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Evaluating and Developing Innovation Capabilities with a Structured Method

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Abstract

Even though the demand for innovation is widely articulated in both professional and academic press, there is still a lack of validated metrics for assessing organizational capacities for innovation as well as systematic methods for developing them. To bridge these gaps in the current literature, this paper presents a method for evaluating and developing innovation capabilities in organizations. The theoretical model underlying the method conceptualises innovation potential as organizational renewal capability, consisting of strategic competence, exploiting time, leadership, connectivity, learning orientation, and knowledge management. These can be quantitatively assessed with the ORCI (Organizational Renewal Capability Inventory) method, which enables a reliable diagnosis of the main organizational strengths and weaknesses in terms of innovation. The utilisation of the ORCI method and the related development process is illustrated with an in-depth case study of an industrial organization.

Keywords: innovation, innovation capability, organizational renewal capability, survey, case study

Introduction

As unexpected changes and global competition have become recurrent features in the current business environment, the pressure for innovation and organizational self-renewal has considerably increased. In fact, it has been argued that organizational capacity to continuously innovate, modify, change, and re-create organizational resources, capabilities, and strategies is the main source of sustained competitiveness in turbulent environments (e.g., Eisenhardt & Martin, 2000; Grant, 1996; Hargadon, 1998; Leonard-Barton, 1995; Nonanka & Takeuchi, 1995; Teece, Pisano, & Shuen, 1997).

The development and maintenance of such a dynamic capability for continuous innovation can be assisted by metrics and tools that identify the organization's main strengths and weaknesses in innovation management. Several innovation management measures and audits have been presented in the academic literature (e.g., Cormican & O'Sullivan, 2004; Kianto, 2008b; Radnor & Noke, 2002; Tang, 1999), but most of them seem to be based on the technological perspective on innovation (Hallgren, 2009). In other

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words, they view innovation in terms of new product development and focus on assessing and improving the stages of the product innovation process. However, innovation is not restricted to the production of new products, but can also pertain to the development of novel services, processes, strategies, and business models. Furthermore, production of novelty does not need to be limited to the research and development activities of the organization, but can be seen to take place all across the organization. Therefore, metrics based on a wider conceptualisation of innovativeness, including the ability to produce many types and sizes of innovation as well as involving a wide range of organizational actors, would seem useful.

This paper presents a method suited for organizations aiming to assess and develop their capacities for company-wide sustained innovation. The method is based on the application of a survey method called ORCI (Organizational Renewal Capability Inventory) (Kianto, 2008a, 2008b) in organizational development. Specifically, the paper conceptualises innovativeness in terms of organizational renewal capability. Organizational renewal capability is based on the knowledge-based view of the organization (Spender, 1996) and addresses the ability of an organization to produce sustained learning and innovation, that is, new products, processes, practices, insights, and mental models, which enable the organization to adapt to external changes as well as to create change from within the organization (Kianto, 2008b; Leonard-Barton, 1995; Pöyhönen, 2004).

The organization's capability for renewal determines how efficiently it is able to use its resources for learning and innovation and, thereby, to achieve competitiveness over other companies with identical resources but less renewal capability. For example, two organizations might have similarly educated and competent personnel, but the firm that is better able to organize a working environment that motivates and enables the employees to utilize their skills and knowledge for continuously improving work practices would achieve a higher competitiveness. Thus it is not the resources possessed by a firm themselves that drive performance, but the organizational capabilities for orchestrating and managing them (Penrose, 1959; Sirmon, Hitt, & Duane Ireland, 2007; Sirmon, Hitt, Duane Ireland, & Gilbert, 2011). Especially in turbulently and unexpectedly changing environments, the ability of the organization to change and modify its resources and routines in a flexible and agile manner is a key factor impacting its sustained competitiveness (e.g., Eisenhardt & Martin 2000; Teece, 2007; Teece et al., 1997).

Furthermore, in their extensive review of innovation management measures, (Adams, Bessant, & Phelps, 2006) observe that there is a lack of research reporting on how such measures have actually been used in practice by real organizations. Thus, there is a need for studies demonstrating how companies have used innovation audits to improve their operations. The current paper demonstrates the use of the ORCI method in one action research project conducted in a case organization.

The paper is organised as follows: First, we present the theoretical framework of organizational renewal capability and its six constituent elements. Next, we briefly introduce the ORCI, a validated method for assessing the renewal capability, which can be used to pinpoint the developmental needs and strengths in an organization's renewal activities. Then, we demonstrate how the measurement method has been used in one case organization to develop its innovation capabilities. This structured process can be applied in many types of organizations to enhance innovativeness. Finally, we discuss the wider implications of the described approach.

Theoretical Background

Organizational Renewal Capability

Innovation can be simply defined as the introduction of any value-creating novelty (Tidd, Bessant, & Pavitt, 2005). While innovation can mean a successfully executed new idea in any part of the organization, a large part of the innovation literature has concentrated on viewing innovation as a technological process pertaining to the development of new products. Therefore, we prefer the concept of organizational renewal capability, which underlines that the essential issue is the *ability to renew* a multitude of organizational features, rather than the specific outcome achieved through enacting this ability. Renewal capability enables the production of many kinds of innovations, thereby enabling continuous flexibility in the face of turbulent environments.

If innovation is understood widely as the organizational capacity to achieve renewal in products, services, processes, strategies, management activities, etc. (as opposed to the narrow view of innovation as product development only), it is clear that this capacity can have its sources anywhere in the organization. It is not only a matter of effective R&D or strategically skilled top management decisions, but an organization-wide process of continuously doing things better, as well as doing them differently (Tidd et al., 2005).

Organizational renewal capability is a holistic company-wide approach to the management of innovation. According to this perspective, innovation should be something pervading the whole company, rather than an isolated effort restrained to the R&D department of the firm. Ideally, innovation is exhibited in the daily activities of all organizational members (Bessant, 2003; Leonard-Barton, 1995). As Lawson and Samson (2001, p. 385) put it, innovation, "for those who do it well, […] pervades all aspects of an organization's existence, from the core value system to the measures and behaviours that are manifested on a daily basis." This company-wide process of continuous improvement is called as high-involvement of innovation (Bessant, 2003; Bessant & Caffyn, 1997) or employee driven innovation (Høyrup, 2010; Høyrup, Bonnafous-Boucher, Hass, Lotz, & Møller, 2012; Kesting & Ulhøi, 2010).

Organizational renewal capability encompasses the abilities of the firm to produce learning and innovation outcomes, that is, new products, processes, and insights, and thereby to adapt to external changes as well as to create change from within the organization. An organization with high renewal capability is able to develop, change, modify, and reorganise its resources, knowledge assets, and routines in a situational and appropriate manner, through which it can achieve competitive advantage. Renewal is demonstrated as organizational learning (i.e., development of novel mental models and insights) (e.g., Fiol & Lyles, 1985; Huber, 1991) and innovation (i.e., development of new products, services, processes, etc.) (e.g., Kanter, 1988; West, 1990). Renewal capability determines how an organization is able to develop its existing resources and capabilities and to create new ones. In other words, an organization with high capability for renewal is not only able to respond to today's challenges and to keep up with the changes in the environment, but it can also act as a forerunner by creating change from within the organization and, thus, change the rules of the market (Hamel, 1998).

Renewal capability is based on a combination of organizational characteristics that enables the firm to learn and innovate, which in turn produces sustainability to face the changing market conditions. Lawson and Samson (2001) argue that successful innovation is based on a set of core elements and processes that are similar across industries and firms. The same idea is reflected in the renewal capability model. The firm-specific processes and tangible and intangible resources are idiosyncratic characteristics for each organization and determine what kind of innovation and learning outcomes an organization can produce (Spender, 1996). For example, the particular substance knowledge of an organization and the relational capital embedded in its customer networks

determines what kind of innovations it is able to generate. In contrast, the elements (such as the six elements of renewal capability) enabling the efficient re-organization and modification of the resources are similar across firms.

