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Knowledge Management operationalization – how it differs in large enterprises and SMEs in
Finland

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Abstract

Information and knowledge are essential resources for businesses to maintain their competitiveness and to constantly develop further. Knowledge Management (KM) enables companies to develop their activities by having the right information at the right time, as well as by offering the tools to manage the skills and knowledge of the personnel. The aim of this paper is to empirically analyze how KM is operationalized in large and small and medium sized companies in Finland, and furthermore, what kinds of challenges the companies face in KM operationalization. The empirical study was carried out in spring 2014 as a web-based questionnaire survey and structured interviews. Results of the study provide direction for the development directions of KM in Finnish companies.

Keywords: Knowledge Management, survey, large and small and medium sized companies

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Introduction

Our research focuses on Knowledge Management (KM) operationalization in Finnish large and small and medium size companies. Knowledge is typically the central resource and element for survival and the primary source of competitive advantage (Brooking, 1999; Fleisher, 2002; Stewart, 1997; Teece, 2000). An overall goal of KM is to utilize information and competencies effectively that organizations could anticipate, implement, adapt and develop their operations. Thus, companies and public sector need tools that actors can manage and develop knowledge further. (Laihonen, 2013)

Efficient information and competence utilization in companies is challenging and not least because it is difficult for organizations to recognize relevant knowledge. Our aim is to empirically analyze how KM is operationalized in large and small and medium sized companies in Finland, and furthermore, what kinds of challenges the companies face in KM operationalization. KM has been defined varyingly in different contexts, but a rather unified definition of “the task of developing and exploiting an organization's tangible and intangible knowledge resources to create a potential of competitive advantages” (McCune 1999) is followed in our study. Basically it can be said that the main idea in KM is the effective diffusion and promotion of the reuse of existing resources (Wah 2000) and managing the sharing and application of knowledge, as well as improving knowledge creation (Marchand & Davenport 2000).

KM has already received a great deal of attention among both academics and managers. Nonaka and Takeuchi (1995) provoked discussion about the importance of knowledge creation, and both Grant (1996) and Spender (1996) presented the idea of a knowledge based view of the firm. It can still be considered a quite new research field and still in its fairly early development. The multidisciplinary approach of the field of KM (referencing e.g. Maier 2002, management science, information science, organization science, sociology, and psychology) has yielded a situation in which KM can be seen as a quite comprehensive and many-sided phenomenon, leading also to a somewhat blurring nature. Hence, much research has been done focusing on the development of the core concepts in this field (Alavi and Leidner, 2001; Bartol and Srivastava, 2002; Hansen, 1999; Huber, 1991; Maier, 2002; Nonaka and Takeuchi, 1995; Ståhle and Grönroos, 1999; van Burg et al., 2008; Wang and Noe, 2010). Despite all the multidisciplinary research, it can be argued that the field is not yet so well developed and much remains to be studied in the field of KM especially empirically. Empirical KM studies are needed to develop the practical content of concepts in the field and to get deeper understanding of those challenges that companies meet in KM.

Knowledge appears in many ways in organization depending context, actor or possess. This study considered KM from human resource (HR) and information technology (IT) aspects. In this article the purpose is to empirically analyze how KM is operationalized in large and small and medium sized companies in Finland, and furthermore, what kinds of challenges the companies face in KM operationalization. This article structure starts with KM theoretical framework, continuing with research methodology and analyses. The comparison between large and small and medium sized companies gives an overall understanding on the potential differences in KM depending on the size of the company. In the conclusion part, the key results of the study are highlighted and directions for further studies are opened up.

Theoretical insights

Knowledge differs from other resources of a company. It's characteristic belongs that it accumulates and it is dynamic over time in processes, and knowledge does not cause additional costs (Leonard-Barton, 1995; Shapiro and Varian, 1999; Nonaka et al., 2001; Prahalad and Hamel, 1990). It can also be hard to grasp (Krogh von and Roos, 1995). Therefore, solid knowledge resources of a company can separate it from its competitors in a manner that is hard for competitors to copy. Hence, knowledge can be said to be an essential source of genuine competitive advantage for a company. (Krogh von and Roos, 1996) In all, KM (see e.g. Grant 1996, Nonaka & Takeuchi 1995) can be argued to offer a set of principles and tools to support the work in the modern networked society (Valkokari & Helander 2007).

To utilize knowledge effectively it should be designed, acquired, developed, and utilized well (Nonaka and Takeuchi, 1995; Nordhaug, 1994), thus proper KM processes should be developed in organizations. For this, there should be built physical, social, and resource-allocation structures that guarantee extensive and systematic utilization of knowledge (Teece, 1998). However, definition, discovery, and use of knowledge are often found to be difficult (Ruohotie, 1996; Ståhle and Grönroos, 1999).

It is essential that how the implementation of KM as a part to organization processes success: how the planners identify relevant information, and how they allocate their existing resources. Knowledge is developed from existing one and created new knowledge. The challenge is to transfer the knowledge that has developed to the processes through organization levels. According to Krogh et al. (2001) the companies should find the way how to inform the possibilities of knowledge exchange and benefits to be obtained, and further, how to motivate personnel to knowledge transferring.

Regarding above continuous human resource development and systematic learning goals are needed to support new knowledge adopting. The management and leadership skills have an essential role in supporting the organizational work, especially in change situations. In general, management can also have a huge influence e.g. on the birth of potential knowledge sharing barriers within organizations (Kukko & Helander 2012, Kukko et al. 2008), which is commonly one remarkable issue that diminish the organizational work climate, but also smoothness of the personnel's work and the productivity of the company. For example, according to Matson and Prusak (2010), the knowledge work barriers can be divided into different groups: physical, technical, social or cultural, contextual and temporal barriers. However, Ho (2009) express that strategy and leadership, organizational culture, organizational incentive system and information technology are the key factors that enable efficient knowledge utilization and support work in the organizations.

