods, business management

1. Introduction

Research literature discusses mixed method approach extensively. This is in view of researches that utilise methodological integration as giving improved comprehension of research problems and research questions (Creswell, 2014; Denscombe, 2016). Qualitative is a series of data collection and analysis processes leading into an interpretation and understanding or an explanation of the situations or people that the researcher is investigating based on interpretive philosophy (Onwuegbuzie and Leech, 2007). Quantitative is the impartial measurements, mathematical and statistical tests, and numerical data collection and analysis through surveys or polls' questionnaires (Babbie, 2010). Mixed methods research approach is a methodology that involves the combining of qualitative and quantitative data collection, analysing and integration (Creswell, 2014; Denscombe, 2016).

This paper is developing from a PhD thesis chapter on Research Methods (Madondo, 2017). It navigates the methodological scepticism of adopting and applying mixed methods in articles published on South African business management studies in academic journals. Business management studies in South Africa lack in taking on mixed methods approach. Therefore, it is looking at the extent to which business management researchers and writers prefer applying either qualitative or quantitative research approach to the application of mixed methods. Thus, the object of this paper is the lack of prevalent use of mixed methods approach in management research. It begins by reviewing mixed methods literature on challenges about this approach. It outlines challenges with sampling and data collection, analysis and interpretation. It explains the methodology and presentation of results. The discussion focuses on why this paper. Conclusion elaborate on the mixed methods and the way in which this approach is applicable in business management in South Africa.

2. Literature review

2.1 Mixed method research challenges

Business management articles are generally from studies that have used either quantitative or qualitative methods, or even combined both (Schmidt and Hunter, 1997). Dumay (2009) has established that for “many researchers questions about quantitative analysis are centred on Big Data sets. In other words, big data requires quantitative analysis. However, the big data sets argument remain philosophical (Dumay, 2009). Combining both quantitative and qualitative methods hardly prevails as common knowledge about mixed methods approach. Available scholarly knowledge about mixed methods approach denotes challenges and problems with sampling and collecting, analysing of data, interpretation and continuum (Schmidt and Hunter, 1997; Creswell, 2014). Such challenges and problem are better resolved in discussions around the types of mixed methods designs (Dumay, 2009; Creswell and Plano Clark, 2011; Creswell, 2014). which require a, rather than investigating a single phenomenon, that lends itself to an interpretive study. In essence there is a continuum, which is not necessarily philosophical, but practical.”

2.1.1 Challenge of sampling and collecting data

For instance, researchers have preference of using sample sizes that are too small to identify differences that are statistically different (Schmidt and Hunter, 1997). Representation in a mixed methods study is a challenge because, on the one hand the quantitative researchers encounter complications when it comes to seizing experiences through their social texts, and on the other hand the qualitative researchers will have problems with working with and understanding experimental data sources (Denzin and Lincoln, 2005; Onwuegbuzie, 2007; Creswell, 2014). Scholars establish that in the mixed methods sampling problem (representation) a researcher is frequently strengthened when quantitative and qualitative components of research convey own unique challenges to the study (Collins, Onwuegbuzie and Jiao, 2007; Onwuegbuzie, 2007; Creswell, 2014). Thus, sampling designs are adopted according to each study’s orientation components and according to “the relationship of the quantitative and the qualitative samples” (Collins et al., 2007, p.267). In respect of this view, a researcher requires to know that each type of mixed method design determine the type of sampling design (Collins et al., 2007; Creswell, 2014).

Another challenge with mixed method sampling design relates to rationality and legitimation (Collins et al., 2007; Onwuegbuzie, 2007). The significance of the legitimacy of quantitative and qualitative research sampling designs are well documented and recognised in business management research works, and this includes content, construct and criterion related validity, as well as external and internal validity (Welman and Kruger, 1999). However, the legitimacy of qualitative research sampling remains contentious even although prominent research scholars have over decades remained resolute in their theorisation of the dependability, transferability, credibility as well as the ability to be confirmed (Lincoln and Guba, 1985; Denzin and Lincoln, 2005). This legitimacy challenge is intense with mixed methods sampling designs as compared to when a researcher has opted for using either qualitative or quantitative sampling design only. Onwuegbuzie and Johnson (2006) view this challenge, as the researcher’s struggle to get his /her findings to be believable and trustworthy, as well as those inferences are confirmable, transferable and dependable.

Further, mixed methods sampling challenge relates to the amalgamation or integration issue (Collins et al., 2007; Onwuegbuzie, 2007). According to Collins et al., (2007) integration challenge requires that when mixed methods researchers are working with quantitative data coming from a large and random sample and with qualitative data from relatively small and purposive sample, they should question themselves how appropriate triangulation is, how suitable expanding is, how comparing fitting is, and how correct consolidating is. In short, researchers should be able to ask themselves how much effort one should put onto the quantitative data component as compared to the qualitative data component (Collins et al., 2007).

The fusing of quantitative and qualitative research approaches brings about the fourth challenge of mixed methods research namely politics (Collins et al., 2007). A challenge of politics concerns the conflicts, the inconsistencies and the difficulties to convince from the data sets and the findings of a mixed method study (Collins et al., 2007). Clashes happen when a single study employs diverse activities for the quantitative component and for the qualitative part (Collins et al., 2007). Inconsistencies tend to occur when researchers adopt and employ two research methods comparatively and claim that as mixed methods. In addition to the

conflict and inconsistencies, it is the challenge to convince the users and beneficiaries of the mixed methods study. That is, it may be difficult for decision-makers and stakeholders to merit the mixed methods study findings.

2.1.2 Challenge of analyses

Data analyses remain a difficulty methods issue for emerging mixed methods researchers (Bazeley and Kemp, 2012). In other words, the researchers' various manner of thinking and writing up on a research problem should lead to increased integrity and conviction in the interpretation. Mixed methods research scholars convince the mixed method researchers that integration analyses should be effective even though integration is understudied, undertheorized and underutilised (Greene, 2007; Bryman, 2008; Bazeley and Kemp, 2012).

Analysis is a method issue is at componential and rationale level of the mixed method study. For instance, Bazeley and Kemp (2012, p.56) state, "we have become aware of the lack of integration in the analysis presented in a very large proportion of articles reporting that used mixed methods". In many such articles mixed methods researchers show tendencies of keeping to "a clear demarcation between qualitative and quantitative methods or approaches to research" (Bazeley and Kemp, 2012, p.56). This is challenge for researchers because they can hardly achieve 1) a common purpose to unite types of data; 2) interdependence of methods, types of data and strategies to reach the intended goal, and; 3) a sum greater than the parts (Bazeley and Kemp, 2012, p.56). Bazeley and Kemp (2012, p.56) further argue that "lack of integration is problematic, for example, in studies where greater understanding or more valid results might have been obtained if all types of available data had been considered together". Often times researcher fall short in considering together all forms of data obtained. The researchers tend to delineate types of data in compartmentalised manner. According to Bazeley and Kemp (2012, p.56) this shows that "the level of integration practiced in many mixed methods studies remains underdeveloped". When different data sources and results are formulated, it is simply a multimethod approach rather than a mixed methods approach (Bazeley and Kemp, 2012). Integration analyses are at the core of mixed methods research approach that result in valid interpretation with findings that users can value (Bazeley and Kemp, 2012).

2.1.3 Interpretation and integration challenges

Novice mixed methods researchers exploring a quantitative-qualitative research problem struggle with interpretation and integration as methods issues. Since mixed methods research practice can be "framed by a whole variety of practical issues and demands" (Denscombe, 2008, p.280) fusing elements of quantitative and qualitative methodologies is predisposed to explanatory disintegration and unpredictability (Ivankova et al. 2006; Denscombe, 2008). This is exactly the challenge emerging researchers "using mixed methods research for a variety of purposes and combining the quantitative and qualitative elements in differing ways" have to face (Denscombe, 2008, p.280). A challenge is always consistency in interpretation and integration methodologies concerning thinking through, explaining and action out the research problem using the research data and results.

Denzin (2012) establishes that when it comes to explaining, thinking and action the meaning for a mixed methods research problem emerging researchers always find it hard to differentiate between "a theory of truth" and a method of interpretation vis-à-vis methodology. Researchers always stumble over concepts and eventually give less meaning to the thinking, explaining and action to the research problem of a study in order to meet the "a theory of truth" (Denzin, 2012). This does not support the "interpretive communities" of mixed methods research (Denzin, 2012). In mixed methods research practice interpretation should show proficiency and erudite in explaining any theory of truth given to a particular research problem (Denzin, 2012).

Moreover, mixed methods research interpretation and integration methodologies draws on pragmatist philosophical foundation for the research. Denscombe (2008, p.273) explains that pragmatism triggers mixed method research practice using four features namely "fusion of approaches, third alternative, new orthodoxy, and expedient". This way, interpretation and integration methodologies as a completely new way of working out the "truth" for a research problem it is required that the researchers conveniently combine quantitative and qualitative methods of understanding and clarifying research data and result. Denzin (2012) proposes that the mixed methods qualitative inquiry community, for example investigating on social justice problem, requires a new narrative form, which "does not confuse pragmatism for triangulation, and triangulation for mixed methods research". In a mixed methods research practice interpretation and integration pragmatism is about the communities of practice, a collective and social activity where acquisition of knowledge, understanding and

clarifying data and the learning have social and communal features to it (Denscombe, 2008; Denzin, 2012). In the discussion on the use of a critical research perspective in the field of Intellectual Capital (IC) practice, Dumay (2009) argues for investigating a single phenomenon, which lends itself to an interpretive study which naturally has continuum and is practical. In the author’s view, IC as a single phenomenon to be studied, is an example where big data sets are not so much issue, but the interpretive and integration thinking behind the study is key and has to be practical (Dumay, 2009).

