

Knowledge sharing in electronic working environments - experiences and practices of knowledge workers

International Business Communication
Master's thesis
Antti Merilehto
2010

“It ain't what you do, it's how you do.”

Hurricanes

Knowledge sharing in electronic working environments - experiences and practices of knowledge workers

Objective of the Study

The objective of the study was to discover how knowledge workers use electronic working environments (EWEs) to share and communicate knowledge and what are the perceived benefits using EWEs. The case company is a knowledge intensive company operating in sales consulting. Knowledge sharing practices were studied within the case company in order to answer the following research questions 1) How do the employees use EWEs? 2) How do they share knowledge using the EWEs? 3) What are the perceived benefits of the use of the EWEs?

Methodology and the Theoretical Framework

The data in this qualitative single case study was collected by conducting 10 semi-structured interviews and conducting observation in the case company. Several background interviews were conducted before the data collection to gain understanding of the phenomenon. The interviews were conducted in Helsinki in the summer of 2010 and they included employees from all organizational levels to get a comprehensive picture of the use of EWEs in the case company. The theoretical framework of the study is based on a combination of Media Richness Theory and knowledge sharing literature as well as Enterprise 2.0 literature.

Findings and Conclusions

A variety of usage patterns of EWEs were found in the sample. Experienced users were able to identify a large number and more important uses for the technology than the ones who were less active. Notable knowledge sharing practices found in the study were search-based practices. Searches are still mainly conducted based on the hierarchical model. Searching data based on tags is getting popular by demand from employees who have been with the company for a shorter period of time. As literature on knowledge sharing suggests, culture seems to play a vital role in knowledge communication in EWEs. Knowledge sharing practices were based mainly on existing, explicit knowledge.

Key words: Web 2.0, Enterprise 2.0, electronic working environments, international business communication, knowledge, knowledge sharing, media richness theory, tacit knowledge,

Tiedon ja tietämyksen jakaminen sähköisissä työympäristöissä -tietotyöntekijöiden kokemuksia ja käytäntöjä

Tutkimuksen tavoitteet

Tutkimuksen tavoitteena oli selvittää tiedon ja tietämyksen jakamisen käytäntöjä sähköisissä työympäristöissä, sekä erityisesti tietotyöntekijöiden kokemuksia tiedon jakamisesta sähköisissä työympäristöissä. Tutkimuksessa selvitettiin miten tietoa ja tietämystä konkreettisesti jaetaan tapausyrityksessä. Tutkimuskysymykset olivat 1) Miten työntekijät käyttävät sähköisiä työympäristöjä? 2) Miten työntekijät jakavat tietoa ja tietämystä sähköisissä työympäristöissä? 3) Mitkä ovat tiedon jakamisen koetut hyödyt?

Tutkimusmenetelmät ja teorettinen viitekehys

Kvalitatiivisen, yhden tapausyksikön tapaustutkimuksen aineisto kerättiin tapausyrityksestä haastatteluin ja observoinnein kesällä 2010. Lisäksi suoritettiin taustahaastatteluja ennen aineiston keruuta, jotta tutkimuksen ilmiö ymmärretään kaikilta osin. Tutkimuksen näytteeseen kuului työntekijöitä kaikilta organisaatiotasoilta laajan näkemyksen aikaansaamiseksi. Tutkimuksen teorettinen viitekehys koostuu tiedon ja tietämyksen jakamisen kirjallisuudesta sekä viestintävälineen monipuolisuuden teoriasta (Media Richness Theory).

Tutkimuksen tulokset ja johtopäätökset

Tutkimuksessa havaittiin useita tapoja käyttää sähköisiä työympäristöjä. Kokeneet käyttäjät kykenivät tunnistamaan suuremman määrän ja olennaisempia käyttötapoja kuin vähemmän aktiiviset käyttäjät. Merkittäviä tiedonjaon käytäntöjä ovat hakupohjaiset käytänteet. Hakujen osalta käytetään edelleen hierarkiseen rakenteeseen pohjautuvia hakuja. Avainsanoittamiseen pohjautuvat hakukäytänteet omaksutaan yrityksessä vähän aikaa työskennelleiden toimesta. Kulttuurilla on merkittävä rooli tiedon jakamisen käytänteiden muodostumisessa. Pääasiassa yrityksessä jaettiin eksplisiittistä tietoa.

Avainsanat: sähköiset työskentelyalustat, kansainvälinen yritysviestintä, yritysviestintä, tieto, hiljainen tieto, tiedonjakaminen, viestinnän monipuolisuuden teoria

ACKNOWLEDGEMENTS

There is always a start. For my studies, and this thesis, it was a kick start by two of my dear friends who I want to thank here first, Vilho Ahola and Kari Sotamaa, who called me from Domus Academica, while having lunch there in the spring of 2000. They asked what my grades from high school were; because University of Helsinki was looking for applicants. I applied and got accepted and in the fall of 2000 I started my academic studies with Professor, now Emerita, Maijaliisa Rauste von Wright, to whom I'll always be indebted for encouraging me to think critically.

From Academia, Aalto-University School of Economics, or Helsinki School of Economics as it was called when I got accepted in 2006, I would like to extend my gratitude to Professor Leena Louhiala-Salminen for guiding this thesis and her flexibility on some of the things we encountered during this process. Professor Emerita Mirjaliisa Charles who introduced me to the world of international business communication. Ulla Höckerstedt for lecturing one of the best courses I've ever attended. I would also like to thank my fellow students Marja Näsi and Miikka Lehtonen for their guidance and continuous support when I needed it. I would like to thank Professor Emeritus Jaakko Virkkunen from University of Helsinki, Institute of Behavioural Sciences, whose course on learning at work in the fall of 2004 was the driver for me to learn more and thus apply to the Helsinki School of Economics. From the exchange study periods there are two outstanding lecturers who I absolutely want to mention here. Professor Ken Wong from Queen's School of Business, and from University of North Carolina, Kenan-Flagler Business School, Professor Dave Roberts. Both of them taught me so much, knowledge and skills, that I'll be using in the future in the 'real world' as the world outside academia is often described.

