KAIZEN AS A BASIS FOR QUALITY SYSTEM PERFORMANCE IN ORGANISATION

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ABSTRACT
Due to high dynamics of change in modern socio-economical environment, companies have to generate new methods of responsiveness to arising challenges. One of the ways to gain sufficient competitive advantage is quality orientation. Although Kaizen is deemed to be one of the core elements of quality improvements, its modern impact is being underestimated. Four basic components of the philosophy - essence, innovation, personal and quality control allows to frame an integrated quality system which will lead to performance improvement. Arising discussion is formulated as following - how to implement these four elements into organizational structure. The central contribution and novelty of this paper is a contemporary integrated approach on improvement internal organizational processes on the basis of Kaizen. The study uncovers several conceptual blocks: theoretical basis of Kaizen philosophy, comparative analysis of methods to implement Kaizen in organization; development of method to implement Kaizen concept, evaluation of «Kaizen effect». The research adopted case study method, collecting data from various sources - documentation investigation, structured questionnaire and interviews - in order to ensure its representativity. The paper would be useful not only for scientists discovering modern Kaizen impact, but also for experts willing to implement kaizen philosophy on practice.

Keywords: *Continuous improvement, Kaizen, Performance of organization, Quality, Quality-oriented strategy*

1 INTRODUCTION

In late 70's American companies faced fierce competition emerged due to the change of essence of the market - corporation «Ford» lost more that 3 billion dollar in 3 year period; «Chrysler» had to borrow money from the US government to evade bankruptcy; «Xerox» lost half of their markets (Imai, 2005). After some time it became obvious that competitive advantages of the new market leaders lie in the sphere of new kind of management. Core characteristics of the new approach became involvement, quality, statistical control of processes and others - Kaizen.

Despite the fact that Kaizen concept has not been developing for a long time, elaboration of Kaizen ideas gained especial actuality in the context of global economic crisis and understanding that not always new methods of management allow to attain maximum results.

A growing interest to the concept has been noticed nowadays - fundamental ideas and mechanisms of Kaizen concept are being used as a basis for quality standards development (for instance ISO 9000, ISO 10000 (http://protect.gost.ru/document.aspx?control=7&baseC=6&page=2&month=3&yaer=2009&

search=&id=174286), ISO 21500:2012). Moreover, Northern Europe commitment to ideas of continuous improvement should be marked - for example, «Volvo» company is one of the word leaders in the sphere of Kaizen ideas appliance.

Although Kaizen concept has strong theoretical framework, the concept has not explicit guidance on how to adapt it on practice. Due to this fact the aim of the papers was formulated as following:

Aim of the work is projecting of a complex approach to internal processes (involved in organizational quality management system) improvement on a basis of Kaizen concept.

A related series of targets was formulated in concordance with the set aim:

- Reviewing of Kaizen concept theoretical basis, accentuation of its fundamentals;
- Comparative analysis of Kaizen concepts implementation approaches into organization;
- Development of an algorithm of activities to Kaizen concept implementation into a particular organization;

The central contribution and novelty of this paper is a contemporary integrated approach on improvement internal organizational processes on the basis of Kaizen. The study uncovers several conceptual blocks: theoretical basis of Kaizen philosophy, comparative analysis of methods to implement Kaizen in organization; development of method to implement Kaizen concept, evaluation of «Kaizen effect». The research adopted case study method, collecting data from various sources - documentation investigation, structured questionnaire and interviews - in order to ensure its representativity. The paper would be useful not only for scientists discovering modern Kaizen impact, but also for experts willing to implement kaizen philosophy on practice.

2 REVIEW OF THE LITERATURE AND THEORETICAL FRAMEWORK

Since 1986 management as a science has been undergoing sufficient changes. A legendary book, which has changed the vision of managers on how to run their business was published that year. A book written by Masaaki Imai «Kaizen: the key to Japan’s competitive success» became a foundation for further development of a new managerial concept based on continuous improvement and quality orientation.