Behind a successful KM systematic and process development should be a clear strategic thinking. A KM strategy is defined as a general, issue-based approach to defining operational strategy and objectives with specialized KM principles and approaches. (Dalkir, 2005.) Changing environment drives the companies to develop their business activities, and it means that they need to identify, assess and map the existing knowledge strength: which kind of KM strategies they should apply to support the work of their personnel. (Hansen et al. 1999, Seeley & Dietrick 1999, Zack 1999.) It is significant to develop a proper KM strategy, as well as systematic process of KM. (von Korgh et al. 2001.)

According to Hansen, Nohria & Tierney (1999) there are two basic KM strategies: codification and personalization. Codification strategy aims to capture and codify knowledge in explicit form such as in documents and databases, and to make sure that these are available to everyone in the organization for further reuse. It can be a good strategy to store large amounts of knowledge and to create an organizational memory for all employees

(Boh, 2007). Under codification strategy, organizations invest once in the development of explicit knowledge and store it, and are able to reuse it whenever required (Scheepers, Venkitachalam, & Gibbs, 2004). Especially because of the technology systems, in knowledge creation and innovation processes increasingly the customers and suppliers are involved with the companies. (See e.g. Krogh et. al. 2001.) When an organization provides a standard product or solution to its clients, it would be helpful with a codification strategy which leverages the ability to reuse the organization's knowledge. (Hansen 1999), However, there is still weakness of codification strategy that it typically does not provide a rich medium for communication. According to Boh (2007), the richness of a communication is usually measured by bandwidth where the amount of information exchanged between parties, the degree of customization that if the information can be selected, restructured and provided to specific user demands, and the degree of interactivity to ensure that both parties can involve in repeated exchanges. Personalization strategy focuses on the interpersonal relationships to mobilize and share knowledge in tacit form across the organization (Hansen 1999). Instead of storing information and knowledge explicitly, it is the strategy knowledge management which links people to each other to cultivate person-to-person sharing of knowledge. With this strategy, organizations tend to create and stimulate networks between people in order to share and study their individual skills, experiences and expertise (Scheepers, Venkitachalam, & Gibbs, 2004).

Research setting

The research purpose was to explore KM in different sized companies in Finland. The study was carried out as a quantitative survey and qualitative interviews. The quantitative methods enabled effective data gathering from a large company groups, and with interviews the researcher wanted to regard if the interviews verified the quantitative results. For theory verifications and generalizations, quantitative research generally employs survey

designs (Creswell 2003), which has been utilized in this research too. The questionnaire was divided in different themes covering the varying aspects of KM. The first theme of the questionnaire dealt with organizational structure and strategic capability, as they build the backbone of KM in organizations. This aspect included questions about decision making practices, feedback and confidence, technology utilization and organization structures and their support for knowledge sharing. The second theme focused on organizational process capability, which included information technology utilization, information and competence acquiring, developing and implementing. The third part of the questionnaire explored organizational effectiveness and the challenges and development targets in KM in general.

The respondents' industries were manufacturing and construction, wholesale and retail trade and finance and services. The researchers wanted to get both human and technical perspective to the responses, thus from each of the respondent companies both representatives from human resources (HR) and information and communication technology (ICT) functions were contacted. 84 % (n=36) of the large companies' respondents represented more than 2500 employee company. SMEs (n=22) were divided so that eight companies had less than 100 employees, five of them less than 300 employees and three of them had over 300 employees and, six of the companies did not report the amount of employee. In overall, the sample was collected from 58 companies, which included 51 Internet-based questionnaire responses and seven structured phone interviews from small and medium sizes companies.

The data was statistically analyzed with SPSS program and the interviews were analyzed with content analysis. Frequencies were used to examine distribution of responses, and were made sum variables. The reliability analysis was made with Cronbach's Alpha ($\alpha > 0.6$). For factor extraction was used Principal Component Analysis, and the criterion used of factor was minimum Eigenvalue > 1 , KMO and Bartlett's test Varimax method ≥ 0.6 , $p =$

0,000. Because of the low response the results can be considered as descriptive rather than as universalize.

Results

In next we will open up the key findings of the empirical study. The findings take an overview of KM operationalization and also comparative stand between the SMEs and the large enterprises analyzed through the aspects of KM goals and definition in practice, KM systematics and processes and KM challenges and development targets.

KM goals and definition of the concept in practice

The most important large companies' goal for KM was strategy based development (33 %). Business intelligence capability development (22 %) was the second important goal, and the third was information and resources management (18 %), especially timely information. Social and cultural point of view came out also: KM was a way to affect attitudes. Other goals (12 %) were competence management, value based management and clear areas of responsibilities.

In SMEs in KM the most goal-directed was to ensure professional knowledge (35 %). The respondents emphasized self-responsibility and multi skills in professional development. The second important goal for KM was timely information (18 %), and the third important was KM for interaction (17 %). Other goals (30 %) were customer oriented approach and services, decision making verifying and good management. Some of the companies' hadn't thought or defined any goals for KM.

Surprisingly, to increase employees' strategy identification was not a goal for KM. Only one SMEs respondent thought that it is the goal. The companies have a business strategy and information of future plans, but if there is no dialog of the strategy, how the

personnel can assimilate business goals so that they know what the strategy means for their work operations.

In this study was asked with open questions, how the respondents understood KM content and term. Based on analyses the content was discursive. Mostly the content in large companies was information management, competence management or development or also competence model. Some told that they didn't have any term for KM or that it was difficult to name term for one function.

SMEs' respondents told that it is important that the functions are not defined too narrow, and that the relevant knowledge can be identified. Competence management definition was developed in some companies, especially if they were mapping existing competence resources. The main point was that information and competence management must be assimilated in personnel attitude and daily operations.