For example, in view of a study seeking to change the world for social justice purposes, Denzen (2012) introduces the concept ‘interpretive methodological bricolage’. This is a view that a mixed methods research practice is an interactive process and a creation from a diverse range of available contextual views and theories of truth of the researched communities (Denzen, 2012). Therefore, the product of mixed methods interpretive methodology is to make visible “a set of fluid, interconnected images and representations ... the murky, tragic facts of history” (Denzin, 2012, p.86). This is interactive process is presented and discussed as made possible by mixed methods sequential designs (Creswell et al. 2003). Creswell et al. (2003) explain “in the mixed-methods sequential designs, the quantitative and qualitative phases are connected ... In the sequential explanatory design, a researcher typically connects the two phases while selecting the participants for the qualitative follow-up analysis based on the quantitative results from the first phase”. In a study the quantitative and qualitative approaches are fused “at the study design stage by introducing both quantitative and qualitative research questions and integrated the results from the quantitative and qualitative phases during the interpretation of the outcomes of the entire study” (Ivankova et al. 2006, p.11). In order to answer the quant-qual questions and to achieve a robust and meaningful image of the research problem interpretation and integration methods should run across the phases of a study (Ivankova et al. 2006; Dumay, 2009).

3. Methodology

The quantitative approach was used adopting survey method to fit the research question, how is the bias towards the qualitative and quantitative methods in the South African business management research enhancing the evidence of a lack in the teaching of mixed methods research approach as the different approach? Thus, focusing on analysing research articles published on South African business management studies this paper applied a quantifiable survey. This achieved establishing the prevalent utilisation of research procedures and methods, as well as the sampling, types of measurements and information collection and analysis in papers. Thus this paper used a quantitative enquiry of 45 articles identified from 10 journals and articles focus on business management studies in South Africa showing that the use of quantitative methods, or alternatively qualitative, is more favourable than the use of mixed methods. Using Microsoft Excel logical evaluation tests to analyse and evaluate direct methodological choices as presented in articles in view of arguing for the inadequacy use of mixed methods approach to research. Articles were selected purposefully using Sabinet online web <https://journals.co.za/content/publications> which hubs various accredited journals through the access provided by the University of KwaZulu-Natal - Pietermaritzburg Campus’ online library system.

4. Results

A simple logical test was run in Excel = $C2 > D2 > E2$. In this case, C2 is qualitative, D2 is quantitative, and E2 is both qualitative and quantitative. This generated the Table 1 below.

Table 1: Presentation of data (Source: Authors)

Journal	No of Articles	Qualitative	Quantitative	Both Qual & Quan	Difference	Deployment
1	6	1	5	0	4	6
2	3	0	3	0	3	3
3	6	2	3	1	1	5
4	6	0	4	0	4	4
5	3	2	0	1	-2	2
6	5	1	4	0	3	5
7	4	1	2	1	1	3
8	6	0	4	2	0	4
9	4	1	3	0	0	4
10	2	0	2	0	2	2
Totals	45	8	30	5	16	38

Table 1 shows that between the use of the qualitative and quantitative is at 16. Examined together the deployment of qualitative and quantitative is at 38. Logically, the Figure 1 clarifies this result showing that 12% of examined articles employ qualitative and quantitative methods, 18% use qualitative methods only and 70% use quantitative methods only.

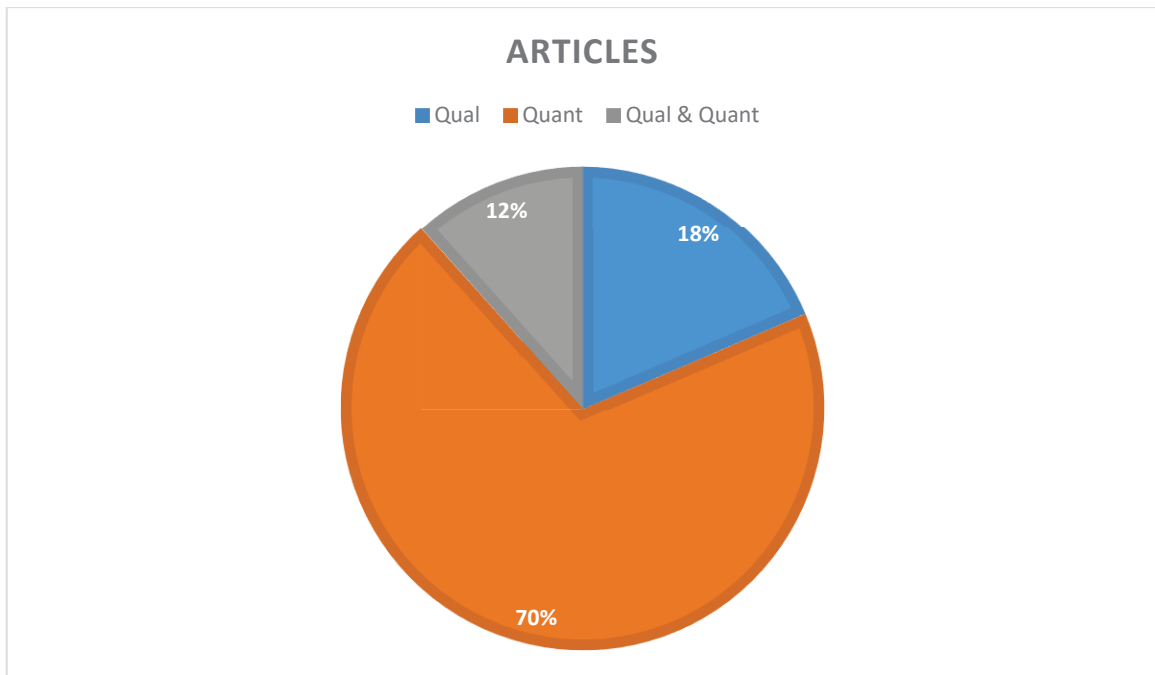


Figure 1: Distribution of methodological preferences (Source: Authors)

Figure 1 is the extent of methodological preferences by scholars in their studies. Having run XY sketch value analysis in Excel test and plot the existence of bias and scepticism of using mixed methods. Point A in Figure 2 demonstrate a higher level in numbers articles that do not show preference for the mixed methods.

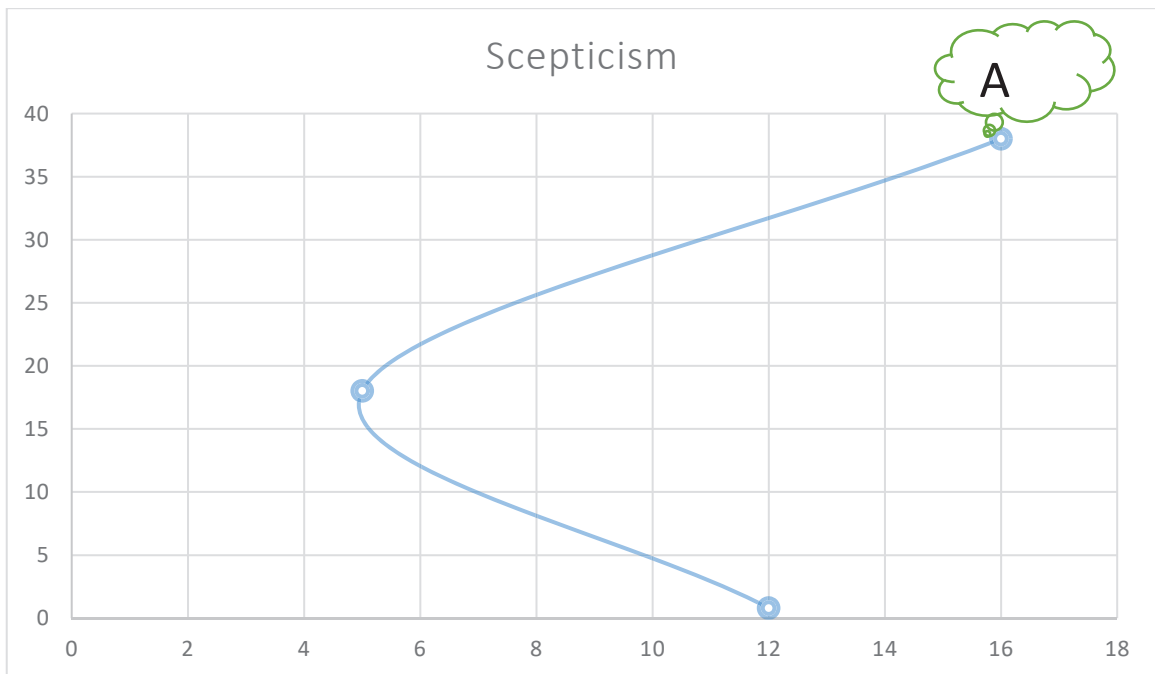


Figure 2: Existence of bias and scepticism of mixed methods approach (Source: Authors)

There is evidence for methodological preference bias towards using quantitative and/or qualitative alone. Related to this bias, it is the existence of scepticism for adopting and applying mixed methods.

5. Discussion: Why this paper?

This paper aimed at inspiring and extending on knowledge power in mixed method approach as developed by ongoing research and methodology studies scholars such as Collins et al. (2006) and Creswell (2014). Results obtained from systematically explored articles on business management studies predict that in South Africa researchers generally prefer the quantitative and qualitative methodological adoption and implementation.