In this sense, renewal capability can be understood as a higher-order integration capability or a meta-capability, allowing the firm to orchestrate and integrate multiple capabilities (cf. Kianto & Ritala, 2010). Along the same line of thought, Lawson and Samson (2001, p. 384) define innovation capability as "the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders." More specifically, they state that innovation capability concerns the ability to synthesise business new stream and mainstream capabilities. Also, emphasising the requirement of combining multiple operating paradigms within the same firm, Boer and Gertsen (2003) define continuous innovation as the ability to combine strategic flexibility with operational effectiveness. In contrast, organizational renewal capability provides a knowledge-based view (Grant, 1996; Kogut & Zander, 1992; Spender, 1996) on innovation capability discussion. Likewise, there is evidence that knowledge management indirectly impacts on innovation (Andreeva & Kianto, 2011; Darroch & McNaughton, 2003; Kianto, 2011), competitive advantage (Chuang, 2004) and performance of an organization (e.g., Lee & Choi, 2003).

Previous literature (Kianto, 2008a, 2008b; Pöyhönen, 2005) has identified fundamental characteristics that function as a basis for capacity for renewal in organizational settings: *strategic competence, exploiting time, leadership, connectivity, learning orientation and knowledge management* (Figure 1).

Figure 1. The elements of organizational renewal capability

More specifically, *strategic competence* represents connecting the visionary element, basic task, identity, and general steering principles of the whole organization. *Exploiting time* is related with firm capabilities for exploiting time consciously as a competitive asset in order to produce new ideas and turn them into successful outputs. *Leadership* characterises the decision-making and reward systems in the organization as well as the ability of the leaders and supervisors to support innovative activities through their personal activities. *Connectivity* represents the structure and quality of social relationships within and across organizational boundaries. *Learning orientation* represents the general attitudes of organizational members towards creativity and learning, and the extent to which these activities are supported and allowed by organizational structures and

processes. Finally, *knowledge management* represents the organization's systematic practices and tools for information storage and knowledge sharing.

In sum, we propose that organizations that consciously maintain and develop these six elements of renewal capability are likely to attain a higher innovation performance and, also, to gain competitive advantage over their competitors. Having now theoretically defined organizational renewal capability and its constituent elements, we next move on to demonstrate how it was assessed and developed in one particular case organization.

Research Design

The Case Study

The case study design adopted in this research gives a narrative account of the subject of the study. The study draws from a variety of sources and multi-method data collection (both quantitative and qualitative data) to form a coherent story composing together the complexities and coincidences of the case organization. Yin (1994) presents two strategies for analysing case studies: following up theoretical propositions and developing a case description for the research. In this research we synthesise these both approaches. The conducted study is an action research in the sense that one of the explicit goals of the research project was to help the case firm to improve its innovation capabilities. As a reflective process it draws from practice as a means of improvement and increasing scientific knowledge (Kemmis & McTaggart, 1982). It is appropriate, for example, when managers are aware of their problem, but lack the requisite knowledge to deal with it.

The Case Company

The case company is a global actor in the field of the plastic industry and employs 450 people. Based in Finland, the firm was established in the 1950s and some 15 years later it was merged with a large group. Since its establishment the company has grown remarkably and the nature of its operation is becoming more and more hectic and demanding. The company has recognized the increased needs of a constantly changing environment and is willing to develop its capabilities to better face these challenges. Collaboration with the university research project was sought to address these challenges.

Sustained organizational renewal is challenging in the field of the plastic industry, and as the production processes are rather fixed, actors in the field are traditionally considered as slow renewers. After all, the rhythm of markets is fast and, therefore, the close customer–producer connection is fundamental. That connection increasingly influences the cycle of production, but also the new product development. The timing of the production cycle is somewhat unexpected; namely, in particular products it is strongly related to the events and indicators of the environment (timing of seasonal products). However, the nature of business and functions of the company are becoming more and more hectic and often need quick decisions, especially, when working at the client interface. Close contacts between production control and marketing are also needed. Besides, the present practice to keep ”buffer stocks” as low as possible puts the operations of the company into a totally different mode throughout the organization.

The nature of operation of the production departments, R&D and administrative (administration and marketing) departments differ from each other, which imposes challenges for the renewal capability. The company has been aware of the development needs in the security of their deliveries and production control, and the company has already recognised some other development needs (which also came up in research data). However, on the one hand, they have not had a holistic understanding about the needs and, on the other hand, they have lacked knowledge and ideas about how to make improvements and conduct focused development activities.

Data Collection and Analyses

For the study, the data was collected with the ORCI-survey -method (Kianto, 2008a) and open-ended in-depth interviews. Besides, workshops and discussions carried out with organization members were used for research purposes.

The ORCI (Organizational Renewal Capability Inventory) is a method for analysing innovativeness of an organization in term of the above-mentioned six elements of renewal capability and their subcomponents. (See Kianto (2008a) for full explanation of the development and validation of the method.)

The questionnaire elicits the respondents' experiences and perceptions about the presence of renewal-enabling and hindering characteristics in their working environment. The response format for all items is a 7-point Likert scale, anchored by "strongly disagree" and "strongly agree". Altogether the questionnaire includes 146 items grouped onto six scales, representing the six elements of renewal capability. The six components are still further divided into subcomponents. Multi-item variables are used to measure each subcomponent of the model in order to reduce measurement error (cf., Malhotra & Grover, 1998). In addition to the structured part of the questionnaire, some open-ended questions addressing the main issues facilitating and hindering innovation in the organization were added in order to reveal ideas not included in the standardized questionnaire.

The questionnaire is intended to be filled in by a representative sample of organization members. In a continuously renewing organization, innovation and learning should take place from the shop floor to the executive level (Bessant & Caffyn, 1997; Bessant & Francis, 1999; Damanpour, 1991; Leonard-Barton, 1995; Nonaka & Takeuchi, 1995; Pöyhönen, 2004; Weick & Sutcliffe, 2001), and it is therefore important to gather information about the perceptions of employees from all organizational levels. Organizations are not unilateral and internally homogenous entities but rather collections of various situated spaces where activities emerge in day-to-day interactions between the members of the organization (cf., Orlikowski, 2002). It simply is unrealistic to assume that one person could possibly be aware of the working conditions all over the firm. Collecting data from all employees, thus, enables a valid and thorough diagnosis of the challenges concerning organizational renewal.

The survey was carried out during three weeks in September – October 2010. Prior to the launch of the survey, information about the upcoming measurement and its purpose was spread by email and on the intranet with high support from top management. Most of the employees filled in the web-based version of the questionnaire, and for those employees with no personal work computers, the organization arranged computer access. (For filling-in the questionnaire, the organization also supplied computers in the factory.) The questionnaire was directed to all employees, and it was filled in by a representative sample of the organization's employees. Altogether 106 respondents submitted their responses. The response rate in the case organization was 23.3%. Of the respondents, 30% were female and 70% male. Likewise, of the respondents 45.3 % (N=48) were blue collar workers, 26.4% (N=28) white collar workers, 20.8% (N=22) senior white collars and 7.5% (N=8) managers/directors. The group *blue collar workers* represented the employees in the three production departments. The white collar workers were the employees in administration and marketing departments, while the group senior white collars included supervisors and experts in case organization. The group manager/director included the managers, including top management of the organization.

