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**KNOWLEDGE MANAGEMENT PRACTICES AT SMALL AND MEDIUM SIZED
OULU REGION ENTERPRISES**

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ABSTRACT

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The commissioners for this research were Oulu University of Applied Sciences and the project Kilpailukykyä ICT-yrityksille, shortly known as Kilpa. The purpose of this research was to describe how the small and medium sized Oulu region enterprises are managing knowledge and whether any differences exist in knowledge management practices between information and communication technology and others. Data collected from the 17 enterprises that returned completed questionnaires was analyzed and the results were compared with some earlier studies of knowledge management practices. The results and conclusions of this research, mainly based on Karl-Erik Sveiby's knowledge based theory of the firm to guide strategy formulation, describe the knowledge management practices only at the 17 enterprises that returned completed questionnaires.

Two thirds of the surveyed enterprises were found to exercise knowledge management systematically. Differences exist between the small and medium sized enterprises operating within or outside information and communication technology business sector. The surveyed companies do not usually place knowledge management under any certain function, but many of the information and communication field companies do. Most often they place knowledge management under the function of business development. Most of the companies have assigned the main responsibility of knowledge management to a specific person or persons, most commonly to the entrepreneur himself or to one of the managers.

Inside information and communication technology business sector companies most frequently practice knowledge management at reports on expenses and other accounting reports. and half of them apply knowledge management to product development information. The other surveyed companies have strong weight on areas of employees' competence and knowledge. The surveyed enterprises have knowledge management related technical support but for example the use of integrated enterprise systems is not very common. The surveyed enterprises actively manage both conscious and silent knowledge, but differences are in variety of used activities, in frequency of their use, as well as perhaps in direction of the focus.

Keywords:

knowledge management, silent knowledge, competence asset, intangible asset, value network, knowledge creation

TIIVISTELMÄ

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Toimeksiantajina tälle tutkimukselle olivat Oulun seudun ammattikorkeakoulu ja hanke Kilpailukykyä ICT-yrityksille, lyhemmin Kilpa. Tutkimuksen tarkoitus oli kuvata kuinka Oulun seudun pienissä ja keskisuurissa yrityksissä hallitaan tietämystä, ja onko siinä eroja informaatio- ja kommunikaatioalan sekä muiden tutkimuksen kohteina olevien yritysten välillä. Tutkimuksessa käytetty data kerättiin 17 tutkimuskyselyn loppuun täyttäneestä yrityksestä ja analysoituja tuloksia verrattiin muutamien aikaisempien tietämyksen hallinnan harjoittamisesta tehtyjen tutkimusten tuloksiin. Tämän, pääasiallisesti Karl-Erik Sveibyn tietämykseen perustuvaan teoriaan yrityksen strategian muodostamisesta pohjautuvan tutkimuksen tulokset ja johtopäätelmät kuvaavat tietämyksen hallinnan käytäntöjä ainostaan loppuun täytetyn kyselylomakkeen palauttaneiden 17 yrityksen osalta.

Kaksi kolmasosaa tutkituista yrityksistä todettiin harjoittavan systemaattista tietämyksen hallintaa. Informaatio- ja kommunikaatioalan, sekä muiden alojen pienten ja keskisuurten yritysten välillä todettiin olevan eroja. Tutkitut yritykset eivät tyypillisesti sijoita tietämyksen hallintaa minkään tietyn toiminnon alle, useat informaatio- ja kommunikaatioalan yritykset kuitenkin tekevät näin. Useimmiten tietämyksen hallinta on sijoitettu liiketoiminnan kehittämistoimintoihin. Useimmat yrityksistä ovat nimenneet tietämyksen hallinnan pääasiallisesti tietyn henkilön tai henkilöiden vastuulle, tavallisimmin itse yrittäjälle, tai jollekulle johtajista.

Informaatio- ja kommunikaatiosektorilla yritykset harjoittavat kaikkien useimmin tietämyksen hallintaa kulu- ym. kirjanpitoraportteihin liittyen, puolet sektorin yrityksistä soveltaa tietämyksen hallintaa tuotekehitysinformaatioon. Muut tutkitut yritykset painottavat vahvasti työntekijöiden kompetenssiin ja tietämykseen liittyviä alueita. Tutkituilla yrityksillä on tietämyksen hallinnassa käytettävissä tekniikan tukea, mutta esimerkiksi integroitujen yritysjärjestelmien käyttö ei ole kovin yleistä. Tutkitut yritykset myös hallinnoivat aktiivisesti niin tietoista kuin hiljaistakin tietoa, mutta eroavaisuuksia on käytettyjen toimintojen valikoimassa, toimintojen yleisyydessä, kuin myös tarkastelusuunnassa.

Asiasanat:

tietämyksen hallinta, hiljainen tieto,osaamispääoma, aineeton pääoma, arvoverkosto, tiedon luominen

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1 INTRODUCTION

Competence is in the core of management and has highlighted the importance of information and knowledge, as well as the need to understand the asset of knowledge as a company resource. Small and medium sized enterprises (later called SMEs) as well as larger enterprises are believed to benefit from applying a comprehensive knowledge management approach incorporating all intangible assets equally.

This research was done for Oulu University of Applied Sciences and for Kilpailukykyä ICT-yrityksille, which is shortly known as Kilpa. Kilpa is a project funded by European Union/Council of Oulu region (European Regional Development Fund), City of Oulu and Oulu University of Applied Sciences. The project is coordinated by Oulu University of Applied Sciences. Project's objectives are to develop product proficiency among the Oulu region ICT-enterprises, and to increase their organizational competence (<http://www.oamk.fi/hankkeet/kilpa/>).

The purpose of this research was to enlighten how SMEs around Oulu region currently are managing knowledge. The target group consisted of SMEs operating on different business fields. The invitation to participate to the survey was sent to total of 181 Oulu region SMEs, but since the response rate was only 9.4 %, the results of this research reflect only the situation of knowledge management practices among the 17 enterprises that returned completed survey forms. No generalization of results to outside of this group should be made.

This mainly quantitative research was done to test among Oulu region SMEs some earlier found results and conclusions about knowledge management practices. Possible differences in knowledge management practices between the SMEs of information and communication technology business sector (ICT) and others (non-ICT) were also anticipated. Some open questions were included to the survey to provide possibilities for further explanation and comments. By answering the open questions the repliers were also able to present some qualitative insight to the questions. At the planning state of the survey there was also an interest for finding out whether all sizes of SMEs were equally implementing knowledge management, or if evident differences exist. This question was later abandoned as the small number of replies did not enable division to that specific sub groups.

The theoretical research for this study was done by reading books, articles, reports on earlier studies and other published material on knowledge management. It was followed by empirical research where data on implemented knowledge management practices, as well as future plans, was collected from Oulu region SMEs using a structured electronic survey form, planned for this specific research.

The target group consisted of all Oulu region SMEs representing several business sectors. Surveyed companies included enterprises of two projects conducted at Oulu University of Applied Sciences "Kilpa" and "Strategisen liiketoimintaosaamisen kehittäminen" (SLK). In addition enterprises were chosen by the company information collected through Fonecta Finder (www.finder.fi/yrityshaku), where all found suitable size enterprises with information on an email address were selected to the sample. Some more SMEs were added to the selection from a list of enterprises presented at City of Oulu web-page (www.ouka.fi/linkit/yrityksiä.htm). The persons approached by email were if possible chosen to be persons in managerial positions within the company. Quite often the only available email address was for sales or customer information purposes. All together a private link to access the survey form was sent to total of 181 Oulu region SMEs.

17 respondents (9.4%) returned their completed anonymous replies before the survey was finally closed. Reminders were sent 3 days before originally announced closing date to the enterprises that had not returned their reply by then and the answering time was continued until 28.5.2010. Six (35%) of the returned replies were from ICT enterprises, and 11 (65%) from non-ICT enterprises.

1.1 Background

Companies as well as their operational environment are becoming more knowledge intense (free translation from Hannula, Kukko & Okkonen 2003, 1). Production is flowing out from Finland with accelerating speed as it is transferred to countries of cheaper labor costs. In Finland production is turning to services, information products and intangibles. (Free translation from Ojala 2008, 11.)

There are also other challenges for current knowledge management. Renting work force is becoming increasingly common. Rental employees are expected to be competent and to provide

maximum work effort all of the time they are hired. To maximize their efficiency they should develop their competency themselves and be allowed to participate in competence development of the hiring organization. That in turn is causing doubts or fear for the competence to be transferred to the next organization, perhaps even to competitor. (Free translation from Ojala 2008, 137.) More and more enterprises are also outsourcing their operations. In line with competence strategy also some competencies are being outsourced (ibid., 157).

Protection of competence asset is also a challenge. Traditional scientific publishing practices are slow compared to the speed at which knowledge is formed. Further challenges are brought up by people who walk out from their work place every night with valuable new information in their heads and connections to whole world in their portable computers with which to spread and share information. Every day new competence is born; new ideas, innovations connected to services provided for customers, or for organization's own operations and developing the competitiveness. Most of these are outside the borders of immaterial property rights. More risks exist in transfer of information itself. Or competence is carried away together with competent employees who were responsible for development, and are leaving the organization. Organizations should be more careful to secure sharing of competence, so the important competence would not be completely lost. Emphasis should also be put on the fast organizational learning, the ability to learn new methods or new practices faster than competitors are able to copy the old. (ibid., 174 -176.)

Initiatives could be wasted if organization invests in sophisticated IT-system for information sharing while the organization has very highly competitive climate causing only "junk" to be shared. The value of document handling systems can be reduced by lack of standards and poor taxonomies. Commercial secrets could neutralize knowledge sharing with customers. If people leave the firm alienated, or alumni programs are delegated to administrative function, the effort to build marketing relationships by using ex-employees is useless. If data bases are not made highly interactive they are not supporting in improving individuals' capacity to act. (Sveiby 2001b, date of retrieval 17.10.2009.)

Non-Disclose Agreements (NDA) or agreement for not accepting later a possible work offered by competitor is an often applied protective attempt, however difficult to control reasonably after the employee has left the office. Computers and their protection methods is one question. Another is the easy transfer of information and its difficult control. (Free translation from Ojala 2008, 175.)

Reward systems encourage competition and therefore may block efforts to enhance knowledge sharing (Sveiby 2001b, date of retrieval 17.10.2009).

Knowledge transfers/conversions often are not coordinated in a coherent strategy. This according to Karl-Erik Sveiby is because of managements' lack of full perspective. Sveiby also acclaims that most organizations have legacy systems and cultures that block the leverage wasting good initiatives. Separate good initiatives may also neutralize each other. (ibid.)

These changes in Finnish work life have lifted competence to the core of management. Company management is more often in a situation where it has to create opportunities with two resources: money and people who enable the creation of knowledge. (Free translation from Ojala 2008, 11.) In order to survive the competition, knowledge and skills need to be looked after and managed efficiently (free translation from Hannula, Kukko & Okkonen 2003, 1).

The highlighted importance of information and knowledge has increased the need to understand the asset of knowledge as a company resource, how it is formed, how it could be assessed and even evaluated (free translation from Ojala 2008, 11). Knowledge today is such an important resource and asset, that it should be managed in the same manner as financial assets. Its management should become a responsibility penetrating through the whole organization. (Free translation from Ojala 2008, 12.)

Tangible goods tend to depreciate in value when they are used. Knowledge in contrast grows when used and depreciates if not used. A clear example of this is competence in language, built with investments in training, and if not practiced it will gradually dissipate. (Sveiby 2001b, date of retrieval 17.10.2009.)

New solutions can be created by combining and reusing existing knowledge. Increasingly important is to manage not only tangible, but also intangible knowledge. Knowledge management is able to offer tools for managing information, for development of skills and for creation of new knowledge. This is done by using organizational memory, groupware technology, individual learning and organizational learning, document management and technical solutions. (Free translation from Ikola 2004, 117.)

Dr. Karl-Erik Sveiby has said: "People are beginning to realize that human beings and not IT-systems are at the core of value creation. More and more people have come to realize that efficiency through IT is not enough. The real value for corporations and society will be generated only by creating environments that enable all people to create and share knowledge". (The knowledge:Karl-Erik Sveiby 2002, date of retrieval 16.10.2009.)

A resource-based approach compared to a market and customer oriented product-based approach could be a better option to strategy formulation, for firms that are dependent on intangible resources, for example for rapidly growing knowledge-based services and knowledge-intensive industries. It places more emphasis on the organization's capabilities and core competences. According to Sveiby's theory, knowledge based strategy formulation should start with the competence of people, the primary intangible resource. People are the true agents in business. All tangible physical products and assets as well as the intangible relations, are results of human action and their continued existence depends on people. People can use their competence for value creation in two directions. They can transfer and convert knowledge externally or internally to the organization they belong to. If the efforts of the employees are directed internally, tangible goods and intangible structures such as better processes and new designs are created. If the manager of the manufacturer directs the employee efforts externally, also intangible structures, such as customer relationships, brand awareness, reputation and new experiences for the customers are created. (Sveiby 2001b, date of retrieval 17.10.2009.)

1.2 Prior studies

Research has been done about the history and current situation of knowledge management among fifty largest companies in Finland (ranked by annual turnover). That study aimed to answer questions such as why knowledge management was taken into use, and where inside the company is the organization and planning of knowledge management placed. Along with analysis of current state of knowledge management that study also tried to vision the future. (Free translation from Hannula, Kukko & Okkonen 2003.)

In their research Hannula, Kukko and Okkonen found that 82% of the companies had systematic activities for organizing competence and knowledge management. 67% of the companies had systematically organized these activities from one to five years, and 19% had been working on

the subject already for more than 10 years. According to the research knowledge management was mainly placed under the function of human resources management. Covered areas of knowledge management were heavily weighted on employees' competence and knowledge. 92% of enterprises activities included information on employees' education, 89% on employees' competence, 85% on employees' experiences, 81% on employees' development plans and 78% on employees' education plans. This all was interpreted to support the thought, that it is essential for competence and knowledge management to know who knows what. (Free translation from Hannula, Kukko & Okkonen 2003, 39.)

Knowledge management activities also take place in small companies, but it is not necessarily called "knowledge management". However a study of small businesses in Australia and Singapore has indicated that the needs and challenges for knowledge management are surprisingly similar with bigger companies. Actually many knowledge management processes were found easier to apply in smaller companies due to the fact that it is easier to capture tacit knowledge in less formalized environments. (Salojärvi, Furu & Sveiby 2004, 1-2. date of retrieval 29.8.2009.)

A study among SMEs in Hong Kong showed that awareness of knowledge management, or knowledge management operation plans, will not guarantee the automation and success of knowledge management. Also a balanced deployment of culture, technology, and infrastructure along with adequate capability to acquire, combine, apply, and create knowledge are needed. Also financial capital constrains directly affect to knowledge management systems. 70.6% of the respondents stated that their organization does not possess any knowledge management related technical support and neither intends to install any. Half of the remaining respondents stated that their organization has widely adopted document management systems and yellow pages to facilitate knowledge capture and storage. Respondents also revealed that existing knowledge management systems are not often utilized. More than half of the organizations were stated to have a favorable and simple structure promoting collective rather than individual behavior, and therefore encouraging employees' interaction and sharing of knowledge. However 54% of respondents were unwilling to share knowledge. They did not feel or sense any benefits for doing so. Instead they indicated that knowledge is scarce and considered as personal capital, and should not be shared or traded without adequate reward. A number of respondents that had been working for the organization for longer period, had also little interest in knowing what others were

doing. They perceived the more they know, the more duties they will be assigned. This discourages creation of new knowledge and minimizes efforts to engage in cross-functional learning and sharing. (Chan & Chao 2008, 84.)

There has been a study about the relationship between sustainable sales growth and knowledge management activities concerning SMEs in Finland. This research showed that higher levels of knowledge management maturity correlate with long term sustainable growth. However, only a minor proportion of sample firms were able to benefit in terms of growth from their knowledge management related activities. That was despite the fact that Finnish SMEs were highly aware of knowledge management. Half of the SMEs in the sample did not grow, and the fast-growing companies with high knowledge management maturity were applying knowledge management related activities in a comprehensive and balanced way. The practical implication of the study was that SMEs might be able to shift into higher growth by applying a comprehensive knowledge management approach incorporating all intangible assets equally. (Salojärvi, Furu & Sveiby 2004, date of retrieval 29.8.2009.) Another study about the knowledge management at 26 innovative and growth seeking SMEs across Finland showed that although the studied SMEs had some characteristics of knowledge management the documentation was mostly of explicit knowledge (Free translation from Ahtinen, Martimo & Nieminen 1999, 1).

A study among member organizations of Helsinki region Chamber of Commerce in 2005 showed that 63% of the responded organizations used one or more of the *enterprise systems* in question. The systems included enterprise resource planning (ERP), customer relationship (CRM), supplychain management (SCM) and knowledge management (KMS) systems. About 25% of the surveyed organizations had integrated at least one of their enterprise systems with their co-operating partner. The respondents were all SMEs and 10% of organizations were micro size enterprises. According to the report there had been in average a 6% growth in usage of these systems between years 2003 – 2005. 19% of the organizations indicated that they are using knowledge management systems. The growth in use from year 2003 to year 2005 was in average 2%. (Free translation from Andersson 2006, 22, date of retrieval 14.11.2009.)

The main findings and conclusions of the study among Helsinki region SMEs included the following:

- Active information management is becoming an existing practice.

- eBusiness is strongly proceeding and enterprise systems are directing the core business processes. Solutions for electronic communication are also supporting the outbreak.
- The size of the organization is the most significant explanation for multiform use of eBusiness solutions, and for the development of its benefits. Still also small organizations have the opportunity of benefitting from information technology since the offerings are plenty and a variety of methods for acquiring exist. Outsourcing is used by more than half of the organizations and growing. Renting of applications was used by more than one fourth of the surveyed enterprises.
- The greatest barriers or inhibitors for the IT supported more efficient operations, or breakthroughs increasing the profitability, are; readiness of partners, questions of incompatibilities, the costs of setting up and managing, lack of package and service solutions, limited time resources for development and information security questions. (Free translation from Andersson 2006, 7, date of retrieval 14.11.2009.)

2 OBJECTIVES

The objective of this research is to enlighten how widely knowledge management is currently implemented by Oulu region SMEs, how it is being implemented and how the implementation of knowledge management is seen to be practiced in the near future. The study also aims to discover and describe if there are differences in the implementation of knowledge management between medium, small and micro sized enterprises, as well as between enterprises within and outside of the ICT-sector.

In order to meet the objective of this study the following research questions need to be answered:

- Is knowledge management systematically exercised?
- Which areas of knowledge management are covered by company practices?
- What tools and technology are used for knowledge management?
- How are knowledge transfers and conversions enabled and supported?
- Do companies actively manage both conscious/explicit and silent/tacit knowledge?
- How is knowledge management seen to be practiced and developed at the company within next five years?

3 DEFINITIONS

Before getting into the theory of knowledge management and the results of this research on knowledge management practices at Oulu region SMEs, it is first time to define some of the used most central terms and abbreviations.

3.1 Small and medium-sized enterprise

On 6 May 2003, the Commission of the European Union adopted a new recommendation for definition of SME (Small and medium-sized enterprise). This new recommendation entered into force on 1 January 2005 and applies to all the policies, programmes and measures that the Commission operates for SMEs. The use of this definition is voluntary for Member states, but the Commission is inviting them as well as the European Investment Fund to apply it as widely as possible. (Recommendation 2003/361/EC of the European Commission, date of retrieval 23.10.2010; European Commission, date of retrieval 10.10.2009.)

The European Commission (*ibid.*) defines an enterprise as 'any entity engaged in an economic activity, irrespective of its legal form'. The category of micro, small and medium-sized enterprises consists of enterprises which employ fewer than 250 persons and either have annual turnover not exceeding 50 million euro, or annual balance sheet total not exceeding 43 million euro. Within this category are further defined the small and micro sized enterprises as shown by table 1.

