Organizational Innovations and Knowledge Based Enterprises. Theoretical Postulates and Empirical Issues

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ABSTRACT

The nature and the set of futures describing a knowledge based enterprise does not form a unified concept. The conception of knowledge based enterprise evolved from a learning organization to a competitive learning organization, and finally to an intelligence organization, and agile organization. Theoretical postulates of the organizational innovations in knowledge based enterprises can be treated as a normative model, aimed toward maximum freedom. It is an extremely flat organization, free of official hierarchy, based on horizontal coordination relationships and variable hierarchy of goals, blended into external economic networks, completely decentralized, based on wide specialization of employees, and very low level of standardization and formalization; it uses most of the modern techniques of management. The empirical research of the organizational innovations in knowledge based enterprises (case studies, two special studies in Poland, and some issues from European Community Innovation Survey) indicate, that in practice more diversified organizational solutions are being used, and it is rather hard to find the enterprise on that extremely theoretical level. The gap between
theoretical and practical models led to the following conclusions: 1. the research models were too simplified – in some aspects, 2. One of the most important aspect was: the research model should be adjusted to the particular areas of business processes of an enterprise (marketing, R&D, production etc.)

Keywords: Organizational innovation, knowledge based enterprise, organizational structure

1 INTRODUCTION

This paper is a part of a larger research project called “Adjustment of enterprises’ management systems to knowledge-based economy”. The project, undertaken at the Faculty of Engineering Management at Poznan University of Technology, started in 2009 with the aim to define:

1. Model solutions (best practices) in regard to changes in enterprises regarding: strategy and organizational structure, human capital, innovations, ICT systems, relationships with institutional-legal environment, which enable them to realize the knowledge-based organization model.

2. Mechanisms of enterprises’ behavior, ignoring or blocking the influence of changes occurring in the environment, which result in maintaining the organization inadequate to occurring opportunities and efficient competing.

3. Barriers existing outside and inside the enterprises, which neutralize or make negative the relationship between changes in the environment, reflecting the knowledge-based economy and changes in enterprises describing the knowledge-based organization.

This paper focuses on organizational innovation aspects in knowledge based enterprises with the aim of summarizing the actual research issue both: theoretical postulates and their empirical verification.

2 THE CHARACTERISTIC AND MODELS OF KNOWLEDGE BASED ENTERPRISES


The logic of development of knowledge based organization derives from the concept of “organizational learning”. As a result of this learning process, an organization acquires new characteristics which constitute the notion of “learning organization”. Ashok Jashapara (2006, pp. 303-324) indicates three parallel trends in the development of a learning organization:

- American approach, represented by the concept of fifth discipline and learning
organization by P. Senge, and the concept of organizational learning by D. Garvin;

- British approach, focused around 3 level model of a learning organization by B. Garratt, and a model of a learning enterprise by M. Pedler, J. Bugoyne, T. Boydell;

These three approaches indicate a variety of possible ways of learning and creating a learning organization, through: individual mastery, team learning, knowledge sharing, experimenting, systemic thinking, using heuristic techniques and quality management methods.

Introducing the concept of a knowledge generating enterprise, I. Nonaka (1991) emphasized the role of organizational learning focused on innovations and gaining competitive advantage. It is not enough for the organization just to learn. This learning should be purposeful and oriented at gaining competitive advantage. A. Jashapara (2006, p. 317-321) believes, that a competitively learning organization, unlike a learning organization, reaches a higher level of: learning pace, orientation of learning, level of communication, information flow and organizational efficiency.

Another concept of a knowledge based organization is an intelligent organization. It is treated as another, higher level of a knowledge based organization, sometimes presented as a perfect enterprise. While describing an intelligent enterprise, the following features are indicated (Romanowska 2001, Grudzewski, Hejduk 2004, Krupski 2005, Mikula i inni 2007):
- it is a self-learning and improving organization
- it has adaptation abilities
- it is flexible
- it should be an intelligent innovator
- using intelligence and professional knowledge are crucial
- it has skills in knowledge management and gathering intellectual capital
- it is built on foundations of competencies supported with curiosity, trust and joint actions
- doesn’t need to have a legal personality; it can operate within external economic networks, also as a virtual enterprise.

The last model related to knowledge management is the concept of agile organization. Agility of an organization depends on the knowledge, experience and innovativeness of its members and their access to information. An agile organization, through its structure and management process, quickly and smoothly activates its social capital to generate the value for a customer when a market opportunity occurs (Goldman, Nagel, Preiss, 1995, p. 42-43). A current summary of a development of a concept of an agile enterprise is the model proposed by S. Trzcielinski (2005, p. 12-16), which includes four dimensions:
- acuteness of the enterprise, which is a function assigning to the turbulent environment a string of potential market opportunities,
- resource flexibility of the enterprise, which transforms the string of potential opportunities into a string of resource available opportunities
- enterprise’s intelligence, comprehended as an ability to understand a situation
and find deliberate reactions to them, that is to activate proper resource to weaken the threats or use the opportunities,

- smartness of the enterprise, as an ability to quickly use the opportunities in a benefit bringing manner.