This thesis wouldn't have been the same without the brilliant team players from the case company. From Trainers' House I would like to thank Tiina Antturi, Jukka Koskenkanto and Jari Sarasvuo for opening the doors to their world and last but not least Tarja Paanola who introduced me to the company in the first place.

I want to thank people who supported this project. Timo Hentunen for a world class coaching, I would never have gotten where I am without his knowledge and dedication. Minna Mars, Maija Piironen and Olavi Tenni for their effort.

I'm forever grateful to my family and friends for their constant support. You know who I mean. None of this would have ever been possible without you. Waylon Jennings and Johnny Cash for the music. And many unknown people for their doubt and ignorance while I worked the long night shifts as a bouncer, I burnt your attitude as a fuel.

It's all good. Thank You!

Töölö, Helsinki. August 2010
Antti Merilehto

Table of Contents

1 Introduction	1
1.2 The Case Company.....	7
1.3 Research Questions.....	8
1.4 Structure of the Thesis	10
2. Literature Review	12
2.1 Electronic Working Environment (EWE)	12
2.2 Knowledge.....	30
2.3 Knowledge Sharing	36
2.4 Organizational Culture	42
3. Theoretical Framework.....	48
4 Research Methodology and Data.....	55
4.1 Qualitative Single-Case design.....	55
4.2 Semi-Structured interviews and interview themes	56
4.3 Data Collection	59
4.4 Data Analysis and Basic Information on the Interviewees.....	62
4.5 Trustworthiness of the Study	63
5. Findings: Knowledge Sharing using EWEs in the Case Company.....	66
5.1 The Use of EWEs in the Case Company	66
5.2 Knowledge Sharing	71
5.3 Perceived Benefits	79
5.4 Suggestions How to Enhance the EWEs	82
5.5 Cultural Implications	83
6. Discussion.....	88
7. Conclusions	91
7.1 Research Summary	91
7.2 Main Findings.....	92
7.2 Practical Implications	93
7.3 Limitations of the Study	95
7.4 Suggestions for Further Study	96
REFERENCES	99

APPENDICES

Appendix 1: The interview framework for the semi-structured interviews

List of Figures

Figure 1. Research Area of the Thesis	9
Figure 2. The Evolution of Knowledge Management Technologies	15
Figure 3. Value Proposition of EWEs	16
Figure 4. Knowledge Management Styles	34
Figure 5. Weak and Strong Ties	42
Figure 6. Hierarchy of Media Richness	51
Figure 7. Theoretical Framework for Knowledge Sharing in EWEs	53
Figure 8. Case Study Process	56
Figure 9. Hermeneutic Circle	61
Figure 10. Maintaining Chain of Evidence	64
Figure 11. Matrix of organization level and time in organization	84

List of Figures

Table 1. The elements of Enterprise 2.0.....	19
Table 2. Case Study Tactics for Design Test.....	63
Table 3. Most recent use of EWE	67
Table 4. Applications used by the interviewees	70

1 Introduction

The relation between knowledge within the company and its success has been discussed in several studies. The motivation for the present author to study the topic derives from the essential purpose of the firm, which is to add value to the owners. Acknowledging that knowledge exists within the firm is surely not enough. How knowledge is created, shared and utilized is crucial for a company to perform well, again it is not enough. All of these functions have to earn more profits than what is invested to carry out these functions. Theories are a good starting point, but the complex reality is where business takes place. This thesis starts by introducing the relevant views on areas of interest for this thesis and later dives into the realities of knowledge sharing.

Of all the resources that a firm has, the greatest ability to be the source of sustainable competitive advantage is knowledge (Gupta & Govindarajan, 2000; Dierickx and Cool, 1989). Dunford (2000) states that resources for which firms compete are more likely to be knowledge rather than the ownership of land and access to capital. Several studies (e.g. Grant, 1996; Kogut & Zander, 1992; Nonaka & Takeuchi, 1995) show that the amount of knowledge is not seen as a defining factor, but rather the organization's capacity to share knowledge among its personnel and teams. How to apply that shared knowledge to perform important activities more efficiently is the phenomenon that is increasingly seen as the source of competitive advantage in many industries. Kogut and Zander (1996, p. 503) suggest that a firm should be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge.

There has been a growing interest among companies¹ to become better in knowledge sharing by utilizing web 2.0 tools, or Enterprise 2.0 as they are called when used in a corporate setting. The aim of using Enterprise 2.0 applications is to enhance communication among knowledge workers so that firms would achieve higher levels of competitiveness. Drucker (1999, p. 79) states that the most important contribution

¹ In this study, the terms "firm", "company" and "organization" are used interchangeably.

management needs to make in the 21st century is to increase the productivity of knowledge work and knowledge workers. Knowledge management is thought to be crucial to organizational performance (Kogut and Zander 1992; Liebeskind 1996). Argenti & Forman (2002) discuss how the media environment is changing and how the increasing speed of communications due to the Internet has changed the way organizations communicate. Pfeffer and Sutton (2000, p. 166) argue that interpersonal communication is essential for knowledge based companies.

There are many situations when knowledge exists in the company but it is not properly communicated to all the people who could utilize it. Pfeffer and Sutton (2000) describe these as knowledge gaps that often exist in organizations between what people know and what they actually do. According to Nonaka and Takeuchi (1995, p. 61) knowledge in organizations is created and expanded through social interaction between tacit knowledge and explicit knowledge.

In the information age, business models are marked not by incremental but fundamental and radical changes (Malhotra, 2000). To be able to compete successfully in rapidly changing markets, firms need to gather, share and cultivate their knowledge. Several studies (Doz, Santos & Williamson, 2001; Grant, 1996; Kogut & Zander, 1993) have shown that the ability to effectively share knowledge internally is fundamental for maintaining a competitive advantage for multinational firms.