How did the respondents see the function of KM in organizations? The most important function in large companies for KM was strategy based information and competence development to reach the targets that are set (35 %), especially proactive development. Focusing on competencies was the second important function (25 %), and focusing on core operations with timely information (15 %) was third function for KM. Social and cultural point of view came out with functions' organizational capability raising (10 %) and value based function (10 %). Essential in KM is information and communication sharing through all organization levels. Only one respondent told that goal for KM was interaction.

KM main function in SMEs was to ensure that the company has relevant business information and competence resources for operations. With KM the purpose was to advance communication and common understanding with personnel. The respondents mind

was that it is important to recognize things. That is concretized how to listen to others and ability to compromise, and working together to reach the goals that are set.

KM systematic and processes

In questions concerning systematics of KM there was evaluated organizational infrastructure and strategic capability in decision making, strategy work, feedback systems, confidence, and knowledge sharing and technology utilization.

Free communication and team work were the strongest agents what comes to KM systematic. In large companies' strategy work and commitment to strategy, decision making, feedback and confidence explained 44 % systematic variable range. Surprisingly, organization strategy formulation and definition, strategy based human resource development, strategy discussion and human resource measurement explained only 9 % systematic variable range. Free communication and team work support with workplace planning explained 48 % KM systematic variable range, but organization infrastructure didn't affect that much, only 9 % explanation.

In SMEs the respondent felt that the strategy work with the employees started when the strategy is to be implemented to the processes, not during the strategy planning. The planning with the employees focuses mostly on operational functions. However, there were different kind of teamwork in companies, and the employees had good possibilities to design their own work. Then they felt that discussions about work development with the managers were in really important role.

Based on analyses strongest matter that explains variance of KM systematic in large companies is communication process. Strategy planning, strategy commitment and decision making are in good or very good level. But these don't seem to be the strongest agents in KM systematic. In SMEs strategy planning, strategy commitment and decision

making are in good level. But the strongest agent in KM systematic is confidence and confidence atmosphere.

In all, processes are in important role when operationalizing KM in practice. The companies' process capability was investigated in communication technology utilization, information and competence procurement, sharing, organizing and developing, and in information and competence implementation.

The data was operationalized internal and external information utilization concerning information and competence obtaining and application. In this study internal information includes knowledge that is needed in internal process operation. External information is communication with partners and contacts, and the information which comes outside of the company. KM development was analyzed by drawing on descriptions of information and communication technology utilization, and also how organizations were able to utilize new and old knowledge constructively, see Table 1 large companies and Table 2 SMEs.

Table 1. Rotated Component Matrix (Sum variable) for usage of Knowledge and Information Technology in organizations in large companies (% , n=36)

	1	2	3	4	5	Can't Total Say
Use of internal data and information		3	36	50	11	100
Use of external data and information		5	14	58	23	100
Knowledge and Competence Development		3	31	47	19	100

1 = Totally disagree, 2 =Rather disagree, 3 = Neutral, 4 = Rather agree, 5 = Totally agree

Real-time information, easy to find the information, and learning in work explained 49 % organization internal information utilization variable range. Information in the right place and finding the information, noticing proposals of improvements and updating process and instructions explained only 10 % organization internal information utilization variable range.

Table 2. Rotated Component Matrix (Sum variable) for usage of Knowledge and Information Technology in organizations in SMEs (% , n=15)

	1	2	3	4	5	Can't Say	Total
Use of internal data and information			40	60			100
Use of external data and information			30	60	10		100
Knowledge and Competence Development			30	60			100

1 = Totally disagree, 2 =Rather disagree, 3 = Neutral, 4 = Rather agree, 5 = Totally agree

In SMEs the internal data and information management was ensured by good instructions and daily co-operation with different departments and personnel. The information was delivered by Intranet, info-television, e-mail, meetings or by bulletin boards. However, the respondents told that there need to develop in internal knowledge assimilation and in verifying knowledge implementation. In some operations the companies had the responsibility to receipt the information, but there wasn't any rechecking that the knowledge that is shared is also utilized in processes. The respondents emphasized superiors and employees responsibility to verify that the knowledge is implemented to the processes, and also that the documents and information are updated.

Use of external data and information, based on large companies' responses, was even better level than use of internal information. Organizations' existing process concerning external information of new products and services, competitors, markets and new information explained 35 % of organization external information utilization variable range. Also network with new ideas, and reverence of new employee and his knowledge and competence included this component. It seems, that there is an effect between employer and his support for network of employee ($r = .516, n = 36, p < 0,005$). However, 6 % of the respondents told that they didn't know, if there is process for supplying information of new products and services, competitors, or process for communication with partners.

Also SMEs' use of external data and information was in higher level than internal information utilization. It seems that external information procuring is focused on certain business units and actors, among network, new ideas and the knowledge of the new employee and its utilization. Knowledge development together with customers and co-operators were seen very important, and network were constructed by co-operation with other business units situated in different locality or e.g. by participation for training programs outside the organization.

The level of knowledge development in large companies were seen rather good level. Strategy based consistency for evaluation of competency, utilization and development explained 51 % of KM development variable range. However, there is no efficient way to utilize new information that comes with new employee. New information and competence development with team work were also low level, explaining 10 % of KM development variable range.

Also SMEs felt that knowledge development was in quite good. In central were development discussions and the goals that are set together with superiors and employees. Some of the companies made competence mapping internally and some of the companies used external consult. Main point was that the competence evaluation needs to be ongoing process, and the necessity competence is complemented with internal training or with external education. Big challenge for SMEs was that training and development programs that were made were not implemented successfully, mostly because employees were not engaged to implementation. Surprising was that work circulation was used quite seldom (53 %), 30 % of the companies used seldom or used at all. Developing and working in groups was seen one important way for competence transferring. Using competence mapping and co-operation with teams was verified also substitute system in these organizations. However, how to utilize new employees' knowledge the companies did not have any systematic practice for

that. Introduction was the key function, and the respondents emphasized superiors and other employee responsibility to identify new knowledge and implementing. But introduction was seen as employers teaching from up to down action.