2.1 Basic elements of continuous improvement concept

Analyzing theoretical basis of the considered theory it is possible to assume that Kaizen concept as a «system of systems» could be presented as an interrelation of elements. Structural relation between core elements of such a system is presented on figure 1.

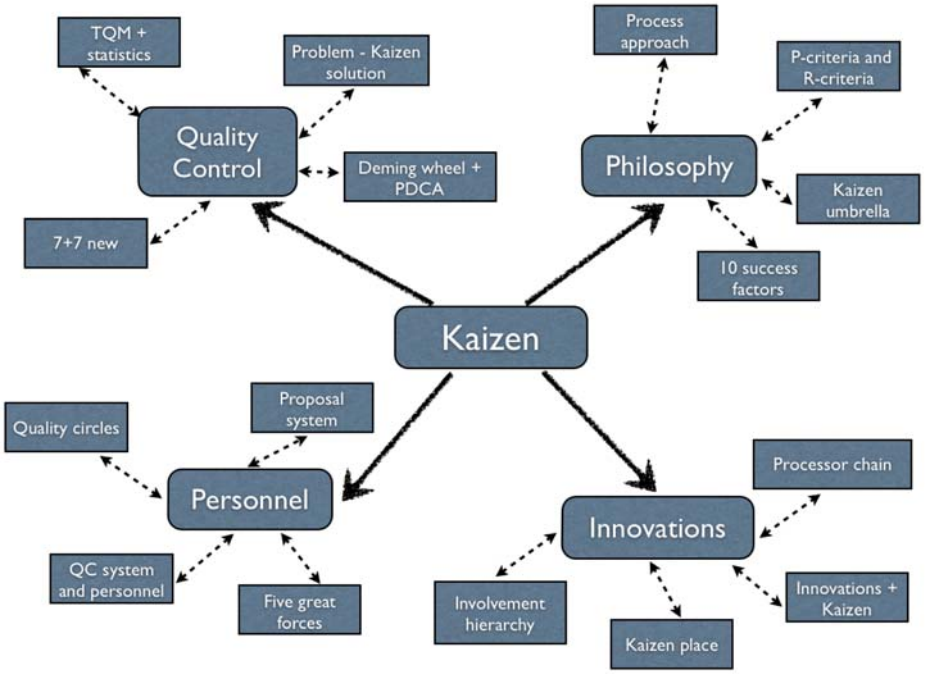

Figure 1: Kaizen concept

- Kaizen philosophy - general insight into the concept of continuous improvement (http://www.kaizen.com/publications/total-flow-management-book.html; Imai, 2004), process approach (Laiker, 2008; http://www.12manage.com/methods_forrester _system_dynamics.html), Kaizen-thinking (Imai, 2004; http://www.emeraldinsight. com/journals.htm?);
- Improvement and innovations - allows to perceive the distinction between innovative development of a company and a continuous improvement oriented strategy with innovation accent (Imai, 2005; Imai, 2004; Wickens, 1987);
- Kaizen and quality control - considering TQC not only as quality control for a product/service but also as a basis for all of the organizational directions of development (Imai, 2005; Robinson, 1990; Wickens, 1987);
- Kaizen and personnel system - a core attribute of efficient organizational performance in the terms of considered concept is coherence between quality control and proposal systems (Imai, 2005; Imai, 2004; http:/www.juse.or.jp/e/; www.questia.com/PM.qst?a =o&d=5000136355).

2.2 Implementation of Kaizen concept

Based on a constructed theoretical basis central elements of Kaizen concept are: philosophy, innovations, quality control and personnel. Modern scientists propose four different approaches of continuous improvement concept implementation: parallel, integrated, coordinated, project.

Parallel approach – improvements are implemented parallel and separately from common activity of the company (http://www.emeraldinsight.com/journals.htm?articleid=850716 &show=abstract; www.tandfonline.com/doi/abs/10.1080/09544120020010084).

Improvements are analyzed and implemented by experts or small groups (including cross-functional teams and project groups with limited involvement into operations) (www.emerald insight.com/0025-1747.htm; Docherty, 1996). Advantage of the approach is transfer of knowledge provided by cross-functional teams. Weak point of the approach is limited involvement of experts.