Interviews to complement the survey were conducted during one day in December 2010. Ten in-depth interviews were carried out to deepen the understanding about the state of innovativeness and the enablers of innovation and learning within the organization. The themes in the interviews concerned the titles as follows: the state of the innovativeness of the company and how it could

be developed, the ability to face the unexpected, the learning culture and learning orientation, as well as the strategy of the company and how it influences day-to-day work and leadership.

The interviewees represented various departments and various groups of employees. The duration of the interviews varied from 40 to 50 minutes. The interviews were digitally recorded and analysed in a data driven fashion. The recorded interviews were listened through several times, and notes made on them were categorised into themes which were entered into an Excel spread sheet (Fisher, 2007). The themes, such as leadership, learning from experience, obstacles to innovation, and development suggestions for innovativeness, were included in interviews.

A preliminary report on the current state of the elements of renewal capability was first produced based on the ORCI measurement results. Next, interviews were designed and conducted to complement and deepen the information obtained with the ORCI. The interview results were then combined with the ORCI results to produce a comprehensive report on the strengths and challenges of the case firm in relation to its renewal capability.

The results of the survey were analysed statistically and presented both in numeric index and graphic form. The results show the present state of organizational renewal capability in the company and enable comparative studies within the company (between departments and various groups of employees) and also between companies. The answers to the open-ended questions were coded and grouped in a data driven fashion.

Results

Next, we proceed to present more specific results of the case organization, obtained by the ORCI measurement method and interviews.

The State of Innovativeness

The interviewees considered current state of innovativeness and support for an innovative climate good and even excellent in R&D and in production departments, which view was supported in the survey results. One interviewee described it as follows:

> *"From the perspective of innovativeness the R&D department is the focus, and there you should be innovative and indeed they are. We have never been this agile—R&D takes up ideas!"* (Interviewee 5)

However, the lack of resources and time hindered the development of initiatives. The company's system for collecting and rewarding useful initiatives was highly appreciated, but several suggestions for the improvement of the system came up. The main weakness of the system was that for someone it might be difficult to describe an idea on paper or in an e-mail.

In contrast, the innovativeness of the administration department was seen weak. The administrative department also lacked a system for collecting, redeveloping, and rewarding useful initiatives. Several suggestions for the development of innovativeness were presented: freer knowledge flow and access to relevant knowledge, openness, closer internal collaboration, and job rotation were suggested as development targets. One interviewee expressed it as follows:

> *"…there's a clear system for initiatives and rewards in the production, but there's no distinct channel for ideas about development and making changes in tasks and activities on the administrative side."*(Interviewee 4)

Various kinds of incentives, like rewarding, positive feedback, and support, were named as the most important facilitators of learning and innovation in this case company. Support for (professional) education was considered as a facilitating factor, as well. Freedom and openness, the supervisor's role, the atmosphere and communication, the workgroup climate, and the system of

initiatives were also mentioned. As the most important inhibiting factors of learning and innovation were identified: constant hurry, poor communication and knowledge flow, lack of collaboration and the in-groups, supervisor/management, old practices and upholding them (”we are used to doing things this way”), a lack of resources and openness, as well as the attitude of underestimating and neglecting. This was described as follows:

> *”Innovations are not seen as a mutual cause for the entire organization, but most often those participating in innovation are far too few and not all the knowledge is exploited.”* (Interviewee 9)

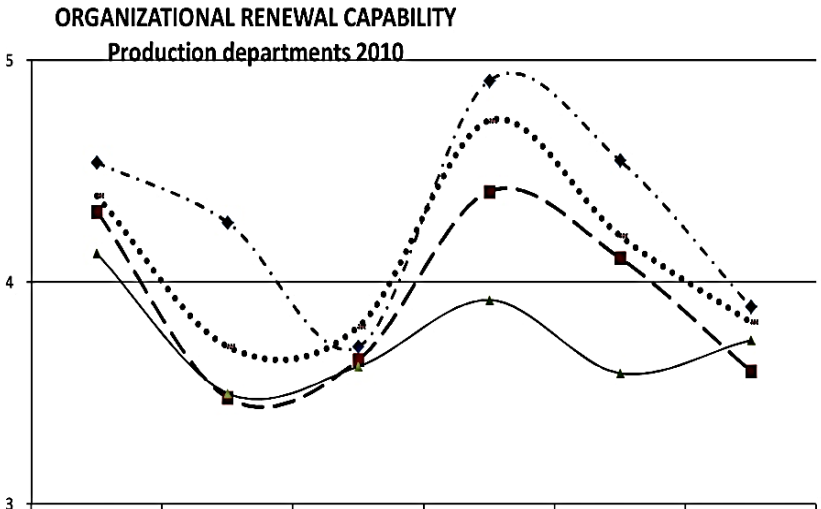
Organizational Renewal Capability in the Case Company

In the conducted analyses, renewal capability was first examined at the level of the whole organization. This level of examination provides an understanding of the main strengths and weaknesses of the organization as a whole. However, as any organization is likely to consist of multiple internal working environments, we have found it useful to proceed from this general examination into a more specific assessment of renewal capability in specific organizational groupings. Therefore, in the case organization, we also examined renewal capability in different departments of the firm, as well as in different personnel groups. This enabled us to gain a more thorough understanding of where in the organization particular problems lay. These more specifically grouped analyses help to pinpoint specific developmental needs across the organization.

The case organization consists of ten departments: three production departments, three production supporting departments, two marketing departments, R&D, and administration. The three production supporting departments (maintenance, warehouse, and production planning) were not presented as separate in the results due to the small number of respondents (<5) in each department. However, these results (altogether eight respondents from three production supporting departments) are included and shown in the results (N=106) of the whole organization. The respondents were grouped into five groups of employees. The respondents (N=106) represented the groups of employees as follows: blue collar workers (N=48; 45.3%), white collar workers (N=28; 26.4%), senior white collar workers (N=22; 20.8%), manager/directors (N=8; 7.5%) and supervisors (N=0; 0%).

The organizational renewal capability was evaluated both in departments and in groups of employees. The results are presented both in graphic and numeric form (Figures 2-4). The ORCI-index, which describes the level of innovation capability in the case organization, was 4.1 (on a scale 1–7). At the organizational level (Figure 2 dot line “Case Organization”) the most highly valued capabilities were *connectivity* and *strategic competence.* The weakest capabilities were *exploiting time, leadership* and *knowledge management*, which were all under the mid value of the scale (4). Also, *learning orientation* was close the mid value. Yet, there were no special strengths, but no severe problems either.

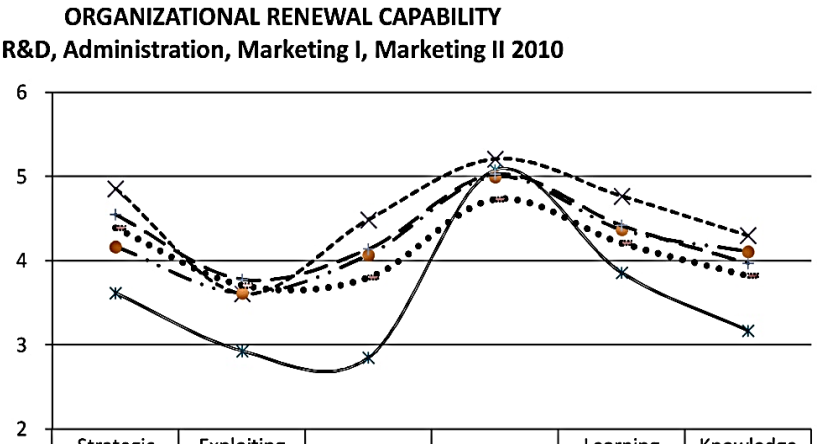
The next results according to the departments are presented in two segments: the production departments and other departments, because the nature of operation is similar within the production departments and it differs from other departments. There were significant differences between the production departments in most of the capabilities (Figure 2). The points of view are similar only in *leadership.* In knowledge management there were minor differences, but on the capabilities of *exploiting time, connectivity* and *learning orientation* there were significant differences between departments. The renewal capabilities of departments B and C were below the average value of the organization in the case (black dot line) and, in contrast, Production department A is above the average curve and in line with the case organization (Figure 2).