Information and system technology gives many possibilities to improve processes in companies. Next results explains how actively large companies and SMEs utilize information technology. First, the large companies are explained with graphical chart (figure 1) and after that the SMEs graphical chart (figure 2).

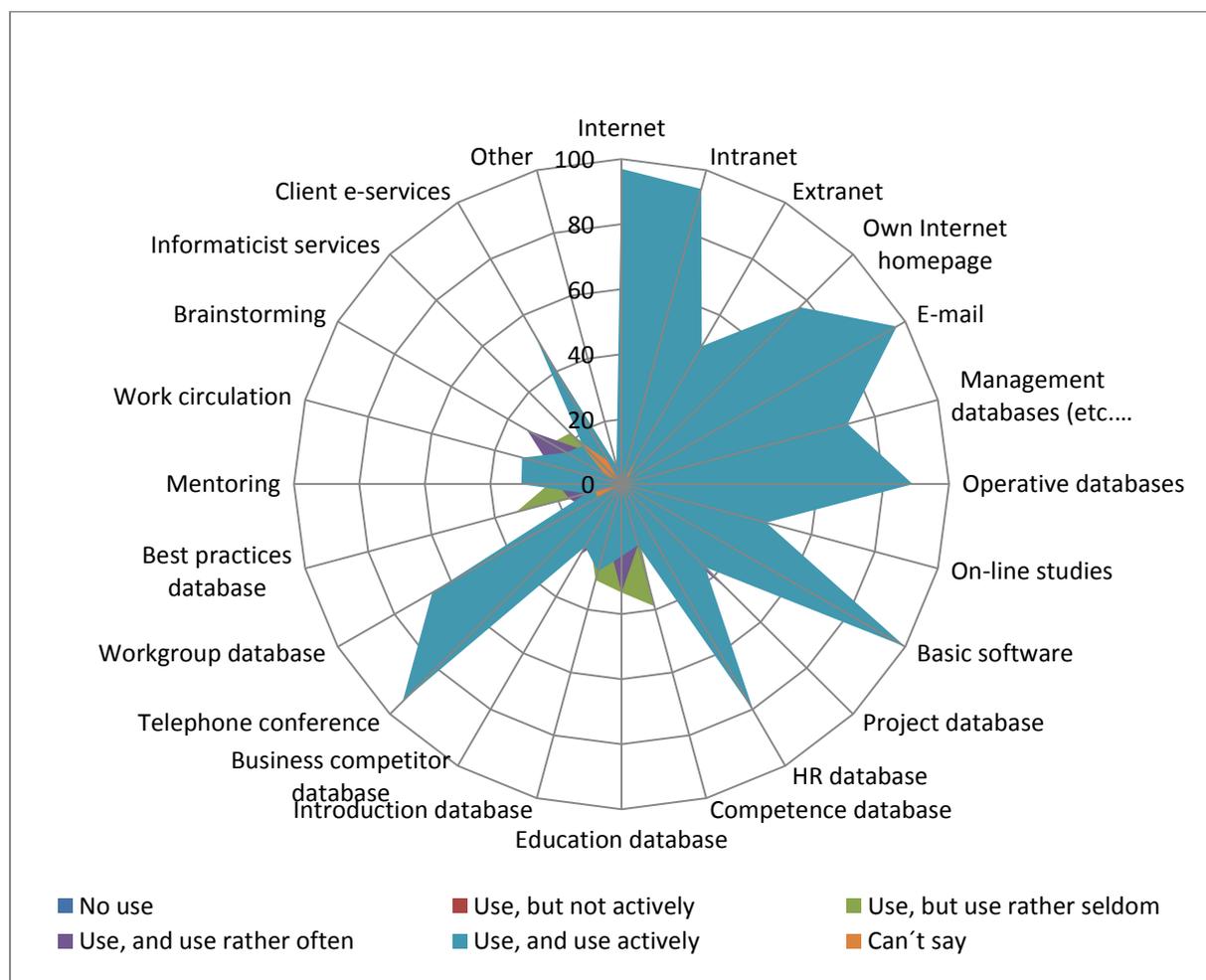


Figure 1. Usage of Information systems large companies (% , n=36).

As Figure 1 demonstrates, the information systems are used actively in process management: operational database were used actively. Also project management systems were utilized well.

Human resource database were used by all large companies. Intranet was efficient way to deliver information. Considering education and competence database, results show that the level of activity is low, or some of the company didn't have those systems at all. Positively can be said, that online learning environments are used actively but some of the companies didn't have online learning systems.

Technology was used for external communication actively. All the companies used Internet actively. One explanation can be that the companies have their own web page, and they may have web services and interaction with their customers. And customer databases were used in actively. Other information systems included Chat platforms, document management, remote access platforms, Wiki platforms, information television and Ideal Work concept. How SMEs utilized technology, be conceived next.