Integrated approach – improvements are part of everyday activity (http://www.emerald insight.com/journals.htm?articleid=850716&show=abstract; Sako, 2004).

Improvements are analyzed and implemented by operators (individually or in groups). Strength of this approach is that autonomy of operators allows attain higher level of freedom in implementation of changes and stimulates knowledge transfer as a part of everyday job (Ellstro¨m, 2000; http://oer.guenther.ws/node/4).

Coordinated approach – summarizes integrated and parallel approaches and combines experts-driven cross-functional teams for temporary projects and self-managed changes as part of everyday job (www.emeraldinsight.com/1756-669X.htm).

Project approach – some improvements are viewed as projects. Every project has limited time bounds and a point of beginning and ending (Krishnan, Shani, Grant and Baer, 1993). When an improvement is viewed as a project there is a certain risk that if first results would not give sufficient changes - priority of a projects would be lowered (www.emeraldinsight.com/1756-669X.htm). In the context of Kaizen process of changes is perceived as a future-oriented continuous improvement therefore its results could be evaluated only after period of time.

In the considered context one of the most interesting papers is D. Swartling and D. Olausson "Continuous improvement put into practice: alternative approaches to get successful quality program" (www.emeraldinsight.com/1756-669X.htm). In the article authors used case analysis to educe differences in implementation of the four approaches.

Furthermore, papers of great importance on the topic are Lindberg and Berger (1997, 2001) (http://www.emeraldinsight.com/journals.htm?articleid=850716&show=abstract; www.tandfonline.com/doi/abs/10.1080/09544120020010084). In the articles the authors explored implification of Kaizen philosophy as a basis of quality system performance in organization and different approaches for its implementation.

3 METHODOLOGY

Arising question is as following - how to combine advantages of different approaches and to turn improvement process in an organization into a continuous process. According to D. Swartling and D. Olausson results (www.emeraldinsight.com/1756-669X.htm) the most efficient approaches to implementing continuous improvement into a company are parallel and integrated approaches.

In our paper a new concept that combines characteristics of parallel and integrated approaches will be presented. In Berger (http://www.emeraldinsight.com/journals.htm? articleid=850716&show=abstract) coordinates («basic constructions of task realization» and «task of improvement») a new concept called «combined approach» is located in the same position as coordinated approach - figure 2.

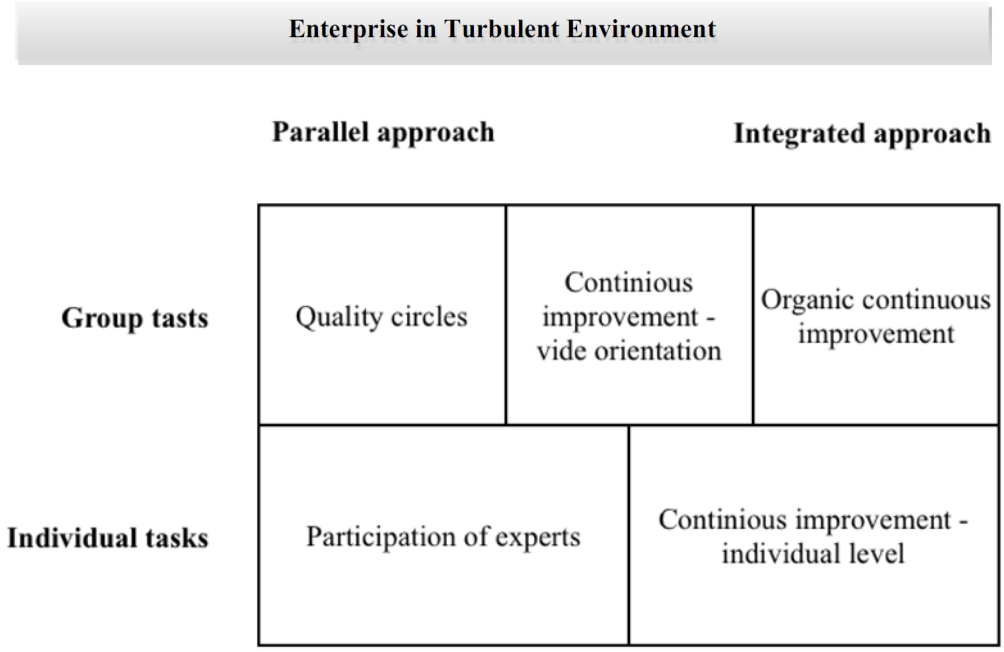

Figure 2: Combined approach in terms of Berger concept coordinates

Core characteristics of the developed concept are:

1 Initial participation of a team of experts as a new element of organizational structure which and transformation into a cross-functional division at a later stage. A new division will act as a permanent «generator of improvement» in organization;

1.1 Participation of experts allows making objective evaluation of processes and overall situation in organization (parallel approach);

1.2 Enjoyment of highly professional experts allows solving complicated problems, which can not be solved by internal organizational resources (parallel approach);

1.3 Formation of a cross-functional improvement generating team (parallel approach).

2 Groups of continuous improvement realize classical Kaizen function. These groups continuously improve processes of their direct influence;

2.1 High level of involvement and motivation of personnel allows achieving continuous process of improvement in organization (integrated approach);

2.2 The groups can independently initiate, plan, implement and evaluate improvement in organization (integrated approach);

2.3 Availability of «cancel of improvement» - members of a group can return to primary standards and patterns without sufficient loss if an improvement does not introduce expected results (integrated approach).

4 RESEARCH METHODS

To analyze the implementation of developed model case method was selected in the work. Case study was conducted on a basis of regional Russian IT company - LLC «Instar Technology». Instar Technology is a regional IT system integrator operating in Perm krai. Number of employees of the company is 75 people. Analysis was conducted in several stages:

- Content analysis of basic strategic documents of the company to educe their compliance with kaizen philosophy: mission, strategy, commitment to excellence, structure of the company;
- General analysis of quality system in the company - quality documents of the company (particularly ISO 9001:2008 certificate) were analyzed;
- Several in-depth interviews (3 interviews with members of the board of management,

7 interviews with managers of functional departments). The interviews accompanied by general analysis allowed to detect the center problem faced by the company;

- Random questionnaire survey of functional division employees of the company (number of respondents - 20 people)
- A «diagram of reasons and relations» was constructed on the basis of obtained results.

5 RESULTS

A critical task for LLC «Instar Technology» revealed in the process of in-depth interviews was formulated as following - transition of quality system in organization into continuous improvement stage. Main problems detected on the basis of in-depth interviews and a survey are absence of system development of improvement and high level of involvement of board of managers into direct control of business processes in organization. Pareto diagram was constructed to understand the reasons of educed problems - chart 1.