Research areas in business management fields in South Africa are fashioned by uncertain issues or research problems. Results in this paper suggest that researchers and writers prefer monolithic approach to uncertain research problems of a study. Now looking at many young and emerging scholars in southern Africa region this paper argues that a preference for monolithic approach is a challenge for them to embrace the mixed methods research approaches. A proposal is towards the adoption and expanding a mixed methods research methodological scope that stimulates a move away from monomythic approach to studies in South African business management issues.

Learning from literature build-up on mixed methods approach, emerging scholars and postgraduate researchers of business management greatly need to close the existing methodological gaps and biases. In view of the research question, how the South African business management research articles published in the peer reviewed journal are methodologically adopting and applying the mixed methods approach, this paper demonstrates with a study conducted in Zimbabwe on the imperatives of endogenous small and medium entrepreneurship (Madondo, 2017). Central to this study was seeking to understand what entrepreneurs do practically to survive business and economic downturn and why they are doing that (Madondo, 2017). Thus motivated by the fact that adopting and applying mixed methods research is becoming a prevalent worldwide practice for many different areas and fields of studies, Madondo (2017) required to collect and analyse the entrepreneurial economic reward data and the personality attribute data together. The results from this study show that, it is possible to realign qualitative and quantitative methodological aspects that warrant an argument for mixed methods in South Africa (Madondo, 2017). In this Madondo's (2017) study, methodological significance of mixed methods is in joining qualitative component and quantitative component methods in an explanatory sequential design (Creswell, 2003; Tashakkori and Teddlie, 2003; Leech and Onwuegbuzie, 2009; Creswell, 2014; Madondo, 2017). Actually, this methodological application confirms arguments that purport mixed methods to be more effective in drawing on the strengths of both qualitative and quantitative research methods. A study combined the two methods and obtained the results that enhanced the comprehension of the topic: *Imperatives for endogenous small and medium enterprises in Mvuma* (Tashakkori and Teddlie, 2010; Madondo, 2017).

Figure 3 demonstrate the choice and application of explanatory sequential mixed methods research design as it was adopted in a study of *Imperatives for endogenous small and medium enterprises in Mvuma*. Initial quantitative data results (numeric) were explained with the qualitative data. It is sequential because the initial quantitative phase was followed by the qualitative phase (Madondo, 2017). Quantitative survey data gathered from rigorously random selected 50 individual entrepreneur participants and were analysed (Madondo, 2017). Qualitative data were gathered from purposefully selected 15 entrepreneur participants for the face-to-face interviews and the focus group interviews (Madondo, 2017). The visual data sources (survey and interviews) were drawn into an integrative dialogue to generate diverse facts and information for interpretive consistency about imperatives for endogenous small and medium entrepreneurship in Mvuma, Zimbabwe (Madondo, 2017). In this study, it is argued that explanatory sequential mixed methods have been methodologically appropriate because it applied integrative-interpretive analysis process in the unearthing of knowledge and truth about how small and medium entrepreneurship is endogenous. Thus, by methodologically performing descriptive and discriminant function analysis for the quantitative phase and textual-interpretive analysis for the qualitative phase of the study (Spencer *et al.*, 2003; Ivankova *et al.*, 2006; Creswell, 2014; Terre Blanche *et al.*, 2006; Madondo, 2017) the study draw out conclusions on the research problem under study. This integrative methodological analysis refined the quality of research results and findings that motivation, social ingenuity, human capital and resilience are the imperatives for endogenous SMEs in Mvuma. This discussion suggests that methodological variety gives improved data quality and results than a merely single approach and mono-methods (Creswell, 2003; Leech and Onwuegbuzie, 2009; Creswell, 2014).

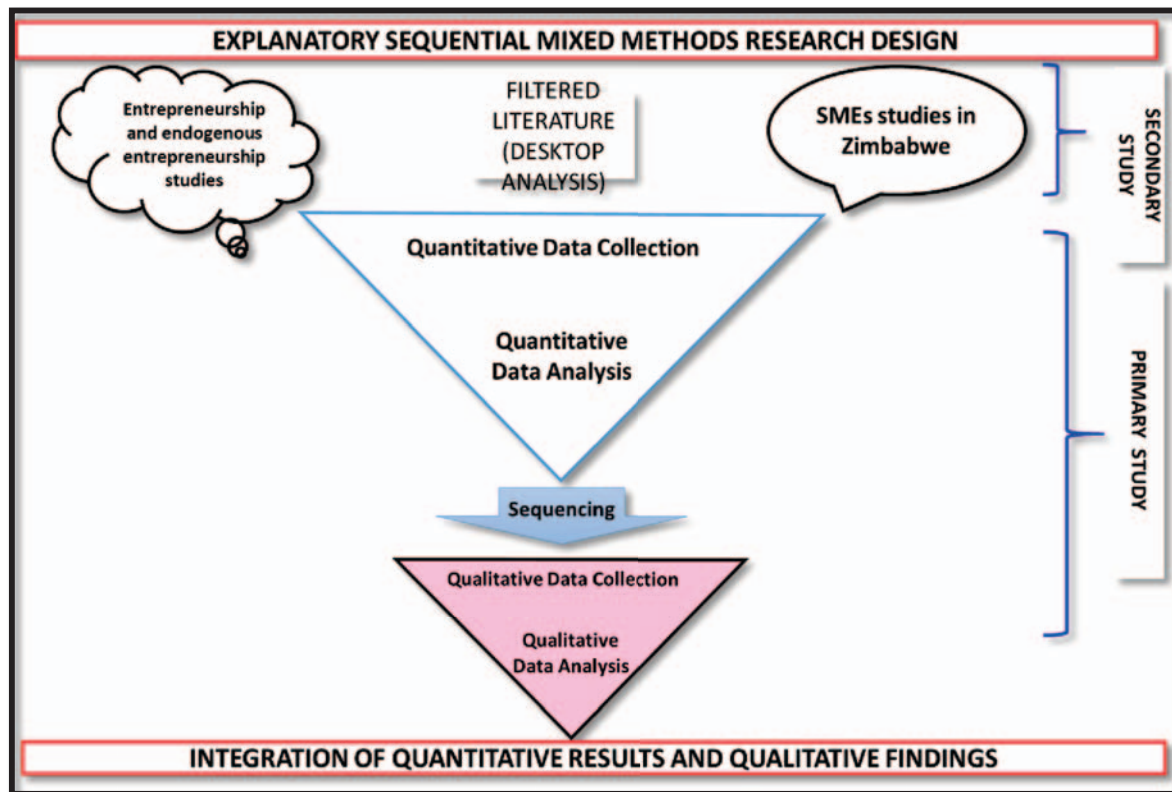


Figure 3: How mixed methods approach was adopted and applied (Source: Madondo, 2017)

This paper therefore confirms a position by Kemper et al (2003) that there is no single omnipotent research method and all methods have advantages, as well as limitation and to not acknowledge such limitation is the central flaw. Utilising one research method, or approach, as well as persisting on traditional boundaries, can deceive emerging researchers into a false supposition that information is an absolute certainty. It is time that in southern Africa supporting mixed methods research approach, postgraduate researchers must be conscious of the fact that embedded research designs and methods should not only be used merely for the sake of it; rather these must be applied for the ability to respond to specific research problems and research questions. This paper therefore submits to Creswell's (2003; 2014) that qualitative data components provide a study with detailed understanding of a research problem whereas quantitative data components gives a study a more general but in-depth understanding of a research problem. But, Dumay (2009, p.494) argues for the research on a subjective reality in which "the researcher interacts with what is researched". In this submission, critical research a paper can be situated in mixed methods because the researcher main deals with complex environments from "a framework that gives a view of the nature of the world yet is still open to interpretation" (Dumay, 2009, p.497). Hence, Dumay (2009) posits the application of a methodical mix of data is a continuum which is practical.

This view is supported by the considerations on the integration of methods which has a long history in the practice of mixed methods research since the 1990s (Tashakkori and Teddlie, 2003; Creswell, 2014). Denscombe (2016) discusses the integration of methods within the context of mixed methods research. This is because the researchers desired to overcome conflicts in the axiological, epistemological, methodological, doxological, as well as ontological differences between qualitative and quantitative research (Tashakkori and Teddlie, 2003). Integration applies to situation where several methodological approaches is utilised in the combination with others. This usually involves some elements that are drawn from quantitative and qualitative approaches to research (Bray and Rees, 1995). Therefore, the southern African region is a context in which business management issues are generated and keep rooted in complex environments. Studying a business management phenomenon require this integration of methods view as Dumay (2009) concludes that "it will be the new investigations of how theory translates into practice that will become the cornerstones of the continuing

discourse of IC". In consideration of this paper, it may not be intellectual capital *per se*, but emerging researchers in business management in southern and South Africa have the possibility of concurrently and sequentially developing pre- and post-hypothesis research and statistical research questions in a study (Dumay, 2009; Creswell, 2014; Denscombe, 2016). This as a methodological adoption enables growth of researchers in challenging the traditional ways of thinking about the research process, as Dumay (2009, p.500) argues "the way forward requires an open discourse and a commitment to narrowing the gap between theory and practice".

Regardless of growth in the adoption of mixed method research and its popularity, results in this paper provide evidence that scepticism still exists. Scepticism is historical. The essence of this scepticism is that many researchers are keeping to Big Data sets views which require a quantitative analysis or qualitative analysis as separate activities of research (Dumay, 2009). For instance, Luck et al (2006) maintain that possible contribution to knowledge by mixed method research is 'often oversold'. Denzin and Lincoln (2005) has other criticisms of mixed method research application, which include that there is no agreement when it comes to meaning of the method and researchers are not all knowledgeable in the full range of research approaches and methods. Several sceptics argue that mixed methods research is fundamentally expensive than utilising qualitative or quantitative approaches, as well as more time consuming and it is hard to implement (Elliot, 2005). To this end, in southern and in particular South Africa mixed methods research still needs some methodological theorisation and attention from the postgraduate researchers.