TABLE 1. *The new thresholds (European Commission, date of retrieval 10.10.2009.)*

Enterprise category	Headcount: Annual Work Unit (AWU)	Annual turnover	OR	Annual balance sheet total
Medium-sized	< 250	≤ € 50 million	OR	≤ € 43 million
Small	< 50	≤ € 10 million	OR	≤ € 10 million
Micro	< 10	≤ € 2 million	OR	≤ € 2 million

The new definition also introduces three categories of enterprises corresponding to three types of relationships that an enterprise could have with another. These categories have been introduced to give a clear picture of an enterprise's economic situation, and depending on which of the category enterprise fits, some or all data from those may need to be added before seeing the table. This will ultimately determine whether the enterprise meets the requirements for SMEs definitions. Most enterprises are autonomous – either completely independent or have one or more minority partnerships (each < 25%) with other enterprises. The other options are partner (holding rising up to 50%) and linked (holding \geq 50%). (Recommendation 2003/361/EC of the European Commission, date of retrieval 23.10.2010; European Commission, date of retrieval 10.10.2009.)

The same thresholds are widely applied for definitions used also in Finland, for example by TE Centre (TE-keskus 2007 a, b, c, date of retrieval 10.10.2009) and by the Statistics Finland (Statistics Finland a, b, c, date of retrieval 10.10.2009). However instead of the categories for autonomous, partner or linked enterprises there only seems to be the restriction that only independent enterprises are included by inside definitions. To be independent an enterprise may not be owned as to 25 % or more of the capital or voting rights by other enterprise or jointly by several enterprises. (ibid.) For the purposes of this study it is only needed to refer to Finnish SMEs and the previous studies of the same. Therefore it is expected to be more relevant to adhere to the definitions used in Finland for example by Statistics Finland.

3.2 Other definitions

There are abbreviations and terms used also for knowledge management systems, tools, technologies, activities, and also for the theory of value creation in the following paragraphs, that might need to be defined beforehand.

CRM (Customer relationship management)

Covers for example collection of customer data, customer relationship development, recognition of customer segments and marketing, selling and services practices (Free translation from Andersson 2006, 22, date of retrieval 14.11.2009).

Data mining

Extraction of hidden predictive information from large databases (An Introduction to Data Mining.). It is used to look for patterns and dependences not usually visible to human eye, from large masses of data. It is often used for business intelligence solutions, but can be very beneficial for other uses (Lukaviecki 2008, date of retrieval 27.3.2010).

ERP (Enterprise resource planning)

Covers and combines for example company's production planning and follow-up, warehouse and order management, financial and quality management practices (Free translation from Andersson 2006, 22, date of retrieval 14.11.2009).

IPR (Immaterial property rights)

Immaterial property rights are in association with laws covering rights to intangible property including for example copyrights, patents, designs, trademarks and company names. Immaterial property rights refer to products created with mental work, services or products created with special skills (Free translation from Ojala 2008, 344).

KMS (Knowledge management system)

Meaning methods, means and tools used for developing information and knowledge out of raw data stored within systems (Free translation from Andersson 2006, 22, date of retrieval 14.11.2009).

Learning organization

Organization capable of renewing itself proactively according to the changing requirements of the operational environment and customers, and is capable to benefit from the competence of all of its members, as well as capable of innovation. Learning organization is sustainably successful. (Free translation from Ojala 2008, 345).

Media monitoring service

Service providing client documentation, analysis or copies of media content of interest to the clients. Media monitoring services often specialize according to media type or content type. Some specialize on news and public affairs content, some on product placement, advertising, sports

sponsorships, video or audio news releases, use of copyrighted video or audio, infomercials, watermarked video/audio or billboards. (Wikipedia, date of retrieval 14.2.2010.)

Organizational competence

The organization's shared view or understanding of issues or commonly adopted procedures that are important for the operation. Organization's ability to act. Organizational competence is not connected to one person and is not lost for example in case of a person leaving the organization. (Free translation from Ojala 2008, 50-53, 345.)

Organizational learning

Organization's ability to create commonly accepted understanding, and to utilize it in operations. (ibid.)

SCM (Supply chain management)

Covers for example company resource management, production, warehousing, ordering and delivery logistics practice, as well as business information management and analysis for the aforementioned activities (free translation from Andersson 2006, 22, date of retrieval 14.11.2009).

Social media

Media used by internet communities, also called as Web 2.0 (and enterprise applications as Enterprise 2.9), and the social application. They offer an opportunity to create and manage common knowledge, and to combine external experts' knowledge with organization's own knowledge. (Free translation from Ojala 2008, 345.)

Teleconference

Conference held via telephone or network connection, either over a private network or over the Internet. Sharing of applications and common whiteboard is also possible after a teleconference is established. (Webopedia b, date of retrieval 27.3.2010.)

Videoconference

A conference between two or more participants at different sites by using computer networks to transmit data (audio, video). In point-to-point (two-person) video conference each participant has a video camera, microphone, and speakers mounted on his/her computer. As the participants

speak to one another their voices are carried over the network and delivered to other and images appearing in front of video cameras appear in a window on the other participant's monitor. In multipoint video conference there are three or more participants sitting and communicating in virtual conference room. (Webobedia, date of retrieval 27.3.2010.)

Wiki

A tool of social media in the Internet where everybody can produce information into common area and the newest information always appears on top. (Free translation from Ojala 2008, 345.)

Work-tracking and work-flow management software

Software that allows organizations to improve management of projects and tasks. They provide instant feedback on progress, generating monitoring statistics and ensuring that the correct steps in particular processes were being followed. Tools for analyzing business data, that allow trends to be quickly identified and informing business decisions. (Brelade, Harman 2003, 20, date of retrieval 7.6.2009.)

4 KNOWLEDGE MANAGEMENT

What is knowledge? Is knowledge something that can be managed? Why should it be managed? How could it be done, and who in the organization should be responsible for managing knowledge?

4.1 What is knowledge

Different notions for **knowledge** and their hierarchy have often been described with “pyramid” shaped graphs. Below are Leenamajja Ojala’s version for the pyramid and definitions, along with notations in Finnish (figure 1).

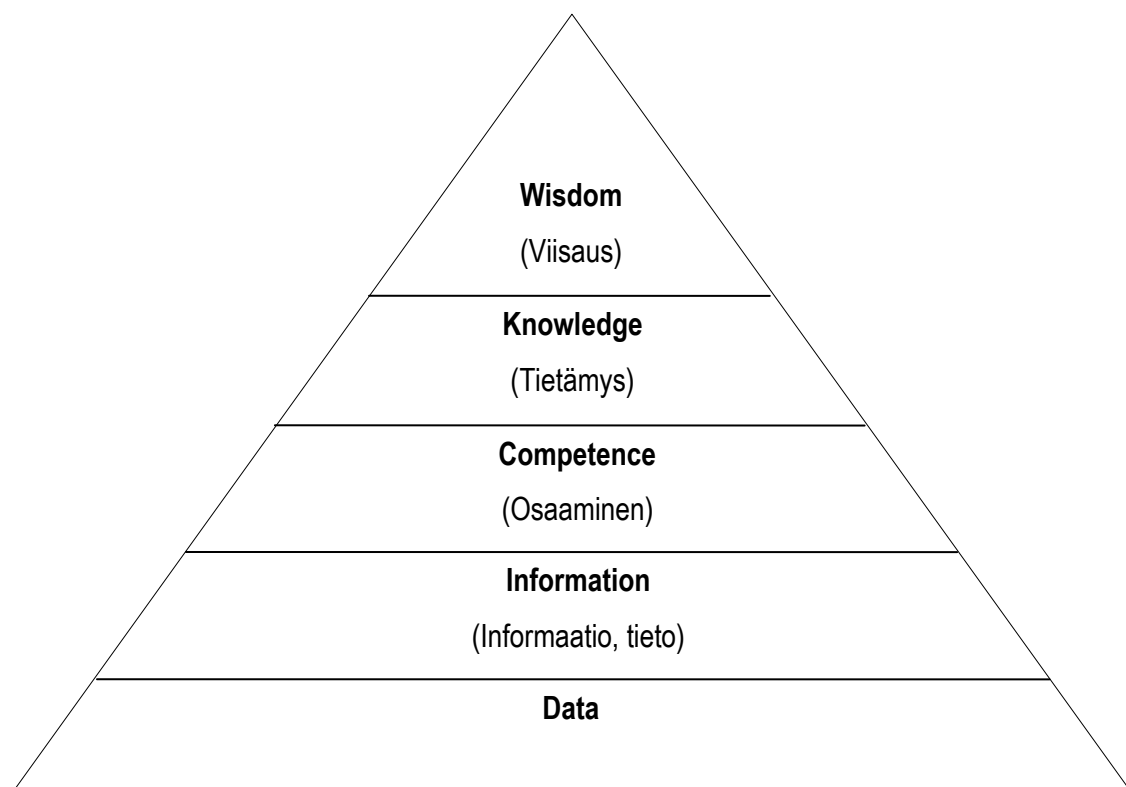


FIGURE 1. Knowledge pyramid – towards more valuable contents (free translation from Ojala 2008, 49)

Data is data without any context. Today enormous amounts of new data are produced and information technology offers endless opportunities to manage it. (Free translation from Ojala 2008, 48.)

As data is connected with some context it will have new meaning and this is called *information*. Information is new, surprising and in connection to the receiver. In one way or the other information is organized. Classic theory of knowledge considers information, as very well argued true belief. Managing knowledge aims to develop knowledge to next higher level of the pyramid towards increased value for the content. In this hierarchy data is seen discrete. Only after data is connected to some other context will it get a new meaning and this can then be called information or knowledge. Knowledge is seen as organized information. According to Ojala some critical scientific theory of realism now defines as information (*tieto*) all statements with the best arguments, even if truthfulness is being rightfully doubted. The arguments should be based on public groundings that are acceptable for any member of the organization. Information (*tieto*) is always something that is agreed upon. As information is applied into practice, it creates *competence*. *Knowledge* is analyzed and understood relative information. Knowledge describes the whole of available accepted information. (*ibid.*, 50.)

Different definitions of knowledge also exist. Researchers and practitioners in the IT-field may see knowledge as objects that can be identified and handled in information systems. As well for researchers and practitioners who have their education in philosophy, psychology, sociology or business/management knowledge means processes, complex sets of dynamic skills, know-how etc. that is constantly changing. (Sveiby 2001a. date of retrieval 2.8.2009.)

In their theory of organizational knowledge creation Nonaka and Takeuchi (1995, 58) define knowledge as “justified true belief”, but instead of traditional way of emphasizing on absolute, static, and nonhuman nature of knowledge, they consider knowledge as a dynamic human process of justifying personal belief toward the “truth”. Nonaka and Takeuchi (1995, ix) also see that the individuals interact with the organization through knowledge.

Sveiby defines knowledge as capacity-to act and emphasizes the action element. According to him knowledge is dynamic, personal and distinctly different from data (discrete and unstructured

symbols) and information (a medium for explicit communication). (Sveiby 2001b, date of retrieval 17.10.2009.)

Wisdom deals with the concept of the balanced entity of the outlook of life. It includes broad view of connections and meanings, as well as understanding of information gathering techniques and the level of the relevance. Besides the information ingredients, also moral aspect, personal values leaning to the human mankind's experience for the goals of good life are inseparable parts of it. Wisdom includes plenty of silent knowledge and experience, and is therefore often considered in connection with aged individuals. (Free translation from Ojala 2008, 50.)

4.2 Classifications of knowledge

Nonaka and Takeuchi classify human knowledge as: *Explicit knowledge*, which can be articulated in formal language (grammatical statements, mathematical expressions, specifications, manuals, and so forth) and *tacit knowledge*, which is personal knowledge embedded in individual experience and involves intangible factors such as personal belief, perspective, and the value system. Explicit knowledge can be transmitted across individuals formally and easily, and has been the dominant mode of knowledge in the Western philosophical tradition. Tacit knowledge is hard to articulate with formal language and has been overlooked as a critical component of collective human behavior. (1995, viii-ix.) Leenamajja Ojala (2008, 344) defines knowledge and competence gathered through experience, commitment, motivation and creation as "silent knowledge". She differentiates it from "conscious knowledge" and states that a person is always able to say more than he/she is capable of writing down. (ibid., 52.) Sveiby (2001b, date of retrieval 17.10.2009) describes knowledge as capacity-to act, which may or may not be conscious. He emphasizes the action element. A fair synonym for knowledge could be "individual competence". Comparison of classification of knowledge by the three authors is shown in table 2.

TABLE 2. Comparison of different classifications of individual's knowledge (Nonaka & Takeuchi 1995,viii-ix; Ojala 2008,50-53,344; Sveiby 2001b, date of retrieval 17.10.2010)

Authority	Knowledge	Knowledge
Nonaka and Takeuchi	Explicit knowledge <ul style="list-style-type: none"> • can be articulated in formal language and transmitted across individuals • grammatical statements, mathematical expressions, specifications, manuals 	Tacit knowledge <ul style="list-style-type: none"> • hard to articulate with formal language • personal knowledge embedded in individual experience and involves intangible factors such as personal belief, perspective, and the value system
Ojala	Conscious knowledge	Silent knowledge <ul style="list-style-type: none"> • knowledge and competence gathered through experience, commitment, motivation and creation
Sveiby	Capacity-to-act or " Individual competence" <ul style="list-style-type: none"> • may or may not be conscious 	

Silent knowledge, and the question how it could be captured, has surfaced as topic for projects and development programmes at many organizations, since the wide age groups are retiring and taking their silent knowledge with them outside organizations. A common problem has been the difficulty to separate silent and conscious knowledge from each other. Instead of this, the methods for information sharing that would connect silent knowledge with conscious knowledge, should be highlighted. (Free translation from Ojala 2008, 50-53.)

Competence or know-how can also be discussed as, an individual, team, group or organizational resource. Individual competence is formed by knowledge, skills, experience, networks, attitudes and personal characteristics, which help to cope with work and will lead to work well done. We talk about dispersed competence and dispersed expertise. Expertise these days often means team work, co-work or networking with other experts or customers. The need for knowledge and the amount of created knowledge is so big that no-one is capable of managing alone all the information he or she needs alone. Organizational competence is the organization's shared view or understanding of issues or commonly adopted procedures that are important for the operation. (ibid.)

4.3 Value network and value creation

Besides the creation of entirely new knowledge by conversion of explicit/tacit knowledge from one type to another, Sveiby talks about the *transfer* of existing – often also hidden and/or underutilized – knowledge. When organizations are creating value from transfers and conversions of knowledge together with its customers, their relationship is seen by Sveiby as a “value network”. Value network refers to interaction between people, in different roles and relationships, who create both intangible value (knowledge, ideas, feedback, etc) and tangible money-value. (Sveiby 2001b, date of retrieval 17.10.2009.)

The intangible value in a value network grows each time a transfer takes place. This is because knowledge does not leave the creator physically as a consequence of a transfer. From an organizational point of view “the knowledge shared is knowledge doubled”. However from an individual’s perspective the knowledge shared may be “an opportunity lost” if the effect of sharing turns into lost career opportunity or extra work with no recognition. According to Sveiby fear of dismissal and competition are often mentioned as reasons for individuals not sharing what they know or create. The questions of how to utilize the leverage and how to avoid blockages preventing sharing and creation of new knowledge are issues of strategy formulation. Research in creativity and creative action suggests that managerial approaches aimed at managing environments or a coaching style are more appropriate managerial style compared to command-control of individual behaviors. (ibid.)

Knowledge transfer

We all are involved in knowledge transfer, which according to Sveiby can either be direct or indirect. Direct transfer of knowledge occurs from person to person in an interaction, for example at work places as juniors are taught by seniors the ‘tricks-of-the-trade’. Text books and articles are examples of indirect transfer of knowledge. Knowledge can be transferred either via information or via tradition. Tradition transfers between people “a whole” process-of-knowing. Information only represents a potential over which the supplier or creator has no power. Information in itself cannot be meaningful, instead every individual reconstructs it his or her own way in order to learn to perform something or learn how to run an intellectual process. Sveiby argues that it is a fallacious belief that human dynamic process-of-knowing is equal to information existing passively in the organization. The passive information, which, like information in

databases, cannot be 'reengineered' or turned into intellectual 'capital' as easily as signals transmitted from computer to computer. The process-of-knowing according to him seems to be better transferred through tradition than through information. (Sveiby 1996,date of retrieval 16.10.2009.) Differences between knowledge transfer via Information and via Tradition can be seen in table 3.

TABLE 3. Knowledge transfer (Sveiby 1996,date of retrieval 16.10.2009)

Via information	Via tradition
Communicates meaningless potentials	Transfers tacit abilities
Reader interprets writer's meaning	Apprentice recreates own version of master's expertise
Static	Dynamic
Articulated	Mostly unarticulated
Quick	Slow
Two dimensional	Multidimensional
Conscious	Largely unconscious
Independent of the individual	Both dependent and independent of individual
Mass distribution easy	Mass distribution difficult

Knowledge conversion

The interaction between explicit and tacit knowledge is the key dynamics of knowledge creation in the business organization. This interaction takes place repeatedly in a spiral process of "Organizational knowledge creation". Organizational knowledge creation consists of two major components: the forms of knowledge interaction and the levels of knowledge creation. The two forms include interactions between tacit knowledge and explicit knowledge, and between individuals and organizations. It can take place at three levels: the individual, the group, and the organizational levels. Because there are two forms of interactions four major processes of knowledge *conversion* (figure 2) exist. Knowledge conversion can happen from tacit to explicit, from explicit to explicit, from explicit to tacit, and from tacit to tacit. (Nonaka, Takeuchi 1995, ix). Organizational knowledge creation is the capability of a company as a whole to create new knowledge, disseminate it throughout the organization and embody it in products, services and systems (ibid., viii).

	Tacit knowledge	To	Explicit knowledge
Tacit knowledge	Socialization		Externalization
From			
Explicit knowledge	Internalization		Combination

FIGURE 2. Four modes of knowledge conversion (Nonaka & Takeuchi 1995, 62.)

Explicit knowledge can without a problem be “processed” by a computer, transmitted electronically and stored in databases. It is not as easy for tacit knowledge. The subjective and intuitive nature of tacit knowledge makes it a challenging task to process or transmit it in any systematic or logical manner. To be communicated and shared within the organization tacit knowledge has to be converted into understandable words or numbers. It is during this conversion - from tacit to explicit, and back again to tacit – that organizational knowledge is created. (Nonaka, Takeuchi 1995, 8-9.)

Because individuals are dispersed around organization we can also talk about dispersed expertise forming the organizational competence. Structures and management are needed to keep it all together. The creation of organizational competence needs to be supported and directed. For the organizational competence the structures are actually more important than for an individual’s competence. Individuals’ competence will turn to organization’s competence as people share, combine and develop their competence together and as the competence is transferred to common view and common practice. Organizational competence is the organization’s shared view or understanding of issues or commonly adopted procedures that are important for the operation. Turning individuals’ competence into organization’s competence requires certain types of organizational structures. The structures need to enable sharing, development and utilization. Organizational competence is an asset and needs to be cared for. (Free translation from Ojala 2008, 53.)

Instructions, practices, process descriptions and also for example quality management instructions are conscious knowledge. Organizations also have silent knowledge. Examples of

silent knowledge could be such as “unwritten rules”, “practices at sister organization”, stories, (hidden) attitudes and values. Organization’s silent knowledge is something that is collectively known, but is never worded. It is only known that this is the way to do. (Free translation from Ojala 2008, 53.)

Organization’s knowledge turns into organizational competence if we are capable of managing and utilizing knowledge at different processes (figure 3). In practice the term “knowledge management” means all of the information systems capable of managing information and knowledge (who knows what, and all of the processes in which individuals’ knowledge is utilized. (ibid., 50.)