Models of intelligent and agile organizations are not just a simple expansion of a learning organization; they are a result of an integration with new concepts of organizational structures, development of IT and lean management philosophy. Therefore an attempt to define a list of features of knowledge based organizations is not an easy task, and interpretations are not always unambiguous.

The most common features of the knowledge–based enterprises are (Mikula et al, 2007, p.33-38):

1. Structure of resources and investments in intangibles, which constitute a majority of organization’s market value. It refers particularly to intellectual capital, which consists of:
   - human capital (people and their knowledge, skill, values, norms, attitudes, views, emotional intelligence, etc.),
   - structural capital - understood mainly as the organizational capital,
   - customer capital - created by customers, which reflects their potential value of purchase of products and services offered by the organization;
   - intellectual property, including: patents, licenses, copyrights, trademarks, secrets, projects, etc.
2. Knowledge management – understood as conscious and deliberate management of knowledge, including the aspects of strategy, structure, culture, technology and people.
3. Shaping the relationship with environment in order to, by using one’s knowledge, gain an advantageous location in economic network.
4. Organizational structure is characterized by: high flexibility, openness to environment within network and virtual structures, wide use of temporary task teams and creation of positions or teams responsible for knowledge management.
5. Organizational culture adjusted to new conditions and favoring knowledge management.
6. Specific roles and responsibilities of people. Gradual diminishing of difference between workers and management. Extending the range of people’s activities and encouraging initiative and searching for possible system improvements.

3 THEORETICAL POSTULATES OF THE ORGANIZATIONAL INNOVATIONS IN KNOWLEDGE BASED ENTERPRISES AND THEIR EMPIRICAL VERIFICATION

Organizational innovation means an implementation of a new organizational method in company’s principles of operation, in workplace organization or in relationships with company’s environment. (Oslo, 2008, p. 53). Organizational
innovation can be differentiated in two types: structural, and procedural. They can be further differentiated in an intra – organizational and inter – organizational dimension. Structural organizational innovations change and improve an organizational structure. Procedural innovations affect routines, processes and operations of a company. While intra – organizational innovations occur within an organization, inter – organizational innovations include new organizational structures and procedures beyond a company’s border (Armbruster at al., 2006, pp. 20-21)

Structural innovations will be analyzed in context of five dimensions of organizational structure: configuration, centralization, specialization, standardization and formalization.

1. A configuration of a structure in a knowledge based enterprise should lead toward maximal flexibility. There are many ways of increasing this flexibility. First of them is flattening the organizational structure by maximally decreasing the number of hierarchical levels, decreasing the administrative role of a manager and replacing the traditional forms of imperative and functional coordination with a horizontal-process coordination. (Stabryla 2009, Zgrzywa Ziemak 2009, Probst at al. 2002). It leads toward transformation from traditional mechanistic structure to organizational structures with an increased role of informal organizational relationships, face to face communications and two loops of communications downwards and upwards (Ahmed, 1998). I. Nonaka and H. Takeuchi (2000, pp. 195-231) in their critique of traditional bureaucratic structures, indicate task based structures as dynamic and flexible solutions. However, they also notice that teams are temporary in character, and the knowledge generated within a team is not easily transferable to other organization's members when the task is terminated. For knowledge creating enterprises, they propose a model of a hypertext organization, which combines the traditional bureaucracy with task teams. A hypertext organization consists of three layers: a business system layer, a project teams layer and a knowledge resources layer. Replacing the rigid organizational structures with teams and projects, replacing individual and group work with teamwork, replacing fixed functions with project work, replacing hierarchy resulting from positions with relationships resulting from the hierarchy of goals - these are the postulates of many authors (Mikula et al, 2007, Zgrzywa – Ziemak, 2009, Stabryla et al., 2009). The most far going postulate is introducing a network organization, which elements are connected with weak coordination relationships and then fuzzing the borders of an organization, increasing the strength of relationships with the environment (customers and cooperators) and increasing the importance of inter-organizational relationships (Stabryla et al., 2009, pp. 179-181). An important postulate for activation of knowledge based organization at the highest level is expanding the types of organizational relationships. C. L. Wang i P.K. Ahmed (2003, pp. 57-60) notice that simple increasing of informal relationships importance is insufficient. It is necessary to introduce three new dimensions of organizational relationships: trust - based relationship, externally-oriented interactive relationship, and emotionally-inclusive
relationship. In Poland, empirical studies related to context variables in knowledge based enterprises, have been conducted twice. At the beginning of 2000, A. Zgrzywa Ziemak conducted a study on the factors which influence the enterprise’s learning ability. The results of this study confirmed that learning is enhanced by flat structures, replacing hierarchical relationships with cooperation relationships and increasing importance of goal hierarchy over the hierarchy of positions (Zgrzywa-Ziemak, Kamiński, 2009, pp. 155-156). A second study, concerning the organizational structures in knowledge based economies, was conducted by the team of A. Stabryła in 2008-2009. The results showed that enterprises with the highest index of knowledge potential showed tendencies similar to theoretical postulates, however at a much lower level than theoretical expectations: structures are rather flattered (usually 3 leveled); a basic form of coordination is still a hierarchical organization (although a half of surveyed enterprises also uses a coordination through plans and goals and through regulations and procedures), the scope of multiple subordination increases (Stabryła et al, 2009, pp.296-312).