In addition mixed method research approach value many disciplines, and allows interpretive and integrative which is the heart of continuum (Dumay, 2009). It addresses a wide spectrum of exploratory, explanatory and confirmatory questions at the same time, whereas studies that use one methodological component usually addresses single-minded results and findings and that keeps theory away from practice (Tashakkori and Teddlie, 2006; Dumay, 2009). This paper therefore proposes more consideration in adopting mixed methods reducing the methodological bias and scepticism in business management academics and practitioners. This means proposing for research results that are less biased – but, close the gap between theory and practice (Dumay, 2009).

6. Conclusion

Kemper et al, (2003) long put forward a recommendation that mixed methods approach must be applied in unfamiliar areas in which hypothetical roadmaps do not exist. This paper deliberated the challenges and usefulness of mixed methods approach contributing towards getting young and postgraduate scholars and practitioners to be familiar with the methodological mix. Business management issues in South Africa do present postgraduate researchers and practitioners with uncountable and unfamiliar roadmaps (complex environment) begging for more than just qualitative or quantitative methods to comprehend a wider range of research questions in a single study (Collins et al, 2006; Dumay, 2009).

This paper's finding suffice in advancing Cameron's (2011) position that the skill to critically evaluate the quality of quantitative research methods is an essential ability for researchers in all business management disciplines especially when it comes to judging the integrity of research results and findings. This ability does not come automatically for many postgraduate business management researchers in South Africa. Therefore, this paper argues that for young researchers and postgraduates to comprehend the theory or idea of mixed methods approach in a comparable manner, there requires deliberate intentions to teach and train on the theories of mixed methods research, logical tests, interpretive and integrative methodology. In short, educating and engaging in continuing discourse of this approach requires attention that will enhance postgraduates' methodological knowledge.

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Financial Literacy Level in the Czech Republic and Selected European Countries

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Abstract: This paper deals with research into the financial literacy with focus on the system in the Czech Republic. First, it provides basic theory related to the financial literacy and it also provides chosen articles published in the past that relate to the financial education, mainly with emphasis on the financial literacy defining and measuring. The main goal of the paper is to describe a method of the financial literacy testing in the Czech Republic, being recently conducted, and to outline its characteristics, contributions, drawbacks and potential space for an international comparison. The research is based on the assessment of the financial literacy among pupils on primary schools in the Czech Republic via a terrain investigation that has been commenced in 2017 and that continues in 2018. It is based on a testing in bigger cities in the Czech Republic with different level of education, economic situation and the situation on the labour market. The testing covers all requested knowledge defined by the government (via the document called The Financial Literacy Standards) for primary schools' pupils. The main outcome is a definition of strengths and weaknesses of the education and the financial literacy determinants. Last but not least, the contribution of the research is also to revise the Financial Literacy Standards of the Czech Republic and to compare if the real knowledge corresponds to the required knowledge (required by the Financial Literacy Standards). Depending on the overall result, the testing is planned to be conducted internationally, preferably in countries with similar attitude to the financial education.

Keywords: financial literacy, financial education, research methodology, Czech Republic

1. Introduction

Financial literacy represents a set of knowledge which is necessary for a correct and appropriate decision in terms of one's investments, debts and other financially orientated issues (OECD, 2015). It consists of three parts – money, price and budget literacy (Ministry of Education Youth and Sports of the Czech Republic, 2010).

Financial literacy according to National strategy for Financial Education in the Czech Republic (Ministry of Education Youth and Sports of the Czech Republic, 2010) consists of:

- Money literacy
- Price literacy
- Budget literacy

Each group is defined and characterized by a different set of knowledge. In general, the price literacy factors knowledge related to price mechanisms, inflation and other macroeconomic and microeconomic indicators, such as unemployment. Money literacy includes knowledge concerning banking products, loans, banking investments, etc. The last mentioned group, budget literacy, includes an ability to administer personal budget and issues that relate to personal finance. (Nesleha, 2017)

The National Strategy for Financial Education is a complex document issued in 2010 (and revised afterwards) by the Ministry of Education Youth and Sports of the Czech Republic. Its target is to provide elementary principles and attitudes towards the financial education in the Czech Republic. On the top of that, it also provides future plans, outlines and visions regarding the financial education in the Czech Republic. (Ministry of Education Youth and Sports of the Czech Republic, 2010)

One of the important parts of the Strategy is also involvement of various institutions in the financial education. The document species and estimates the role of the following institutions in the area of the financial literacy:

- Public administration authorities
- Social partners and associations
- Educational institutions
- Consumer associations
- Media

- Other subjects (Ministry of Education Youth and Sports of the Czech Republic, 2010)

Financial literacy has gained its importance and acceptance, as a part of the formal education in the Czech Republic in the last years. This does not go to the Czech Republic only, but to other European and world countries as well. As a result of the phenomenon, the world society starts to be exposed to financial literacy more than ever (Nesleha, Urbanovsky, 2016). Having said that, needless to add, the financial literacy also needs to be measured and investigated, to verify that the increasing amount of information in the area of finance is properly spread around citizens.

The goal of the paper is to describe a method of the financial literacy testing in the Czech Republic, being recently conducted, and to outline its characteristics, contributions, drawbacks and potential space for an international comparison. The paper also deals with predictors of financial literacy among primary school pupils.

2. Literature review

Although the financial literacy, as a new science and new part of the basic knowledge (comparing to other, more established sciences) does not have a great number of literature sources, the following four sources are introduced.

2.1 Source no. 1: Defining and measuring financial literacy

The first processed study is "Defining and Measuring Financial Literacy". The study was written by three authors, Angela A. HUNG, Andrew M. Parker and Joanne K. Yoong, at the end of 2009. The main objective of this study is to define and measure level of financial literacy and, consequently, to measure the impact of different predictors (determining the different level of financial literacy).

In terms of used statistical methods, various models of regression analysis are employed. The study also supports chosen fact using descriptive statistics. This "tool" is used mainly for initial description of the data sample.

The mentioned study has several positive features to be highlighted. The list of particular ones is following:

- Focus not only on financial literacy measuring
- Difference between financial literacy and financial education
- Usage of various regression models
- Dealing with obstacles

One of the positive aspects of the study is that it does not cope with only ways to measure financial literacy, but authors are aware of the complexity of the term "financial literacy". Therefore, they concern with the term itself. Apart from several stated definitions, such as "Familiarity with basic economic principles, knowledge about the U.S. economy, and understanding of some key economic terms.", „The ability to evaluate the new and complex financial instruments and make informed judgments in both choice of instruments and extent of use that would be in their own best long-run interests.“ or „Knowledge of basic financial concepts, such as the working of interest compounding, the difference between nominal and real values, and the basics of risk diversification.“, they admit that financial literacy is something what difficult and, at the same time, important to be defined.

Furthermore, in order to develop the term, the following scheme (Figure 1) is used. It depicts a relationship between financial knowledge and financial behaviour. It describes a deeper insight in the process of "becoming familiar with issues related to financial literacy". Before one's financial behaviour is shaped, such person enriches their original financial knowledge with real financial skills (ranging from the most basic ones to more complex and sophisticated situations to cope with). Besides financial skills, there is also something which is called "perceived knowledge". It refers to behavioural patterns each of us has. In other words, the scheme summarizes the process of familiarizing with everything that is a part of financial knowledge.

Not only can a reader come across various definitions of what "financial literacy" is, but another obstacle is the difference between "financial literacy" and "financial education". Some researches, teachers or people in general tend to misinterpret these terms, since they take them as synonyms.

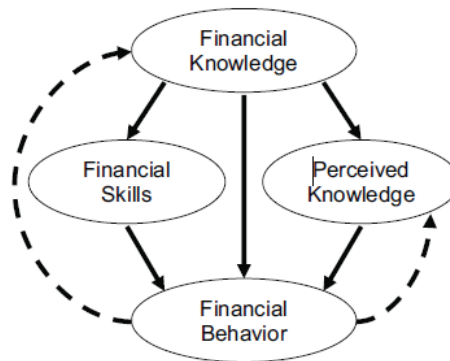


Figure 1: Scheme of financial knowledge (Hung, Parker, Yoong, 2009)

These two terms have, however, quite different meaning. In terms of “financial literacy”, it might be interpreted as: “Financial literacy is the possession of knowledge and understanding of financial matters. Financial literacy is mainly used in connection with personal finance matters. Financial literacy often entails the knowledge of properly making decisions pertaining to certain personal finance areas like real estate, insurance, investing, saving (especially for college), tax planning and retirement.”, while “financial education is rather interpreted as “The process by which financial consumers/investors improve their understanding of financial products and concepts and, through information, instruction and/or objective advice, develop the skills and confidence to become aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being.”

Taking into account both of the definitions, there is an obvious difference between them despite the fact that it is frequently misinterpreted.

In spite of the fact that the regression analysis is a statistical tool which is frequently used across various “fields”, and despite the fact that it is often incorporated in majority of studies or pieces of research, there is still some potential to be utilized. Apart from its plain and easy interpretation, it is also a tool enabling usage of various (and widely modified) predictors/regressors.