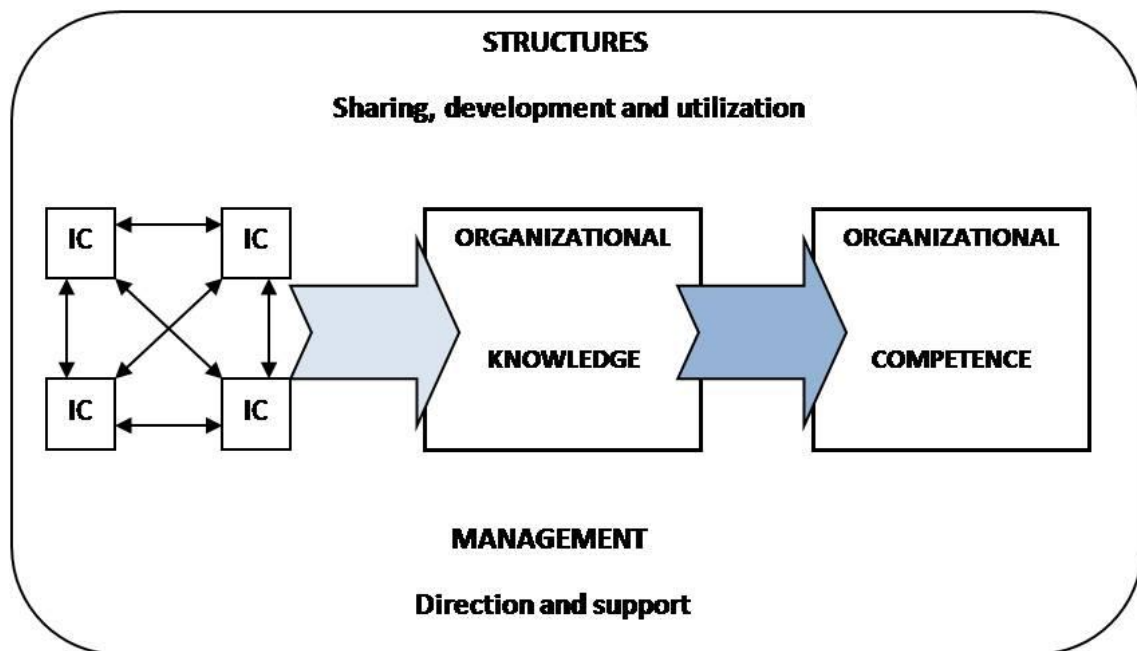


FIGURE 3. Individuals’ competence turns into organizational competence

4.4 Competence assets

Sveiby has listed knowledge management activities taken by companies and practitioners worldwide under three headings of intangible assets; External Structure, Internal Structure and Competence of the people. (Sveiby 2001b, date of retrieval 17.10.2009.) Knowledge transfers in bi-directional process and conversions occur between and within these structures forming all together nine distinguishable knowledge transfers/conversions (figure 4). Sveiby also sees that

knowledge-based theory challenges perceptions and boundaries of an organization. As the importance is placed on how effectively is value created in the whole system, the issues of an individual being either former employee, a customer, a supplier, or a contractor loses importance as long as the relationship is generating value. (Sveiby 2001b, date of retrieval 17.10.2009.)

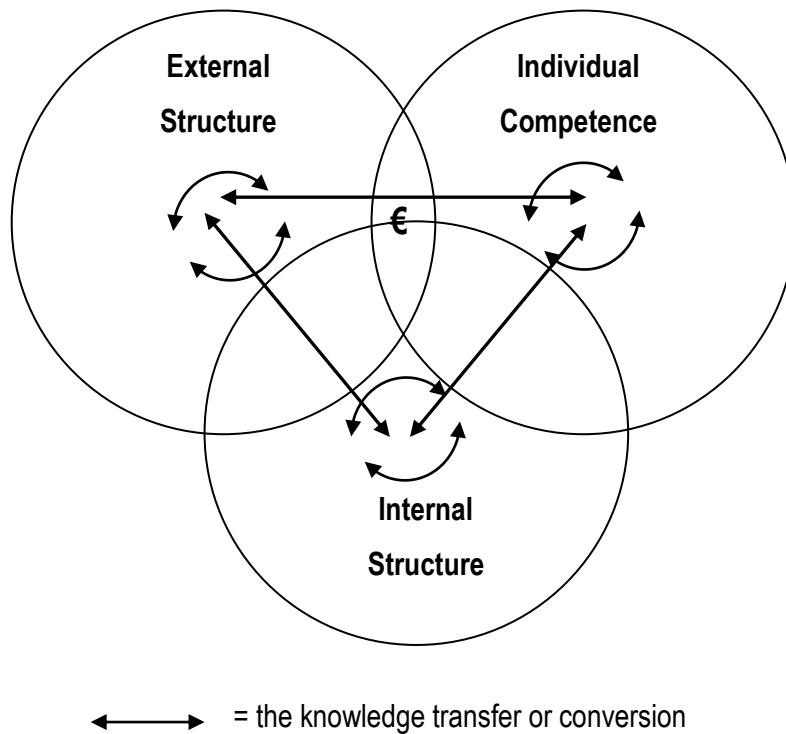


FIGURE 4. Firm from a Knowledge-based Perspective, illustration based on theory by Karl-Erik Sveiby (Sveiby 2001b, date of retrieval 17.10.2009)

External structure initiatives include

- Gain information and knowledge from customers
- Offer customers additional knowledge
- Create new revenues from existing knowledge

Internal structure initiatives consist of initiatives to

- Build knowledge sharing culture
- Capture, store and spread individuals' tacit knowledge
- Measure knowledge creating processes and intangible assets

Competence initiatives are

- Create careers based on knowledge management

- Create micro environments for tacit knowledge transfer
- Support education with communication technology
- Learn from simulations and pilot installations (Sveiby 2001b, date of retrieval 17.10.2009.)

The assets of competence according to Ojala (2008, 57-60) include; Human assets, Structural assets and Relations assets.

- Human assets: People, their knowledge and commitment needed for competence, as well as motivation and enthusiasm
- Structural assets: Systems used for acquiring, managing, developing, utilizing and sharing of competence. The structural assets also include the structures supporting the movement, transfer and utilization of competence, enabling individual competence to change into organizational competence and operations, maintenance, development and acquiring of competence.
- Relations' assets include the relationships with partners, external stakeholders and networks that are complementing organization's own competence. They may also be helping in faster creation of new knowledge.

Competence assets are always dynamic. There is constant flow between the parts (figure 5). If the flow stops, competence assets will come to a halt and soon also lose its value. Continuous learning is safe guarding the realization of learning organization. (ibid.)

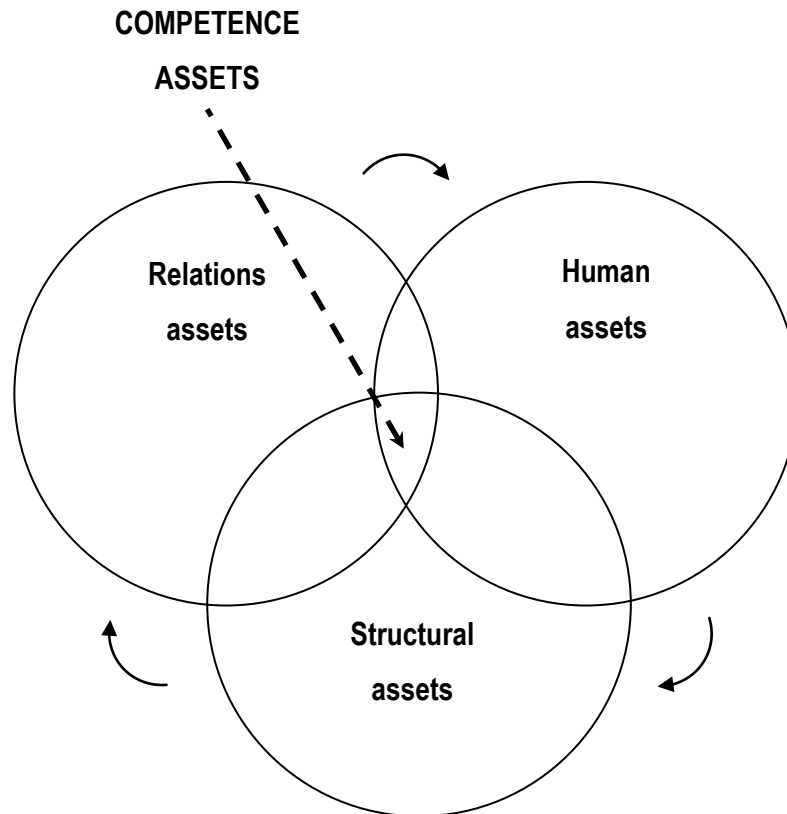


FIGURE 5. Competence assets. Illustration based on Leenamajja Ojala's theories (Ojala 2008, 58)

People operate as directed by structures. The structures of competence assets enable identification of correct competence needs. They enable the acquiring of required competence either from outside, in co-operation or by developing it inside the organization as efficiently as possible. These structures of competence enable the utilization of existing and acquired competence as well. Technology, information networks, processes, practices and methods are needed for this. The development of organizational competence also requires the culture of management, atmosphere and spiritual structures that are supportive to multi level co-operation and co learning. (Free translation from Ojala 2008, 60.)

4.5 Knowledge strategy and value creation

There can be seen nine basic knowledge transfers/conversion which have the potential to create value for an organization; between individuals, from individuals to external structure, from

external structure to individuals, from individual competence to internal structure, from internal structure to individual competence, within the external structure, from external to internal structure, from internal to external structure and within internal structure. (Sveiby 2001b, date of retrieval 17.10.2009.)

Knowledge transfer and conversion between individuals

Between Individuals knowledge transfers and conversions are dealing with the question of how to best enable communication within the organization between employees, as well as what types of environments are most favorable for creativity. Issues concerning trust in the organization are often the most important ones. In what degree are people willing to share what they know and their ideas? Answers to strategic questions lead towards activities that for example have the focus on trust building, enabling team activities, job rotation, induction programs or master apprentice schemes (table 4). (ibid.)

TABLE 4. Knowledge transfer and conversion between individuals (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can we improve the transfer of competence between people in our organization?” How can we improve the collaborative climate?”	Activities that for example have the focus on trust building, enabling team activities, job rotation, induction programs, master apprentice schemes.	Re-designed work areas to create an atmosphere of openness, flexibility, creativity and sharing. To encourage live interaction. Stand up coffee bars to encourage impromptu meetings. Dialogue rooms with tables and chairs helping employees relax while solving problems or sharing knowledge. Locked up elevators to increase accidental meetings.

According to Nonaka and Takeuchi in Japan managers emphasize the importance of learning from direct experience as well as through trial and error. They learn with their minds and bodies, like a child learning to eat, walk, and talk. Along with Zen Buddhism the tradition of emphasizing the oneness of body and mind has been a unique feature of Japanese thinking. (Nonaka,

Takeuchi 1995, 10.) Live interaction between senior and younger employees and the usage of more or less informal master apprentice schemes, to my understanding, provides a safe environment for learning through trial and error and sharing of knowledge, explicit as well as tacit, conscious as well as silent.

Recently it has also been noticed at many workplaces that silent knowledge is disappearing as large generations are retiring. As Maijaleena Ojala mentions (2008, 136), every foreman should have a readymade list of employees that will be retiring within next few years, and about their competences that are important for the organization's operation. At the same time it should be considered how to catch and transfer the important experience based knowledge to younger employees. Importance of transferring competence between people inside organizations needs to be highlighted for this reason as well.

Innovation is not just about putting together diverse bits of data and information. Instead it is a highly individual process of personal and organizational self-renewal. The personal commitment of the employees, their identity with the company and company's mission become indispensable. The creation of new knowledge is about ideals as much as it is about ideas. The essence of innovation is to re-create the company and everyone in it. It is the responsibility of everyone in the organization. Creating new knowledge is not only a matter of learning from others or acquiring outside knowledge, it has to be built on its own. Creating new knowledge requires frequent, intensive and laborious interaction among members of organization. (Nonaka, Takeuchi 1995, 10.)

Today profit targets and other causes of pressure causes people to need societies, networks, and possibilities to share experiences and ask advices from each others. Especially younger people have realized this better than company management, who however are responsible for the structures. This is why the young are demanding for opportunities for networking and interaction with other experts. (Free translation from Ojala 2008, 188.)

Email has become the method of communication and method for storing information. 90% of teamwork according to Ojala's book is done by using email and 75% of company information is located at emails. Email is an easy method of sharing everything with everybody, but it is not

without problems. It is consuming our time, has a risk of sharing wrong information and problems like spams and viruses. (ibid., 188-189.)

Social media is a new way to perform. Instead of the traditional hierarchical pyramid structure, social media is based on networks and communities. Usage of social media is directed by social practices more than by the characteristics of the applications. The main idea is to enable the interaction between experts in order to benefit from everyone's competence. Networking through the Internet is not limited by geographical distances. (Free translation from Ojala 2008, 190.) Social media includes solutions that are in connection with competence management and creation of new competence (ibid., 183).

Social media is becoming an important media that offers an opportunity to participate and to be connected for everybody. The services of social media, such as wikis, are spreading into use at enterprises with good speed, because they are able to respond to the current work life needs of being connected. In addition all the information is saved in XML-format enabling searching by entries. "Googling" is used not only with computers but also with hand phones to find specific information. RSS- feeds are making it easier to control the tidal wave of information and to stay aware of new information. (ibid., 189-190.)

Social media is changing the business operations and work habits. In addition to entertainment and marketing their importance is increasing as a means of human interaction at work. According to a study "Enterprise Social Collaboration", the young employees that have been using the Internet since their childhood, are acquiring the habit of using social networks such as Facebook and Twitter, for work and for pleasure by nature. The trend shows growth also among older employees. In addition management finally seems to begin to understand the importance of social collaboration for effective business operations. Also some actors from public sector have taken the first steps to this direction. For example Tekes has produced new open discussion forum Tori –communal services and VirtualExpo –virtual world. (Nordgren 2009, date of retrieval 1.12.2009.)

Knowledge transfer and conversion from individuals to external structure

From Individuals to the external structure knowledge transfers/conversions are concerned with how employees of the organizations transfer their knowledge to the outer world. Suitable activities

are aimed at empowering employees to help the customers to learn about the products, by providing customer education, holding product seminars and rotating jobs with customers to mention few (table 5). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 5. Knowledge transfer and conversion from individuals to external structure (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
How can the organization's employees improve the competence of their customers, suppliers and other stakeholders?"	Activities focused on empowering the employees to help the customers learn about the products, getting rid of red tape, doing job rotation with customers, holding product seminars, providing customer education, etc.	Product marketers can extend their offerings to include service. Consultants can be encouraged to spend time on publishing their research and methods in order to build company reputation.

Cooperation between different enterprises exists, and also between enterprises and universities where networks for competence management have been realized. Joining this type of networks is a choice and part of competence strategy. Enterprises are free to choose for which areas of competence to utilize networks. (Free translation from Ojala 2008, 154.)

Enterprises are competing harder over the skilled individuals and the changes of competence needs are faster, therefore it is important to create relationships to schools that are the most important for organizations own operations. This way the organization has an opportunity to affect what is taught, how teaching is developed, and also gets opportunities for acquiring suitable skillful employees for the organization at an early state. The best benefits come through real co-operation and partnership, economical support is not adequate. (ibid., 160.)

Co-operation with schools and universities is one part of competence development strategy. Co-operation with schools is changing from tactic employee training or outsourcing of operative research more to the direction of strategic operations. Strategic operations are used to secure sources of both short and longer term competence. In short term universities and schools offer flexible and skillful additional resource for enterprises. In longer term enterprises can through co-

operation affect both the availability and the quality of resources, and the development of enterprise's competence. (ibid.)

Schools are interested in co-operation with enterprises because in Finland they have also been given a third duty, to secure regional well being. This means a responsibility to respond to the needs of the business life in the local region by producing young people with the right competences, and by producing education that enables employed adults to stay fit and professionally skilled to work. Lifelong learning for many organizations is a part of tactic competence development, for schools it is strategic or at least operative practice. Co-operation between enterprises and schools is also required by the European Union and by several ministries if applying or financial support. (Free translation from Ojala 2008, 165.)

Networks are not born by themselves. An actor is needed that collects, coordinates the development, or acts as a "primus motor" for the competence development. The more strategic knowledge and competence is being developed, the more important it is in advance to come to an agreement about the network's objective, common practices and rights to utilize and benefit from the developed competence. It is advisable to write a clear agreement about these issues. (ibid. 155.)

Knowledge transfer and conversion from external structure to individuals

How can the employees of an organization learn from the external structure, to learn from customers, suppliers and community, and how to collect feedback such as ideas, new experiences and new technical knowledge? Organizations often have procedures to capture such knowledge, but the procedures are not measured and they are scattered. Therefore they do not systematically influence strategy formulation (table 6). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 6. Knowledge transfer and conversion from external structure to individuals (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can the organization’s customers, suppliers and other stakeholders improve the competence of the employees?”	Activities focused on creating and maintaining good personal relationships between the organization’s own people and the people outside the organization.	Intangible dimension added to money-based sales and revenue reported so that organization can follow up intangible revenues. Employees participating frequently in customers’ quality management teams to understand and foresee customer needs. Gained knowledge used for product development, leading to increased sales. The value added from this knowledge measured by tracking customers’ return on investment. Employees rewarded for outstanding efforts to increase these returns.

An intensive outside-inside interaction is required. To create knowledge, learning from others and the skills shared with others need to be internalized – reformed, enriched, and translated to fit the company’s self-image and identity. (Nonaka, Takeuchi 1995, 11.)

Knowledge transfer and conversion from individual competence into internal structure

The idea to use database software in order to convert individually held competence into information that is shared with the whole organization has been well marketed. Many managers even believe that buying a database is equal to knowledge management. Karl-Erik Sveiby however argues that this is only one of nine possible strategic activities, and will only take in a fraction of the value which the knowledge-based theory of the firm allows. How can we improve the conversion of individually held competence to systems, tools and templates, is the strategic question that needs to be answered (table 7). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 7. Knowledge transfer and conversion from individual competence into internal structure (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
"How can we improve the conversion of individually held competence to systems, tools and templates."	Activities focused on tools, processes, systems and templates, which enable sharing of knowledge.	Document handling systems, databases, intranets that could also involve customers, electronic means to capture experiences etc. Important is the climate in the company and the level of involvement from all agents in the system.

Knowledge transfer and conversion from internal structure to individual competence

The next strategic question is "How can we improve individuals' competence by using systems, tools and templates?" IT systems can only produce information, but the value creation depends on whether the information generates competence. Investment for a system is a waste unless the information captured in the system is made available to others so that they can improve their capacity to act (table 8). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 8. Knowledge transfer and conversion from internal structure to individual competence (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
"How can we improve individuals' competence by using systems, tools and templates?"	Activities focused on improving the human-computer interface of systems, simulations, interactive e-learning environments and action-based learning processes.	Customized simulations, experimentations, demonstration projects helping individuals to move from superficial knowledge to more basic understanding of processes and learning how and why.

Information technology is used for competence management, development, creation, spreading and acquiring. It is one of the core factors of structural assets. The solution provided by information technology are solutions supporting learning, learning programs that use information

technology. Solutions also include traditional IT-systems, in other words the information management solutions. (Free translation from Ojala 2008, 183.)

Knowledge transfer and conversion within the external structure

Knowledge perspective to strategy formulation also provides a richer range of possible activities to traditional customer satisfaction surveys as well as to one-way public relations activities. It is also possible to support the competence growth of customers, or to influence competence transfers between the stakeholders in the external structure (table 9). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 9. Knowledge transfer and conversion within the external structure (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can we enable knowledge conversions among the customers, suppliers and other stakeholders to improve their competence to serve their customers?”	Activities are focused on partnering and alliances, as well as improving organization’s image, brand equity of products and services, quality of offerings (or conducting product seminars and alumni programs.	Active engagement in building local communities to improve the image of products in the local community. Product seminars directed to customers.