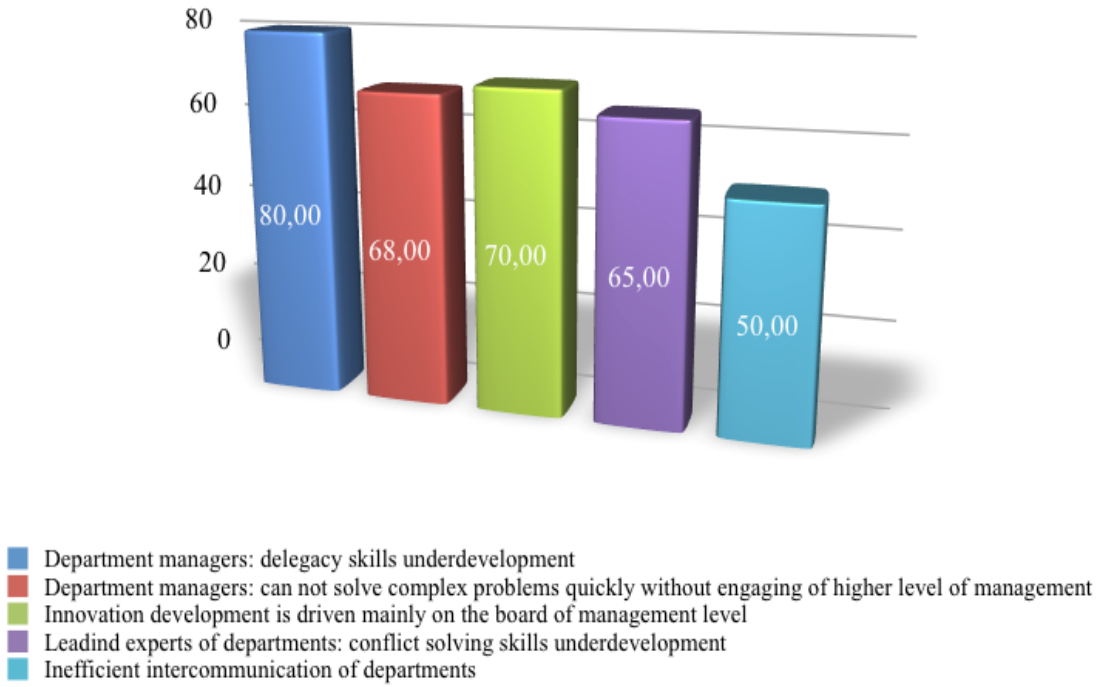

Chart 1: Pareto diagram for LLC «Instar Technology»

Improvements in the organization are not system due to the reason that «quality control department» mechanism was declined by organizational structure therefore improvements are driven mainly by board of managers. This situation reveals weak points of parallel approach because quality control department was designed by external consulting company. The arising problem can de solved by projecting of alternative mechanisms, which will be organic for the company and will encourage improvement development on a system basis.

5.1 Development of Kaizen concept for LLC «Instar Technology»

The company made a decision to create a new software department, which is cross-functional because experts of the department directly interact with all the other departments of the organization. Software department was selected as a potential expert group of improvement

implementation due to the following reasons:

- Flexibility of the department operational behavior because it is yet not strictly built into organizational structure and interactions;
- Possibility of in-depth interviews and targeted guiding seminars due to the paucity of personnel of the department;
- Cross-functional type of interaction with other departments.

Concept of continuous improvement implementation for LLC «Instar Technology» is embodied in initiation of a pilot project through interaction of technical and software departments. Interaction of the two departments leads to creation of a unique product that is oriented on a particular client. The product is called «an integrated solution» and is a combination of software and hardware components. At the moment LLC «Instar Technology» intends to realize an integrated solution for LLC «Teplov i Sukhov» (figure 3).