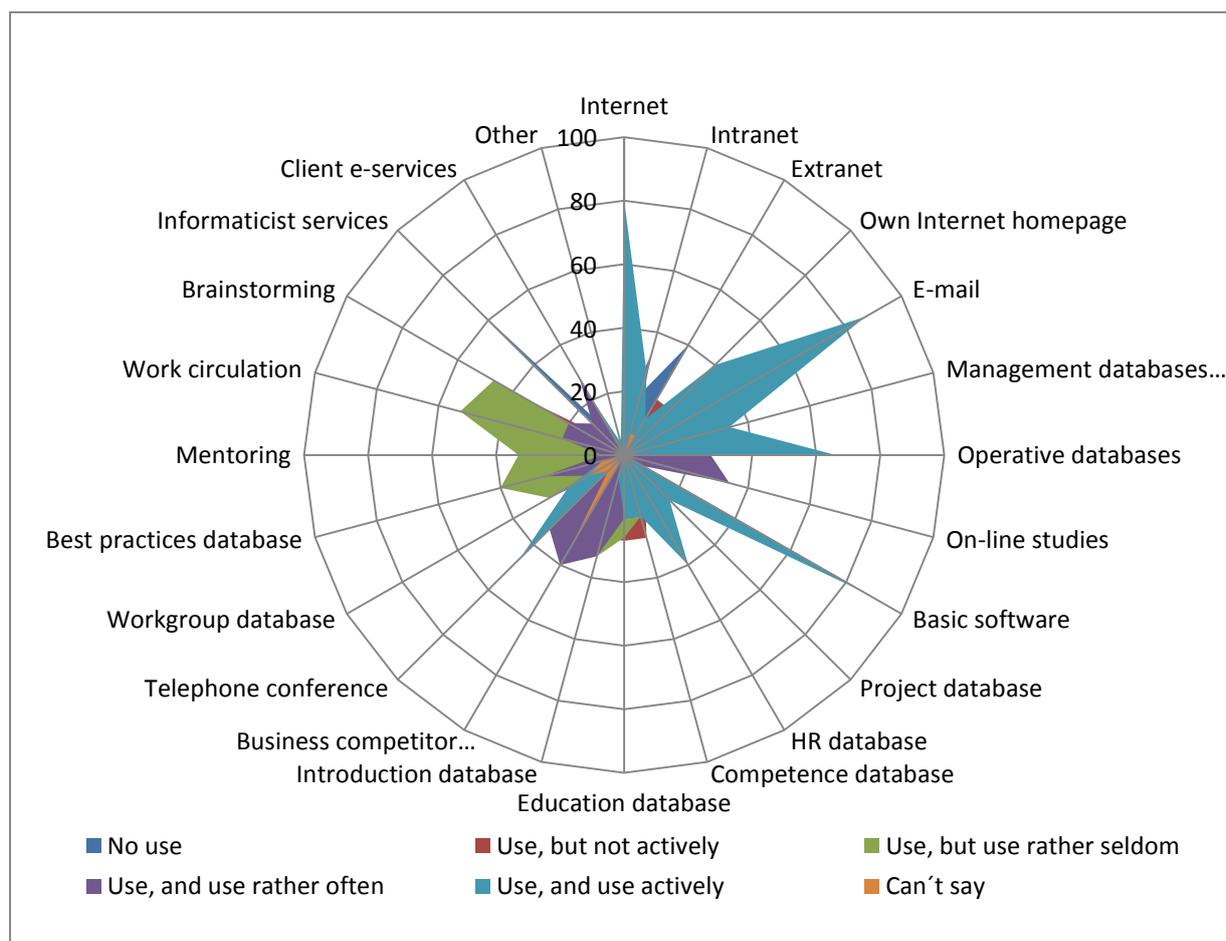


Figure 2. Usage of Information systems SMEs (% , n=15).

Figure 2 illustrates SMEs information technology utilization activity. In process management the utilization activity was 66 % because of operational systems. SMEs used project management systems (PMS) seldom

SMEs used technology for external communication well. Internet and own web pages used actively. One explanation for Internet use may be companies' own web pages and interaction with their customers. Electric customer services were used in 28 % of SMEs. Extranet for external communication was used very seldom. Other technology systems that SMEs used were e.g. Lync for long distance communication, product management systems, utilization rate control and working time control systems.

The possibilities of digitalization utilization SMEs took first steps. Understanding the definition of digitalization was not clear. Some of the respondents told that the implementation depends on individual's skills to utilize digitalization. Some of the companies had plans but the implementation has failed. However, some of these companies had teleworking in certain professions.

Remarkable notice, that in organizations they invest real time information (for operation) and external connections information management (clients or outside interaction), instead of internal information process and competence development systems were inactive use. As such, one can ask based on the research findings that are the respondent's understanding of Knowledge Management development unrealistic comparing to use of information systems activity?

KM Challenges and Development Targets

Following Figure 3 demonstrates what kind of challenges large organizations had in KM. Based on responses, the biggest challenge was personnel resource, second biggest

was challenge to keep schedules and as third biggest was organization internal knowledge utilize. 40 % of the respondents told, that it was challenging to integrate suitable technology to the processes.