Network is a good additional resource to organization’s own development practices. For example Tampere Business Campus, operating in Tampere, and being an organization formed by about 40 enterprises developing their competence together. Tampere Chamber of Commerce coordinated the network in the beginning and was able to push forward the compatibility of the region by creating structures by which enterprises are able to improve their compatibility. (Free translation from Ojala 2008, 155.)

Knowledge transfer and conversion from external to internal structure

What knowledge the organization can acquire from external world and how to convert this knowledge into action is the concern of knowledge transfers/conversions from the external to internal structure. The strategic question being answered will lead to activities focused on such

as creating alliances to generate ideas for new products, research and development alliances and empowering call centers to interpret customer complaints (table 10). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 10. Knowledge transfer and conversion from external to internal structure (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can competence from the customers, suppliers and other stakeholders improve the organization’s systems, tools, processes and products?”	Activities focused on such as creating alliances to generate ideas for new products, research and development alliances and empowering call centers to interpret customer complaints.	A company can use sales force to collect data on customers, data is then analyzed and fed back to sales force. Activity empowers sales force with superior knowledge and competitive intelligence. The information can also be given free to valued customers.

The objectives for a *strategic competence* network are innovations and totally new competences. Strategic networks create new strategic competence to its members. Strategic network needs plenty of trust, transparency, commitment to agreed common objective and understanding of the fact that no one alone could acquire the needed competence fast enough. Otherwise there is danger of “limping” shared knowledge, even concealment of knowledge and unfair division of costs and benefits. Risk of failing for strategic network is high. (Free translation from Ojala 2008, 155.) The target operative competences are usually the generic competences that every member would acquire with or without the network. Perhaps that would happen with an external partner or with the producer. In these situations one objective is to reduce costs and share resources. Experiences of operative competence networks have often been positive. The benefits are seen immediately as reduced costs and perhaps as increased purchasing power. (ibid.)

Knowledge transfer and conversion from internal to external structure

“How can the organization’s systems, tools and processes and products improve the competence of the customer, suppliers and other stakeholders?” is the strategic question for knowledge

transfer/conversion from internal to external structure (table 11). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 11. Knowledge transfer and conversion from internal to external structure (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can the organization’s systems, tools and processes and products improve the competence of the customers, suppliers and other stakeholders?”	Activities focused on making the organization’s systems, tools and processes effective, product tracking, extranets, help desks and for example e-business.	Allowing clients to tap into data sources that are also used by company’s own consultants. Globally accessible customer information database where all staff is required to fill in information about every personal encounter with customer. Customer profiles are then stored and made available to staff in order to ensure personal treatment of all customers.

Knowledge transfer and conversion within internal structures

To take care of the knowledge transfers/conversions within the internal structure of the organization we need to pose the strategic question: “How can the organization’s systems, tools, processes and products be effectively integrated?” (table 12). (Sveiby 2001b, date of retrieval 17.10.2009.)

TABLE 12. Knowledge transfer and conversion within internal structures (Sveiby 2001b, date of retrieval 17.10.2009)

Strategic questions	Activities	Examples
“How can the organization’s systems, tools, processes and products be effectively integrated?”	Activities are focused with improving office layout, streamlining databases, building integrated office systems.	Enterprise systems, company-wide IT solutions, intranet that integrates databases that previously were held individually or locally.

Activities forming the backbone of knowledge strategy are to be aimed at improving the individuals' capacity-to act, both inside and outside the organization. In order to maximize value creation, the tenth issue would be to see the whole, and to have all of the nine sides of the knowledge transfers /conversions coordinated in a coherent strategy. (Sveiby 2001b, date of retrieval 17.10.2009.)

4.6 How to manage knowledge

Knowledge has been "managed" already when the first humans transferred the skill to make a fire. Libraries, schools, apprenticeships and other initiatives used to transfer the skills and information can be considered knowledge management. Librarians, teachers and master craftsmen can be called knowledge managers as well as newer professions such as chief knowledge officer, knowledge engineer, intellectual capital director or intellectual capital controller. (Sveiby 2001a, date of retrieval 2.8.2009.)

Sveiby personally dislikes the notion "knowledge management", since knowledge is not something that can be "managed" except by the individual him/herself. He recommends a better guidance for our thinking as "to be knowledge focused" or to "see" the world from a "knowledge perspective". For him knowledge management is "The Art of Creating Value from Intangible Assets". (Sveiby 2001a. date of retrieval 2.8.2009.) Knowledge management describes how different information is managed in organization and how it is used and benefited from, where certain information is located and who knows what. Information is organized and managed usually according to a certain predefined information structure. (Free translation from Ojala 2008, 345.)

The solutions provided by information technology have supported the conception of knowledge management born in the 1990s. The aim was to manage all of the information within the organization, no matter whether it was in connection to the people or organization. The knowledge management thinking was based on clear information structure, according to which information architecture and certain way to act were created. That kind of given information architecture however, is not able keep up with continuously speeding information creation. (ibid., 187.)

The recognition of tacit knowledge and its importance has given a whole different view of the organization – as a living organism instead of a machine for processing information. It has become more crucial to share and understand what the company stands for, where it is going, what kind of a world it wants to live in, and how to make that world a reality. Highly subjective insights, intuitions, and hunches are seen as an integral part of knowledge. Ideals, values, and emotion as well as images and symbols are embraced by knowledge. Nonaka & Takeuchi (1995, 9-11) have advised western managers also to forget the mode of thinking that knowledge can be acquired, taught, and trained through manuals, books, or lectures. Instead, more attention is needed to the less formal and systematic side of knowledge.

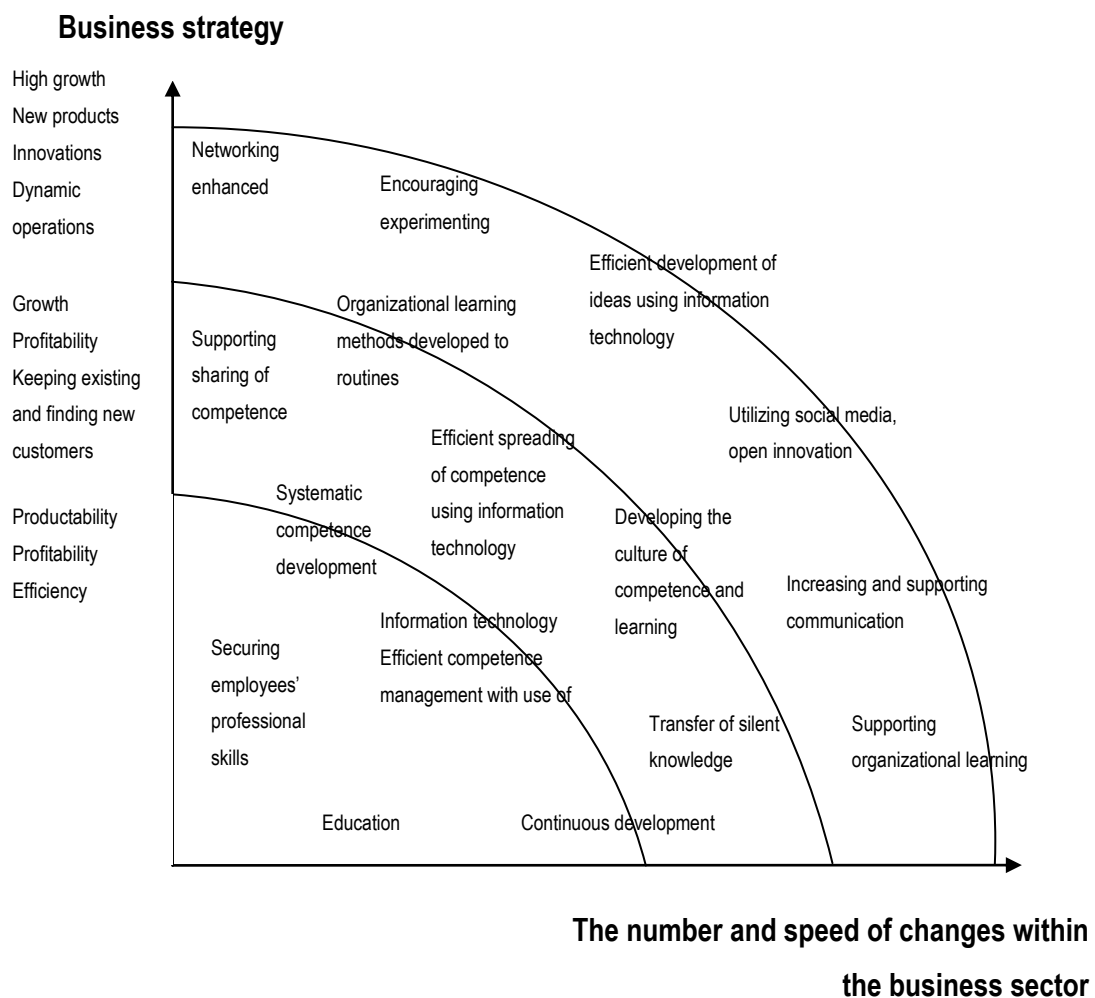


FIGURE 6. Emphasized issues in managing competence assets at enterprises during different stages (Free translation from Ojala 2008, 145)

The speed of changes within a business sector, and what kind of business strategy the organization has, affects competence strategy as seen in the figure 6. Closer to the center the changes are not really fast and the main strategy should be weighted to the direction of cost efficiency and increased production. Competence development and management should focus on training the employees, systematic development of employees, continuous operations' improvements and utilizing information technology for managing knowledge. The professional competence of the work force is emphasized. Many small enterprises live inside this wave. They might produce parts for larger processes as a sub contractor and try to fulfill customer organizations quality and cost efficiency requirements. (Free translation from Ojala 2008, 144.)

Small companies and units could use the lists of competence needs as a ground for evaluating individual's competences. It is possible to make a list of competences needed in the future, or of the ones that will be the most important from the organizations point of view. Competences can also include different duties. Target levels for each competence can also be set. Company management can supervise that adequate amount of correct competences is being developed and required number of employees are signed for duties. The most important competence areas can be appointed competence masters. The responsibilities of developing these areas can be included into the duties and objectives of the appointed individuals. (ibid., 127.)

In the middle wave the changes within a business sector are faster and the number of changes increases. The enterprises are aiming at growing, to better customer satisfaction, to increase automation, and to manage continuous change with processes. The management of competence assets is focused on sharing of competence, and processes and culture supporting it. Focus is on sharing and utilizing silent knowledge and utilizing information technology as a way to spread competence. The emphasis of competence strategy is on sharing competence, co-learning and efficient utilization of competence. (ibid., 144.)

As enterprises aim at high growth with innovative and dynamic operation, the business sector faces many rapid changes. Actions for competence management are focused at increasing communication between people, experimenting and learning of completely new things, fast learning. As the change is great it is not known beforehand what to expect tomorrow. The emphasis of the chosen competence strategy has to be placed at the circumstances where it is possible to learn fast together. (ibid., 145.)

5 RESEARCH METHODS

Net based email survey was chosen for this research because it was believed to be a convenient way of approaching this quite large number of SMEs in a reasonably short time. It is also very user friendly for the repliers since they can choose the time and place for answering according to their own schedules. Reminders are also easy to send for those that have not returned their replies within the time limit. Data collection and analysis of the replies are fast to complete since the answers will be in electronic form.

5.1 Data collection

The questionnaire was structured to have nine parts. First there was a question where different phrases concerning intangible assets were evaluated in relation to organization on scale from one to four. The second part of questionnaire was about existing or planned technology that could support knowledge management efforts. This part was followed with a part where the repliers were to indicate which areas of knowledge management are covered by company practices. The fourth part had nine questions about the used activities that could support the transfer and conversion of knowledge. The fifth part demanded answers to questions about practiced knowledge management in very general level. How long it has been practiced systematically and who are responsible for it. The sixth part of questionnaire covered the future development plans for the next five years, including a question about their vision for the use of social media. The final part aimed at clarifying the company size and type. The repliers were to define their company either a micro, small, or medium size SME or not an SME. They were also asked if they consider their company as an ICT or not an ICT enterprise.

5.2 Data analysis

ZEF editor, an evaluation and comparison tool, was used to design a structured questionnaire, for emailing the invitation letters with links to the questionnaire. ZEF was also used for collecting the answers and some analyzing was conducted with it too. Questionnaire results were statistically analyzed using Microsoft Office Excel 2007 spreadsheets.

The surveyed SMEs were grouped to two separate groups according to answers given to company classification question “Would you consider your company as an ICT enterprise or not?” Another planned grouping, finally not used at the analysis phase, was according to the size of the enterprise. The size of every surveyed enterprise was defined by requesting the repliers to classify the size of their company either as a micro, small or medium size SME, or not an SME. Options for answers followed definitions recommended by EU Commission (table13).

TABLE 13 .The number of SMEs that returned competed survey forms

Business field	Total	Micro	Small	Medium
	17	10	4	3
ICT-sector	6	5	1	0
non-ICT-sector	11	5	3	3

6 RESULTS

Invitations, in Finnish and English (appendix 1), providing a link to the electronic questionnaire form, were sent by email to 181 Oulu region SMEs. The actual questionnaire (appendix 2) was divided to nine parts. In the first part the repliers were requested to evaluate how well 23 different phrases concerning intangible assets relate to their organization. The second part proposed 15 different predetermined technologies, databases or portals which were asked to be marked if used by the organization. In addition it was possible to choose the option “Other than the above mentioned” and to explain it. It was continued by asking if the organization was planning to acquire any of the proposed technologies, databases or portals in the near future. The third part of the questionnaire proposed 26 different areas where knowledge management could be used and the repliers were requested to mark which of the areas are covered by their organization. Again it was also possible to mention other areas than the proposed. Next part included nine sub questions inquiring about the activities that are utilized to support knowledge transfer and conversion. With three questions in the fifth part of the questionnaire the repliers were asked about implementation of knowledge management in general. The sixth part probed if the knowledge management practices had been placed under certain function. The following separate part requested if knowledge management practices were assigned to a certain person or persons. Future plans and expectations, including the importance of social media, were asked in the next part. In the final ninth part the replying enterprises were classified in order to define if they were an SME (medium, small or micro sized) and whether they belong to ICT- or non-ICT group.

The response rate for this survey was 9.4%. As already presented in table 13, six (35%) of the returned replies were from ICT enterprises, and eleven (65%) from non-ICT enterprises. Since the response rate was low, the size of the sample is so low, that it is not possible to generalize the results. Following results can only be seen to represent the 17 SMEs that returned completed questionnaire forms for this survey. The results of the survey are presented following the order and context of the research questions, and not necessarily in the order of the survey questionnaire.

6.1 Systematic practices of knowledge management

Concerning the implemented knowledge management practices, the first question was “How long has knowledge management been systematically exercised by the company?” Given replies indicated that knowledge management is not systematically exercised at one third of the enterprises. The portion of ICT enterprises replying that knowledge management is not exercised systematically was 40%, and for the non-ICT 30%. At one third of the responding enterprises knowledge management has been practiced systematically at least for five years. None of the ICT companies had more than ten years history of systematic knowledge management, among the non-ICT companies 20% had more than ten years of systematic knowledge management. However 60% of the ICT field enterprises had systematically practiced knowledge management between three and ten years. Two out of seventeen did not reply. (Table 14.)

TABLE 14. Length of systematic knowledge management practices

Time	Number	%	Number of ICT enterprises	% of ICT enterprises	Number of non-ICT enterprises	% of non-ICT enterprises
More than 10 years	2	13	0	0	2	20
5 - 10 years	3	20	1	20	2	20
3 - 5 years	3	20	2	40	1	10
1 - 3 years	2	13	0	0	2	20
Less than a year	0	0	0	0	0	0
Knowledge management is not exercised systematically	5	33	2	40	3	30
Total	15	100	5	100	10	100

When asked if the knowledge management practices at the enterprises were placed under a certain function, only one out of total of nine answers given by non-ICT enterprises indicated that they have placed knowledge management practices under a certain function. Within ICT enterprises the answers were evenly divided between all answer options: yes, no and no answer. Independent on the field of business, if any specific function was named, it was “business development”. Four enterprises did not reply. (Table15.)

TABLE 15. Knowledge management practices placed under certain function

Answer	Number	Number of ICT enterprises	Number of non-ICT enterprises
Yes	3	2	1
No	10	2	8
Total	13	4	9

Next question was to clarify if the main responsibility of knowledge management has been assigned to a certain person or persons, and what position in the company does this person hold. It was shown to be more common (66%) at the non-ICT enterprises, than at the ICT enterprises (50%) to name a person or persons responsible. The most common position held by named person was either the entrepreneur himself or someone among the managers. The answers included managers such as sales manager, operative manager and general manager. Only one non-ICT enterprise mentioned "an employee" to have this responsibility. (Table 16.)

TABLE 16. Responsibility of knowledge management assigned to a certain person or persons

Answer	Number	Number of ICT enterprises	Number of non-ICT enterprises
Yes	8	2	6
No	5	2	3
Total	13	4	9

6.2 Knowledge management areas

It was asked on which areas is knowledge management practiced in the company. A short explanation was given for what is meant by knowledge management. Knowledge management was defined here to mean all information systems that are used for managing information and knowledge and all processes utilizing human knowledge.

As seen in table 17, twenty-two different knowledge management areas were proposed. On average 40% of the SMEs practiced knowledge management on the proposed areas. For the non-ICT-field SMEs the average was 48%, and for the ICT-field SMEs it was 23%. From the twenty-two proposed knowledge management areas, five were not covered at all by the ICT enterprises. Seven areas were covered only at one company, and eight areas at two companies. For the non-ICT SMEs the minimum amount of enterprises managing knowledge on certain

proposed area was 18% (two companies). There were three areas that were indicated only by two (18%) of the non-ICT enterprises, and one area indicated by 27% of the non-ICT companies.

More than half of the SMEs indicated knowledge management being applied at employees' competence (71%), employees' education (65%) and at accounting reports on expenses etc (59%). According to this survey less than 20% of the SMEs apply knowledge management to immaterial property rights (18%) and reports on performance capability (18%).

The answer profiles for ICT and non-ICT SMEs were far from equal in this question. The ICT enterprises most frequently practice knowledge management for accounting reports on expenses etc. (67%). In comparison the non-ICT enterprises topped their list with employees' competence (91%) and employees' education (82%). These were followed by employees' experience; employees' work orientation, training and development plans; and customer information (all 64%). However more than half of the non-ICT SMEs indicated had marked also the area of accounting reports on expenses etc (55%). The same percentage of non-ICT SMEs mentioned group calendar, email etc.; project policies; strategies; and customers' business information.

Half of the ICT-field SMEs applied knowledge management to product development information (50%), where as in non-ICT-field less than one fifth (18%) of the companies did so. None of the ICT companies indicated managing knowledge on the areas of product information, information on processes, information on operational development, reports on performance capability or competitor information. The same areas accordingly were covered by the non-ICT enterprises: product information by 36%; information on processes by 46%, information on operational development by 46%, reports on performance capability by 18%, and competitor information by 46% of the companies.