In this study, the authors used various predictors in order to reveal gaps in the level of financial literacy among different target groups. Among those which appear to be interesting/less common are: wage/salary per hour, bachelor degree (researchers usually distinguish only between “have a degree” and “do not have a degree”. Consequently, respondents were supposed to answer different tests, aiming at specific areas of financial literacy. It helped the authors to analyse particular “areas” in which respondents scored more or less. (Hung, Parker, Yoong, 2009)

2.2 Source no. 2: Financial literacy standards

As outline in the National Strategy for the Financial Education in the Czech Republic (Ministry of Finance of the Czech Republic, 2017), this part of education has become an obligatory curriculum of various level of the formal education. One of the levels is also primary schools in the Czech Republic. The Financial Literacy Standards contain required knowledge of pupils, separating the requirements for:

- Pupils on the first grade of a primary school (first five classes of primary school)
- Pupils on the second grade of a primary school (last four classes of primary school)

Pupils on the first grade of a primary school (first five classes of primary school)

The financial education starts when a child visits the first grade of a primary school. Despite the fact that such an education is far away from what an adult needs to be familiar with (with regards to the financial literacy), pupils on the first grade of a primary school should be aware of basics related to:

- Money
- Household budget and debt administration
- Financial products

When it comes to the first set of knowledge, related to money, pupils are supposed to understand the difference between cash and non-cash transaction, ways of payment and the main role of bank. In relation to household budget, a pupil is able to understand and name particular expenses and incomes of a family and is able to understand when a person is eligible for a complaint, for instance, in case of a faulty product. For the section "Financial products, pupils on the first grade of primary schools are expected to understand the benefit of savings, issue of debts and to understand when a loan or debt financing can be justifiable.

Pupils on the second grade of a primary school (last four classes of primary school)

The particular groups of knowledge, required on the second grade of primary schools are not changed. Pupils are also expected to get familiar with basic knowledge related to money, household budget and bet administration and financial products. However, the sub-description of the groups is different. When it comes to the knowledge about the first group, money, pupils are supposed be able to fundamentally describe the phenomenon called inflation and be aware of its disadvantage. While pupils on the first grade are required to know what is the difference between cash and non-cash operation, pupils on the second grade also need to know how to deal with money in order not to have expenses higher than income. Pupils on the second grade of primary school should be also aware of the way a price is created, mainly the logic of a tax impose or a margin calculation and purpose.

With regard to the household budget and debt administration, a pupil visiting the second grade of primary school manages to come up with a few rights of a consumer, manages to draw up a basic family budget and manages to explain what a balanced/equal budget is, as well as surplus and deficit budget.

The last group determines mainly the following pieces of knowledge such pupil could gain:

- Difference between a debit and a credit card, their characteristics and limitations
- Logic of interests paid and obtained
- Existence of basic insurance types and suggestion for their usage
- Understanding of other issues related to the financial literacy, such as leasing, instalment sale, basic investment types, etc.)

2.3 Source no. 3: Financial literacy: An overview of practice, research and policy

The study was published by two authors – Sandra Braunstein and Carolyn Welch, who were (at the time of the article preparation) members of the Board's Division of Consumer and Community Affairs.

Apart from the theoretical background and the stated results, the study takes into account the following trends and tendencies which should be approached as those with important impact on ways of financial education:

- Increasing attention to financial literacy
- Technological changes and market innovation
- Changes in personal finances
- Changes in demographics
- Focus on financial literacy training

This increasing attention arises from the fact that financial markets have become more complex systems. Consumers are exposed to higher number of products, services, types of loans and others which they need to become familiar with if they want to make a correct decision on its usage.

As a consequence of this development, financial literacy (and notably its measuring) have to be treated in this way. In other words, researches or institutions conducting such research have to aware of completely different ways of financial literacy testing than used to work ten or twenty years ago. On the one hand, technological innovations are usually approached as positive developments. However, it might also include obstacles and complications. One of them (which is mentioned in the article) is the necessity to catch up with such developments. This applies also to innovations related to financial markets, since innovations play an important role in case of financial markets. What is good to take into consideration is the positive aspect of it (faster

communication, more convenient products, etc.) as well as the negatives ones – such as potential failures of more advanced and sophisticated systems or the need to have necessary knowledge enabling to use such innovations it properly. This trend is introduced in a negative way, since it refers mainly to an increasing level of debt financing. Such situation is prone to lead to an increasing number of personal bankruptcies. In accordance with this negative trend, there are other event expected to occur (as a result of soaring level of debt financing and number of defaults), such as lower personal savings.

The study refers to data from the U.S. market which does not consist of only original citizens of the USA. There is a soaring trend in the number of “foreign-born” households which operate on the U.S. market despite the fact that they are not completely familiar with this particular market. Such situation more often results in a lack of knowledge related to mainstream financial systems of this market. Instead of relying on it, they are to find other alternatives, such non-banking loan providers, which is more likely to lead to adverse situations, such as defaulting on loans, etc.

However, there are also positive developments mentioned. One of them is a reference to emerging (and increasingly more attractive) financial literacy trainings. Their existence enables participants to get to know financial system, its functions, advantages, disadvantages, etc. Such programs (according to the text) offer different contents, yet the goal is always the same – to provide participants with information leading to correct decisions on financial market(s) made by its participants.

2.4 Financial literacy among youth

The paper was published in 2018 by Garg Neha and Singh Shveta. The goal of the study is to analyse the level of the financial literacy among young, particularly with focus on the socio-economic and demographic factors of it.

According to the results of the study, the significant predictors of the financial literacy level among youth are age, gender, income, marital status and gained education. Apart from it, their study has also verified a relationship between the financial knowledge, financial education and financial behaviour. (Neha, Shveta, 2018)

3. Research methodology

This chapter describes the ongoing investigation into the financial literacy of young children in the Czech Republic and chosen European countries. The described investigation is partially the goal of the author’s recently processed dissertation thesis. The chapter outlines the whole testing, data collection, research hypotheses, Financial Literacy Standards and it also provides information concerning the intended international comparison.

3.1 Data collection and way of testing

With focus on the set and with a focus on the target audience (pupils on the second grade of primary schools in the Czech Republic), the data has been collected via a terrain investigation. Taking into account the composition of the target audience (children/teenagers in the age between 10 and 15 years), such method has been assessed as the most appropriate, most accepted by approached primary schools and the fastest way of data gathering.

Pupils were given a paper based document, which is for the purposes of the study called “questionnaire”. The questionnaire consists of three parts:

- Multiple choice questions (in total, 12 questions covering all groups defined by the Financial Literacy Standards for the second grade of primary school)
- Three tasks devoted to computation, explanation and a choice justification
- Questions devoted to demographic factors of respondents (enabling to determine key factors and predictors of the financial literacy level and key predictors of insufficient financial literacy level)

In total, four regions of the Czech Republic are being added to the testing. The reason for this is to choose regions with different macroeconomic indicators and also with different demographic statistics. The National Strategy for Financial Education sets the rules and standards for the whole Czech Republic, meaning that there should not be significant gaps among various areas of the Czech Republic. Yet the intention of this study is to verify if this assumption is correct. If not, which areas suffer a lack of financial education and in which particular sub-areas. Every region has been expected to bring around 1,500 – 2,000 respondents.

3.2 Predictors of financial literacy

One of the targets of the investigation is to reveal predictors of the financial literacy level. For such purpose, the following research hypotheses have been formulated.

H1: The level of financial literacy is influenced by a particular class a pupil visits

- The aim is to verify if the financial literacy level grows with higher age (or school class). It is worldwide known and logic that an increase in age should lead to an improvement in the education in general, mainly by gaining new experience, however, the question that remains unanswered is how this works in the area of the financial literacy and in what age is the difference the most significant.

H2: The level of financial literacy is influenced by the gender

- The goal of this hypothesis is not (primarily) to verify if males or females tend to have a higher level of the financial literacy, the main target is to find out in what areas males are likely to excel and the other way round.

H3: The attitude towards leisure time activities determines the financial literacy level

- This hypothesis is tested without a particular expectation or bias towards the results. The goal is to determine what type(s) of activities correlated (if any) with higher/lower level of the financial literacy.

H4: Pupils' perception of the financial education leads to a higher financial literacy level among primary school pupils

- If young pupils perceive the financial literacy as an important part of education, it might result in a higher level of the financial literacy of such pupils themselves.

H5: The presence of siblings has an impact on the financial literacy level

- It is believed that a presence of siblings might have a positive effect on pupils' financial literacy level.

H6: The measured knowledge of primary schools' pupils corresponds to the required knowledge established in the Financial Literacy Standards after the revision in 2017.

- From the point of the future research, this hypothesis seems to be the most crucial one – the goal is to verify if the real level of the financial literacy corresponds to the knowledge regulated (and expected) by the Financial Literacy Standards.

The data for such testing is provided by the last part of the questionnaire pupils have been given during the testing.

3.3 Revision of the financial literacy standards

As mentioned in the chapter 2.3 Financial Literacy Standards, there is set of required knowledge for young pupils on the second grade of primary schools in the Czech Republic. Despite it, it has not been evaluated so far; particularly, if the real knowledge corresponds to the required knowledge. One of the targets of this investigation is to bring this result.

Such finding can be further used for either completion or amendment of the Standards or for an amendment or an enhancement of primary schools curriculum related to the financial education. Either way, first a deep insight in the real composition of pupils' knowledge needs to be collected.