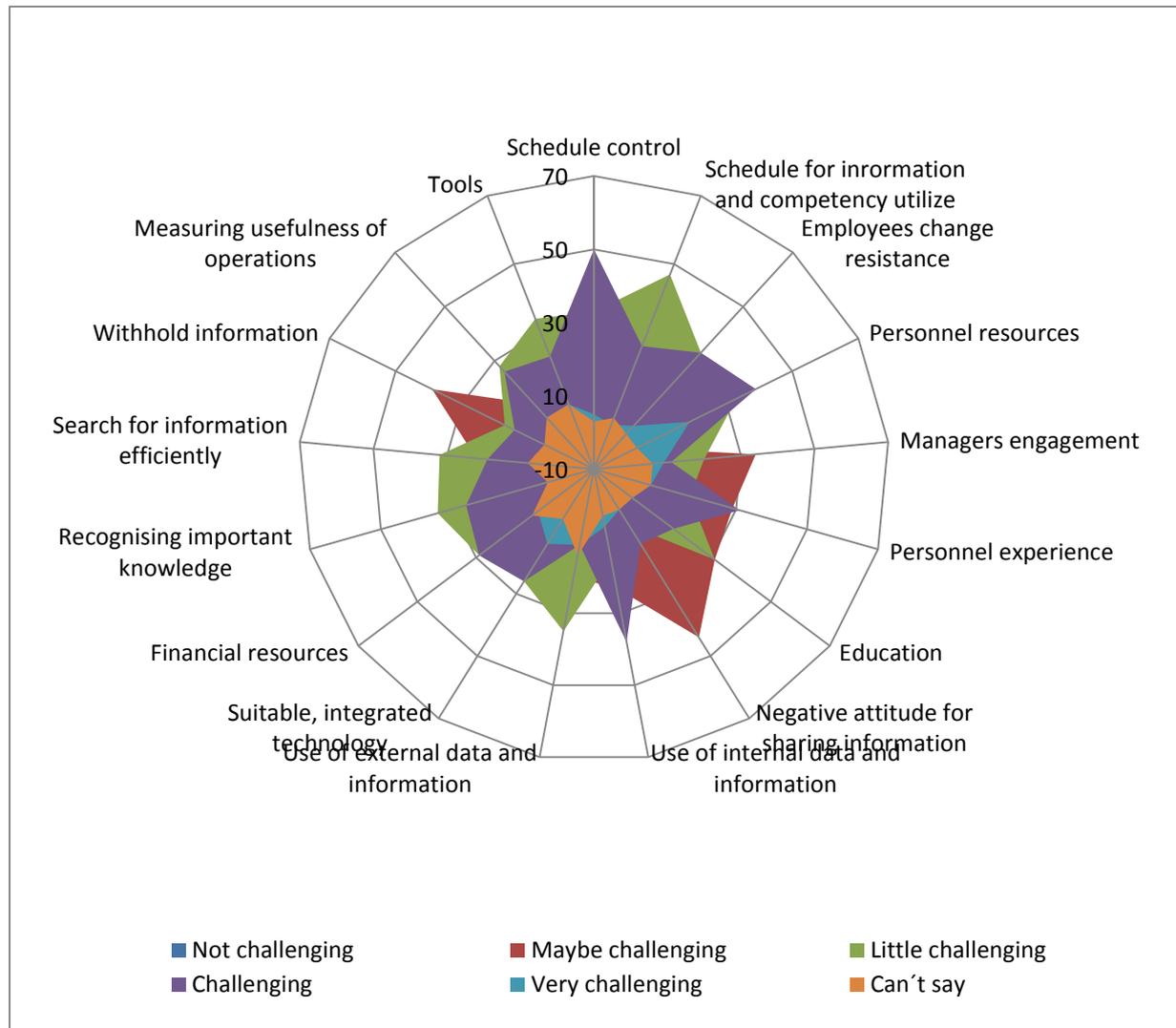


Figure 3. Organizational challenges in large companies (% , n=36)

As figure 4 illustrates SMEs the biggest challenge in KM was internal knowledge utilization and time resources for information and competence exploitation. The second biggest challenge was the efficiency of knowledge acquiring and knowledge administration. The third was human resources, and the fourth was schedule control and the measuring of business operation utility. The respondents specified that because of the enormous amount of information it is essential to identify the relevant information. For that

they hoped that information technology systems could give some facilitation. Also they specified that competence management should be implemented to organizations' daily processes.

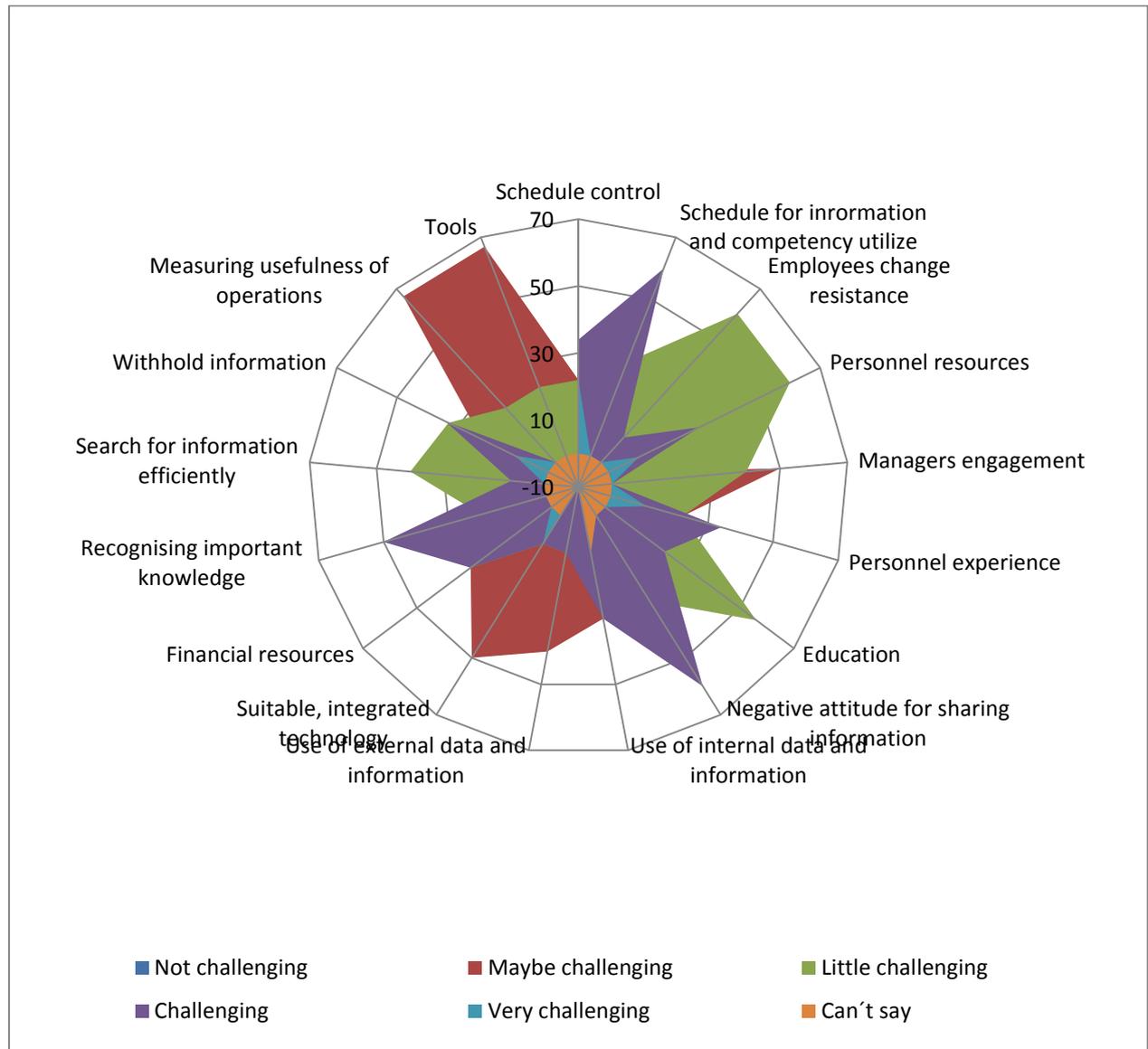


Figure 4. Organizational challenges in SMEs (% , n=15)