TABLE 17. Knowledge management areas

Area:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non- ICT enterprises
Employees' education	11	65	2	33	9	82
Employees' competence	12	71	2	33	10	91
Employees' experience	8	47	1	17	7	64
Employees' work orientation, training and development plans	8	47	1	17	7	64
Group calendar, email etc.	7	41	1	17	6	55
Project and activity resources	6	35	1	17	5	46
Project policies	7	41	1	17	6	55
Information produced by projects	7	41	2	33	5	46
Product information	4	23	0	0	4	36
Information on quality	7	41	2	33	5	46
Product development information	5	29	3	50	2	18
Idea bank	5	29	1	17	4	36
Immaterial property rights	3	18	1	17	2	18
Used technologies	5	29	2	33	3	27
Information on processes	5	29	0	0	5	46
Information on operational development	5	29	0	0	5	46
Accounting Reports on expenses etc.	10	59	4	67	6	55
Reports on performance capability	3	18	0	0	2	18
Strategies	8	47	2	33	6	55

Customer information	9	53	2	33	7	64
Customers' business information	8	47	2	33	6	55
Competitor information	5	29	0	0	5	46
Other, what?	0	0	0	0	0	0

6.3 Tools and technology used for managing knowledge

On average among the surveyed ICT-field enterprises the use of proposed technologies, databases and portals was slightly less common (32%) than among the non-ICT-field enterprises (36%). All surveyed SMEs indicated usage of the Internet and search engines. None of the surveyed SMEs were utilizing media monitoring services or orientation database. There was one company within both ICT- and non-ICT-group that indicated use of some other technology, database or portal than proposed. Competitor database was not utilized by the ICT enterprises, but among the non-ICT companies four (24%) indicated using competitor database. Besides Internet and search engines at least half of the ICT-field SMEs indicated using customer database (83%), tele- or videoconferencing (50%), work tracking and work-flow management (50%) and educational database (50%). For the non-ICT enterprises, in addition to Internet and search engines top-five list includes work tracking and work-flow management (64%), project portal and project database (64%), customer database (64%) and business analysis and decision support (55%). (Table 18.)

TABLE 18. Tools and technology used for managing knowledge

Technology, database or portal:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Internet and search engines	17	100	6	100	11	100
Data-mining	3	18	1	17	2	18
Tele- or videoconference	7	41	3	50	4	36
Work tracking and work-flow management	10	59	3	50	7	64
Business analysis and decision support	8	47	2	33	6	55
Media monitoring service	0	0	0	0	0	0
Employee database	3	18	1	17	2	18
Skills database	4	24	2	33	2	18
Experience database	3	18	1	17	2	18
Educational database	6	35	3	50	3	27
Orientation database	0	0	0	0	0	0
"Company CV"	3	18	1	17	2	18
Project portal and project database	8	47	1	17	7	64
Customer database	12	71	5	83	7	64
Competitor database	4	24	0	0	4	36
Other than the above mentioned?	1	6	0	0	1	9
What?						

To the question "Are you planning in near future to acquire technologies, databases or portals mentioned in the previous question?" replies were received from two ICT-field companies and from eight non-ICT companies. One of the ICT enterprises indicated that no need exists for the implementation of the asked technologies, databases or portals in the near future. The other one

wrote "Perhaps within about 5 years." The replies from non-ICT-field SMEs included two "No" answers and four "Yes" answers. With one of the Yes-answers it was further defined that some kind of centralized system for management and document handling were in mind. Another explained that plans included implementation of a search engine and the Internet. An answer that was interpreted to be a "Yes" explained that "Something is always under planning." One non-ICT company replied "Maybe".

6.4 Support for knowledge transfer and conversion

How knowledge transfers and conversions are enabled and supported was viewed at this survey from all nine different sides of basic knowledge transfer/conversion that have the potential to create value for an organization: between individuals, from individuals to external structure, from external structure to individuals, from individual competence to internal structure, from internal structure to individual competence, within the external structure, from external to internal structure, from internal to external structure and within internal structure.

Nine different questions were used accordingly:

1. Which activities are used to improve the collaborative climate and to improve the transfer of competence between people in your organization?
2. How are your employees able to improve the competence of your customers, suppliers and other stakeholders?
3. How are your customers, suppliers and other stakeholders able to improve the competence of your employees?
4. What tools, processes, systems and templates are used at your company to enable sharing of knowledge?
5. How are systems, tools and templates used to improve individuals' competence?
6. How do you support the transfer and conversion of knowledge among customers, suppliers and other stakeholders (To improve their competence to serve their customers)?
7. What activities are used to enable the competence of the customers, suppliers and other stakeholders to improve your organization's systems, tools, processes and products?
8. How do your systems, tools and processes enable the improvement of competence of your customers, suppliers and other stakeholders?

9. Which integrated systems, tools, processes or products are utilized by your organization?

Knowledge transfer/conversion between individuals

In general the activities that would be able to improve the collaborative climate and the transfer of knowledge between people were not very popular among the surveyed SMEs. Even the most popular activities were practiced at less than half of the surveyed enterprises. The three most common activities include trust building activities (47%), team activities (35%) and redesigned work areas (47%). Master apprentice schemes (18%) and job rotation (12%) are quite rare.

Among the ICT enterprises the most common activities, team activities and trust building activities were used only by one third of the SMEs. Induction programs, master apprentice schemes and redesigned work areas to create an atmosphere of openness flexibility, creativity and sharing were indicated to be practiced only by one (17%) company. One of the ICT enterprises also named shared visits at customer's premises as one of their activities used for this purpose. Job rotation and encouragement for live interaction are not used at all.

Non-ICTSMEs indicated having wider range of activities in use. More than half of the repliers (55%) mentioned trust building activities, and the place for the second common activity was shared by encouraging for live interaction between senior and younger employees, and redesigned work areas to create an atmosphere of openness, flexibility, creativity and sharing (46%). Team activities and induction programs were used by 36% of the non-ICT SMEs. Job rotation and master apprentice schemes were also mentioned (18%). (Table 19.)

TABLE 19. The activities used to improve the collaborative climate and to improve the transfer of competence within organization

Activity:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Team activities	6	35	2	33	4	36
Trust building activities	8	47	2	33	6	55
Job rotation	2	12	0	0	2	18
Induction programs	5	27	1	17	4	36
Master apprentice schemes	3	18	1	17	2	18
Encouragement for live interaction	5	27	0	0	5	46
Redesigned work areas	6	35	1	17	5	46
Some other activity	1	6	1	17	0	0
Comments:			shared visits at customer's premises			

Knowledge transfer/conversion from individuals to external structures

The two most popular activities for employees to improve the competence of customers, suppliers and other stakeholders were customer education (60%) and cooperation and partnerships with schools (53%). Especially ICT-field SMEs often utilize customer education (67%). The non-ICT-field SMEs on the contrary more frequently indicated using cooperation and partnerships with schools (55%), and indicated the usage of customer education as frequently as offerings extended to include service (46%). Non-ICT enterprises also indicated using publishing research results or used methods to build company reputation (27%), product seminars (18%), rotating jobs with customers (9%), and one replier even mentioned "sparring customer co-operation". (9%). (Table 20.)

TABLE 20. The activities through which employees are able to improve the competence of customers, suppliers and other stakeholders

Activity:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Customer education	9	60	4	67	5	46
Product seminars	2	1	0	0	2	18
Rotating jobs with customers	2	7	0	0	1	9
Offerings extended to include service	6	40	1	17	5	46
Publishing research results or used methods to build company reputation	3	20	0	0	3	27
Cooperation and partnerships with schools	9	53	3	50	6	55
Some other activity	1	7	0	0	1	9
Comments:	We only offer services				Sparring customer cooperation	

Knowledge transfer/conversion from external structures to individuals

ICT-field SMEs seem to rely on three activities in order to improve their employees' competence through their customers, suppliers and other stakeholders. The three activities are good personal relationships between people inside and outside of the organization (67%), procedures for customer feedback (50%) and captured ideas, new experiences and new technical knowledge from the community (50%). None of the ICT enterprises indicated having procedures for supplier feedback.

The non-ICT companies seem to have much wider range of activities in use. The three most common activities among non-ICT-field SMEs were also used by the ICT-field companies. However, the most commonly used activity is procedures for customer feedback (82%). The next common is good personal relationships between people inside and outside of the organization (64%). The captured ideas, new experiences and new technical knowledge from the community are used by 55% of the non-ICT enterprises. About 36% of the non-ICT SMEs also indicated that their employees frequently participate in customers' quality management teams. Two of eleven

non-ICT-field SMEs are also measuring the feedback given by customers or suppliers, and/or ideas, new experiences and new technical knowledge captured from their community. In addition to proposed activities one of the non-ICT-field SMEs mentioned also theme days for developing customer cooperation and strategy. (Table 21.)

TABLE 21. How are the customers, suppliers and other stakeholders able to improve the competence of the company's employees

Activity:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Procedures for customer feedback	12	80	3	50	9	82
Procedures for supplier feedback	3	20	0	0	3	27
Ideas, new experiences and new technical knowledge from the community	9	60	3	50	6	55
The above mentioned are also measured	2	13	0	0	2	18
Good personal relationships between inside and outside	11	73	4	67	7	64
Participation in customers' quality management teams	4	27	0	0	4	36
Some other activity	1	7	0	0	1	9
Comments:					Customer co-op. days.	

Knowledge transfers/conversion from individual competence to internal structure

Besides email, which was used by all but one surveyed enterprise, the other common tools, processes, systems and templates used for sharing knowledge included databases (59%), and local area network (59%). At the non-ICT enterprises also the use of intranets and document handling systems seems fairly common (46%), where as not so common at the ICT enterprises (17%). Half of the ICT enterprises use also teleconferencing and social media. Among non-ICT companies these both are used by 36% of the SMEs. Groupware, videoconferencing and electronic means to capture experiences were indicated to be in use only by one non-ICT-field SME. (Table 22.)

TABLE 22. The tools, processes, systems and templates used at the company to enable sharing of knowledge

Tools, processes, systems and templates:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Document handling system	6	36	1	17	5	46
Email	16	94	5	83	11	100
Groupware	1	6	0	0	1	9
Databases	10	59	4	67	6	55
LAN	10	59	4	67	6	55
Intranet	6	35	1	17	5	46
Extranet	3	18	1	17	2	18
Teleconferencing	7	41	3	50	4	36
Videoconferencing	1	6	0	0	1	9
Social media	7	41	3	50	4	36
Electronic means to capture experiences	1	6	0	0	1	9
Some other	0	0	0	0	0	0

Knowledge transfers/conversions from internal structure to individual competence

To improve individuals' competence, systems, tools and templates are used at SMEs for experimenting (35%). ICT companies (50%) used this activity more commonly than the non-ICT companies (27%). The non-ICT companies also mentioned the use in demonstrative projects (18%) and in action-based learning processes (9%). (Table 23.)

TABLE 23. The systems, tools and templates used to improve individuals' competence

Activity:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Experimenting	6	35	3	50	3	27
Demonstrative projects	2	12	0	0	2	18
Customized simulations	0	0	0	0	0	0
Interactive e-learning environments	0	0	0	0	0	0
Action-based learning processes	1	6	0	0	1	9
Some other	0	0	0	0	0	0
Comments:						

Knowledge transfers/conversions within external structure

The most commonly used activity to improve knowledge transfer and conversion among customers, suppliers and other stakeholders (to improve their competence to serve their customers) is partnering. Partnering was used for this purpose by more than half (59%) of all the surveyed SMEs. It was the most commonly used activity for the purpose by both ICT enterprises (50%) and non-ICT enterprises (64%). However at the non-ICT companies it was just as common (64%) to improve the quality of offerings for the same purpose. Besides partnering, about every third of the SMEs also have alliances.

The other fairly commonly used activities among non-ICT-field included improvement of organization's image (46%) and improving brand equity of products and services (36%). The ICT-field organizations indicated equal use of improvement of brand equity of products and services (33%) and active engagement in building local communities (33%). Different from non-ICT companies, none of the ICT-field enterprises indicated the use of improvement of the quality of offerings. (Table 24.)

TABLE 24. The activities used to improve knowledge transfer and conversion among customers, suppliers and other stakeholders

Activities:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Partnering	10	59	3	50	7	64
Alliances	5	29	2	33	3	27
Improvement of organization's image	6	35	1	17	5	46
Improving brand equity of products and services	6	35	2	33	4	36
Improving quality of offerings	7	41	0	0	7	64
Conducting product seminars	0	0	0	0	0	0
Alumni programs	1	6	0	0	1	9
Active engagement in building local communities	3	18	2	33	1	9
Some other activity	0	0	0	0	0	0
Comments:						

Knowledge transfers/conversions from external to internal structure

The most common method used to enable the competence from the customers, suppliers and other stakeholders to improve organization's systems, tools, processes and products according to this survey are research and development alliances. 47% of the replying enterprises use this method. For the ICT enterprises the percentage was 67, and for the non-ICT enterprises 36. The second most popular means include two options; alliances to generate ideas for new products and by sales force collected and analyzed data on customers that is then again used by the sales force. ICT enterprises seem to prefer alliances to generate ideas for new products and the non-ICT firms rather collect and analyze customer data. Call centers to interpret customer complaints, as well as analyzed customer data being also provided free for valued customers, were both used only by one non-ICT enterprise. One of the repliers indicated their company to use other than proposed method; Condensed customer cooperation e.g. shared processes. (Table 25.)

TABLE 25. The activities used to enable the competence from the customers, suppliers and other stakeholders to improve organization's systems, tools, processes and products

Activities:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Alliances for ideas for new products	4	24	2	33	2	18
Research and development alliances	8	47	4	67	4	36
Call centers for customer complaints	1	6	0	0	1	9
Data on customers collected , analyzed and used by sales force	4	24	1	17	3	27
Analyzed customer data provided free for valued customers	1	6	0	0	1	9
Other activity	1	6	0	0	1	9
Comments:					Condensed customer cooperation e.g. shared processes	

Knowledge transfer/conversion from internal to external structure

Customer profiles that are made available to staff in order to ensure personal treatment of all customers, and customer information database where all staff is required to fill in information about every personal encounter with customer are the most common (24%) systems, tools and processes enabling the improvement of competence of customers, suppliers and other stakeholders. Customer profiles are more commonly used for this purpose among non-ICT companies (27%). ICT enterprises indicate to prefer customer databases (33%). In addition non-ICT companies (18%) allow also their customers to tap into data sources that are also used by company's own consultants. (Table 26.)

TABLE 26. The replier organization's systems, tools and processes enabling the improvement of competence of their customers, suppliers and other stakeholders

Activities:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Allowing customers to tap into data sources used by company's own consultants	2	12	0	0	2	18
Customer information database of every personal customer encounter	4	24	2	33	2	18
Customer profiles that are available to staff (personal treatment of customers)	4	24	1	17	3	27
Other activity	0	0	0	0	0	0
Comments:						

Knowledge transfers/conversions within internal structures

According to this survey among Oulu region SMEs 53% of the enterprises use at least one of the enterprise systems (ERP, CRM, SCM, KMS) measured also by the survey among member organizations of Helsinki region Chamber of Commerce. Among Oulu region SMES for the ICT-field the portion was 33% and for the non-ICT-field 64%.

67% of the ICT enterprises do not use any of the mentioned four systems. Instead one (17%) enterprise uses only databases connected via company internet. One of the CRM system users has manual CRM-system. 50% of the ICT enterprises use none of the proposed integrated systems tools, processes or products.

64 % of the non-ICT SMEs use at least one of the four systems (ERP, CRM, SCM, KMS). 18% use all four systems and in addition have also mentioned uses of companywide IT-solution and databases connected via company intranet.36% do not use ERP, CRM, SCM or KMS and 27% of the non-ICT-field enterprises have not chosen any of the proposed options.

Enterprise resource planning system (ERP) that covers and combines for example company's production planning and follow-up, warehouse and order management, financial and quality management practices, was not used by the ICT-field companies, but more than every fourth of the non-ICT enterprises used it.

Customer relationship management system (CRM) that covers for example collection of customer data, customer relationship development, recognition of customer segments, and marketing, selling and services practices, was the most used (33%) integrated system among the ICT enterprises. It was even little more commonly used among the non-ICT companies (36%).

Supply chain management system (SCM) and companywide IT solutions were also both quite common (36%) at the non-ICT enterprises, but not used at the ICT enterprises. Supply chain management system covers for example company resource management, production, warehousing, ordering and delivery logistics practice, as well as business information management and analysis for the aforementioned activities.

By *knowledge management system* it was meant at this survey methods, means and tools used for developing information and knowledge out of raw data stored within systems. Only one of the six ICT companies indicated using knowledge management systems. For the non-ICT companies the usage was indicated to be little more common, since 27 % of the non-ICT companies indicated using knowledge management systems.

Databases connected via company intranet and also other means of integration were both admitted to be in use only by one ICT-field enterprise. The used other integration form was explained to be manual CRM. Within non-ICT-field companies databases connected via company intranet, was as common as CRM, SCM and company wide IT-solutions (36%). (Table 27.)

TABLE 27. *Integrated systems, tools, processes or products utilized by the organization*

Integrated systems, tools, processes or products:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Enterprise resource planning system (ERP)	3	18	0	0	3	27
Customer relationship management system (CRM)	6	35	2	33	4	36
Supply chain management system (SCM)	4	24	0	0	4	36
Knowledge management system (KMS)	4	24	1	17	3	27
Companywide IT-solutions	4	24	0	0	4	36
Databases connected via company intranet	5	29	1	17	4	36
Other means of integration	1	6	1	17	0	0
Comments:			Manual CRM			

6.5 Intangible assets and management of conscious vs. silent knowledge

In this survey active management of silent knowledge is considered to include all activities taken in order to support interactive learning environment for collecting, organizing, sharing and spreading of silent /tacit knowledge. In order to define if the surveyed SMEs actively manage both conscious and silent/tacit knowledge it was necessary to ask several questions about the *evaluation of intangible assets* as well.

In the survey among Oulu region SMEs the repliers were asked (appendix 1) to indicate how well twenty three phrases relate to their organization on scale from one (fully disagree) to four (fully agree) or "No answer". As all phrases included positive characteristics for enterprises seeking for successful management of intangible assets, the result could be interpreted as the higher the score the better the management of intangible assets. The results are seen below in the table 28.

TABLE 28. Evaluation of intangible assets relating to organization on scale from 1 to 4 (1 = fully disagree, 4 = fully agree)

Question	Average	Average of ICT SMEs	Average of non-ICT SMEs
Human resources play a very significant role in our business and for the growth.	3,5	3,6	3,5
Our personnel on average are highly competent and professional.	3,6	3,6	3,6
We use plenty of time and effort in our enterprise in updating and developing our knowledge and skills.	3,3	3,5	3,2
Our employees are highly motivated and committed.	3,5	3,3	3,6
Our human resources management functions well	3,1	3,0	3,2
Team work is a typical way of working at our company.	3,1	2,6	3,4
Employees are continuously encouraged to bring ideas and new knowledge to our business.	3	2,7	3,1
Employees are continuously encouraged to share their knowledge with colleagues.	3,2	2,9	3,3
Values and norms are very important and all our employees are aware of them.	3,2	2,8	3,4
Our work processes are continuously developed.	3	2,5	3,3
Responsibilities and the structure of our organization are continuously developed.	2,6	2,3	2,8
We consider patents, licenses and copyrights in our possession very important.	2,9	2,9	2,8
Our information systems are useful and updated.	3,1	3,3	3,0
The culture and spirit at our enterprise are positive.	3,5	3,3	3,6
Communication at the company is open and reaches everybody.	3,4	3,5	3,4
Customers play the most significant role in our business.	3,8	3,8	3,7
It is important for us to keep frequent contact with our customers.	3,6	3,6	3,6
We keep frequent contacts with our stakeholders and our social environment, and develop our networks all the time	3,3	3,4	3,3
Our products represent well-known brands.	2,8	2,7	2,8
Without exception the feed-back from our customers is positive.	3,2	3,2	3,2
We are able to learn and add value through our partners.	3,6	3,5	3,6
Good image and reputation are very important to us.	3,6	3,6	3,6
It is important for us to share our knowledge with our partners.	3,2	3,3	3,2
Total	3,27	3,17	3,31

As the average for all phrases for all of the SMEs was quite high (3.3), the intangible assets in general seem to be well valued by the surveyed SMEs. There was not much difference between the average for the ICT- (3.2) and non-ICT-fields (3.3).

There were five phrases that were in average given value greater than 3.5. They were “Our personnel on average is highly competent and professional”, “Customers play the most significant role in our business”, “ It is important for us to keep frequent contact with our customers”, “We are able to learn and add value through our partners” and “Good image and reputation are very important to us”. Two phrases were graded in average with numbers less than 3.0. They were “Responsibilities and the structure of our organization are continuously developed” and “We consider patents, licenses and copyrights in our possession very important.”