Due to the rapid evolution of web-based communication tools, Hearn, Foth and Gray (2009) consider that academic literature is currently lagging behind the pace of technological change. The research on intranets has concentrated on, for example, who is allowed or whose responsibility it is to produce content to the intranet (see Lehmuskallio, 2008). With Enterprise 2.0 tools the question becomes irrelevant for the most parts. Especially information that is used daily can be shared by all the users in electronic working environments.

However, there is still relatively little research on knowledge sharing in electronic platforms in particular using Enterprise 2.0 applications. Lehtonen (2009, p. 102) suggests that as online collaboration has increased vastly during recent years but the research has not yet followed, knowledge sharing in virtual environments should be studied. Jablin and Sias (2001, p. 840) propose that to have communication competence in the information age one needs to understand and be able to use computer-mediated communication systems “to send and receive messages and to obtain, process, and interpret information at all levels of the organization”.

Another gap that this thesis aims to bridge, in addition to the gap related to the use of Enterprise 2.0 applications mentioned above, is the one related to the size of the company. Knowledge sharing practices of multinational companies (MNCs) have been studied widely (see Mäkelä, Kalla & Piekkari, 2007; Kogut & Zander, 2003; Szulanski, 1996). However research on knowledge sharing in micro, small and medium-sized enterprises² (SMEs) has been on the agenda of notably fewer scholars (Thorpe et al., 2005; Wong and Aspinwall, 2004). According to the European Commission (2003) SMEs have a significant role in the economic development. In most European countries SMEs are an important source of employment, innovation and national wealth-creation. In the enlarged European Union of 25 countries, some 23 million SMEs provide around 75 million jobs and represent 99% of all enterprises (European Commission, 2003).

This thesis aims to uncover how virtual platforms are used by knowledge workers and what are the benefits for the firms. Weick and Roberts (1993) suggest that firms’ knowledge is emergent. The emergent structure of working environments is needed first because knowledge workers, not the IT-department, are the experts on how they want to use their tools and second, as stated by Gold, Malhotra and Segars (2001), because autonomy is viewed as a prime factor in creating a prosperous learning environment

² The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.

Grover and Davenport (2001, p. 5) claim that knowledge management is becoming an integral business function for many organizations as they realize that competitiveness stems from effective management of intellectual resources. Still a key question remains to be unanswered: how do employees as knowledge workers actually use the tools provided to them? And after the revelation of the usage patterns, what are the perceived benefits to their work?

Against the background discussed above, the objective of this thesis is to examine knowledge sharing in electronic working environments, with a particular focus on knowledge sharing using Enterprise 2.0 tools. Consequently, the main research questions were formulated as follows:

How do knowledge workers use an electronic working environment?

How do they share knowledge while using electronic working environments?

What are the benefits from using Enterprise 2.0 tools, as perceived by the knowledge workers?

The research questions will be elaborated in Section 1.3.

As stated earlier, knowledge and sharing of it are vital to firms. However, few researchers (Gold et al., 2001; Haas & Hansen, 2007) have combined knowledge sharing and the business value of it. As Haas and Hansen (2007, p. 1133) emphasize, understanding why and how a firm's knowledge capabilities translate into performance of knowledge work. This thesis aims to take part into this discussion, concentrating on knowledge sharing practices in electronic working environments.

The ground for studying knowledge sharing from a communications perspective stems from the definitions of knowledge management and knowledge sharing. Knowledge management involves processes (Bukowitz & Williams, 1999) and communication (Nonaka & Takeuchi, 1995) between individuals with different backgrounds (Mäkelä, Kalla & Piekkari, 2007) that in essence is knowledge sharing (von Krogh, 1998). Von Krogh (1998) views communication and trust as critical success factors for the firm.

For the purpose of this thesis, the distinction between data, information, and knowledge follows the main stream view of current literature (e.g. Davenport and Prusak, 1998). Data is viewed as isolated recordings that are regularly generated automatically. Data cannot be used directly to answer questions. Information is connected, condensed or generally processed data that allows an individual to answer questions (Eppler, 2007). Knowledge enables an employee to ask relevant questions. It refers to the capability of an individual to solve problems (Probst, Romhardt & Raub, 1999). Information only becomes knowledge, if a person interprets that information correctly, connects that piece of information with his or her prior knowledge, and can apply it to problems or decisions (see also Alavi and Leidner, 2001)

Communication in firms is not carried out solely by communications professionals. Today the knowledge workers spend a vast amount of their time searching for knowledge, information and data that they need. This is done by means of communication. Argenti (2006, p. 358) defines corporate communication as an attitude or set of beliefs that people have about what and how to communicate and the inherent value of such efforts to communicate. Argenti (2006, p. 362) also acknowledges that the change in technology has changed the communication ecology: “(...) with access to e-mail, blogs, and social networking sites for sharing corporate information, most employees today are themselves corporate communication managers and potential publishers.” Ihator (2001) argues further that the transparency of the Internet has changed corporate communication.

Kalla (2006, p. 11-12) recognizes that it is important to know why people communicate in organizations, in addition to how they communicate. This thesis aims to understand the “why” through “how”. This is achieved through interviewing and observing what specific communication acts that knowledge actually workers engage in.

The topic of this thesis was inspired by Janz and Prasarnphanich (2003) who state that with the prevalence of information technologies that permit asynchronous, at-a-distance collaboration, future research needs to address how knowledge creation, dissemination, and learning are affected by a more virtual, technologically “wired” context. Hansen, Nohria, and Tierney (1999 p. 116) state that knowledge management should not be seen as a separate function, but embedded and aligned with the firm’s strategy. If not, firms risk losing the benefits, which, according to Hansen et al. (1999 p. 116), are highest in the context of HR, IT, and competitive strategy. This motivates the present author to study whether or not knowledge sharing truly is embedded in the strategy in the case company studied.