What things the companies underline that needs to be developed? Figure 5 demonstrate large organization's development targets.

Most important large companies' target for KM development was internal knowledge utilization. Measuring with many indicator of this study confirms, that KM utilization or recognition of resources were not that effective than there is potential in organizations. The second important development target was change resistance and schedule management, as a challenge, change resistance in KM was number five. The third was personnel resource management developing and the fourth was suitable and integrated technology systems for operational support.

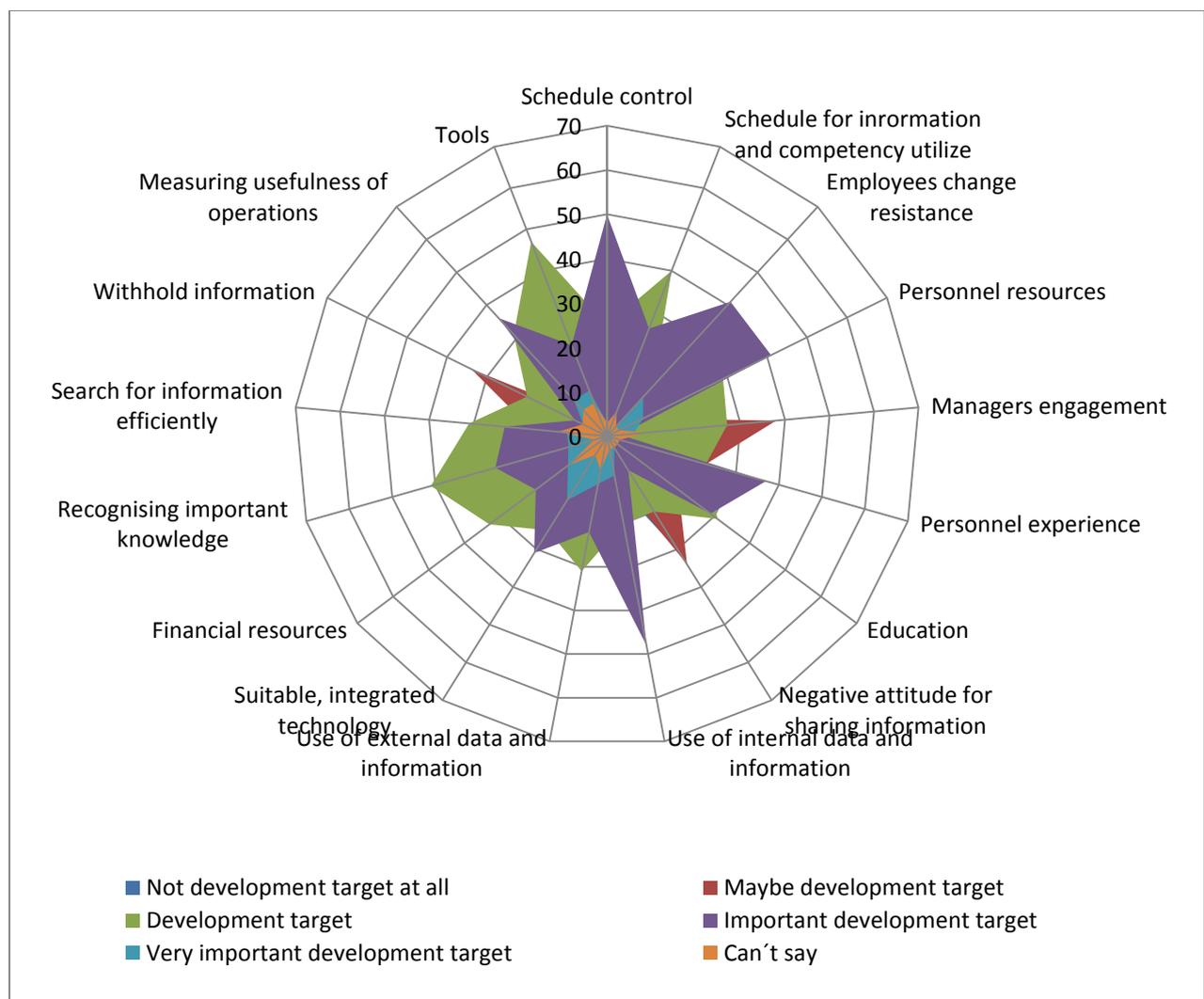


Figure 5. Organizational development target in large companies (% , n=36)

SMEs recognized as development target in KM firstly time resources for information and competence utilization. The second important development target was internal and external knowledge utilization. There is more potential in SMEs’ organization to input resources for identifying the knowledge, what comes to responses. As the next graphic figures (figure 6), the personnel’s’ negative attitude for knowledge sharing is one develop target. The respondents wished that their organizations put on effort for communication development. The third develop target that was named were human resources and training programs.