Four of the phrases were valued higher by the non-ICT enterprises (at least 0.5 difference) than by the ICT enterprises; “Team work is a typical way of working at our company”, “Values and norms are very important and all our employees are aware of them”, “Our work processes are continuously developed” and “Responsibilities and the structure of our organization are continuously developed”.

The proposed phrases in the earlier mentioned question for intangible assets had seven phrases referring directly to information sharing and close co-operation where silent knowledge such as “unwritten rules”, “practices at sister organization”, stories, (hidden) attitudes and values could be transferred via tradition from person to person. Even if it is not worded and still could also be collectively known way to do.

The seven phrases included; “Team work is a typical way of working at our company”, “Employees are continuously encouraged to bring ideas and new knowledge to our business.”, “Employees are continuously encouraged to share their knowledge with colleagues.”, “The culture and spirit at our enterprise are positive. “, “It is important for us to keep frequent contact with our customers.”, “We keep frequent contacts with our stakeholders and our social environment, and develop our networks all the time.” and the phrase “It is important for us to share our knowledge with our partners.”. All of these phrases were in average valued between 3.1 and 3.6, except for the two last ones the average for the non-ICT SMEs was little higher than for the ICT-field.

6.6 Future

Overall the expected changes concerning knowledge management at the surveyed SMEs within next five years were for the better. It was pointed out by the ICT-field enterprises that “Small enterprises do not usually have big needs for knowledge management, unless cooperate with larger companies” and that “Development is practiced as resources allow it”. At least one of the non-ICT-field SME expects “lots of changes for the better”. More specific expectations included implementation and utilization of good methods, (centralized) systems for management and document handling; databases or portals; search engine and the Internet; and “Virtualizing”.

Five sub questions were used in this survey to find the answer to research questions “How is knowledge management seen to be practiced and developed at the company within next five years?”

1. Which are the most important areas to be developed at your company, in connection to knowledge management practices?
2. Why do you see the development of these exact areas important?
3. Consider how important role social media will play at your company within next five years on scale from one to four, or “no answer” (1 = completely meaningless, 4= very important).
4. For what purpose you expect your company to utilize social media within next five years?
5. Concerning knowledge management, what kind of changes do you expect at your company within next five years?

Important areas to be developed

In general the non-ICT-field SMEs indicated more areas (15/17 of the proposed areas) of importance for development in connection to knowledge management compared to the ICT-field enterprises (12/17). The average amount of the companies recognizing proposed areas as important was for the ICT enterprises 16% and for the non-ICT enterprises 24%.

For the replying seventeen SMEs, employee resources was most frequently (47%) indicated as one of the most important areas to be developed. It was also the most frequently indicated development area among the sub group of non-ICT enterprises (55%). 33% of the surveyed ICT enterprises named it as one of the most important ones. Just as often they had marked

recognition of critical knowledge needs. 50% of the ICT-field enterprises and 18% of the non-ICT-field enterprises indicated budget to be among the most important development areas.

None of the SMEs saw personnel's negative reactions towards change or rental workers as belonging to the most important group. None of the ICT-field enterprises also mentioned defining and measuring knowledge, suitable integrated technologies or outsourcing practices. Quite differently 36% of the non-ICT enterprises indicated that defining and measuring knowledge, competence protection and immaterial property rights, as well as effective acquire and management of knowledge, and measuring the effectiveness of practices are all among the most important areas to be developed, and 27% saw that suitable integrated technologies also forms an important area for development. As frequently marked by the non-ICT companies were also the areas of beneficial use of company's internal knowledge, and tools. (Table 29.)

TABLE 29. The most important areas to be developed at the company, in connection to knowledge management practices

Area to be developed:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non-ICT enterprises
Keeping planned deadlines	4	24	1	17	3	27
Budget	5	29	3	50	2	18
Personnel's negative reactions towards change	0	0	0	0	0	0
Employee resources	8	47	2	33	6	55
Defining and measuring knowledge	4	24	0	0	4	36
Management commitment	3	18	1	17	2	18
Recognition of critical knowledge needs	5	29	2	33	3	27

Amount of education	2	12	1	17	1	9
Beneficial use of company's internal knowledge	4	24	1	17	3	27
Beneficial use of company's external knowledge	3	18	1	17	2	18
Competence protection and immaterial property rights	5	29	1	17	4	36
Suitable, integrated technologies	3	18	0	0	3	27
Tools	4	24	1	17	3	27
Effective acquire and management of knowledge	5	29	1	17	4	36
Measuring the effectiveness of practices	5	29	1	17	4	36
Rental workers	0	0	0	0	0	0
Outsourcing practices	1	6	0	0	1	9
Other, what?	0	0	0	0	0	0

Why are they important

Why are these areas seen as important? The ICT-field enterprises mentioned reasons such as: "These are essential for a sole entrepreneur like me."; "To be trusted by customers is most important"; and "Because planning of budget is difficult these days, small enterprises just aim to find projects and to work on those, if found. At larger enterprises it is easier to be successful in planning budget."

Answers by non-ICT-field enterprises were: "Knowledge management is linked to all activities requiring participation from several internal and external stakeholders.", "Knowledge management is part of operational and production management, where especially processes and integrated systems are needed"; "These are areas, which we have not been developing."

Social media

When asked to evaluate the future importance of social media for their organizations, on scale from one to four (1 = completely meaningless, 4= very important), the representatives of the ICT-field enterprises in average returned the value of 3.1. The representatives of the non-ICT-field companies returned slightly lower average of 2.8.

All of the SMEs that answered this survey expect to utilize social media within next five years. The most frequently expected purpose of all proposed options was marketing communications (71%). 73% of the non-ICT enterprises and 67% of the ICT enterprises expect to use social media for this purpose. Almost half of the SMEs also believe they will use social media for sharing and co-creating of knowledge (47%) and networking (47%). Non-ICT companies expected social media to be used for networking purposes more often (55%) than the ICT companies (33%), and for sharing and co-creation of knowledge little less (46%) than the ICT companies (50%). Learning was believed to be one purpose for the use of social media by 50% of the ICT-field enterprises, but only by 27% of the non-ICT-field enterprises. None of the SMEs expects to use social media for simulation or conferences. (Table 30.)

TABLE 30. The expected purposes to utilize social media within next five years

Purpose:	Number (17)	%	Number of ICT enterprises (6)	% of ICT enterprises	Number of non-ICT enterprises (11)	% of non- ICT enterprises
Sharing and co-creating of knowledge	8	47	3	50	5	46
Learning	6	35	3	50	3	27
Simulation	0	0	0	0	0	0
Recruiting	4	24	2	33	2	18
Induction programs	2	12	1	17	1	9
Conferences	0	0	0	0	0	0
Networking	8	47	2	33	6	55
Marketing	12	71	4	67	8	73
Communication Involving customers with product development	3	18	2	33	1	9
For nothing	0	0	0	0	0	0
Some other	1	6	1	17	0	0
Comments:			Producing (or importing) games to Finland			

7 CONCLUSIONS

Based on the presented results several conclusions have been made about the implementation of knowledge management at the 17 Oulu region small and medium sized enterprises that completed and returned questionnaires for this survey. Differences were found in the knowledge management practices between ICT- and non-ICT-field SMEs. However, part of the differences could also be explained by different company size, even within the group of SMEs, by the maturity of the business in general, or by the maturity or age of the surveyed SMEs. The used questionnaire did not include questions about maturity or age of the business sector or company. Therefore these possibilities were not clarified by this research. This study was aimed to discover if there are differences between SMEs of more precise size-groups of medium, small and micro. This factor could not be clarified since the low response rate did not allow division of the sample to such sub groups.

In general the ICT-field SMEs seemed to focus to cost efficiency and increased production, which according to Ojala (2008, 144) is typical business strategy for the business sectors with not really fast speed of change. In the so called middle wave (figure 6), where the changes within business sector are faster and the number of changes increases, the enterprises aim at growing, to better customer satisfaction, to increase automation and to manage continuous changes with processes. According to Ojala (*ibid.*), in this situation the emphasis of competence strategy is on sharing competence, co-learning and efficient utilization of competence. For example experimenting is typical for the third wave, where enterprises aim at high growth with innovative and dynamic operation. The emphasis of the chosen competence strategy has to be placed at the circumstances where it is possible to learn faster (*ibid.*, 145).

According to this study signs of the business strategies applicable to second and also to the third wave were seen on some of the surveyed SMEs. Networking is practiced for example in forms of partnerships and alliances. The surveyed ICT companies participate in building local communities. Systems, tools and templates are used for experimenting, especially at non-ICT SMEs. The other SMEs use them for demonstration and for action based learning processes. Competence strategy for enterprises, that are in the middle of frequent and really fast changes, aiming at high growth with innovative and dynamic operation, should also focus at increasing

communication between people, and the emphasis of the chosen competence strategy has to be placed at the circumstances where it is possible to learn fast together. (ibid.) Increasing communication, especially face-to-face interaction, is important already for the organizations within the second wave (figure 6). The activities for improving collaborative culture, and transfer and conversion of competence between people of the organizations, were not very commonly used at the surveyed SMEs, especially among the ICT-field. Therefore in order to transfer silent knowledge from one person to another, and to effectively support organizational learning, more attention should be paid to these activities.

7.1 Systematic practices of knowledge management

Two thirds of the surveyed Oulu region's SMEs now exercise knowledge management systematically, and one third has been systematically practicing knowledge management at least for five years. The non-ICT SMEs have longer history in systematic practices of knowledge management than the ICT-field SMEs. More than ten years of systematic knowledge management practices was true only for small part of the non-ICT-field enterprises. The proportion of surveyed SMEs still not practicing knowledge management systematically was higher within ICT-sector than within non-ICT-sector. It was also shown that among the SMEs that responded to this survey, systematic practice of knowledge management is still not as common as it was among the 50 largest companies, when studied by Hannula, Kukko and Okkonen (2003, 39). According to Hannula, Kukko and Okkonen the 50 largest companies in Finland mainly placed knowledge management under the function of human resources management (ibid.). At the surveyed Oulu region SMEs knowledge management usually is not placed under any certain function. If the replier had indicated that knowledge management is placed under a certain function, and had named the function, it was most often business development. Most of the non-ICT-field companies and half of the ICT-field companies have assigned the main responsibility of knowledge management to a specific person or persons, most commonly to the entrepreneur himself or to one of the managers.

7.2 Knowledge management areas

The responding companies indicated the three most frequently covered knowledge management areas as employees' competence, employees' education and accounting reports on expenses

etc. About one fifth of the SMEs apply knowledge management to immaterial property rights, and to reports on performance capability. The answer profiles for ICT and non-ICT SMEs were not equal. Just as the 50 largest companies in Finland (ibid.), the answers representing non-ICT-field SMEs at Oulu region had strong weight on employees' competence and knowledge. Their most frequently covered areas were employees' competence and employees' education, followed by employees' experience; employees' work orientation, training and development plans; and customer information. All these areas of knowledge management are covered by more than half of the non-ICT companies. Most of the responding ICT-field SMEs most frequently practice knowledge management at the area of accounting reports on expenses etc. and half of them apply knowledge management to product development information.

7.3 Knowledge management tools and technology

The surveyed SMEs all use the Internet and search engines, but none use media monitoring service or orientation database. At least half of the ICT-field SMEs utilize customer database, tele- or videoconferencing, work tracking and work-flow management, and educational database. Competitor database is only utilized by some of the non-ICT companies. The five most used tools or technologies for non-ICT enterprises include also project portal and project database, business analysis and decision support. Tele- or videoconferencing and educational database are not on that list. Compared to Hong Kong, where about seventy percent of the SMEs were found not to have any knowledge management related technical support (Chan & Chao 2008, 84), the surveyed SMEs of Oulu region seem to be better equipped.

Compared to results by Helsinki region Chamber of Commerce in 2005 (see Andersson 2006, 22, date of retrieval 14.11.2009), the surveyed SMEs within Oulu region now use integrated enterprise systems less. More than half of the Oulu region's SMEs use at least one of the enterprise systems. The same systems were measured to be used by almost by two thirds of the surveyed SMEs of Helsinki region (ibid.). Use within Oulu region is twice as common among non-ICT-field SMEs as among ICT-field SMEs. Half of the Oulu region's ICT SMEs do not use any of the proposed seven integrated systems tools, processes or products. Among the non-ICT companies the proportion is smaller. Use of knowledge management systems (KMS) is more frequent among the surveyed Oulu region SMEs now than among Helsinki region SMEs in 2005. However, if the rate of growth would have stayed the at same level for Helsinki region as it had

been between years 2003 and 2005, the expected use for year 2010 would have been around thirty percent. Compared to that, the SMEs within Oulu region use less KMS. Perhaps unexpected, but the ICT-field SMEs use knowledge management systems even less than the non-ICT-field SMEs.

7.4 Support for knowledge transfers and conversions

Knowledge transfers and conversions at the enterprises could be supported through actions at nine different sides of interaction that have the potential to create value for an organization as described in chapter 6.4. The comparison of found characteristics and differences between the used supportive activities at the surveyed Oulu region ICT- and non-ICT-field SMEs is shown in the table 31.

TABLE 31. Comparison of the surveyed Oulu region ICT- and non-ICT-field SMEs: Utilized supportive activities for knowledge transfer and conversion

Support for knowledge transfer and conversions	All surveyed SMEs	ICT-field SMEs	Non-ICT-field SMEs
1.BETWEEN INDIVIDUALS: Which activities are used to improve the collaborative culture and to improve the transfer and conversion of competence between people in your organization?	Use of proposed activities is not very common. The three most common activities include trust building activities, team activities and redesigned work areas. Master apprentice schemes and job rotation are quite rare.	The most common activities are team activities and trust building activities. Job rotation and encouragement for live interaction are not used at all.	Wider range of activities, activities used more often. Quite common to encourage face-to-face interaction between senior and younger employees; to redesign work areas to create an atmosphere of openness, flexibility, creativity and sharing; and to use induction programs. Some use job rotation and master apprentice schemes.
2.FROM INDIVIDUALS TO EXTERNAL STRUCTURE: How are your employees able to improve the competence of your customers, suppliers and other stakeholders?	Enabled mainly through customer education and cooperation and partnership with schools.	Favor customer education.	Favor cooperation and partnership with schools. Also pretty common to extend offerings to include service.
3.FROM EXTERNAL STRUCTURE TO INDIVIDUALS: How are your customers, suppliers and other stakeholders able to improve the competence of your employees?	The three most important activities: procedures for customer feedback, good personal relationships between people inside and outside of the organization, captured ideas, new experiences and new technical	Only three activities used: good personal relationships between people inside and outside of the organization, procedures for customer feedback and captured ideas, new experiences and new	Has wider range of activities than the ICT-sector, use feedback more, some measure the feedback and employees may participate in customers' quality management teams.

	knowledge from the community.	technical knowledge from the community.	
4.FROM INDIVIDUAL COMPETENCE TO INTERNAL STRUCTURE: What tools, processes, systems and templates are used at your company to enable sharing of knowledge?	Besides email other common tools, processes, systems and templates used include databases and local area network.	Half of the enterprises use teleconferencing and social media.	Use of intranets and document handling systems is fairly common. Less use of teleconferencing and social media than the ICT-field enterprises.
5.FROM INTERNAL STRUCTURE TO INDIVIDUAL COMPETENCE: How are systems, tools and templates used to improve individuals' competence?	Mostly experimental activities.	Experimenting is more common than for the non-ICT companies.	Demonstrative projects and action-based learning processes used.
6. WITHIN EXTERNAL STRUCTURE: How do you support the transfer and conversion of knowledge among customers, suppliers and other stakeholders?	The most used activity is partnering, one third of the SMEs also have alliances.	Improvement of brand equity of products and services, and active engagement in building local communities.	Common to improve the quality of offerings, fairly common to improve the organization's image and brand equity of products and services.
7. FROM EXTERNAL TO INTERNAL STRUCTURE: What activities are used to enable the competence of the customers, suppliers and other stakeholders to improve your organization's systems, tools, processes and products?	Research and development alliances are the most common activities.	Research and development alliances are the most common activities, and even more common than among the non-ICT enterprises. Also alliances for developing new product ideas exist.	Research and development alliances are the most common activities. Some companies gather and analyze customer data.

<p>8. FROM INTERNAL TO EXTERNAL STRUCTURE: How do your systems, tools and processes enable the improvement of competence of your customers, suppliers and other stakeholders?</p>	<p>None of the proposed activities used by more than one third of the companies. The most common activities are use of customer profiles to ensure personal treatment of all customers, and customer databases.</p>	<p>The most common activity is use of customer database.</p>	<p>In general, activities are more common than for the ICT-field enterprises.</p>
<p>9. WITHIN INTERNAL STRUCTURE: Which integrated systems, tools, processes or products are utilized by your organization?</p>	<p>KMS is not common. Half of the SMEs use at least one of the integrated enterprise systems (ERP, CRM, SCM, KMS).</p>	<p>About half of the companies do not use any of the seven proposed integrated systems, processes or products.</p>	<p>Some use several integrated enterprise systems. One third of the companies do not use any integrated systems, processes or products, some do not use any other means either. Databases connected via intranet, CRM, SCM and companywide IT-solutions are used by more than one third of the companies.</p>

7.5 Management of conscious vs. silent knowledge

In this survey active management of silent knowledge was considered to include all structures, values, tools and technologies as well as activities used for support in collecting, organizing, sharing and spreading of silent knowledge. The proposed question for intangible assets had seven phrases referring directly to information sharing and close co-operation where silent knowledge gathered through experience, commitment, motivation and creation could be transferred via tradition, and from person to person.

- “Team work is a typical way of working at our company.”
- “Employees are continuously encouraged to bring ideas and new knowledge to our business.”
- “Employees are continuously encouraged to share their knowledge with colleagues.”
- “The culture and spirit at our enterprise are positive. “
- “It is important for us to keep frequent contact with our customers. “
- “We keep frequent contacts with our stakeholders and our social environment, and develop our networks all the time.”
- “It is important for us to share our knowledge with our partners.”

On the scale from one (fully disagree) to four (fully agree) all of these phrases were in average valued above three (between 3.1 and 3.6). Except for the two last ones, the average for the non-ICT SMEs was slightly higher than for the ICT-field enterprises. Team work as a typical way of working clearly relates more to the surveyed non-ICT- than the ICT-field SMEs. Also the phrase “Employees are continuously encouraged to share their knowledge with colleagues” was evaluated to relate better to non-ICT than ICT SMEs.

To answer the question if companies actively manage both conscious and silent knowledge, the evaluation of mentioned phrases about intangible assets should be studied together with the previously discussed other results of this survey. The other parts included results concerning covered knowledge management areas, used technologies, activities used in support of transfer and conversion of knowledge, and the implementation of knowledge management in general.

Most of the surveyed non-ICT SMEs, use knowledge management for employees’ experience. However it is not clear if this involves unwritten face-to-face contacts that would enable transfer of

silent knowledge. For the ICT-field companies use of knowledge management on the area of employees' experience was rare. Half of the surveyed ICT-sector, and about one third of the non-ICT-sector SMEs, use tele- or videoconferencing for communication. These tools are capable of transferring knowledge that could not be written, for example through tone of voice and facial expressions.

The activities for improving collaborative climate and the transfer of competence between people could offer plenty of opportunities for face-to-face communication. These activities in general are not very popular among the surveyed Oulu region SMEs. In average even the most common proposed activities; trust building activities and team activities are used by less than half of the companies. The sub group of the non-ICT enterprises uses all of the proposed activities and they use them more than ICT enterprises. More than half of the non-ICT companies use trust building activities, and almost half encourage for live interaction between senior and younger employees. As many have redesigned work areas to create an atmosphere of openness, flexibility, creativity and sharing. The wider range and more frequent use of activities by non-ICT-field SMEs seem to offer more possibilities for face-to-face communication. For example co-operation and partnerships with schools, services included to offerings, participation in customers' quality management teams, sparring customer co-operation, condensed customer co-operation and demonstrative projects were mentioned by non-ICT SMEs. Therefore the non-ICT-field enterprises, compared to the ICT-field SMEs, also are able to create more opportunities for knowledge transfer and conversion, as well as for management of silent knowledge. However the surveyed ICT-field enterprises use teleconferencing and social media, and have more alliances for different purposes.