3.4 International comparison

Apart from the investigation conducted in the Czech Republic, the research is being run in other countries as well. Such step is expected to enrich the existing research by:

- Detection of similarities in the financial education across different locations
- Detection of quality of the governments' attitudes towards young children education in the area of the financial literacy

When initiating the international comparison, countries with similar macroeconomic indicators are taken into account. The followed macroeconomic indicators are:

- Gross domestic product per capita
- Gross wage per capita
- Unemployment rate
- Total level of education in the country
- Other macroeconomic indicators

Needless to say, countries with different values of the chosen criteria should have different level of the financial education. By omitting countries whose indicators' values are not homogenous, it is more justifiable to attribute the different level of the financial education to the quality of the financial education itself. By not omitting countries with different values of the macroeconomic indicators, it would not be certain if the different level of the financial literacy is not caused by the economic situation itself (expressed by the indicators).

When conducting an international comparison, the same questions will be used in order to analyse potential analogies and differences. The test will be translated into the languages that official languages in the tested countries.

4. Discussion

The planned research is expected not only to determine the strengths, weakness and key determinants of the financial literacy in the Czech Republic and possible in selected European countries, but it also might come up with an assessment of how relevantly governments state their requirements when it comes to the formal financial education. When doing so, the study, as well as other studies devoted to the financial education, is likely to suffer from the following problematic areas.

4.1 Difficulties to collect the data

A problem that might be a burden of every researcher concerns the area of the financial education as well. Especially when the target audience consists of young children who cannot be expected to use a computer for the data collection. Hand in hand with this, sometimes schools cannot afford to participate in such study, mainly due to a lack of time, interest or due to some organization obstacles.

4.2 Necessity to include various regions

This drawback elaborates on the first one. To provide a proper and correct study reflecting the whole situation within a country, not only big cities when data is generally more accessible have to be included. Also smaller cities or villages might play a significant role in the research.

4.3 International comparison

The intended and previously mentioned international comparison itself causes trouble to the research. Despite knowing that the presence of international data benefits the investigation, the access to particular dataset and the choice of countries or locations with similar educational systems might be (at least partially) subjective. Although there are some attempts to have same baseline of knowledge taught around the world, the systems are unlikely to be the same around the world.

4.4 Other obstacles

This list is definitely not a complete one. Worth mentioning is also the length of testing. As a consequence of the target audience, the testing cannot be comprehensive and it has been necessary to make some parts smoother, faster and easier in order to make sure that the dataset consists of a sufficient number of observations. Another issue is the problem of closed and multiple choice questions, allowing the possibility that some correct answers are chosen correctly, even when a respondent can opt for "I do not know" answer. However, taking into consideration the number of observations (ranging in thousands), such a drawback can be eliminated.

5. Conclusions

The main target of this paper has been to describe a method of the financial literacy testing in the Czech Republic, being recently conducted, and to outline its characteristics, contributions, drawbacks and potential space for an international comparison. In the first chapter is stated theoretical background in relation to the

financial literacy, the following chapter then sums up chosen articles in the area. The main part, chapter no. 3, deals with the methodology and the research itself. Apart from it, it also comes up with possibilities for an international comparison. Consequently, it adds information regarding the constraints and complications hit during the investigation.

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Developing General Analytical Inductive Qualitative Research Strategy to Explore Small Enterprise Growth in Turbulent Economies

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Abstract: The purpose of this paper is to examine the application of General analytical inductive qualitative approach within the field of entrepreneurship and management research. It critically assesses the research design and analytical processes that facilitated the development of a framework for understanding how small enterprises (SEs) grow and develop in turbulent economies. The study adopts a qualitative research design unlike the dominant quantitative designs in studying small enterprises. An Interpretivist approach (Blaikie, 2007) guided this study to understand (verstehen) how people make sense of their world where human actions are based upon the actor's interpretation of events, social meanings, intentions and beliefs (Gill and Johnson 2010; Denzin and Lincoln, 2005). In this research, therefore, as individuals the owners/Entrepreneurs of Small Enterprises were thought likely to view the phenomenon of growth and development differently in a turbulent economy. The research design followed Thomas's (2006) analytic inductive approach and the outcomes of this paper demonstrates how an analytical inductive analysis, that is a systematic procedure of data analysis and refers to detailed readings and interpretations of raw data, can be rigorously used to drive the identification of concepts, themes, and models. Sri Lanka, as a turbulent economy, was the context of this research. Data was collected from Sri Lankan small enterprises throughout one year period using 21 in-depth interviews and 7 informal conversations in three phases. As a part of data analysis, interviews were transcribed and a provisional list of common features and divergent cases identified. Then similarities between categories were established. Deviant features were accommodated either by linking them with other common features or by generating a new category with unique feature. Eventually, cross case analysis within and between data from SEs led to the emergent of themes, which forms the discussions section of the study. This process was followed with the aim to 1) condense extensive and varied raw text data into a brief, summary format; and 2) to establish clear links between the research objectives and the summary findings derived from the raw data and to ensure that these links are both transparent and justifiable given the objectives of the research (Thomas, 2006). The challenges of this method of data analysis are also discussed in the paper.

Keywords: general analytical inductive approach, analytic analysis, qualitative research strategy, small enterprises, turbulent economy

1. Introduction

The purpose of this paper is to examine the application of General analytical inductive qualitative approach which was developed by Thomas (2006) within the field of an entrepreneurship and management research. It is based on an empirical study and critically assesses the research design and analytical processes that facilitated the development of a framework for understanding how small enterprises grow and develop in turbulent economies. A review of the literature on small business closure (Stokes and Blackburn 2001) found that most studies focused on the factors associated with the relative 'success' or 'failure' of small businesses, and a large number of studies have also adopted a positivistic approach and have used quantitative designs and attempted to build or test models on business failure (Blackburn and Kovalainen, 2009). The study adopts a qualitative research design unlike the dominant quantitative designs in studying small enterprises.

Small enterprises are critical to economic growth, given their capacity to create new jobs (Acs and Mueller 2008, Henrekson and Johansson 2010). Although the impact of the environment on growth of firms has been extensively explored, there were only a limited number of relevant studies exploring small enterprise growth in post war turbulent economies (Nichter and Goldmark, 2009; Ishengoma and Kappel, 2011; Njanja, Ogutu and Pellisier, 2012). Bongomin et al. (2018) found that business skills, capital adequacy, access to finance, access to market, entrepreneurial education, and government support have significant and positive impacts on Small business survival in post-war communities in Northern Uganda. Most past studies have mainly focused on the large high growth firms and micro start-ups (Parker, Storey and Witteloostuijn, 2010). Established small enterprises have received a little attention (Delmar, Davidsson and Gartner, 2003; Moreno and Casillas, 2007; Barbero, Casillas and Feldman, 2012). This paper therefore tried to study about established SEs growth in a turbulent economy using general analytical inductive strategy.

Sri Lanka is an island, in the South Asian region, which is known as 'the pearl of the Indian Ocean'. Sri Lanka is an emerging economy, which is passing through a process of rapid transformation. The key factors behind this transformation were the end of long-standing internal conflict and the subsequent changes aimed at improving the country's socio and economic conditions. The current environment in Sri Lanka, hence, provided an attractive landscape for a comprehensive study on the way small enterprises reacted in a macro environment in a turbulent emerging economy. After reviewing the literature, the following research questions formed

- What are the challenges for growth of High Growth Small enterprises over the turbulent environment?
- What are the characteristics, which contribute to the growth of High Growth Small Enterprises over the turbulent environment?
- What are the growth strategies of these high growth Small Enterprises in this turbulent environment?

In order to explore the answers to the research questions, the research design will be explained in the following order: 1) Discuss the interpretive approach followed by the underlying philosophical assumption of the research, 2) the research methods utilised including the data collection technique 3) data analysis approach - general analytic induction- followed by Johnson, 1998, 4) step by step data analysis procedure followed by Thomas, 2006, 5) the process of data reduction and emerging themes. This will follow by a discussion on the challenges faced and strategies utilised to overcome them.

2. An interpretive approach in exploring small business growth

Different worldviews and philosophical underpinnings can affect the way research is conducted. Any research has an appropriate research paradigm, according to the traditions it follows. Paradigms in the human and social sciences help us to understand phenomena (Creswell, 1994). Different types of paradigms have been described by others in many ways as the constructivist approach, the interpretivist approach, the post-positivist approach or the postmodern paradigm (Lincoln and Guba, 1985; Carson and Coviello, 1996).

Interpretivism was the guided philosophy of this study and it was compatible with the explorative and qualitative nature of the research questions in this study. We didn't adopt the most prevalent approach in Small and Medium Enterprise (SME) literature; positivist paradigm and considered that knowledge, meaning and understanding were socially constructed and was not concentrated to search for an objective reality. Interpretive researchers assume that access to reality is only through social constructions such as language, consciousness, shared meanings, and instruments (Myers, 2009). Hence, the focus was upon the details of characteristics, challenges and strategies used by small enterprises, the reality behind these details and the subjective meanings of each stakeholder selected as our research participants. We endeavoured to make sense of how SEs grows through participants lenses. Gill and Johnson (2010) argue that the aim of interpretivist approaches is to understand (verstehen) how people make sense of their worlds. This study hare the same belief with Blaikie (2007) that people are constantly involved in interpreting and reinterpreting their world - social situations, other people's actions, their own actions, and natural and humanly created objects. Hence owners, managers and employees of SEs were thought likely to view the phenomenon of growth differently . The definitions of the firm growth vary and had measured by utilizing various levels of sales growth over a defined period or by considering employee growth (Moreno and Casillas, 2007). Sales volume is a common growth measure and it can be argued that it is affected by external factors like inflation and exchange rates (Kirkwood, 2009). On the other hand, employment growth is not dependent on such external factors (Delmar et al., 2003). It is also noted that, regardless on the definition of high growth, very few firms had actually achieve high growth (Barringer et al., 2005). That was our main reason for collecting qualitative data and adopting an interpretivist analysis for this study.