	Strategic competence	Exploiting time	Leadership	Connectivity	Learning orientation	Knowledge management
Production A (18)	4,54	4,27	3,71	4,91	4,55	3,89
Production B (22)	4,32	3,48	3,65	4,41	4,11	3,60
Production C (13)	4,13	3,50	3,62	3,92	3,59	3,74
Case Organization (106)	4,39	3,71	3,80	4,73	4,21	3,82

Figure 2. Organizational renewal capability in production departments (scale 1–7).

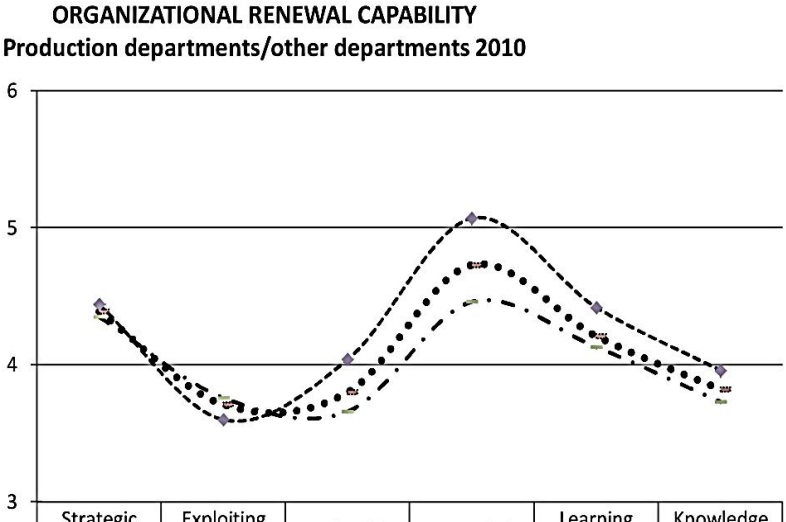
Figure 3 presents the renewal capabilities in the departments of R&D, Administration, Marketing I, and Marketing II. There were differences between the departments in most of the capabilities. Marketing I differs significantly from the other departments in most of the capabilities of renewal. The renewal capabilities of R&D, Administration and Marketing II are mostly above the average curve of the case organization and in line with each other.



	Strategic competence	Exploiting time	Leadership	Connectivity	Learning orientation	Knowledge management
R&D (10)	4,86	3,61	4,49	5,21	4,77	4,30
Marketing I (6)	3,62	2,93	2,85	5,08	3,86	3,17
Marketing II (7)	4,17	3,62	4,07	5,00	4,37	4,11
Administration (22)	4,55	3,78	4,14	5,03	4,42	3,97
Case Organization (106)	4,39	3,71	3,80	4,73	4,21	3,82

Figure 3. Organizational renewal capability (Scale 1–7) in R&D, Administration, Marketing I and Marketing II departments (scale 1–7).

In sum, Figure 4 illustrates the difference between the production departments and other departments on an average.

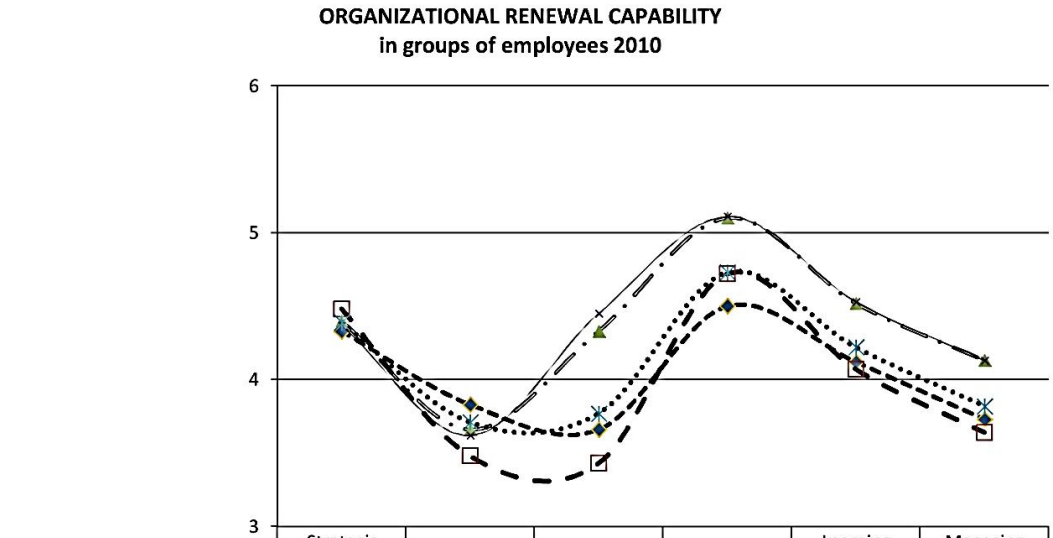


	Strategic competence	Exploiting time	Leadership	Connectivity	Learning orientation	Knowledge management
Case Organization (106)	4,39	3,71	3,80	4,73	4,21	3,82
Production A, B, C (53)	4,35	3,76	3,66	4,46	4,13	3,73
Other departments (45)	4,44	3,60	4,04	5,07	4,42	3,96

Figure 4. Organizational renewal capability (Scale 1–7) in Production departments and in other departments. (The Appendix shows the means and standard deviation values more detail)

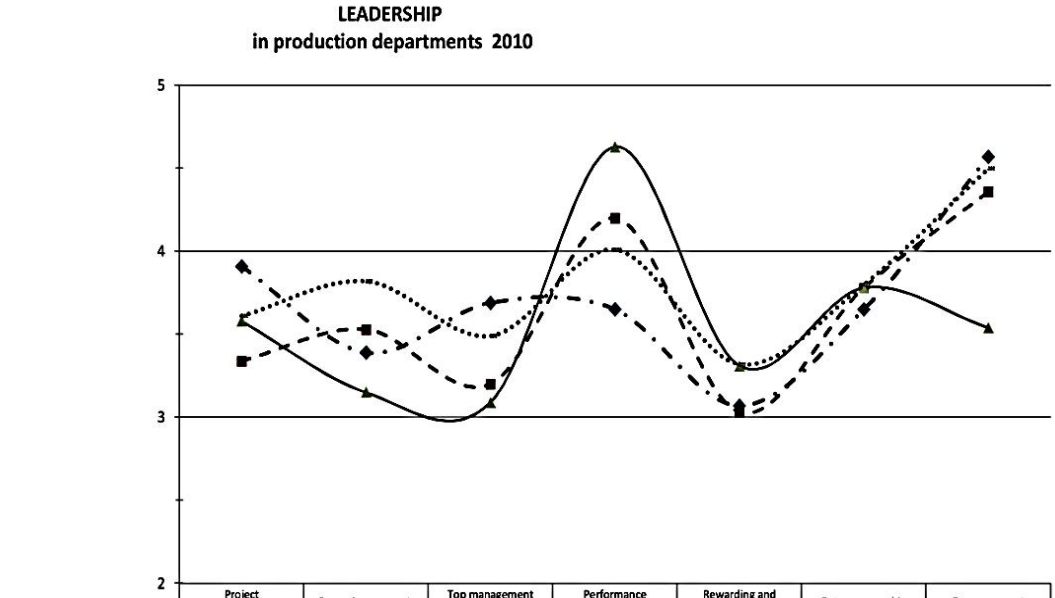
Next, the organizational renewal capabilities are presented in groups of personnel (Figure 5). The points of view are similar in capabilities of *strategic competence* and in *exploiting time*. On the contrary, there are differences in capabilities of leadership, connectivity, learning orientation, and knowledge management. The most significant differences are in the *leadership* capability. The points of view of the manager/directors are similar with the senior white collar group of employees in all the capabilities. The points of view of white collar workers and blue collar workers are similar in connectivity, learning orientation and managing knowledge.