It can be concluded that the surveyed SMEs at Oulu region actively manage both conscious and silent knowledge. Differences exist between ICT- and non-ICT-field enterprises in variety of used activities, in frequency of their use, as well as perhaps in direction of the focus. The non-ICT SMEs might be more focused on managing silent knowledge connected to company's internal structure and individual competence. The surveyed ICT-field SMEs focus on external structure and individual competence.

7.6 Future

The expected changes concerning knowledge management at the surveyed SMEs within next five years were for the better. Small surveyed enterprises do not necessarily see “big needs“ for knowledge management and develop it as resources allow. The non-ICT-field SMEs expressed some specific expectations. Employee resources form an important area to develop in connection to knowledge management for almost half of the surveyed SMEs.

The non-ICT-field SMEs mentioned more areas to be developed than the ICT-field enterprises. For the non-ICT SMEs the most important areas for development are employee resources, defining and measuring knowledge, competence protection and immaterial property rights, as well as effective acquire and management of knowledge, and measuring the effectiveness of practices. Little less see suitable integrated technologies, or beneficial use of company’s internal knowledge and tools forming an important area for development. Budget is not often seen important. Knowledge management is seen to be linked to all activities requiring participation from several internal and external stakeholders. It is seen as part of operational and production management, where especially processes and integrated systems are needed.

Half of the ICT-field see budget an important development area. Other important areas include employee resources and recognition of critical knowledge needs. None of the ICT-field enterprises mentioned defining and measuring knowledge, suitable integrated technologies or outsourcing practices. ICT-field enterprises explained their choices being “essential for a sole entrepreneur”, with importance to be trusted by customers and with the difficulty of planning budget at small enterprises.

According to this survey all of the SMEs expect to utilize social media within the next five years. The ICT-field enterprises evaluated the role of social media slightly more important than the non-ICT-field companies. Most often social media is expected to be used for marketing communications, sharing and co-creating of knowledge, and for networking. Non-ICT companies expect social media to be used for networking purposes more often than the ICT companies, and for sharing and co-creation of knowledge little less than the ICT companies. Learning was believed to be one purpose by half of the ICT-field enterprises. None of the SMEs expects to use social media for simulation or conferences.

8 DISCUSSION

The research topic of knowledge management practices at small and medium sized Oulu region enterprises was a challenging and fascinating topic to dive in. Terms and definitions about knowledge management, used by theories written by different authors, differ from each other. The known complexity to separate conscious knowledge from silent knowledge brought additional challenge. Another challenging task was to motivate required number of target enterprises to participate the survey. I believe the very abstract nature of knowledge management itself made it less tempting topic to get involved with, no matter how “fashionable” topic.

Use of electronic questionnaire forms and invitations sent through email were correct choice for the purpose. There would not have been an alternative for reaching such a large number of representatives of Oulu region SMEs in a reasonable time period. In order to achieve better response rate the survey topic and questionnaire should have been narrowed down more. Although the decision to base the research mainly on Sveiby’s Knowledge Based Theory of the Firm to Guide Strategy Formulation already demanded quite extensive questionnaire to be used.

The low number of replies caused the results to be reliable only for the 17 SMEs that returned the completed questionnaires. No generalization of results or conclusions can be made. Validity of the research and its results to my opinion is good as far as it is question about the results describing the current implementation of knowledge management at the 17 responding Oulu region SMEs. One originally set objective for the study was to discover if there are differences between SMEs of more precise size-groups of medium, small and micro. This objective however was not fulfilled since the low response rate did not allow division of the sample to such sub groups.

When it comes to the results and conclusion made about the differences in knowledge management between the ICT- and non-ICT-field SMEs, there might be other factors affecting the results than the field of business. For example the more specific size of the company, the maturity of the business and business field, and the age of the company. The needs and possibilities to implement systematic knowledge management at micro sized enterprise could differ already from small enterprises, and even more from the medium sized enterprises. If the

entrepreneur is the only person employed by the micro sized enterprise the need and possibilities for knowledge transfer and conversion within internal structure are very limited. Documentation of existing and required competences, individual and internal knowledge, either conscious or silent, would still be recommended for future needs. In addition, no business, micro sized or larger, could be practiced completely independent from external structures. For more mature businesses with faster change, the size of enterprises is often also larger. Sharing of competence, co-learning, efficient competence utilization and circumstances enabling faster learning together require also more efficient systematic knowledge management practices. Five of the six studied ICT-sector SMEs represented micro sized enterprises. Therefore the results on ICT-field enterprises might well reflect the characteristics of the company size instead of the business field. The studied non-ICT-field companies represented more even distribution of different size groups; five companies were micro sized and six either small or medium size enterprises.

Further studies could be conducted in order to compare knowledge management related issues between different business sectors. For example, to compare use of social media for knowledge management purposes, at different business sectors. Another interesting topic for further research could be to study how the effectiveness of knowledge management practices is measured by companies.

As a learning experience, this research taught me wider and deeper understanding of knowledge and the meaningfulness of face-to-face, live, and even less formal interaction between individuals, sharing of experiences, values, stories and other unwritten, silent knowledge. This also made me realize the lack of respect and good tools to support efficient systematic management of silent knowledge.

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APPENDICES

Hyvä Oulun alueen PK-yrityksen edustaja

Oulun seudun ammattikorkeakoulun Business Informaatio Teknologian koulutusohjelman opiskelijana kutsun teidät jakamaan tietämyksen hallinnan tietämystä kanssani. Vastaamalla tähän kyselyyn osallistutte uuden tiedon luomiseen koskien Oulun seudun PK-yritysten tietämyksen hallinnan käytäntöjä, samalla mahdollistaen lopputyöni Degree Programme in Business Information Technology opinnoissani.

Yritykset ja niiden toimintaympäristöt ovat muuttumassa yhä tietointensiivisemmiksi. Osaaminen on johtamisen ydinalueella ja se on korostanut informaation sekä tietämyksen tärkeyttä, samoin kuin tarvetta ymmärtää tietämispääoman merkitys yrityksen resurssina.

Aikaisemmin on tutkittu harjoitetun tietämyksen hallinnan käytäntöjä Suomen suurimpien sekä julkisten yritysten osalta. Joitain selvityksiä on myös PK-yrityksistä, mutta ei sellaista joka kuvaisi kuinka PK-yritykset Oulun seudulla tietämystä hallitsevat.

Kutsu tähän kyselyyn on lähetetty valitulle ryhmälle Oulun seudun kaiken kokoisia PK-yrityksiä (mikroyrityksiä, pieniä- ja keskisuuria yrityksiä) lukuisilta toimialoilta.

Tutkimukseni ja tämän kyselyn tarkoituksena on valaista käsitystä siitä kuinka laajasti tietämyksen hallintaa tällä hetkellä harjoitetaan Oulun seudun PK-yrityksissä, kuinka sitä harjoitetaan ja miten tietämyksen hallinnan toteuttaminen nähdään lähitulevaisuuden osalta.

Kyselylomakkeeseen pääsee joko suoraan annetun linkin kautta tai kopioimalla ja liitämällä linkin selaimen osoitekenttään. Vastaamalla kyselyyn paneudut yrityksenne tietämyksen hallinnan käytäntöihin noin 20-30 minuutin ajan. Tarvittaessa voit tuki käyttää enemmänkin aikaa. Voit myös keskeyttää ja jatkaa myöhemmin, kunhan vain muistat palauttaa vastauksesi ennen toukokuun 24. päivää 2010.

Täytetyn kyselyn palauttaneilla on mahdollisuus halutessaan saada PDF-kopio valmiista lopputyöstä. Anonyymit vastaukset tietoisena tullaan käsittelemään noudattaen hyvää tieteellistä käytäntöä. Mahdollisiin kysymyksiinne vastaan mielelläni sähköpostitse (k7sepi00@students.oamk.fi).

Tietämyksen hallinta erään määritelmän mukaan on "Taidetta arvon luomiseksi aineettomasta pääomasta". Tämä taiteenlaji varmasti kiinnostaa yritystänne.

Klikkaa vain tätä yksinomaan yrityksenne käyttöön varattua linkkiä siirtyäksesi kyselyn etusivulle.

#WWW_CLIENT

Yhteistyöterveisin,

Elina Seppälä

Business InformationTechnology opiskelija

Oulun seudun ammattikorkeakoulu

Aloitettuasi vastaamisen voit tarvittaessa vaihtaa kieltä (suomi tai englanti) ikkunan ylälaidan valikosta.

Dear representative of an Oulu region SME

As a Business Information Technology student from Oulu University of Applied Sciences I am inviting you to share some knowledge management information about your company with me. By replying to this survey you will participate in creation of new knowledge about the knowledge management practices at Oulu region SMEs, and enable me to complete my final thesis for Degree Programme in Business Information Technology.

Companies and their operational environment are becoming more knowledge intense. Competence is in the core of management and has highlighted the importance of information and knowledge, as well as the need to understand the asset of knowledge as a company resource.

Studies have been done about the implemented knowledge management practices in Finland among larger companies and public organizations. Even some studies exist about the SMEs, but not one that would picture how SMEs around Oulu are managing knowledge.

Invitation to this survey is sent to a selected group of Oulu region SMEs (micro, small and medium) of numerous business sectors.

The objective of my research and this survey is to enlighten how widely knowledge management is currently implemented by Oulu region SMEs, how it is being implemented, and how the implementation of knowledge management is seen to be practiced in the near future.

The survey form is accessed either directly through provided link or after the link is copy-pasted to web-browser's address-field. Answering will make you consider the knowledge management

practices of your company for about 20-30 minutes. Of course if needed you can also spend more time with it. You can also stop in between and continue later, just as long as you return your reply before May 24th 2010.

Respondents who have returned a filled survey, will be offered a PDF-copy of the finalized thesis. The anonym replies with all the information will be handled according to good scientific practices. Should you have any questions, feel free to contact me by email (k7sepi00@students.oamk.fi). Knowledge management according one definition is "The Art of Creating Value from Intangible Assets". This type of art surely interests your company.

Just click on this link provided only for your company's use and you are taken to the front page of the survey.

#WWW_CLIENT

Yours sincerely,

Elina Seppälä
Student of Business Information Technology
Oulu University of Applied Sciences

After starting the survey it is possible to switch to another language (finnish or english) by selecting it from a list on the upper section of the window.

Hyvä Kilpa-projektin yhteistyökumppani

Oulun seudun ammattikorkeakoulun Business Informaatio Teknologian koulutusohjelman opiskelijana kutsun teidät jakamaan tietämyksen hallinnan tietämystä kanssani. Vastaamalla tähän kyselyyn osallistutte uuden tiedon luomiseen koskien Oulun seudun PK-yritysten tietämyksen hallinnan käytäntöjä, samalla mahdollistaen lopputyöni Degree Programme in Business Information Technology opinnoissani.

Yritykset ja niiden toimintaympäristöt ovat muuttumassa yhä tietointensiivisemmiksi. Osaaminen on johtamisen ydinalueella ja se on korostanut informaation sekä tietämyksen tärkeyttä, samoin kuin tarvetta ymmärtää tietämispääoman merkitys yrityksen resurssina.

Aikaisemmin on tutkittu harjoitetun tietämyksen hallinnan käytäntöjä Suomen suurimpien sekä julkisten yritysten osalta. Joitain selvityksiä on myös PK-yrityksistä, mutta ei sellaista joka kuvaisi kuinka PK-yritykset Oulun seudulla tietämystä hallitsevat.

Kutsu tähän kyselyyn on lähetetty valitulle ryhmälle Oulun seudun kaiken kokoisia PK-yrityksiä (mikroyrityksiä, pieniä- ja keskisuuria yrityksiä) lukuisilta toimialoilta.

Tutkimukseni ja tämän kyselyn tarkoituksena on valaista käsitystä siitä kuinka laajasti tietämyksen hallintaa tällä hetkellä harjoitetaan Oulun seudun PK-yrityksissä, kuinka sitä harjoitetaan ja miten tietämyksen hallinnan toteuttaminen nähdään lähitulevaisuuden osalta.

Kyselylomakkeeseen pääsee joko suoraan annetun linkin kautta tai kopioimalla ja liitämällä linkin selaimen osoitekenttään. Vastaamalla kyselyyn paneudut yrityksenne tietämyksen hallinnan käytäntöihin noin 20-30 minuutin ajan. Tarvittaessa voit tuki käyttää enemmänkin aikaa. Voit myös keskeyttää ja jatkaa myöhemmin, kunhan vain muistat palauttaa vastauksesi ennen toukokuun 24. päivää 2010.

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Klikkaa vain tätä yksinomaan yrityksenne käyttöön varattua linkkiä siirtyäksesi kyselyn etusivulle.

#WWW_CLIENT

Yhteistyöterveisin,

Elina Seppälä

Business Information Technology opiskelija

Oulun seudun ammattikorkeakoulu

Aloitettuasi vastaamisen voit tarvittaessa vaihtaa kieltä (suomi tai englanti) ikkunan ylälaidan valikosta.

Dear Kilpa-project partner

As a Business Information Technology student from Oulu University of Applied Sciences I am inviting you to share some knowledge management information about your company with me. By replying to this survey you will participate in creation of new knowledge about the knowledge management practices at Oulu region SMEs, and enable me to complete my final thesis for Degree Programme in Business Information Technology.

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Respondents who have returned a filled survey, will be offered a PDF-copy of the finalized thesis. The anonym replies with all the information will be handled according to good scientific practices. Should you have any questions, feel free to contact me by email (k7sepi00@students.oamk.fi). Knowledge management according one definition is “The Art of Creating Value from Intangible Assets”. This type of art surely interests your company.

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Yours sincerely,

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After starting the survey it is possible to switch to another language (finnish or english) by selecting it from a list on the upper section of the window.

Kysely/ Questionnaire

Tervetuloa vastaamaan kyselyyn tietämyksen hallinnasta Oulun seudun PK-yrityksissä ! / Welcome to answer to this survey about knowledge management at Oulu region SMEs!

Vastaukset tietoisesti tullaan käsittelemään noudattaen hyvää tieteellistä käytäntöä. Vastaaminen vie aikaa n. 20-30 minuuttia. Voit myös keskeyttää ja jatkaa myöhemmin, kunhan vain muistat palauttaa vastauksesi ennen toukokuun 24. päivää 2010. PIKAOHJE: 1. Vastaaminen tapahtuu hiirellä työskennellen. 2. Voit muuttaa vastauksiasi valittuasi kysymyksen aktiiviseksi esimerkiksi kysymyslistasta. 3. Voit keskeyttää jatkaaksesi myöhemmin klikkaamalla "X"-merkkiä vastausalueen oikeassa yläkulmassa. 4. Kun olet vastannut kaikkiin kysymyksiin klikkaa "Valmis" -nappia.

Replies will be handled according to good scientific practices. Answering will take about 20-30 minutes. You can also stop in between and continue later, just as long as you return your reply before May 24th 2010. INSTRUCTIONS IN BRIEF: 1. Click your answers with mouse on the response base. 2. You can change your answers after activating the question e.g. from the list. 3. You can interrupt your answering to go on later by clicking "X" on the upper right corner of the response base. 4. When you have answered all the questions click "Done" button.

Aineeton pääoma/ *Intangible assets*

Arvioi asteikolla 1 – 4 tai "En osaa sanoa", kuinka hyvin seuraavat väittämät mielestäsi sopivat yritykseenne. (1 = täysin erimieltä ; 4 = täysin samaa mieltä) / Indicate how well following phrases relate to your organization on scale from 1 to 4 or "No answer". (1 = fully disagree; 4= fully agree)

Henkilöstö resursseilla on erittäin suuri merkitys liiketoiminnalle ja kasvulle./ Human resources play a very significant role in our business and for the growth. _____

Henkilöstömme keskimäärin on hyvin osaava ja ammattitaitoinen./ Our personnel on average is highly competent and professional. _____

Käytämme yrityksessämme paljon aikaa ja vaivaa pitääksemme tietomme ja taitomme ajantasalla./ We use plenty of time and effort in our enterprise in up-dating and developing our knowledge and skills. _____

Työntekijämme ovat hyvin motivoituneita ja sitoutuneita./ Our employees are highly motivated and committed. _____

Henkilöstöhallintomme toimii hyvin./ Our human resources management functions well. _____

Yrityksessämme tiimityöskentely on tavanomainen työskentelymuoto. /Team work is a typical way of working at our company. _____

Työntekijöitä kannustetaan jatkuvasti uusien ideoiden ja tiedon tuomisessa yritykseen./ Employees are continuously encouraged to bring ideas and new knowledge to our business. _____

Työntekijöitä jatkuvasti rohkaistaan jakamaan tietonsa kollegojensa kanssa./ Employees are continuously encouraged to share their knowledge with colleagues. _____

Arvot ja normit ovat tärkeitä ja kaikki työntekijämme ovat niistä tietoisia./ Values and norms are very important and all our employees are aware of them. _____

Työprosessejamme kehitetään jatkuvasti./ Our work processes are continuously developed. _____

Yrityksessämme kehitetään jatkuvasti tehtäväjakoja ja organisaatorakenteita./ Responsibilities and the structure of our organization are continuously developed. _____

Omistamamme patentit, lisenssit ja tekijänoikeudet ovat meille hyvin tärkeitä./ We consider patents, licenses and copyrights in our possession very important. _____

Tietojärjestelmämme ovat käytännölliset ja ajan tasalla./ Our information systems are useful and updated. _____

Yrityksemme kulttuuri ja henki ovat positiivisia./ The culture and spirit at our enterprise are positive. _____

Vuorovaikutus yrityksessä on avointa ja tavoittaa jokaisen./ Communication at the company is open and reaches everybody. _____

Asiakkailla on liiketoimintamme tärkein rooli./ Customers play the most significant role in our business. _____

Tiivis yhteydenpito asiakkaidemme kanssa on meille tärkeää./ It is important for us to keep frequent contact with our customers. _____

Yhteydenpito sidosryhmiemme ja ympäröivän yhteisömme kanssa on tiivistä, ja kaiken aikaa kehitämme verkostojamme. / We keep frequent contacts with our stakeholders and our social environment, and develop our networks all the time. _____

Tuotteemme edustavat tunnettuja tuotemerkkejä./ Our products represent well-known brands. _____

Asiakkailta saamamme palaute on poikkeuksetta positiivista./ Without exception the feed-back from our customers is positive. _____

Oppiminen ja lisäarvon tuottaminen yhteistyökumppanien kautta on meille mahdollista./ We are able to learn and add value through our partners. _____

Hyvä imago ja maine ovat meille erittäin tärkeitä./ Good image and reputation are very important to us. _____

Meille on tärkeää jakaa tietomme yhteistyökumppaneidemme kanssa. / It is important for us to share our knowledge with our partners. _____

Käytössä olevat teknologiat/ Used technologies

1.Käytetäänkö yrityksessänne seuraavia teknologioita , tietokantoja tai portaaleja? / Does your company use following technologies, databases or portals?

Selitykset: Tiedon louhinnalla tarkoitetaan erilaisten erikoismenetelmien (esim. erilaiset algoritmit) käyttöä, joilla pyritään löytämään oleellista, ihmissilmällä havaitsemattomissa olevaa tietoa suurista tietomassoista./ Explanations: Data mining means the usage of special methods (e.g. different algorithms), that are used to find essential information, not visible to human eye, from large masses of data.