The aim is to study how EWEs are used, what are the perceived benefits to the knowledge workers and what are the benefits for the firm. Any change in the system of the firm can result in a vast change in the collective behaviour. This study is not suggesting a general theory of EWEs but is a more like a frame of time, describing “what was” in the context of the firm at a certain time. Guzzo & Dickson (1996, p. 327) describe the complex nature of organization that is visible in teams, so that changes in team effectiveness can have consequences for change in the larger system, which is typical for complex adaptive systems.

As a growing number of firms are using EWEs a study on their use is needed. Majority of companies that operate geographically dispersed use one or more applications that are presented in this study. Although the data of this study is collected from a company that operates in one country, similar communication structures are used internationally as the platform on which the EWE is built is provided by Microsoft.

1.2 The Case Company

This section gives a brief introduction of the case company of this thesis

The case company is a technology-dependent training company that helps its customers to grow. The case company is a Finnish public company, located in Helsinki, Finland. The company was merged from two companies in the beginning of 2008. At the time of this study the company employed 230 people. As the whole earning logic is based on utilizing knowledge, the firm offers a great setting for conducting research on knowledge sharing.

The business idea of the case company is to translate the customer's vision into strategic everyday operation, and competitive advantage into customer benefits and cash flow. This is done using three disciplines: Marketing & Communications, Training, and Management Systems. Marketing and communications is specialized in reaching the customers of the customer, with the purpose to support business growth. It implements a variety of marketing and sales support tailored to customer needs. Marketing aims to improve the customer's market position and to change the operating environment. Training includes business coaching, including business coaching for the whole staff or personalized, individual coaching. Process business operates with management systems which are delivered as Software as a Service (SaaS).

According to the case company, in order to capitalize on a growth idea, the practices essential for growth should be integrated into the enterprise's everyday operations and processes. This is reached by means of management systems and by strategically commercializing processes and successfully turning concepts into saleable products and business-critical growth management services. These services are based on SaaS services, which deliver quantifiable results on productivity growth in marketing, sales and cooperation management. SaaS services aim to reduce the cost of additional sales and to improve the chances of success. The case company has built the EWE that was researched in this thesis. According to the company it is a solution that supports strategic activity.

According to the company, the EWE improves the productivity of companies by focusing on the value and human process and time management on strategically important issues. It makes redeeming promises, innovation and objectives a shared responsibility in the whole company, and gives managers tools for real-time monitoring.

The enabling features of the EWE, as described by the case company are:

- managing and distributing information throughout the organization quickly and effectively
- modelling, digitizing and improving processes and working methods
- locating the right competencies and experts in the organization quickly and easily
- learning as a community at lower training costs
- supporting collaboration and teamwork regardless of time and space
- deploying a continuously developing intranet quickly and cost-effectively

1.3 Research Questions

This section describes the research area and the three research questions of this thesis. A brief explanation is offered after each question on how the particular research question is addressed in the research.

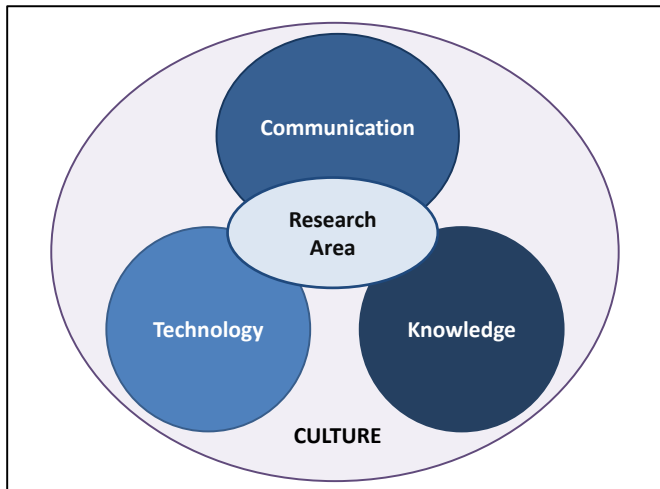


Figure 1. Research Area of the Thesis

Figure 1 explains the research area of the thesis. Knowledge, sharing of knowledge that can be viewed as communication and the technology that facilitates virtual communication are all surrounded by and influenced by the culture as explained in Section 2.5.

1. How do the employees of the case company use the Electronic Working Environment?

The first research question seeks to map the actual usage of EWEs that the employees carry out in their everyday work. The purpose is to discover what are the most commonly used applications and why they are used.

2. How do they share knowledge using the EWEs?

The objective of the second research question is to identify the knowledge sharing practices within the firm i.e. how knowledge is shared, what applications are used and what kind of knowledge is shared. The applications of the EWE that was studied in this thesis are described in section 2.1.

3. What are the perceived benefits of the use?

Employees seldom practice anything that does not add value to their individual tasks. As the previous research questions have concentrated on the question “how”, the purpose of the third research question is to find out “why” employees use the EWEs. These findings are then reflected on the literature.

1.4 Structure of the Thesis

This section describes the structure of the thesis. Chapter 1 has introduced the background to knowledge sharing research and discussed the necessity of knowledge management for successful companies. Also the case company has been briefly introduced and the research objectives have been outlined.

The thesis is divided into seven chapters. Next, Chapter 2 will introduce the relevant literature on technology and knowledge sharing as well as on organization and culture. The chapter first introduces the significant features of Enterprise 2.0 and then discusses the dimensions of knowledge and how knowledge sharing is made possible in organizations.

Chapter 3 presents the theoretical framework for this thesis. The chapter introduces the media richness theory that together with the literature presented in Chapter 2 guides this study toward understanding how and why employees communicate when they use EWEs.

Chapter 4 introduces the research design and the methods used to accomplish the empirical part of the study. The chapter explains qualitative single-case design, semi-structured interviews, the collection and analysis of data and finally the trustworthiness of the study is discussed. Chapter 5 presents the findings of the empirical case study. The chapter is divided into five sections based on the categories created in the analysis phase. Chapter 6 presents discussion on the findings of Chapter 5. Chapter 7 will

conclude the thesis. The final chapter will first present the main findings of the present study, and then discuss the implications of the findings, followed by the recognized limitations that the present thesis has. Last, suggestions for further research are also provided.