For a more detailed analysis of renewal capabilities, we draw from these four organizational level results and focus on the capabilities of *leadership, learning orientation*, and *knowledge management,* which were among the weakest capabilities in the case organization. Besides, there were significant differences in these capabilities both between departments (Figures 2–4) and between groups of employees (Figure 5). The capability of *exploiting time* was also one of the main weaknesses, but in the workshop where the results were reported, as well as in discussions with the key contact persons of the case firm, the organizational members demonstrated a stronger interest in addressing the other issues.



	Strategic competence	Exploiting time	Leadership	Connectivity	Learning orientation	Managing Knowledge
Blue collar worker (48)	4,33	3,83	3,66	4,50	4,12	3,73
White collar worker (28)	4,48	3,48	3,43	4,72	4,07	3,64
Senior white collar (22)	4,40	3,66	4,33	5,10	4,52	4,13
Manager/Director (8)	4,37	3,62	4,45	5,11	4,53	4,13
Case organization (106)	4,39	3,71	3,77	4,73	4,22	3,82

Figure 5. Organizational renewal capability (scale 1 – 7) according to the groups of employees. (The Appendix shows the means and standard deviation values more detail)



	Project management	Supervisor support	Top management support	Performance measurement	Rewarding and resources	Entrepreneurship	Empowerment
Production A (18)	3,91	3,39	3,69	3,65	3,07	3,65	4,57
Production B (22)	3,34	3,53	3,2	4,2	3,03	3,78	4,36
Production C (13)	3,58	3,15	3,09	4,63	3,31	3,78	3,54
Case Organization (106)	3,61	3,82	3,49	4,01	3,32	3,80	4,50

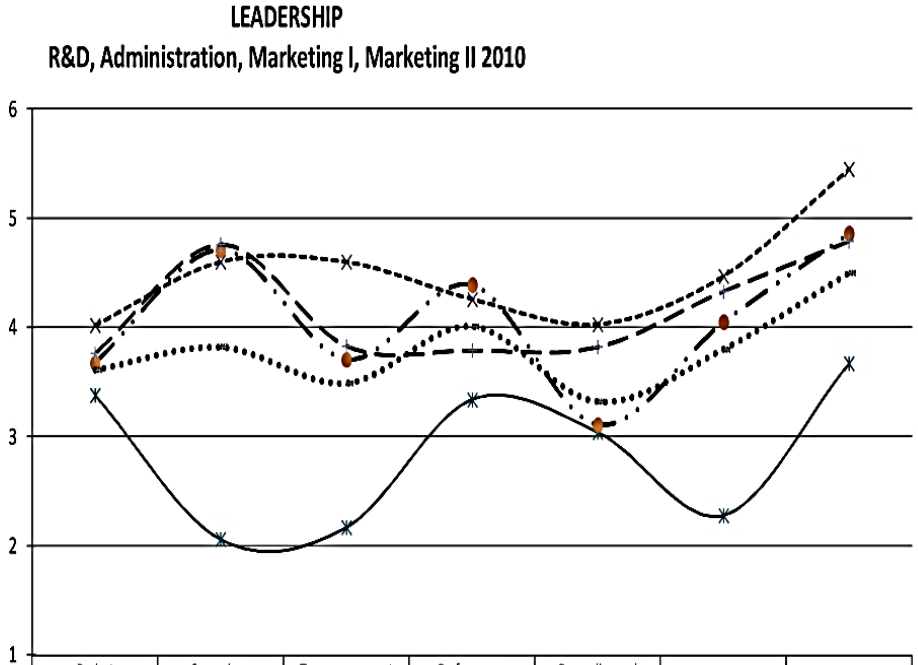
Figure 6. Leadership capability (scale 1–7) in the production departments of the case company 2010.

Leadership

At the organizational level the leadership capability is mostly below the mid (4) value and only empowerment exceeds it (Figure 6).

In leadership (Figure 6), the points of view of the production departments were similar. However, in sub-areas of leadership capability there were differences between production departments in all the sub-areas. In production departments, supervisor and top management support for learning and innovation is below the average value of the company. Rewarding innovative initiatives and learning, and resourcing these activities were also perceived as insufficient.

There were significant differences between the departments of R&D, Administration, Marketing I and Marketing II in the leadership capability (Figure 7) in most of the sub-areas of leadership capability. Marketing I differs significantly from the other departments and the average value of the company.



	Project management	Supervisor support	Top management support	Performance measurement	Rewarding and resources	Entrepreneurship	Empowerment
R&D (10)	4,02	4,60	4,60	4,26	4,03	4,47	5,45
Marketing I (6)	3,38	2,06	2,17	3,34	3,04	2,28	3,67
Marketing II (7)	3,68	4,71	3,71	4,39	3,11	4,05	4,86
Administration (22)	3,76	4,76	3,83	3,79	3,82	4,33	4,79
Case Organization (106)	3,61	3,82	3,49	4,01	3,32	3,80	4,50

Figure 7. Leadership capability (scale 1–7) in R&D, Administration, Marketing I and Marketing II departments of the case company 2010.

With regard to supervisor support and top management support, the questions concern support for innovativeness and learning (support for the development of new ideas, learning, and improvements), which in production departments was much lower than in other departments. Rewarding and resourcing learning and innovation initiatives are also very low in all production departments, while R&D and Administration were considered more supported.

In the interviews, leadership came up in various contexts of discussion. On the one hand, freedom and the low hierarchy of the company were appreciated, but on the other hand the leadership and especially the leading of people were seen as a focus of improvement. This was exhibited in, for example, the following interview quote:

> *"The management culture—rather open, even though the general opinion at the factory may be different, they don't know what issues we are tackling—non-hierarchical—the management is not isolated—we're working side by side with the production—is part of our way of action."* (Interviewee 5*)*

The skills of managing people (leadership) and communication skills were mentioned as a matter of development in leadership. The voluntary self-development and suggesting ideas for improvements were also seen as less supported and appreciated, which is in line with survey data, where supervisor support in production departments and top management support in all departments (excluding R&D) for innovation, learning, and rewarding and resourcing these activities were low. The interviewees described the situation as follows:

> *"Openness should start from the management and be a positive example that everyone's input is important—no one can do this alone. Valuing one's work is about getting encouragement [from the management]. It has a big influence on the work atmosphere. Understanding how one's input impacts on the work of others. If we withhold information, it can affect someone else's job and he or she may have to do the same things over and over again."*(Interviewee 9)

> *"…I almost said to the person that you had a once in a lifetime opportunity to make a break but you missed it with a few wrong words. It was a good idea and a good outcome, and yet, the person managed to present it in a way that left me with a lousy feeling."*(Interviewee 1)