3. Data collection method

Interviews and informal conversations

Semi-structured in-depth interviews was the main method of data collection. The owners of the SEs as the best source of knowledge were identified and interviewed to ensure the richness and detailed qualitative data was gathered. Through these interviews, the details of the respondents own perception and accounts is explored. Semi-structured interviews are widely recognised as a useful way to capture qualitative data (Qu and Dumay, 2011; Silverman, 2005; Have, 2004; King, 2004).

Through the interviews the focus was on understanding how these SEs grow in a turbulent emerging economy. These interviews were carefully conducted to ensure a reliable set of data.

We were able to enter into the SE owner’s perspective and were able to find out things which we couldn’t directly observe (Patton, 1990). These interviews allowed us to build a thick description and to triangulate with other sources (Merriam, 2002; Yin, 2013; Stake 1995; Patton, 1990).

21 semi structured in-depth interviews with SE owners/entrepreneurs conducted throughout one year period in 3 phases. The details of these 3 phases were given in table 1.

Table 1: Three phases of interview process

Phase	Time period	Information collected/areas covered	Purpose
One	2015 November – 2016 January	Background information on the SE and owner/founder	To establish rapport with the participants and get general feeling about the participants thoughts on the research. To gain background information of participants.
Two	2016 February – 2016 April	Challenges faced	To understand on the challenges and barriers came across when operating in a turbulent environment
Three	2016 July – 2016 September	Strategies utilized	Gain an insight into how the SEs faced the challenges and how they overcome them.

To gain quality data, we have to build a good rapport with the participants. The lead author built that relationship with participants as she was living in the country. This was achieved by conducting three interviews with each and every owner of the SE. Similarly to Polkinghorne (2005), it was considered that the interview needed to engage with participants in more than one shot 1 hour session. All the interviews were conducted in familiar environments for the participants and this ensured them safety and they were comfortable to reveal even the deeper personal feelings and information (Polkinghorne, 2005).

Seven Informal Conversations (IC) were carried out with some managers and employees in the SEs. These ICs provided a holistic view and to cross check some of the owners’ comments. ICs with secondary informants gave plethora of information to enrich the collection of data. The data gathered through the semi structures in-depth interviews conducted with owners compared and cross checked with the data gathered through Information Conversations conducted with managers/employees. Through this methodological triangulation was achieved.

Maximum variance sampling technique

In this exploratory research design it was not required the sample to be representative of the population. Besides this is not considered as a weakness for researchers pursuing qualitative research designs. Hence probability sampling technique which was dominant among positivist researchers was not adopted and instead non-probability sampling technique of purposive sampling was utilised for this research. Among the 16 types of purposive sampling techniques presented by Patton (1990), maximum variation sampling technique (MVST) was used for this study and it is the most useful strategy for the naturalistic approach (Lincoln and Guba, 1985). Naturalistic approach means qualitative assessment is focused on understanding how people make meaning of and experience their environment or world (Patton, 2002).

A survey was conducted among the Sri Lankan SEs, using a questionnaire to get their basic information before applying the MVST. Afterwards the following inclusion criteria was utilised to select the most suitable sample;

- Businesses Started before 2008
- Number of permanent employees less than 100
- Continuous operations for 5 years or more

Finally utilising the MVST, the final sample of 7 companies was selected after considering the boundaries of this research (Cresswell 2003; Silverman 2005). Contrasting cases from different industries were selected in order to generate new insights. Tourism, food, manufacturing, shipping line, catering and distribution industries represented by the sample selected. By selecting companies from different industries it gave the opportunity to compare between the barriers and specific characteristics employed on the respective industries. Contrasting cases in terms of demographic factors and composition allowed to develop insights on different perspectives. All the owners of these SEs were selected as the participants. There were mainly two reasons for them to be selected for the interviews; first they know everything on the company and secondly their support was a main concern for the success of this study in granting access to the company and other data collection methods.

A topic guide was used to conduct the interviews. Drawing on the main findings of SE literature, a list of interview questions and guide such as 'how did they start their business?' was designed to explore on growth of these SEs in a turbulent emerging economy. We used some useful prompt to encourage the interviewee to talk about specific issues if they do not come up spontaneously. This topic guide helps to maintain the consistency across all the interviews. Most of the questions were open-ended which allows them to talk freely and laddering questions were used to attain more clarification.

All the interviews were tape recorded and transcribed. All of them were verbatim transcriptions which is an essential raw data for qualitative analysis. We found "getting inside" the data much easier through writing field notes, and transcribe data by the lead author of this paper. After that each and every interview transcript was shown to the participant for their consent and confirmation on the content. Both authors of this paper independently coded interviews for similarities and differences in terms of how the entrepreneurs at SEs talk about their growth in post-war turbulent environment. This independent coding assured the inter-coder reliability (Yin, 2003) and adds the credibility of the study.

4. Data analysis approach

Analysis of qualitative data is a creative process and the creativity depends on the researcher, hence, there is no right way to organize, analyse and interpret qualitative data (Patton, 1990; Hesse-Biber and Leavy, 2011; Stake, 1995; Creswell, 2003 and Miles et al., 2014). It was challenging to make sense of massive amounts of data, reduce the bulk of information through identifying significant patterns and communicate the message that the data trying to reveal. Among the dozen ways of analysing qualitative data, General Inductive Approach which was identified in the past decade as a systematic procedure for analyzing qualitative data in which analysis is guided by specific evaluation objectives (Maxwell, 2005; Silverman, 2005; Thomas, 2006) was adopted.

General Analytical inductive analysis (GAIA)

Data analysis began with the first interview itself since qualitative research studies analysis should be concurrent with data collection (Miles et al., 2014; Strauss and Corbin, 1998; Tobin and Begley, 2004; Stake, 2010). GAIA strategy (Thomas, 2006) which involves five steps: initial reading of text data, identification of specific text segments related to the objectives, labelling the segments of the text to create categories, reducing overlap and redundancy among the categories, and creating a model incorporating most important categories, was adopted. This strategy was followed with the aim of reducing the massive amount of data guided by evaluation objectives, which is to explore on characteristics, challenges faced and strategies utilized by SEs in the turbulent emerging economy, through coding, development of categories into themes. Three main themes namely; 'crises and challenges', 'path to resilience' and 'relationships and networking' were emerged from data analysis.

5. Data reduction process

Data was managed both manually and electronically using NVivo software. All the transcriptions and field notes were read for several times. As Thomas (2006) suggested, inductive coding begins with close readings of text and consideration of the multiple meanings that are inherent in the text. Miles et al. (2014) stated that coding is deep reflection about and, thus, deep analysis and interpretation of the data's meanings. When it comes to coding Miles et al.'s (2014) method was followed, by beginning first cycle of coding, then code the coding (Saldana, 2016), after that second cycle of coding and later deriving more general themes. Coding is not simply labelling the data, it is linking the data. As Richard and Morse (2013) mentioned, it leads the researcher from the data to the idea and from the idea to all the data pertaining to that idea. Coding was an integral part of this study.

First cycle of coding

We used descriptive coding, In Vivo coding, process coding, values coding, attribute coding and versus coding as different approaches of coding. Some of the examples of these codes are given in table 2.

Table 2: Types of coded used

	Category	Meaning	Examples from the coding
1	Descriptive Coding	A word is given as a label to summarise the data in a paragraph.	Niche strategy, New markets, Agreements with customers
2	In-Vivo Coding	Use words/ phrases from participant’s own language in data records	“Zero government support”, “Never get bored”, “Gut feeling on business”
3	Process Coding	Used gerunds (“-ing” words to connate observable action in the data)	Understanding the competitors position, Evaluating the potential markets, Accepting employee mistakes
4	Values Coding	These codes reflect a participant’s values, attitudes and beliefs.	Government is hopeless, Ignore the rules, Family attachment
5	Attribute Coding	Notion of basic descriptive information such as participant characteristics/demographics	Age, Number of years in operation, Case
6	Versus Coding		Father Vs Son, Micro-management Vs Macro management, International market Vs. local market

We used the inductive coding, where we allowed codes to emerge progressively during the data collection. This method is different with deductive coding, where the coding list comes from conceptual framework and research questions, where it was accepted that inductive coding is better grounded empirically and it was visible that we were open to what the field was suggesting (Miles et al., 2014; Boyatzis, 1998). In the first cycle of coding every sentence and phrase were coded based on the authors interpretation of the raw data. The words and ideas which repeated in several places, the important things happened in participants’ lives, the things which directly connect with the study objectives, and surprising data were coded. This was done for each and every interview conducted separately. Both authors were involved in this process. Important insights emerged from the different ways in which two of us look at the same set of data, a form of analytical triangulation (Patton, 1990).

This process itself acted as a data condensation task by giving opportunity to retrieve the most meaningful material and to assemble chunks of data that go together. After the first level of coding we found that there were instances where it had coded same thing in various terms as synonymous; employee satisfaction, motivation to work, reasons to work, reasons to stay, employee benefits. Then with coding the codes, we were able to reduce the initial number of codes. As Saldana (2016) suggested, through coding the codes, one can condense the data through lump codes. Moreover Thomas (2006), had referred to the same thing giving another term as overlapping coding. Afterwards all the codes were taken out from the transcriptions with their relevant phases and separate tables were developed under different cases with their participants’ relevant quotes. A numbering system was assigned for the participant quotes. For example, if a quote from the 1st interview of founder of the case A, taken out that was named as AF1 and if it is the 2nd interview of the Owner of the case C, the number was CO2 (Table 3). This separation was helpful when it came to cross-case analysis. This enabled us to easily distinguish the quotes among the cases as well as within the cases. With this exercise the first level of coding was finished.