2. Literature Review

This chapter explores the relevant literature. First the electronic working environment is defined and the elements of electronic working environment are presented. Knowledge and knowledge sharing are both described and defined for the purpose for this thesis. Finally to conclude the setting in which this study takes place, organization and culture are discussed for the relevant parts.

2.1 Electronic Working Environment (EWE)

This section defines electronic working environment and introduces some of the possible elements of its structure. Also the history and evolution of the platform are discussed.

According to Vartiainen (2006, p. 16) *electronic working environment* refers to a virtual place or virtual working space. He argues that the internet and intranet provide a platform for complex communication tools, e.g. collaborative working environments.

For the purpose of this thesis electronic working environments (EWEs, hereafter) are defined as platforms which are being used from a browser, are limited to a certain group of users, often the whole organization and they use one or more of the Enterprise 2.0 applications that are presented later in this chapter. EWEs share same features, and especially desired end states, with knowledge management systems of the past without being one. The difference between knowledge management systems and EWEs is in the principles. Knowledge management systems relied on a centralized model with limited rights to upload and content was moderated before publication. In a EWE, by comparison, activities are decentralized and people add content voluntarily without moderation (Levy, 2009, p. 130). It must be noted here, that because the technology — and hence term — are fairly new, EWEs lack established, universal and exclusive definition.

There are several definitions used in the field of knowledge management. The term knowledge management has been used from 1995 onwards, when the emphasis was on the information systems, not on the users as stated by Tuomi (2002, p. 1). As mentioned earlier, EWEs share similar features with knowledge management systems. EWEs are not knowledge management systems, nor are EWEs purely intranets. Rationale why EWEs are not intranets stems from the difficulty of describing what an intranet actually is, as Lehmuskallio (2008, p. 96) appropriately states: “There are probably just as many definitions for intranets as there are companies that use them.” Although EWEs fit some of the technical definitions of intranets, such as: intranets are private networks that reside inside the firewall, use TCP/IP as the transport protocol, and have the web browser as the client interface (Bidgoli, 1999), EWEs are not intranets *per se*.

The reason why the focus of this thesis is on EWEs and not intranets is exhaustively communicated by Stenmark (2002, p. 2): “Instead of users actively sharing knowledge on a peer-to-peer level, the intranets have become one-way communications channels for corporate information.” The features of EWEs can include all of those that are needed from an intranet, but the defining feature, the essence of EWEs are in the communicative, collaborative nature as elaborated later in this chapter. This thesis investigates the uses of EWEs in knowledge sharing. Naturally EWEs have various other uses for firms, such as having an EWE as an innovation platform. These uses have been discussed in other studies (see e.g. Alahuhta, 2010; Hansen, 1999) but are not discussed further in this thesis.

The firms’ interest in enhancing their knowledge, managing or leading it, is based on the notion that putting knowledge in to its best use is the basis of competitive advantage and, the source of cash flows for many companies, as was commented in the previous chapter. The reason for firms for capitalizing on Enterprise 2.0 technologies, like EWEs, is derived from the capability of the technologies to increase users’ capacity and speed to acquire, produce, communicate, and use knowledge (Chi, 2008, p. 91). Komito (2008, p.84) states that direct cost drivers that support the spreading of EWEs, derive from technological developments like inexpensive online storage, reasonably priced and

widely available fast broadband access to remote sites, and a vast increase in the supply of inexpensive digital devices that can store audio and visual data.

2.1.1 History and evolution of EWEs

This subsection will draw upon the information technology (IT) literature to justify why EWEs are studied in the present thesis. This is done in order to clarify how the current form of an EWE is unlike any of its predecessors and why this is important for knowledge communication and knowledge sharing.

First it is important to realize, as Dalkir (2005, p. 12) explains, that knowledge management as a phenomenon has existed much longer than its concept. EWE-like systems started to develop when the focus of the corporations shifted from competitive intelligence to business intelligence in the beginning of the 1990s. Chi (2008, p. 90) argues that collaborative technologies were experimented in companies in the late 1990s because business intelligence focused more on human interaction than on information systems, like the competitive intelligence systems before. According to Tuomi (2002, p. 6) the driver for creating collaborative tools for firms derived from the research on organizational cognition. Tushman and Nadler (1978) say that organizational cognition research is historically inspired by the same information processing view that was the foundation of cognitive theories of human mind.

The different phases of information systems can be described with the following figure.

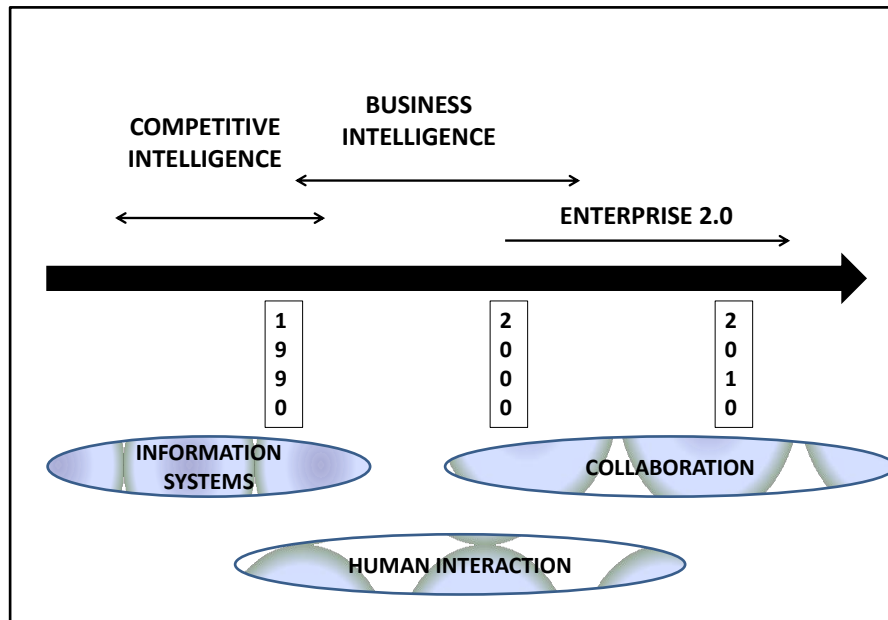


Figure 2. The Evolution of Knowledge Management Technologies

In the Figure 2 the phases are shown above the timeline and the matching areas of interest are shown below. Naturally there are no exact dates, but the direction from information systems towards human interaction is visible. The Figure 2 is created by the present author based on the literature on knowledge management.