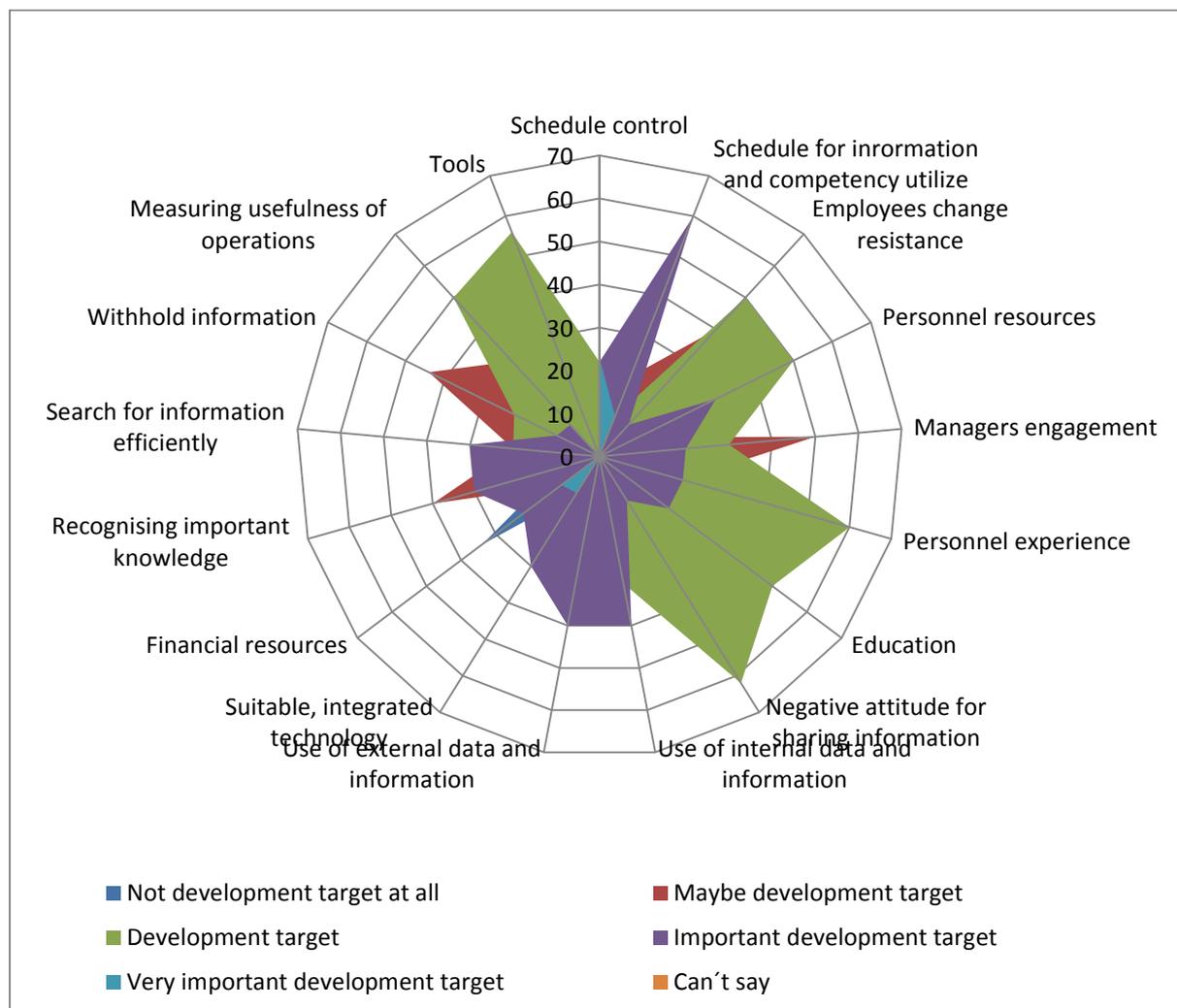


Figure 6. Organizational development target in SMEs (% , n=15)

In all, there can be identified several rather important development areas and targets in KM in different size of companies based on the research findings.

Conclusions

This study examined, with multidisciplinary approach, empirically the operationalization of KM in different sizes of companies. The results verified earlier studies carried out in the Finnish context (see e.g. Hannula et al., 2003; Helander et al., 2007) about the biggest KM challenges: companies have still challenges in defining what KM really means for their organization processes and further, how to develop systematic KM operations and to build a KM strategy. After the building of KM strategy they also need to put on effort to the strategy implementation and dialog.

The results indicate that the systematic of KM is stabilized part of the organization operations and that KM has become more goal-directed action. KM was seen important or very important way to utilize organization internal information in schedule and human resource management, and a way to effect personnel's attitude. And also suitable and integrated technology to support organization processes was important. However, only process management and communication as organizational functions utilized most effectively technology information systems.

KM strategy could help organizations to put on effort to those resources that are not used effectively, or to decrease overlapping information and functions. These invests are one way to search productivity in companies. It effects for employees' sense making process and strategy implementation how the companies involve their personnel. Only timing in strategy planning is different in various organization levels. And because individuals reflect the strategy and knowledge changes with their previous knowledge and experience, they also

need time for assimilating and approving. So it is important that organizations have dialog of their strategy that personnel have common understanding company's targets and can engage to the strategy. It means also that the companies have strategy for KM also – what are the goals for KM, what are the practices to operate communication and how to utilize information technology.

In sum, this study present theory and data regarding how KM is operated in Finnish companies. The study provides a causal argument to link of need of concrete tools and the challenges that organizations have in daily operations, especially internal knowledge and competence utilization effectively.

Our study also carries limitations. First, our data was collected average half of the 50 largest companies and in small area of SMEs in Finland. Even though the results were reflecting same kind of specifics, the thesis can see as descriptive rather than as universalize. Second, the sample is quite small, and therefore the results are rechecked with many analyze methods.

In future studies there is need to more carefully study the development of KM as an inter-organizational practice in a globalized and networked business environment. Additionally KM should be further studied as a practice that helps organizations to cope in a digitalized business environment and information overload. Especially the human, the “soft” side of KM should be understood and developed more deeply.

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