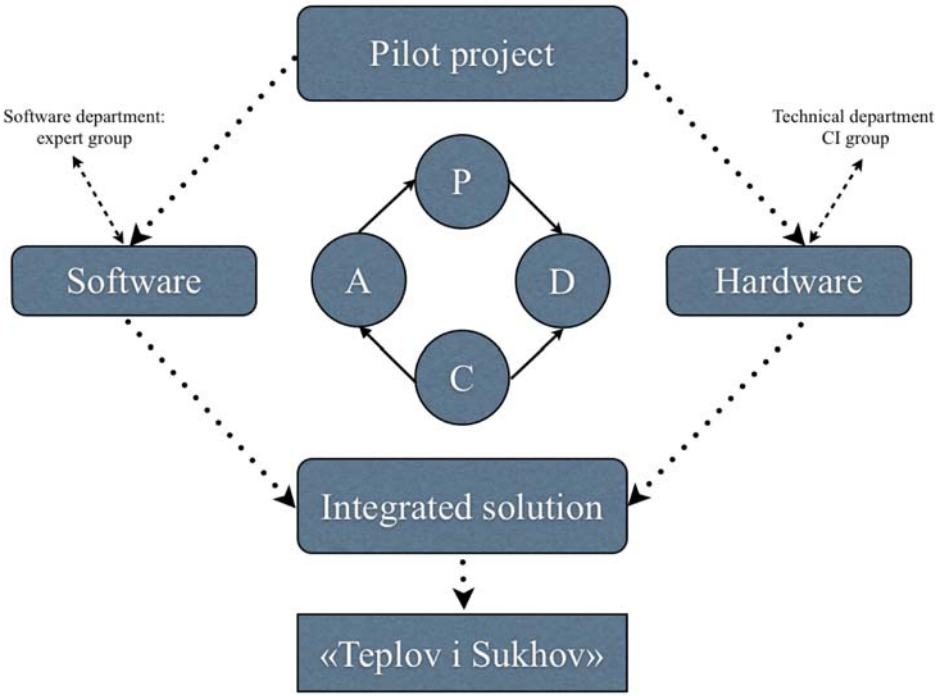

Figure 3: Combined approach of Kaizen concept implementation for LLC «Instar Technology» on a basis of realization of integrated solution

An integrated solution is a completed cycle and demands continuous improvement, refinement and specification on every stage of production. Due to that reason special recommendations on how to form the idea of continuous improvement in software and hardware departments have been proposed:

Stages of integrated solution concept realization:

1. Formation of common information field where experts from both departments in the process of communication could optimize chosen methods - both hardware and software;
2. Creation of an expert group of continuous improvement concept implementation in the software department. In the pilot project the expert team would be oriented on software sphere - specification of software in accordance with the need of the client on the basis of PDCA cycle, process thinking during development of the integrated solution);

3. Creation of continuous improvement group in technical department, which will help to find optimized hardware solutions for the need of the client and to improve processes of equipment assembly;
4. Discussion on the solution's integration in the common information field (everyday meetings). Two-way interaction in the case is the key factor of success due to the reason that it allows to optimize process of integrated solution development and to bring it into maximum compliance with the customer's requirements;

5.2 Expert groups of software department

It is proposed to hire an external expert in the sphere of continuous improvement and business process engineering. Furthermore, it is strongly recommended to find an expert with coaching experience in order to stimulate transfer of knowledge to other departments. Personnel of software department will attain competencies and skills of process thinking, PDCA cycle, continuous improvement during team-work and seminars with the expert. Therefore software department personnel would become a «generator of improvement» in the project of integrated solution development. A new task will be set for software department experts when the project will be finished - transfer their knowledge throughout the organization (which will be realized through cross-functional interactions and series of seminars).

5.3 Continuous groups of technical department

It is proposed to use similar method as quality circles. Special meeting among the group of technical experts (3-5 people) would be organized in order to discuss directions of improvement of the project from technical point of view. After that transfer of knowledge will proceed throughout the technical department. Also it is planned to introduce proposal system and to change motivation system in order to stimulate improvement in organization.

6 FINAL CONSIDERATIONS

Implementation of Kaizen concept in the organization is divided into two directions: expert group's competencies formation from one side and creation of continuous improvement groups, explanation of Kaizen concept and lower level personnel involvement from the other side. Moreover, modernization of interrelation system between board of managers and personnel, division of innovation and maintenance functions. Final considerations on how to launch an initiative impulse of continuous improvement in the organizations are presented in table 1.

Table 1: Kaizen strategy - combined approach for LLC «Instar Technology»

Kaizen		Philosophy	Innovations	Personnel	Quality Control
Management		Seminars + training	Division of innovation and maintainance functions + training	Five forces of relations between an employee and organization	Seminars + training
Group	Experts	Seminars + training	Seminars + training	Seminars + training	Seminars + training
	CI	Explanation of Kaizen concept	«Classical Kaizen»	Proposal system	Creation of Continuous Improvement groups
Individual		Explanation of Kaizen concept			

7 FURTHER DISCUSSION

Implementability of Kaizen concept on a basis of combined approach for LLC «Instar Technology» was analyzed in the article. First stage of Kaizen concept implementation for the company was also proposed. In the aggregate it is possible to start implementation of Kaizen concept on the basis of current quality system in organization. Expert team that provide training and organize Kaizen seminars subsequently become an organic part of organization and stimulate continuous improvement. Experience gained during realization of pilot project will allow to evaluate the effectiveness of the concept and conclude on advisability of developed mechanisms' scaling enterprise-wide.