The shift toward constructivism came in the 1980s when Weick's studies in organizational cognition research introduced constructivist ideas in to organization science (e.g., Bougon, Weick, & Binkhorst, 1977; Daft & Weick, 1984; Weick, 1995). This research highlighted the fact that organizational knowledge cannot be objectively recorded and stored in databases (Tuomi, 2002, p. 6). The most important finding from Weick (1995) in the context of this thesis is that organizational knowing is an active process where people try to make sense of their environment. How they actually do it is in the field of interest of this thesis.

As described above, the need for highly usable, modern platforms that enhance the profitability of the company derive from the basic assumption of a firm: that by specializing in knowledge acquisition and creation, the company can coordinate the efforts of its many specialists (Grant, 1996, p. 113). The more the success of a firm is dependent on its knowledge the more essential are its capabilities in knowledge management and knowledge sharing (Prahalad & Hamel, 1990). Nonaka and Konno (1998, p. 47) claim that combining new explicit knowledge with existing information and knowledge generates and systematizes explicit knowledge within the firm and thus the combination of explicit knowledge is most efficiently supported in collaborative environments utilizing information technology.

EWEs, like any software are only tools. The difference comes in that the benefits for the individual and for the firm are correlated to the frequency of the actual use of EWEs. This is further explained in Subsection 2.1.2.

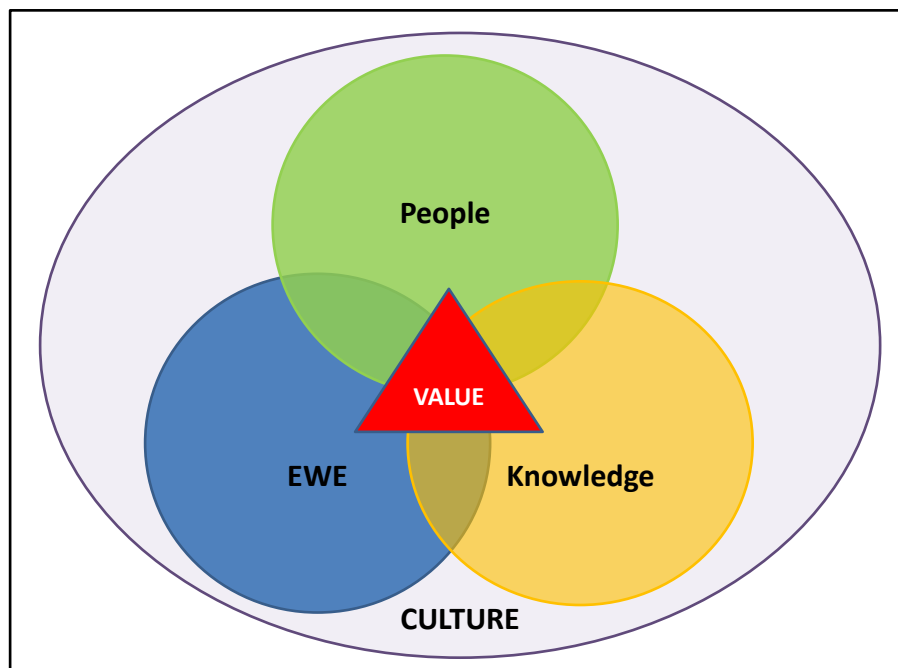


Figure 3. Value Proposition of EWEs

Adapted from Pór & Molloy (2000).

EWEs generate value for the firm through interaction of the elements described in Figure 3. All the elements are intertwined and unable to create value without the other elements. For example, people would not be able to communicate virtually without EWEs. If EWEs would exist with the people but without knowledge, very little value would be created. And naturally, without people who create, generate and make sense of the knowledge, the structure would be of no use. As Figure 3 shows, all the elements are surrounded and influenced by the culture of the firm.

EWEs need a critical mass of users to be effective (McAfee, 2009). Without sufficient usage they cannot deliver value for the organization. The intertwined relation of culture of the firm and the effectiveness of EWEs is further elaborated in Subchapter 2.5

2.1.2 Enterprise 2.0

The term Enterprise 2.0 was coined by McAfee (2006, p.23). He describes it as “those platforms that companies can buy or build in order to make visible the practices and outputs of their knowledge workers”. Unlike the previous generation of knowledge management tools, where the centre of attention was on the technology, Enterprise 2.0 focuses on the practices and the output (McAfee, 2006). The features of Enterprise 2.0 are similar to those of Web 2.0, but as Chi (2008, p. 90) states, when they are used in a corporate environment they are called Enterprise 2.0. Levy (2009, p. 125) defines the term as follows “Enterprise 2.0 symbolizes implementation of the WEB 2.0 infrastructure and/or tools by organizations”.

Web 2.0 again is defined by Kaplan and Haenlein (2010, p. 61) as a platform where content and applications are created and published and continuously modified by all users in a participatory and collaborative fashion. Kolbitsch and Maurer (2006) argue that the significant difference compared to the precursors is that Web 2.0 technologies draw from the expertise of all the users. Creese (2007) claims that Web 2.0 tools like, wikis, blogs and RSS feeds create a fundamental shift on the organization’s collaborative knowledge, which again has an impact on customer relations, workplace demographics and the firm’s culture.