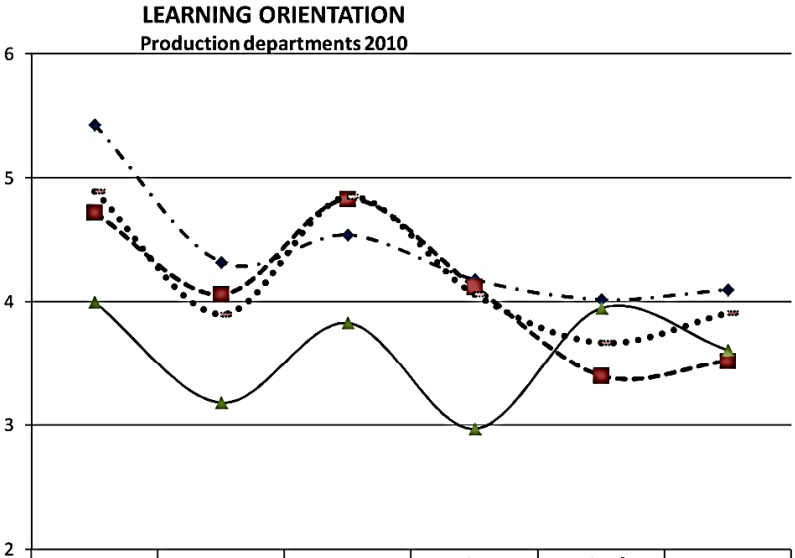
In production departments the management was considered as distant, which is in line with the result of the survey. One interviewee expressed it as follows:

> *"Some of the big directors should visit the factory more often and we could then offer ideas…" and …"it's a tremendous hurdle to go to the other building!"*(Interviewee 3)

Learning orientation

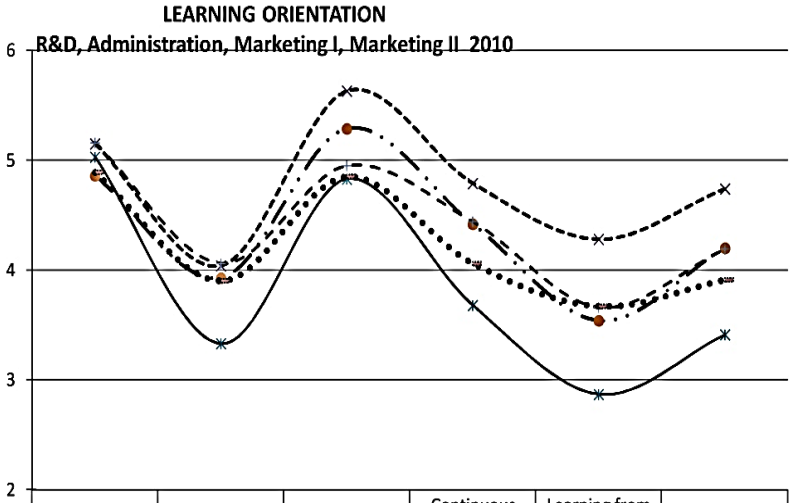
At the organizational level *social learning* and *purposefulness* were most highly valued. On the contrary, *learning from experience* and *questioning* were the lowest sub-areas of learning orientation. Also, feedback and continuous improvement were at the mid (~4) level.

Production C differs significantly from the other departments in *social learning, feedback, purposefulness and continuous improvement* (Figure 8), being far below the average value of the company. In Production C *learning from experience and questioning* are below the average value of the company.



	Social learning	Feedback	Purposefulness	Continuous improvement	Learning from experience	Questioning
Production A (18)	5,43	4,32	4,54	4,18	4,02	4,10
Production B (22)	4,72	4,06	4,83	4,12	3,40	3,52
Production C (13)	4,00	3,18	3,83	2,97	3,95	3,61
Case Organization (106)	4,89	3,9	4,85	4,06	3,67	3,91

Figure 8. Learning orientation (scale 1–7) in Production A, Production B and Production C 2010



	Social learning	Feedback	Purposefulness	Continuous improvement	Learning from experience	Questioning
R&D (10)	5,15	4,04	5,63	4,79	4,28	4,74
Marketing I (6)	5,03	3,33	4,83	3,68	2,87	3,41
Marketing II (7)	4,86	3,93	5,29	4,42	3,54	4,20
Administration (22)	5,16	4,06	4,95	4,44	3,66	4,19
Case Organization (106)	4,89	3,9	4,85	4,06	3,67	3,91

Figure 9. Learning orientation (scale 1–7) in R&D, Administration, Marketing I and Marketing II departments of the case company 2010

There are significant differences between departments in learning orientation (Figure 9). *Social learning* was highly and equally valued in all departments. Purposefulness was highly valued, but there were differences between departments. The most significant differences are in *learning from experience, questioning* and *continuous improvement*. The Marketing I department differs from other departments and is far below the average value in *social learning, feedback, purposefulness* and *continuous improvement*.

Based on the interviews, the attitude to learning included some tensions between the older and younger people. The individuals who had worked a long time in the company were considered less willing to learn, whereas, the younger individuals were considered more willing to learn and develop new practices. The people actively taking part in professional training were mostly younger individuals.

The professional training offered by the company was highly appreciated, and it was seen as a fruitful possibility to learn about the other departments of the company. The training was both formal and learning in practice at the workplace, which included training periods in each production department. Otherwise, the overlapping work tasks and internal job rotation between co-workers, departments, and units was suggested as a fruitful development activity. Such activity increases understanding and gives a broader perspective and a sense of the whole system, and it may trigger innovation. Indeed, the question how one's own work is related to other tasks, to the broader functions of the production and to the functions of the company needs clarification. One of the interviewees illustrated it as follows:

> *"At one time the word was multi-skilled, but now it's forgotten in practice and limited only to departments."* (Interviewee 3)

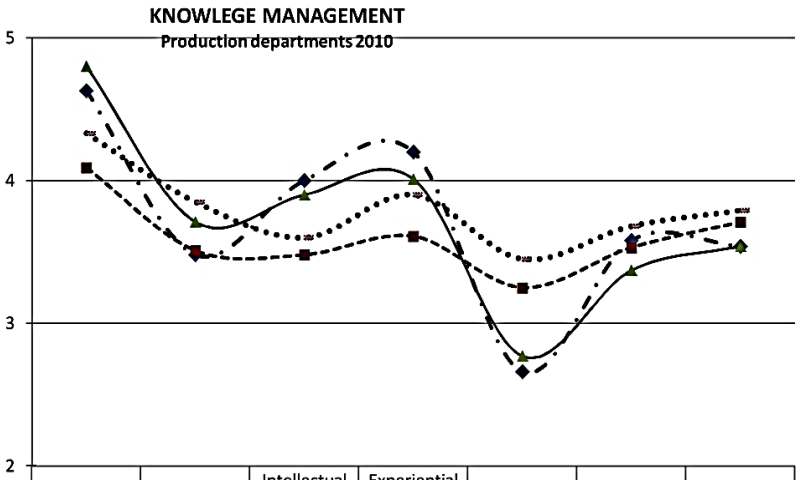
Senior employees mostly learned their work in practice, but there were also special self-created work roles (in marketing), which were considered more as learning by doing. However, it was considered that the utilisation of tacit knowledge and learning from experience needs improvement in this company. Especially in a situation when an employee is soon retiring, long enough co-working was considered important. One interviewee described it as follows:

> *..."training the young should start early enough... when people are about to retire and after they have left the company, there have been problems as to who takes over their responsibilities and how a particular task was done before. It has now been acknowledged with a few individuals that it was wrong and that training should take more time."* and *"...there hasn't been enough knowledge or understanding of all the things included in someone's duties, of all the subtle nuances in the work not only with software but also with client relationships."*(Interviewee 4)