2. Specialization as a dimension of an organizational structure of a knowledge based organization is rarely discussed in literature. A general tendency (not only in knowledge based organizations) to expand the level of specialization and versatile education necessary in teamwork is indicated. A hypothesis: the lower level of specialization, the more innovative organizational structure, has not been fully confirmed by the studies of A. Zgrzywak-Ziemak (for the detailed distribution of tasks the hypothesis was insignificant, however the flexibility of task distribution was significant) The study of A. Stabryła confirms that in 68% of surveyed enterprises which belonged to a group with a highest knowledge potential, a wide specialization of work occurred.

3. Centralization is a dimension which describes the level of concentration or dispersion of decision making authority in organizations. Theoretical postulates are usually consistent: increasing decentralization increases utilization of employees intelligence, which also increases their participation in creation and usage of knowledge. The study of A. Stabryła confirm that in the group with the highest knowledge potential, 78% of enterprise declares high level of decentralization. In the study of A. Zgrzywak-Ziemak, in turn, this factor is considered irrelevant to the learning ability of an organization. Certain doubts regarding the significance of centralization are also expressed by G. Probst, S. Raub and K. Romhardt (2002, p.284). They point out that decentralization leading toward the freedom of action may have positive influence on the development of internal knowledge, however the empowerment of company’s units may impede the usage of knowledge in the company as a whole.

4. Standardization and formalization unifies and consolidates the processes and human behaviors in organizations. It enables gaining high repeatability of processes' flow and results of these processes. On the other hand it limits the use of workers’ initiative and intelligence. High standardization and formalization are associated with a model of a fixed, bureaucratic organization,
very distant from knowledge based organizations. The study of A. Zgrzywak-Ziemak confirm a thesis that the lower the level of standardization and formalization, the more likely we are to encounter an innovative organizational structure. Organizational learning is also favored by acceptance of different ways of activity and behavior. The studies of A. Stabryła prove however that the majority of enterprises with the highest index of knowledge potential have full organizational documentation (statute, organizational regulations, organizational structure chart, scopes of activity for workstations, employment plan and documents flow regulations), and the convergence of tasks of organizational units actually performed with the tasks described in an organizational regulations is very high (95% of companies).

Summarizing the theoretical postulates regarding the structure of a knowledge based organization and the concepts of intelligent organization in particular, we get the picture of an organization with a maximal internal freedom. It is an extremely flat organization, almost devoid of the chain of command, based on relationships of horizontal coordination and changing hierarchy of goals, blended into external economic networks, totally decentralized, based on wide specialization of workers, characterized by a very low level of standardization and formalization (Pawłowski et al, 2011). However, the empirical studies reveal the reality quite distant from a theoretically-normative model. A general relation between organizational structure innovativeness and enterprise’s learning ability is confirmed. Structures are more flat, the importance of horizontal coordination processes increases, the role of task teams and project teams supplementing traditional organizational structure also increases. A level of centralization, standardization and formalization has no unequivocal interpretation in empirical studies.

**Procedural organizational innovations** change or implement new procedures and processes within the company, such as simultaneous engineering or zero buffer-rules. They may influence the speed and flexibility of production (e.g. just in time concepts) or quality of production (e.g. continuous improvement process, quality circles) (Armbruster at al, 2006, p. 20). Procedural innovations are usually a result of implementation of new management concepts, methods and techniques. In theories of knowledge based organizations there are no explicit postulates regarding the list of management methods and techniques which should be implemented. Some methods, such as learning methods, knowledge management methods, heuristic methods and techniques, methods connected with processes improvement and quality management, are inevitably associated with knowledge based organizations. This list may be expanded however, having in mind specific features of intelligent and agile organization. On the other hand, such list should not be identical for industrial, trade and service companies. Empirical studies conducted by the team of A. Stabryła, were focused on twelve methods. In a group of enterprises with the highest knowledge potential, the following management methods and techniques were used (Stabryła et al, 2009, p. 300): Controlling (in 75% of enterprises from this group), Budgeting (50%), Scenario planning (30%), TQM (30%), Outsourcing (30%), Reengineering (22%), Lean Management (22%), Outsourcing the organizational units (22%), JIT (18%), BSC (18%), Benchmarking
(18%), Outplacement (8%) In the enterprises with lower knowledge potential, these methods were used in much smaller degree. Nevertheless, the level of procedural innovation for the group of enterprises with the highest knowledge potential is surprisingly low.