Centralized publishing practices of Web 1.0 were replaced by blogs, wikis, and collaborative projects in Web 2.0 (Kaplan & Haenlein, 2010, p. 61). The advantages of using Web 2.0 technologies for firms have been acknowledged in the literature (e.g. Levy, 2009; Wagner & Bolloju, 2005). One of the direct improvements is that content management is not dependent on only few employees. Content management here can be defined as the “process of collecting, managing, and publishing information to whatever medium you need” (Boiko, 2005, p. xv). Content-management allows all willing employees of the firm to contribute, share, edit, and reshape content. Pullman and Gu (2008) point out that because in knowledge intensive firms everyone is in knowledge creation; storing, sharing, and publishing knowledge within the system, meaning that when implementing a new system nearly everyone has to change his or her writing practices to fit to new way of sharing content. Pullman and Gu (2008) argue further that changing the way people work is a challenging task, particularly if the changes most clearly benefit the firm while doing nothing visibly beneficial for the individual users. The implications to the culture are discussed in the Section 2.5 of this chapter.

Implementing new tools is valuable for the firm only if they enhance the performance by adding to effectiveness and efficiency. Hackman (as cited by Janz & Prasarnphanich, 2003, p. 362) suggests that one component of effectiveness is that work outputs meet expectations of those who review them—such as a supervisor or customer. Efficiency can be defined as the amount of work the team produces with a given amount of resource inputs (Janz and Prasarnphanich, 2003, p. 362).

As Hearn et al. (2009) point out; Web 2.0 applications were first used by corporations to interact with existing customers and to maintain the corporate image. They argue further, that Web 2.0 offers a more open, collaborative, and therefore a more participatory experience than the Web 1.0. Participation can be viewed as level of collaboration that varies across the spectrum of the tools used. According to Chi (2008) in the light end of collaboration is voting and in the heavy end is co-creation, such as Wikipedia.

McAfee (2006, p. 23) uses the acronym SLATES to indicate the six elements of Enterprise 2.0 technologies.

Table 1. The elements of Enterprise 2.0

Element	Function
Search	allowing users to search for other users or content
Links	grouping similar users or content together
Authoring	including blogs and wikis
Tags	allowing users to tag content
Extensions	recommendations of users; or content based on profile
Signals	allowing people to subscribe to users or content with RSS feeds

As can be seen from Table 1, the six elements of Enterprise 2.0 enable employees in firms to author, link and tag with only a web browser and are hence easy to use (McAfee, 2006, p. 25). The developers of these applications do not impose any preconceived notions on the structure or output. As McAfee (2006, p. 25) emphasizes, the structure is emergent. This is a vital characteristic of EWEs as explained next.

As briefly explained in Chapter 1, the emergence of structure and autonomy in conducting the work are key issues in knowledge work. First, the emergent, non-predefined structure is needed because it is impossible for the IT department to know what kind of uses knowledge workers will discover (McAfee, 2009). Second, autonomy is viewed as an important dimension of learning climates that facilitate learning among individuals or groups of individuals (Gold et al., 2001; Slater & Narver, 1995). Autonomy refers not only to the process but also to the tools by which the knowledge work is done. Campion, Medsker, and Higgs (1993) suggest that increasing levels of autonomy will enhance outcomes of work in terms of work satisfaction and performance. Janz and Prasarnphanich (2003, p. 372) argue further that in order to learn in a cooperative manner, knowledge workers should be given the freedom—that is, the

autonomy—to decide how to work, how to schedule work, and how to assign resources to their work.

This view is supported by O’Dell and Grayson (1998) who believe that employees should have the opportunity to self-organize their knowledge as well as the communication networks used to solving new or existing problems and to share knowledge. For many companies the question is not whether or not they should lead their knowledge, but how to do it.

2.1.3. Channels and platforms

Following the categorization by McAfee (2006), majority of the information technologies that knowledge workers use for communication, fall into two categories; channels and platforms. The first category is channels, for example e-mail and person-to-person instant messaging. E-mails and instant messenger do not fit the definition of platform as they are not published either on a publicly accessible website or on a social networking site accessible to a selected group of people (OECD, 2007; Kaplan & Haenlein, 2010). In the channels, digital information can be created and distributed by anyone, but not many people have access to this information, once it is created.

The second category is platforms like intranets, corporate Web sites and information portals. The platforms are the opposite of channels in that their content is generated by a small group, but after it is created it is widely visible to many. For the purpose of this thesis, the above mentioned categorization is used.

According to Drucker (1999) there is a need for better tools for knowledge workers to raise the productivity. The driver is the sometimes poor usability of the current tools. In a survey conducted on knowledge workers in United States, all of them used email. Of the respondents 26% felt it was over used in their organizations, 15% felt that it actually diminished their productivity (Davenport, 2005, p. 126). Time and effort wasted on communicating knowledge via one-to-one channels, makes knowledge intensive firms hurt compared to the rivals that use platforms in their knowledge sharing.

The use of platforms is based on the idea that for any information to be valuable, the users have to be able to find what they are looking for (McAfee, 2006, p. 23). Naturally the use itself is not enough. The information has to be indexed or tagged to match the information or data. Tagging is discussed later in this section.

Platforms according to Hearn et al. (2009) enable a world of networked co-creation. Creating in a network environment contrasts with the hierarchical structure of the one-to-many broadcast paradigm that according to Hearn et al. (2009) is still predominating in much of corporate communications. The outspoken fears related to network structure — and Enterprise 2.0 in general — where sharing knowledge is lifeline for any progress to take place are often security related. Levy (2009, p. 127) suggests that the actual fear is losing control.