Knowledge management

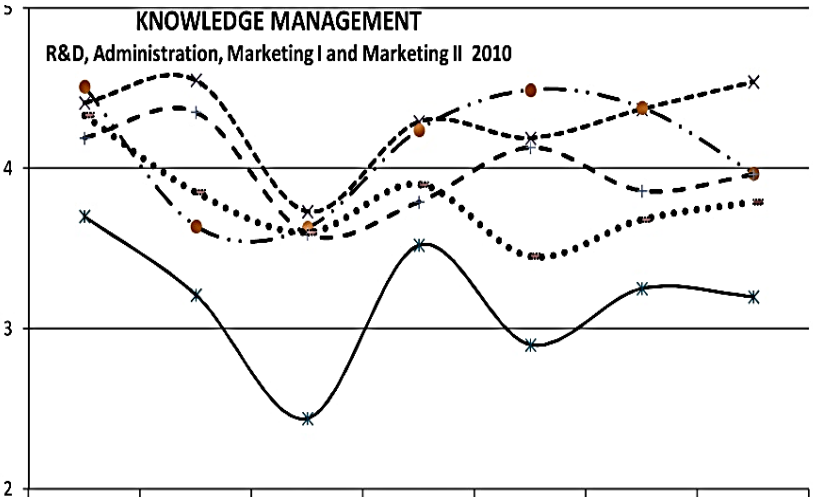
Knowledge management was among the weaknesses of the case company. At the level of the organization knowledge management is mostly below the mid value (4). The lowest values were in *knowledge acquisition*, *intellectual capital management* and in *knowledge sharing*.

In all the production departments the utilisation of *documented knowledge* is below the mid value (4) and there are significant differences among the departments in all the sub-areas of knowledge management capability (Figure 10). Production B is below the average value of the case company in all the sub-areas of knowledge management. In Production A and Production C *knowledge acquisition* from external sources is very low, but the nature of these departments does not require such activities.



	Documented knowledge	Information systems	Intellectual capital management	Experiential (tacit) knowledge	Knowledge acquisition	Knowledge sharing	Knowledge creation
Production A (18)	4,63	3,48	4,00	4,20	2,66	3,58	3,54
Production B (22)	4,09	3,51	3,48	3,61	3,25	3,53	3,71
Production C (13)	4,80	3,71	3,90	4,01	2,77	3,37	3,54
Case Organization (106)	4,33	3,85	3,60	3,90	3,45	3,68	3,79

Figure 10. Knowledge management (scale 1–7) in Production A, Production B and Production C department 2010.



	Documented knowledge	Information systems	Intellectual capital management	Experiential (tacit) knowledge	Knowledge acquisition	Knowledge sharing	Knowledge creation
R&D (10)	4,41	4,55	3,73	4,29	4,19	4,37	4,54
Marketing I (6)	3,70	3,21	2,44	3,52	2,90	3,25	3,20
Marketing II (7)	4,51	3,64	3,63	4,24	4,49	4,38	3,97
Administration (22)	4,19	4,35	3,59	3,79	4,13	3,86	3,96
Case Organization (106)	4,33	3,85	3,60	3,90	3,45	3,68	3,79

Figure 11. Knowledge management (scale 1–7) in R&D, Marketing I, Marketing and Administration department 2010.

In knowledge management, Marketing I differs significantly from the other departments, being far below the average value of the company (Figure 11). Moreover, among the other departments there are also significant differences. The points of view are similar in the utilisation of *documented knowledge* and in *intellectual capital management*. The most significant differences are in *information systems*.

Based on the interviews, the utilisation of experiential (tacit) knowledge was essential in production departments, and the newcomer and expert are closely working together in these tasks. In learning from experience, problematic situations and mistakes were seen as fruitful learning possibilities, like one interviewee it expressed:

> *"Is it possible to transfer knowledge learnt through experience and to teach someone? Yes, it is—especially when there's a problem. Otherwise it's impossible to remember all the possible cases, and they don't necessarily understand what you're saying if there's no prior experience of the situation. Teaching is natural, when something has already happened or the problem is at hand."* (Interviewee 3)

The development of internal collaboration and knowledge flow was also considered important, which was described in the interviews as shown below:

> *"There's too little dialogue between the departments. I would like to have more product knowledge because it changes all the time and it's not enough to be informed of particular launches, but we should know more and already when something is being planned… …a big company, so that perhaps the knowledge is not communicated or there's no desire to give enough knowledge in time."* (Interviewee 2)

> *"… there are always some comments that reveal that we don't always understand each other and there might be cause for deepening the understanding on both sides."* (Interviewee 9)

When drawing conclusions about the capabilities of *leadership, learning orientation,* and *knowledge management*, we notice that the collective processes of learning and innovation were among the lowest values. In the capability of leadership, the processes supporting learning and innovation, such as supervisor and top management support, rewarding and resourcing learning and innovation activities, as well as voluntary improvement (entrepreneurship), were less supported. In the capability of learning orientation, feedback, and the utilisation of feedback given by employees, constant improvement, questioning and learning from experience also got low values. In the knowledge management capability, the utilisation of experiential knowledge, knowledge acquisition, knowledge sharing and knowledge creation were all weak.

The Process for the Organizational Development

In this section we present the systematic process for organizational development enabled by the ORCI -method (Figure 12), illustrated in this paper through the case study of one industrial organization. The process constitutes from the following phases: i) *the ORCI -data collection (survey),* ii) *ORCI -analysis,* iii) *interviews and analysis,* iv) *results workshops,* v) *the development activities planning workshop,* vi) *specific theme workshops* and vii) *concrete development actions*. We propose that this kind of procedure is suitable for organizational development purposes for many types of organizations.

First, data is collected with the ORCI survey and analyzed to produce a first-level analysis on the main weaknesses in the renewal capability of a case organization. Then the interviews are conducted in order to deepen understanding on the particularities of facilitators and inhibitors of renewal. The ORCI -survey, the interviews, and the analysis of the case organization used as an illustrating example in this paper are presented in the section titled *Research Design*.

Next, workshops are organized to report on the results of the surveys and interviews. Special attention should be paid to designing the results workshop so that rich dialogue can emerge among the management and the representatives of the employees. In the case organization's results workshop there were 27 participants; both management and a number of representatives of employees from various departments of the company were taking part in the discussion.

The second workshop is based on the communicated results of the first workshop. The communication highlights the specialities that may have an effect on results. In this workshop the goal is to find the main issues to be developed and to decide upon a number of concrete development actions, as well as to find responsible persons to facilitate and carry out them. The ideas are communicated broadly to fit the situation of the company and to advance the continuous learning and development process.

In addition, we propose that specific theme workshops (2 or 3) could be organized, which are directed to the themes that are the most topical ones for the case organization. For example, in our case organization, collective creativity techniques to enable constructive questioning, a social interaction workshop to improve feedback giving and receiving, and the strategic management of intellectual capital were such specific themes.

The basis for concrete development actions becomes systematically generated in each workshop and thereby the participants already have a broad understanding about the situation and the field of development. Thereby they also have activated themselves for the forthcoming development activities by actively taking part in dialogue during workshops. Through this process the company can start to build a culture of development and to increase personnel's participation in the process of concrete development activities throughout the organization.

Finally, the second data collection (survey) can be carried out in order to diagnose the state of innovation capability of the company and to contrast the results with the results at the beginning of the development process. In this phase we also carry out interviews in order to observe and recognize the factors that may have an influence on the results of the survey (for example structural changes or changes in management etc.) during the development period within the organization. Ideally, the process should be repeated every two to three years in order to detect changes in and to ensure that renewal capability is optimally enabled throughout the organization.