Table 3: First level of coding

Company A – 1 st Interview with the Owner		
No.	Code	Statement
1	Origin	Well.... It is an interesting question and the answer is also very interesting. was started by my father and his ex-girlfriend. My father’s ex-girlfriend’s name is and my father’s name is So they put the first letters of their names and come up with a name called “....” (.... +) [AO1]

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Company A – 1 st Interview with the Owner		
No.	Code	Statement
2	Sole Proprietor started with 4 people as a sole proprietor in 1968 and the technical support got from Japan. [AO1]
3	Technical Support from Japan	My father started with 4 people as a sole proprietor in 1968 and the technical support he got from Japan. From 1968 to 1975 the company grow in a very slow rate with the backing from Japan. [AO1]
4	Competition	When China came, the market was flooded with ceramics. [AF1]
5	Loss of customers	50% of the USA customers were taken over by China [AF1]
6	Heavy losses	in 2002-2003 was making heavy losses. [AF1]
7	People idling	People were idling
8	Family requirement	Then in 2004 dad asked me to come to Sri Lanka to take over the marketing function of [AO1]
9	Moving from comfortable zone	At that time I was in USA after my studies. Then I took the most difficult decision in my life to come back to Sri Lanka. Because all my plans were to stay in USA. At that time I was an American citizen too. [AO1]
10	Family attachment	But at that moment my father needed me more than anything else. So I decided to come back to Sri Lanka. [AO1]
11	Mass-scale production	We were concentrating at that time on the mass scale production [AO1]
12	Niche strategy	I decided to move from mass scale production to high quality handmade niche strategy. [AO1]
13	Generation Gap	You know my father's generation. They do not like to take a risk. So I wanted to convince them. [AO1]

Second cycle of coding

We entered the phase of second cycle of coding to develop pattern codes. Pattern coding is a way of grouping the summaries of first cycle codes into a smaller number of categories, themes, or constructs (Miles et al., 2014). They combine massive junk of data from first cycle of coding to a more meaningful unit of analysis. All the developed tables with the codes were read carefully again. After that the codes were printed and they were cut into 3*3 data cards. Then all the data cards were scrutinized by putting them on the ground. The similar topics were highlighted with the same colour in all the cases. Then similar codes were taken together separately and piled them. An excel work book was maintained allocating separate sheet per pattern code developed through this process. Then the best fitting label was assigned for the cluster of the codes.

The substantial amount of categories developed through data reduction, became a challenge. The relevant categories were selected among the pattern codes emerged by referring to the objectives of the study. According to the GAIA approach, the upper-level or more general categories are likely to be derived from the evaluation aims. Some of the categories needed to be combined and some categories simply discarded due to their inapplicability and incomparability with the objectives of the study. Some of the categories were left behind. This was accepted as, for the findings to be useable and acceptable the authors had to take a decision about what is most significant in terms of objectives and what is less significant in the data (Thomas, 2006). Hence the methodological challenge of selection of the most appropriate data was resolved by concentrating and focusing on the objectives of the research (Thomas, 2006). Then, it end up with three main themes; 'crises and challenges', 'path to resilience' and 'relationships and networking'. Development of theme 1 is given in figure 1. The development of themes as described by the voices of the participants of this study, provided thick descriptions of their experiences and opinions on growth of their respective company, in a turbulent economy.

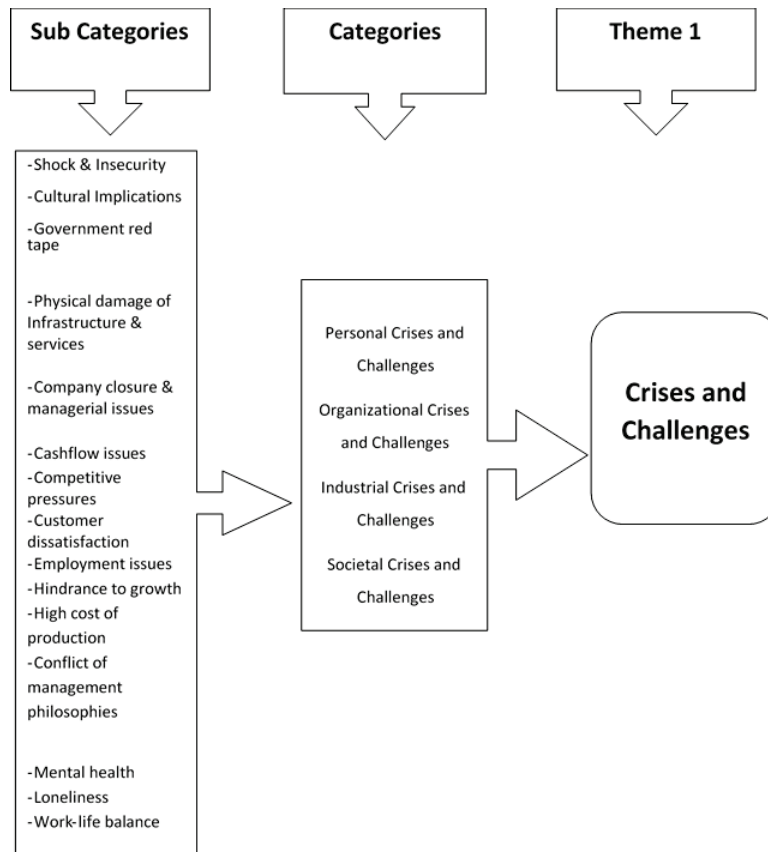


Figure 1: Development of theme 1

6. Research output

The final output of this study is the development of a framework for understanding how small enterprises grow and develop in turbulent economies. This framework incorporates the three main themes that we developed from the findings of this study.

7. Methodological challenges and strategies utilised to overcome them

The most practical challenging thing faced in this study was to get a list of small enterprises in Sri Lanka. There is no proper institution, record or database related to the small enterprises in Sri Lanka. To overcome this challenge we utilised maximum variation sampling technique. Dennis (2004), stated that there are two main occasions to use maximum variation sampling; when the sample size is too small or when no population information is available. Hence due to the non-availability of population information maximum variation sampling technique was the best option to overcome the challenge.

Another challenge was to prove and achieve the trustworthiness of the results. We followed various strategies to overcome this accusation imposed by quantitative researchers. Using multiple methods of data collection, semi-structured in-depth interviews and informal conversations facilitates the validation of data through triangulation. Member checks were carried out to attain the credibility. Member checking is where, “data, analytic categories, interpretations, and conclusions are tested with members of those stake holding groups from whom the data were originally collected” (Lincoln and Guba, 1985, p.314). Peer examination and expert advice were taken on the research methodology especially with topic guides, sampling procedures and analytical procedures. Confirmability refers to the researcher’s ability to demonstrate that the data represent the participants’ responses and not the researcher’s biases or viewpoints (Cope, 2014). We understood the importance of being neutral and impartial throughout the data collection, data preparation, data condensation and interpretation and developing conclusions phases, even though an interview is a conversation between the interviewer and interviewee (Esterberg, 2001), which is not a neutral tool for at least two people creating the reality of the interview situation (Denzin and Lincoln, 2000). To achieve the neutrality this purpose we maintained a reflective journal, which recorded all the decisions taken throughout the process.

The final challenge was related to using an audio file recorder. In the very first interview, in one occasion the recorder battery was not charged. As a result of that one hour interview was missed. As a strategy we wrote down all the words uttered by the interviewee. It was a daunting task as it wasn't easy to concentrate on the conversation with the interviewee. With that scenario, more attention was paid to details and preparation before conducting an interview.

Lessons learnt

We realised that after collecting data from 7 information rich companies and after finishing analysing them that the quotes of the participants were repeated among themes developed. This paper was based on the PhD study done by the principle author, and only 7 cases were used for the purpose of this paper. Later it was decided to increase the sample to 12. Cope (2014), claimed that in reporting qualitative research, confirmability can be exhibited by providing rich quotes from the participants that depict each emerging theme. Researcher fulfilled this when presenting finding and elaborating on the development of themes and by increasing the sample size to 12 companies.

We learnt that depending too much on audio recorder is a risk and to maintain manual note taking simultaneously with tape recording.

8. Conclusions

This study mainly focused on the design of a general analytical inductive qualitative research Strategy. Justifications of the selection of interpretivism as the guided philosophy was presented and it's compatibility with the research objectives were clearly justified. An Interpretivist approach (Blaikie, 2007) guided this study to understand (verstehen) how people make sense of their world where human actions are based upon the actor's interpretation of events, social meanings, intentions and beliefs.

Through a practical application of the research approach, research strategy, research design, data collection and data analysis approach, this study demonstrates the credibility of the general analytical inductive research strategy as a qualitative research methodology; a straight forward method which defensibly address evaluation objectives. In addition, dealing with bulk amount of qualitative data, and condensing raw data can be devastating and challenging. This paper gradually explained the procedure of analysing 21 semi-structured in-depth interviews from the data preparation stage to developing themes stage. Both the technology and manual data management was used in an intelligible and transparent way which is a new approach to qualitative data analysis, and can be useful in particular to early career researchers and doctoral students.

We believe this research contributes to the SE literature by exploring the growth of small enterprises in a turbulent emerging economy using an inductive qualitative approach which was a rare selection among the past researchers and scholars. In this manner, key benefits for companies are understanding the characteristics, challenges and strategies utilised by SEs under turbulent environments.

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