Adaptability of developed concept depends on the degree of implementation because Kaizen concept presume complex integration. Separate elements of the system will introduce improvements into organization. However, only four Kaizen elements: philosophy, innovations, personnel and quality control on three concept levels (management, group, individual) allow attain synergy in department interaction and a company will actualize its own «Japanese wonder».

8 BIBLIOGRAPHY

1. *12 manage, management portal, «system thinking, system dynamics*. Retrieved from http://www.12manage.com/methods_forrester_system_dynamics.html.
2. Berger, A. (1997). Continuous improvement and kaizen: standardization and organizational designs. *Integrated Manufacturing Systems*, 8(2), 110–117. Retrieved from http://www.emeraldinsight.com/journals.htm?articleid=850716&show=abstract.
3. Bhuiyan, N. and Baghel, A. (2005). An overview of continuous improvement: from the past to the present. *Management Decisions*, 43(5), 761–771. Retrieved from www.emeralddinsight.com/0025-1747.htm.
4. Chang, R. (1995). Core threats of continuous improvement. *Management development*,

8(4), 14–16. Retrieved from http://www.emeraldinsight.com/journals.htm?articleid=878762&show=abstract

5. Docherty, P. (1996). *La¨ roriket – va¨ gar och va¨ gval i en la¨ rande organization*. Solna: Arbetslivsinstitutet.
6. Ellstro¨m, P.-E. (2000). La¨rande och kompetensutveckling i 'magra organisationer': problem och mo¨jligheter. In L. Lennerlo¨f (ed.), *Avveckla eller utveckla? En antologi om verksamhetskonsekvenser i magra organisationer, Ord & Vetande AB, Uppsala* (pp. 136–157).
7. *Federal agency of technical regulation and methodology, GOST ISO 9001-2008* (13.11.2009). Retrieved from http://protect.gost.ru/document.aspx?control=7&baseC=6&page=2&month=3&yaer=2009&search=&id=174286.
8. Imai, M. (2004). *Kaizen*. Moscow: Alpina Busniess Books.
9. Imai, M. (2005). *Gemba Kaizen*. Moscow: Alpina Busniess Books.
10. Kaizen Institute. *Total Flow Management: Achieving Excellence with Kaizen and Lean Supply Chains*. Retrieved from http://www.kaizen.com/publications/total-flow-management-book.html.
11. Krishnan, R., Shani, A., Grant, R. and Baer, R. (1993). In search of quality improvement: problems of design and implementation. *Academy of Management Executive*, 7(4), 7–20.
12. Laiker, J. (2008). *Dao Toyota*. Moscow: Alpina Busniess Books.
13. Lillrank, P. and Kano, N. (2009). *Continuous improvement: Quality Control Circles in Japanese Industry*. Michigan: University of Michigan, Center for Japanese Studies. Retrieved from http://www.questia.com/PM.qst?a=o&d=5000136355.
14. Lillrank, P., Shani, A. B. and Lindberg, P. (2001). Continuous improvement: exploring alternative organizational designs. *Total Quality Management*, 12(1), 41–59. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/09544120020010084.
15. Nonaka, I. (1994, 2004). A dynamic theory of organizational creation. In K. Starkey, S. Tempest and A. McKinlay (eds.), *How Organizations Learn: Managing the Search for Knowledge* (pp. 165–201). London: Thomson. Retrieved from http://oer.guenther.ws/node/4.
16. Robinson, A. (1990). *Modern approaches to Manufacturing Improvement*. Portland (OR): Productivity Press.
17. Sako, M. (2004). Supplier development at Honda, Nissan and Toyota: comparative case studies of organizational capability. *Industrial and Corporate Change*, 13(2), 281–308.
18. Swartling, D. and Olausson, D. (2011). Continuous improvement put into practice: alternative approaches to get a successful quality program. *Informational journal of quality and Service Sciences*, 3(3), 337–351. Retrieved from www.emeraldinsight.com/1756-669X.htm.
19. *Union of Japanese Scientists and Engineers, center of TQM*. Retrieved from http:/www.juse.or.jp/e/.
20. Wickens, P. (1987). *The Road to Nissan*. London: Palgrave Macmillan.