4 ANALYSIS OF A GAP BETWEEN THEORY AND PRACTICE OF KNOWLEDGE BASED ENTERPRISES

Theoretical models of knowledge based enterprises create postulated view of an enterprise with the highest level of organizational innovativeness. Empirical studies show the organizational reality rather distant from such extreme normative model. Basic empirical trends of enterprises development in the process of adjustment of knowledge based economy confirm major theoretical assumptions, however not in their radical version.

While searching for the sources of these discrepancies, we should mention well known publication from a trend based on case studies (Peters and Waterman, 2000, Hammer and Champy, 1995, Senge et al, 2002, Probst et al, 2002, Jashapara, 2006, Nonaka, Takeuchi, 2000, Grudzewski, Hejduk 2004). They present various organizational innovation, however none of them confirms a comprehensive implementation of theoretical normative models. Successful American enterprises from the 80s were characterized by: using flexible and fixed organizational forms at the same time, autonomy and initiative of some departments and rigid discipline in other, centralization in some areas and decentralization in other (Peters and Waterman, 2000, PP. 46-50). Similar examples are given by Hammer and Champy (1995, pp. 51-64): hybrid centralization and decentralization of operations, multi-variant standards of process, control limited to economically justified level, limiting excessive distribution of tasks and specialization.

Another contribution to explanation of the analyzed gap between theory and practice is the result of empirical studies over the scope of implementation and scope of usage of organizational innovations. The analysis of the German Manufacturing Survey 2003 shows that only a small proportion of the companies that make use of a certain organizational innovation have fully implemented this organizational innovation in all business areas. For example: more than 60% of all firms claim to have implemented team work, however, only 10% say that they have fully exploited the potential of this organizational innovation, task integration has been realized by more than 60%, but only 7% have implemented this innovation throughout the whole corporation (Armbruster et al, pp. 34-35).

We may therefore form a hypothesis that organizational innovations in an enterprise are not evenly distributed between all areas of enterprise's activity, and so, drawing conclusions based on the average results of entire enterprise does not reflect the actual innovativeness of key areas of the enterprise. To verify this hypothesis I conducted a preliminary study in the second half of 2011 on a group of 30 Polish enterprises. These enterprises were selected according to four criteria, which enabled their differentiation based on: economic sector (production, trade,
services), size of an enterprise, dependence of the international corporations (independent enterprise, subsidiary or division), enterprise’s age (year of creation). A research tool was a structuralized interview with the companies’ Management, based on a questionnaire and verification of source documentation. Questions were constructed in a manner, which allowed gaining information confirming (or not) the existence of symptoms of a given characteristic (such as organizational structure or management method characteristic) and not only the declaration of managers. Major conclusions drawn from this study are the following:

1. There is a positive relationship between the size of an enterprise and the level of organizational innovativeness. A similar relationship exists between internationalization of the enterprise and organizational innovativeness. Large and medium sized enterprises are dominant, particularly the divisions of international corporations. Small companies use a number of innovative organizational solutions, however they do it rather intuitively and not are not always able to name them.

2. Small companies more often and more easily enter the external, network organizational structures.

3. For large and medium sized organizations, a hypothesis of diversified level of organizational innovativeness in various areas of enterprise’s activity was confirmed. The most flexible solutions in regard to the dimensions of organizational structure were present in the following areas: marketing and sales, products development and logistics. The most rigid structural solutions were found in accountancy, human resources and production.

5 SUMMARY AND FINAL CONCLUSIONS

Knowledge based enterprises should be innovative by definition. Along with this assumption, theoretical normative models of a learning enterprise, competitively learning enterprise, intelligent and agile enterprise are constructed. Organizational innovation in such enterprise is identified with the highest possible level. Empirical studies do not confirm these expectations, indicating intermediate solutions between traditional and intelligent enterprise. Case studies and empirical studies over the scope of implementation of organizational innovations in enterprises have shown that the scope of innovations’ implementation is different in different areas of the enterprise. I also confirmed this thesis in my own pilot research.

A conclusion, that the model of knowledge based enterprise presented at the level of general concept related to the characteristic of the entire enterprise does not yet explain the internal logic of functioning of such enterprise, seems reasonable. Internal organizational innovations, both structural and procedural, should be distinguishable in particular areas of enterprise’s functioning.
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