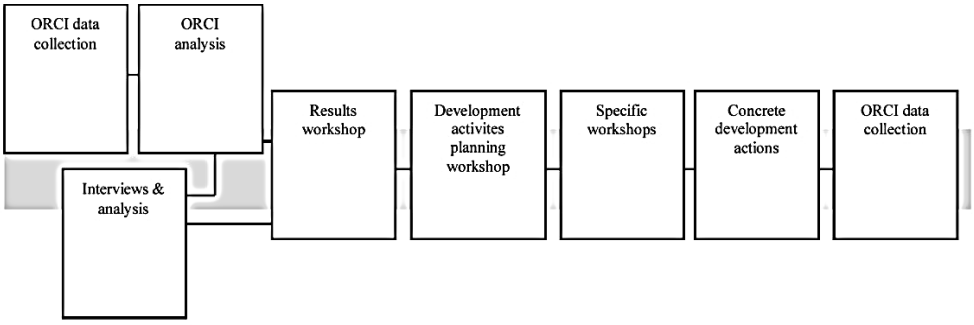


Figure 12. The process for organization development by the ORCI-method.

Through this kind of a mutual collaboration process the results become clearer and concrete for the members of the company and some results or differences may get a natural explanation, which is valuable information to the researchers. For example, intra-organizational collaboration can be weak in a particular department, because its nature of operation does not include such activities. The process also allows a number of organizational members to participate in the generative development process, which enables the fluent integration of concrete actions. It also

works as a base for development from within organization, and thereby initiates sustained development.

At the time of writing this paper, the project is in the phase of preparing for the second workshop. In the conclusion of the first workshop, the organizational actors agreed to disseminate the results of the diagnosis concerning the current state of organizational renewal capability to their respective departments. They also agreed to prepare (at least) three concrete development ideas which will be collected and discussed in the second workshop.

Conclusions

The more complex and unexpected the economy is, the more important the capability of an organization to orchestrate and integrate multiple capabilities will become. Accordingly, a clear understanding of what these capabilities are and what their current state is in terms of each organization form the basis for mastering these capabilities. Even in the same field of business, organizations are not unilateral and homogenous entities. There seem to be differences even between departments and groups of personnel within each organization, as the findings of this study indicate. Hence, there are multiple different ways to utilize resources, capabilities, and strategies for continuous learning and innovation. In this respect, the holistic approach and process for evaluating and developing organizational renewal presented in this study allows organization-specific features, especially the observed strengths in renewal capability, to work as a basis for building renewal from within the organization.

This paper demonstrated the application of a structured method for analysing the developmental needs in organizational renewal capability through the application of the ORCI method in one case company. The method is based on a holistic organization-wide approach to the management of innovation, constituting of six main elements: strategic competence, exploiting time, leadership, connectivity, learning orientation, and knowledge management. These elements are measured with a survey, and more in-depth information concerning them is acquired in individual interviews as well as organizational workshops. Thereafter, in various types of workshops the results are reported to various groupings of organizational members, to motivate and facilitate them to discuss renewal-related issues, to think about solutions to the identified problems and to start to conduct development activities in their work environments.

The approach proposed in this paper is middle ground between the traditional audit approach and the new high-involvement type of an approach, as characterized by Hallgren (2009). Our approach is a traditional audit approach in the sense that it employs a scientifically validated structured and standardised metric (the ORCI) for identifying the main strengths and developmental needs in the organization. However, the process does not end with merely presenting the measurement results to the organization. Instead, the results are used as a basis for qualitative interviews to gain a deeper understanding of the issues involved, as well as for workshops with organizational actors to help them to select the most important challenges and to plan concrete development activities. Ideally, this combination works to enable an organization-wide process of organizational learning on the main issues impacting on continuous renewal and possibilities for its development in the participating organization.

Overall, the process for diagnosing organizational renewal will help organizations to develop a better ability to continuously renew themselves and to succeed in the changing knowledge economy. In general, broader implications can be reached through leveraging the presented method to various types of organizations. The more the organizations become aware of their organizational capabilities, the strengths, the weaknesses, and the developmental needs in terms of continuous learning and innovativeness, the better they can focus their development efforts on the most crucial issues and thereby succeed in changing environments.

The main limitation of this study is that the structured process for evaluating and developing capabilities presented here is on-going and the final findings cannot yet be presented. Another limitation is that there is only single case involved in this paper. However, there are a few on-going cases simultaneously in process and their comparative results will be forthcoming. Third limitation is that the three small production supporting departments could not be presented as separate in graphs due the minor (<5) number of respondents each. The results of them are, however, included into to the results of the whole case organization.

Future studies concerning innovation capabilities should be directed to identifying differences in capabilities between the various units of an organization. Questions that still need clarification are whether the various parts of an organization need different capabilities of innovation and how these capabilities are successfully integrated and orchestrated.

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Appendix

Figure 2	Strategic competence		Exploiting time		Leadership		Connectivity		Learning orientation		Knowledge management	
	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd
Production A (18)	4.54	1.34	4.27	1.48	3.71	1.07	4.91	0.82	4.55	0.58	3.89	1.05
Production B (22)	4.32	1.24	3.48	0.77	3.65	1.05	4.41	1.00	4.11	0.97	3.60	0.92
Production C (13)	4.13	0.83	3.50	1.02	3.62	0.79	3.92	0.60	3.59	0.59	3.74	0.75
Case Organization (106)	4.39	1.16	3.71	1.06	3.80	1.07	4.73	0.88	4.21	0.85	3.82	0.90

Figure 3	Strategic competence		Exploiting time		Leadership		Connectivity		Learning orientation		Knowledge management	
	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd
R&D (10)	4.86	0.85	3.61	0.72	4.49	1.02	5.21	0.61	4.77	0.48	4.30	0.85
Marketing I (6)	3.62	0.89	2.93	0.98	2.85	0.61	5.08	0.66	3.86	0.92	3.17	0.70
Marketing II (7)	4.17	0.47	3.62	0.73	4.07	1.05	5.00	0.61	4.37	0.58	4.11	0.79
Administration (22)	4.55	1.36	3.78	1.04	4.14	1.04	5.03	0.85	4.42	0.89	3.97	0.83
Case Organization (106)	4.39	1.16	3.71	1.06	3.80	1.07	4.73	0.88	4.21	0.85	3.82	0.90

Figure 4	Strategic competence		Exploiting time		Leadership		Connectivity		Learning orientation		Knowledge management	
	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd
Case Organization (106)	4.39	1.16	3.71	1.06	3.80	1.07	4.73	0.88	4.21	0.85	3.82	0.90
Production A, B, C (53)	4.35	1.18	3.76	1.16	3.66	0.99	4.46	0.92	4.13	0.84	3.73	0.92
Other departments (45)	4.44	1.19	3.60	1.00	4.04	1.08	5.07	0.76	4.42	0.85	3.96	0.84

Figure 5	Strategic competence		Exploiting time		Leadership		Connectivity		Learning orientation		Knowledge management	
	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd	Mean	sd
Blue collar worker (48)	4.33	1.26	3.83	1.23	3.66	1.11	4.50	0.92	4.12	0.87	3.73	0.95
Supervisor (0)	-	-	-	-	-	-	-	-	-	-	-	-
White collar worker (28)	4.48	1.26	3.48	0.97	3.43	0.98	4.72	0.82	4.07	0.86	3.64	0.95
Senior white collar (22)	4.40	0.86	3.66	0.79	4.33	0.91	5.10	0.78	4.52	0.72	4.13	0.65
Manager/Director (8)	4.37	1.10	3.62	1.00	4.45	0.95	5.11	0.77	4.53	0.80	4.13	0.83
Case Organization (106)	4.39	1.16	3.71	1.06	3.80	1.07	4.73	0.88	4.21	0.85	3.82	0.90

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