Käytössä/Used

Internetti ja hakukoneet/ Internet and search engines

[]

Tiedon louhinta / Data-mining

[]

Puhelin tai videokonferenssi/ Teleconference or Videoconference

[]

Töiden seuranta ja työvirtojen hallinta /Work tracking and work-flow management

[]

Liiketoiminnan analyysi ja päätöksen teon tuki/ Business analysis and decision support

[]

Median monitorointi palvelu/ Media monitoring service

[]

Henkilöstötietokanta/ Employee database

[]

Osaamistietokanta/ Competence database	[]
Kokemustietokanta/ Experience database	[]
Koulutustietokanta/ Education database	[]
Perehdytystietokanta/ Orientation database	[]
”Yritys-CV”/ “Company CV”	[]
Projektiportaali ja projektitietokanta/ Project portal and project database	[]
Asiakastietokanta/ Customer database	[]
Kilpailijatietokanta/ Competitor database	[]
Muu kuin yllämainittu? Mikä?/ Other than the above mentioned?	[]

What? _____

2. Suunnitteletteko lähitulevaisuudessa hankkivanne edellisessä kysymyksessä mainittuja teknologioita, tietokantoja tai portaaleja käyttööne? /

Are you planning in near future to acquire technologies, databases or portals mentioned in the previous question?

Tietämyksen hallinnan alueet/ *Knowledge management areas*

1. Mitä osa-alueilla tietämyksen hallintaa toteutetaan yrityksessänne?/ On which areas is knowledge management practiced by your company?

Tietämyksen hallinnalla tarkoitetaan kaikkia informaatiojärjestelmiä, joilla informaatiota ja tietämystä voidaan hallita (kuka tietää mitä, ja kaikki prosessit jotka hyödyntävät yksilöiden tietämystä). /

Knowledge management means all of the information systems capable of managing information and knowledge (who knows what, and all of the processes in which individuals' knowledge is utilized).

Työntekijöiden koulutus/ Employees' education []

Työntekijöiden osaaminen/ Employees' competence []

Työntekijöiden kokemus/ Employees' experience	[]
Työntekijöiden perehdytys, koulutus ja kehitys suunnitelmat/ Employees' work orientation plans, training plans and development plans.	[]
Ryhmäkalenteri, sähköposti jne./ Group calendar, email etc.	[]
Projekti- ja toimintaresurssit/ Project and activity resources	[]
Projekti käytännöt/ Project policies	[]
Projektien tuottama informaatio/ Information produced by projects	[]
Tuotetiedot/ Product information	[]
Laatutiedot/ Information on quality	[]
Tuotekehitystiedot/ Product development information	[]
Ideapankki/ Idea bank	[]
Tekijän oikeudet/ Immaterial property rights	[]
Käytettävät teknologiat/ Used technologies	[]
Prosessitiedot/ Information on processes	[]
Operationaalisen kehittämisen tiedot/ Information on operational development	[]
Kirjanpidon raportit kuluista jne./ Accounting Reports on expenses etc.	[]
Suorituskykyraportit/ Reports on performance capability	[]
Strategiat/ Strategies	[]
Asiakastiedot/ Customer information	[]
Asiakkaiden yritystiedot/ Customers' business information	[]
Kilpailijatiedot/ Competitor information	[]
Muu, mikä?/ Other, What? _____	[]

Toiminnot/ Activities

1. Mitä toimintoja organisaatiossanne käytetään yhteistyöilmapiirin parantamiseksi ja yksilöiden välisen osaamisen siirtämisen ja muuntumisen tehostamiseksi?/ *Which activities are used to improve the collaborative culture and to improve the transfer and conversion of competence between people in your organization?*
tiimitoiminnot/ *team activities* []

luottamusta rakentavat toiminnot/ <i>trust building activities</i>	[]
tehtävien kierrätys/ <i>job rotation</i>	[]
perehdytysohjelmat/ <i>induction programs</i>	[]
mestari-oppilas ohjelmat/ <i>master apprentice schemes</i>	[]
rohkaiseminen elävään kanssakäymiseen kokeneempien ja nuorempien työntekijöiden välillä/ <i>encouragement for live interaction between senior and younger employees</i>	[]
työtilojen uudelleen suunnittelu avoimen, joustavan, luovan ja tiedon jakamiseen kannustavan ilmapiirin luomiseksi/ <i>redesigned work areas to create an atmosphere of openness, flexibility, creativity and sharing</i>	[]
jokin muu toiminto (kerro lyhyesti)?/ <i>some other activity (include short explanation)</i>	[]

2. Kuinka työntekijänne pystyvät parantamaan asiakkaiden, tavarantoimittajien ja muiden sidosryhmien osaamista?/ *How are your employees able to improve the competence of your customers, suppliers and other stakeholders?*

asiakkaiden kouluttaminen/ <i>customer education</i>	[]
tuoteseminaarit/ <i>product seminars</i>	[]
työtehtävien kierrätys asiakkaiden kanssa/ <i>rotating jobs with customers</i>	[]
tarjotut tuotteet on laajennettu sisältämään myös palvelua/ <i>offerings extended to include service</i>	[]
tutkimustulosten ja käytettävien menetelmien julkaiseminen yrityksen maineen rakentamiseksi/ <i>publishing research results or used methods in order to build company reputation</i>	[]
yhteistyö ja kumppanuus koulujen kanssa/ <i>cooperation and partnerships with schools</i>	[]
jokin muu toiminto (selitä lyhyesti)/ <i>some other activity (include short explanation)</i>	[]

3. Kuinka asiakkaiden, tavaran toimittajien ja muiden sidosryhmien on mahdollista parantaa työntekijöidenne osaamista?/ *How are your customers, suppliers and other stakeholders able to improve the competence of your employees?*

asiakaspalautteelle olemassa olevat käytännöt/ <i>existing procedures for customer feedback</i>	[]
tavarantoimittajien palautteelle olemassa olevat käytännöt/ <i>existing procedures for supplier feedback</i>	[]

ideoita, uusia kokemuksia ja uutta teknologiatietoutta kerätään yhteisöstä/ *ideas, new experiences and new technical knowledge from the community are captured* []

yllämainittuja käytäntöjä myös mitataan/ *the above mentioned procedures are also measured* []

hyvät henkilösuhteet niin organisaation oman henkilöstön kesken kuin myös ulkopuolisten kanssa/ *good personal relationships between the organization's own people and the people outside the organization* []

työntekijät osallistuvat usein asiakkaiden laadunhallintatiimien työskentelyyn ymmärtääkseen paremmin asiakkaan tarpeita/ *employees frequently participate in customers' quality management teams to gain better understanding of customer needs* []

jokin muu toiminto (selitä lyhyesti)?/ *some other activity (include short explanation)* []

4. Mitä työvälineitä, prosesseja, järjestelmiä ja malleja yrityksessänne käytetään tiedon jakamisen mahdollistamiseksi?/ *What tools, processes, systems and templates are used at your company to enable sharing of knowledge?*

asiakirjanhallintajärjestelmä/ *document handling system* []

sähköposti/ *email* []

ryhmätyökalut/ *groupware* []

tietokannat/ *databases* []

LAN (paikallisverkko)/ *LAN (Local Area Network)* []

intranetti/ *intranet* []

ekstranetti/ *extranet* []

telekonferenssi (puhelinkonferenssi)/ *teleconferencing* []

videokonferenssi/ *videoconferencing* []

sosiaalinen media/ *social media* []

sähköinen kokemusten keräämismenetelmä/ *electronic means to capture experiences* []

jokin muu toiminto (selitä lyhyesti)/ *some other (include short explanation)* []

5. Kuinka järjestelmiä, työkaluja ja malleja käytetään yrityksesänne yksilöiden osaamisen parantamiseen?/ *How are systems, tools and templates used to improve individuals' competence?*

kokeilevassa toiminnassa/ <i>experimenting is practiced</i>	[]
esittelyprojekteissa/ <i>demonstrative projects exist</i>	[]
räätälöidyissä simulaatioissa/ <i>customized simulations are used</i>	[]
käyttämällä interaktiivista elektronista oppimisympäristöä/ <i>interactive e-learning environments are used</i>	[]
toimintapohjaisten oppimisprosessien hyödyntäminen/ <i>action-based learning processes exist</i>	[]
jokin muu toiminto (selitä lyhyesti)/ <i>some other (include short explanation)</i>	[]

6. Miten tuette tiedon siirtymistä ja muuntumista asiakkaiden, toimittajien ja muiden sidosryhmien keskuudessa? (Parantaaksenne sidosryhmien osaamista heidän asiakkaidensa palvelemisessa.)/ *How do you support the transfer and conversion of knowledge among customers, suppliers and other stakeholders (To improve their competence to serve their customers)?*

kumppanuus/ <i>partnering</i>	[]
liittoutuminen/ <i>alliances</i>	[]
organisaation imagon parantaminen/ <i>improvement of organization's image</i>	[]
tuotteiden ja palvelujen brandin arvon parantaminen/ <i>improving brand equity of products and services</i>	[]
tarjousten laadun parantaminen/ <i>improving quality of offerings</i>	[]
toteuttamalla tuoteseminaareja/ <i>conducting product seminars</i>	[]
valmistuneille opiskelijoille suunnatut ohjelmat/ <i>alumni programs</i>	[]
aktiivinen osallistuminen paikallisten yhteisöjen rakentamiseen/ <i>active engagement in building local communities</i>	[]
jokin muu toiminto (selitä lyhyesti)/ <i>some other activity (include short explanation)</i>	[]

7. Mitä toimintoja käytetään mahdollistamaan asiakkaiden, toimittajien ja muiden sidosryhmien osaamisen hyödyntäminen organisaationne järjestelmien, työvälineiden, prosessien ja tuotteiden parantamiseksi?/ *What activities are used to enable the competence of the customers, suppliers and other stakeholders to improve your organization's systems, tools, processes and products?*

liittoutumat uusien tuoteideoiden synnyttämiseksi/ <i>alliances to generate ideas for new products</i>	[]
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tutkimus- ja kehityslitoutumat/ *research and development alliances* []

puhelinkekus asiakaspalautteen välittämiseen/ *call centers to interpret customer complaints* []

myyntihenkilöstö kerää ja analysoi asiakastiedot omaan käyttöönsä/ *data on customers is collected by sales force, analyzed and then used by sales force* []

analysoitu asiakastieto tarjotaan myös arvostettujen asiakkaiden vapaasti käytettäväksi / *analyzed customer data is also provided free for valued customers* []

jokin muu toiminto (selitä lyhyesti)/ *other activity (include short explanation)* []

8. Kuinka järjestelmänne, työvälineenne ja prosessinne mahdollistavat asiakkaiden, toimittajien ja muiden sidosryhmien osaamisen parantamista?/ *How do your systems, tools and processes enable the improvement of competence of your customers, suppliers and other stakeholders?*

mahdollistamalla asiakkaiden yhteyden samoihin tietolähteisiin jotka ovat myös yrityksen asiantuntijoiden käytössä/ *by allowing customers to tap into data sources that are also used by company's own consultants* []

ylläpitämällä asiakastietokantaa johon koko henkilöstö on veloitettu täyttämään tiedot kaikista henkilökohtaisista asiakasyhteydenotoistaan/ *by keeping a customer information database where all staff is required to fill in information about every personal encounter with customer* []

koko henkilöstön käytössä olevien asiakasprofiilien avulla varmistetaan, että jokainen asiakas saa henkilökohtaisen asiakaspalvelun/ *by customer profiles that are made available to staff in order to ensure personal treatment of all customers* []

jokin muu toiminto (selitä lyhyesti)/ *other activity (include short explanation)* []

9. Mitä integroituja järjestelmiä, työkaluja, prosesseja tai tuotteita organisaationne käyttää?/ *Which integrated systems, tools, processes or products are utilized by your organization?*

Selitykset: Toiminnanohjausjärjestelmä kattaa ja yhdistää mm. yrityksen tuotannon suunnittelun ja seurannan, varastotoiminnot, tilausten käsittelyn, taloushallinnon ja laadunohjauksen. Asiakkuudenhallintajärjestelmä kattaa mm. asiakastiedon keräämisen, asiakassuhteen kehittämisen, asiakasryhmien tunnistamisen sekä markkinoinnin, myynnin ja palvelujen ohjaamisen. Toimitusketjun hallintajärjestelmä kattaa mm. yrityksen resurssien hallinnan,

valmistus-, hankinta-, tilaus-, ja toimituslogistiikan ja edellisiin toimintoihin liittyvän liiketoiminnallisen tiedon hallinnan ja analysoinnin. Tietämyksenhallintajärjestelmä tarkoittaa menetelmiä, välineitä ja työkaluja, joiden avulla jalostetaan tietoa ja tietämystä järjestelmissä sijaitsevasta raakatiedosta/datasta.

Explanations: Enterprise resource planning system covers and combines for example company's production planning and follow-up, warehouse and order management, financial and quality management practices. Customer relationship management system covers for example collection of customer data, customer relationship development, recognition of customer segments and marketing, selling and services practices. Supply chain management system covers for example company resource management, production, warehousing, ordering and delivery logistics practice, as well as business information management and analysis for the aforementioned activities. Knowledge management system means methods, means and tools used for developing information and knowledge out of raw data stored within systems.

toiminnanohjausjärjestelmä / <i>enterprise resource planning</i>	[]
asiakkuudenhallintajärjestelmä / <i>customer relationship management system</i>	[]
toimitusketjun hallintajärjestelmä / <i>supply chain management system</i>	[]
tietämyksenhallintajärjestelmä / <i>knowledge management system</i>	[]
koko yrityksen kattavat IT-sovellukset/ <i>companywide IT-solutions</i>	[]
sisäisen verkon yhdistämät tietokannat/ <i>databases connected via company intranet</i>	[]
jokin muu järjestelmien, työkalujen, prosessien tai tuotteiden integrointitapa (selitä lyhyesti)/ <i>other means of integration (include short explanation)</i>	[]

Harjoitettu tietämyksen hallinta yleensä/ *Implemented knowledge management in general*

1. Kuinka kauan yrityksessänne on systemaattisesti harjoitettu tietämyksen hallintaa?/

How long has the knowledge management been systematically exercised by the company?

Enemmän kuin 10 vuotta/ More than 10 years

[]

5 – 10 vuotta/ 5 –10 years

[]

3 – 5 vuotta/ 3–5 years

[]

1–3 vuotta/ 1–3 years

[]

Vähemmän kuin vuosi/ Less than a year

Tietämyksen hallintaa ei harjoiteta systemaattisesti/ Knowledge management is not exercised systematically

2. Onko tietämyksen hallinta pääosin sijoitettu jonkin tietyn toiminnon alle?/ Has knowledge management mainly at your company been placed under a certain function?

Kyllä/ Yes Ei/ No

Sijoitus/ Placement

1. Jos vastauksesi oli Kyllä, minkä toiminnon alle se on sijoitettu?/ If your answer was Yes, under which function has it been placed?

Strateginen suunnittelu / Strategic planning

Liiketoiminnan kehittäminen / Business development

Henkilöstöhallinto / Human relations

Muu, mikä?/ Other, What? _____

Vastuuhenkilöt/ Responsibility

1. Onko päävastuu tietämyksen hallinnasta annettu tietylle henkilölle tai henkilöille?/ Has the main responsibility of knowledge management been assigned to a certain person or persons?

Kyllä/ Yes Ei/ No

Vastuuhenkilöt / Persons responsible

Jos vastasit Kyllä, mikä on tämän henkilön tai henkilöiden asema yrityksessänne? / If your answer was Yes, what is the possession hold by that person?

Tulevaisuus/ Future

1. Mitkä ovat yrityksenne tärkeimmät tietämyksen hallintaan liittyvät kehittämissalueet?/ Which are the most important areas to be developed at your company, in connection to knowledge management practices?

Suunniteltujen määräaikojen noudattaminen/ Keeping planned deadlines	[]
Budjetti/ Budget	[]
Henkilöstön kielteiset reaktiot muutoksiin/ Personnel's negative reactions towards change	[]
Henkilöstöresurssit/ Employee resources	[]
Tietämyksen määrittely ja mittaaminen/ Defining and measuring knowledge	[]
Yritysjohdon sitoutuminen/ Management commitment	[]
Kriittisten tietämystarpeiden tunnistaminen/ Recognition of critical knowledge needs	[]
Koulutuksen määrä/ Amount of education	[]
Yrityksen sisäisen tiedon hyödyntäminen/ Beneficial use of company's internal knowledge	[]
Yrityksen ulkoisen tiedon hyödyntäminen/ Beneficial use of company's external knowledge	[]
Osaamisen suojaaminen ja tekijän oikeudet/ Competence protection and immaterial property rights	[]
Sopivat integroidut teknologiat/ Suitable, Integrated technologies	[]
Työvälineet/ Tools	[]
Tehokas tietämyksen hankinta ja hallinta/ Effective acquire and management of knowledge	[]
Toiminnan tehokkuuden mittaaminen/ Measuring the effectiveness of practices	[]
Vuokratyövoima/ Rental workers	[]
Ulkoistamistoiminta/ Outsourcing practices	[]
Muu, mikä? (selitä lyhyesti)/ Other, what? (include short explanation)	[]

2. Miksi näette juuri näiden alueiden kehittämisen tärkeäksi? Why do you see the development of these exact areas important?

3. Arvioi asteikolla 1 – 4 (1= täysin merkityksetön, 4= erittäin merkittävä) tai "En osaa sanoa", kuinka merkittävä rooli sosiaalisella medialla tulee olemaan yrityksessänne lähimmän viiden

vuoden aikana. / Consider how important role social media will play at your company within next five years on scale from 1 to 4 or "No answer". (1 = completely meaningless, 4= very important).

—

4 .Mihin tarkoitukseen arvelette yrityksessänne käyttävän sosiaalista mediaa lähimmän viiden vuoden aikana?/ For what purpose do you expect your company to utilize social media within next five years?

tiedon jakaminen ja tuottaminen yhdessä/ sharing and co-creating of knowledge

oppiminen/ learning

simulointi/ simulation

rekrytointi/ recruiting

perehdyttäminen/ induction programs

konferenssit/ conferences

verkostoituminen/ networking

markkinointiviestintä/ marketing communication

asiakkaiden ottaminen mukaan tuotekehitykseen/ involving customers with product development

ei mihinkään/ for nothing

jokin muu (selitä lyhyesti)/ some other (include short explanation)

5. Ajatellen tietämyksen hallintaa, minkälaisia muutoksia odotat tapahtuvan yrityksessänne lähimmän viiden vuoden kuluessa?/ Concerning knowledge management, what kind of changes do you expect at your company within next five years?

Yritysluokittelu / *Company classification*

1. Mikä on yrityksenne henkilöstömäärä (tai vuosityöyksiköt)/ *What is your company's headcount (or annual work units)?*

- alle 10 / less than 10
- 10-49
- 50 – 249
- enemmän / more

2. Yrityksenne liikevaihto tai taseen loppusumma (€, miljoonaa)?/ *Annual turnover or annual balance sheet total (€, million)?*

liikevaihto korkeintaan 50 milj.€ tai taseen loppusumma korkeintaan 43 milj.€ /
annual turnover max 50 milj.€ or annual balance sheet total max 43 milj.€

liikevaihto korkeintaan 10 milj.€ tai taseen loppusumma korkeintaan 13 milj.€ /
annual turnover max 10 milj.€ or annual balance sheet total max 13 milj.€

liikevaihto korkeintaan 3 milj.€ tai taseen loppusumma korkeintaan 2 milj.€ /
annual turnover max 2 milj. or annual balance sheet total max 2 milj.€

ei PK-yritys/ *not a SME*

3. Onko yrityksenne informaatio- ja kommunikaatiolalan yritys (ICT-yritys)?/ *Is your company considered as an information and communication technology (ICT) enterprise?*

ICT-yritys/ *an ICT-enterprise*

ei ICT-yritys/ *not an ICT-enterprise*

Kiitos kyselyyn vastaamisesta! / Thank you for replying!