As Davenport and Prusak (1998, pp. 141-142) note the technologies, though exiting, are only good for knowledge management and knowledge sharing when extensive behavioural, cultural and organizational change takes place. This is the responsibility of the management. In emphasizing that Enterprise 2.0 is not solely about technology, Davenport and Prusak (1998, p. 173) argue that if a firm spends more than a third of the budget in technology it no longer is a knowledge management project but a IT-project. Gold et al. (2001, p. 186) claim this often being the case. This view stresses the cultural aspects and importance of the shared view of the knowledge sharing. Hearn et al. (2009) support this further in saying that the focus of Web 2.0 is not in the technologies per se, but in the communicative and discursive culture that they provide.

Reflecting to the previous paragraph, one of the essential functionalities of EWEs is the conversational nature that they offer. Nishida (2002) recognizes conversations to be useful in knowledge exchange and extraction. Brown (2000) argues further that storytelling is a fundamental form of knowledge transfer.

In explaining why stories are in the centre of business practices, Aaltonen (2007, p. 185) states that stories are a rare vehicle of communication, in a sense that they are capable

of explaining the causal and temporal order of things. According to Aaltonen (2007) a human being, in his sensemaking activities, is essentially a storytelling animal, i.e., he understands and explains his life in the form of stories and that the world can be understood as a continuous process of re-creation. Aaltonen (2007, p. 184) says that people have always been connected to responsive communicative processes within their social worlds: through the web and its technological environment (Barabasi, 2002), or as Granovetter (1983) explained with the weak ties of their social environment. Brown and Duguid (1991) found that storytelling enhances learning because learners construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the people involved. Storytelling can be the connector between past events, new information and other people involved in the situation.

Traditional communication channels have not offered firms a virtual venue for storytelling whereas Enterprise 2.0 technologies are conversational by nature. Much of the knowledge creation and sharing is carried out through a process of discussion with questions and answers, collaborative editing or through a process of storytelling (Wagner & Bolloju, 2005, p. ii). As Hearn et al. (2009, pp. 56-57) state, the communicative ecology consists of three layers that co-evolve together: the social, content and technology.

Next the main applications of Enterprise 2.0 are defined for the purposes of this thesis. A common denominator for all of these applications, according to Hearn et al. (2009), is that every time a piece of knowledge is iterated it adds communicative value for all the users. Jackson (2007) argues that interest in Web 2.0 technologies will rise as computer-based communication becomes an organic part of business practices.

2.1.1 Wikis

Wikis are structured websites. They allow and encourage the editing of existing content. Users can and should incrementally improve each others' contributions. To avoid undesired modifications, wikis keep extensive Web page histories and permit viewing and the rollback of earlier versions when needed. With their focus on incremental knowledge creation and enhancement, version management, and multiuser participation, wikis can effectively be an open source technology for knowledge content (e.g., Wagner & Bolloju, 2005, p. iv; Levy, 2009, p. 124).

In the context of a firm, Wikis are generally good tools for research, information technology, and customer service areas that need to create a shared knowledge repository (Fichter, 2005, p. 50). Other uses for Wikis in firms are dissemination of knowledge; skills transfer or teaching new things to others. Majchrzak, Wagner and Yates (2006, p. 100) have identified several specific uses for Wikis in organizations including: software development, e-learning, project management, posting of general information and knowledge management, communities of practice and user groups, ad hoc collaboration, technical support, marketing and customer relationship management, resource management, and research and development.

Another identified use for firms is the sharing of knowledge in best practice communities; this is especially true when firms have similar functions that are geographically dispersed. Wikis can lead to incremental development in these practices (Wagner & Bolloju, 2005, p. v) as they are updated constantly. Fichter (2005, p. 50) suggests that creating internal Wikis can be restricted as needed to particular teams, groups, or departments within the company.

Louridas (2006) emphasizes a Wiki's cultural fit to the organization, because to work properly the culture has to have a certain amount of tolerance and openness. Louridas states (2006, p. 91) that a wiki gives a voice to everybody within the firm and supports cooperation based on trust. This is important because unlike traditional software, Wiki needs a critical mass of contributors to be effective. Mastery of traditional software is in

the hands of the individual employee. The reason why culture has a vast impact on the true usability of the Wikis, as well as other Enterprise 2.0 applications, is that a sufficient number of people are needed as active users for any individual to benefit. The effect of organizational culture is discussed in Section 2.4. In brief it can be said, that the same quality that makes EWEs powerful tools, the discursive nature, is also the discipline that is most difficult to adopt for many organizations.

A criticism of Wikis is the lack of transparency in authoring. Users can find it difficult to trust the content of the Wiki without knowing who created it, while some might lack motivation to contribute if they receive no credit (Chi, 2008, p. 90). A solution in an enterprise setting is identifying contributors. McAfee (2009) presents the benefits of identifiable authors to be that not only knowledge but also the ones who know can be identified and contacted for further information. The implications of identifying authors in transforming nonexistent or weak ties into strong ties are further elaborated in Section 2.3 where knowledge sharing is discussed.

2.1.2 Blog

A blog is a personal diary, a two-way Web-based communication tool. These pages written by the users form together a sub-world in the Internet known as the Blogosphere (Levy, 2009, p. 124). Many blogs are interconnected, some more densely than others, as bloggers who read other blog entries link to them and reference them in their own blogs (Murugesan, 2007, p. 35). To enhance readability and success in searching particular information, blogs are dated and time-indexed (Wagner & Bolloju, 2005, p. vi). Fichter (2005, p. 49) acknowledges as the advantages of blogs their ability to spread ideas quickly, as well as connecting loosely joined communities. Knowledge can be shared via blogs by telling stories. When using stories for sharing knowledge they are not necessarily being used to generate action but rather as Denning (2006) explains, to show cause and effect.

Lee, Hwang and Lee (2006) have recognized two main strategies for corporate blogs; using a bottom-up strategy or using a top-down strategy. Bottom-up blogging strategies often focus on product development and customer service content, while top-down blogging focuses on thought leadership or promotional content. According to Lee et al. (2006) this allows organizations to consider blogging as a new tool for communication, rather than focusing on control issues.

2.1.3 RSS

RSS (Really Simple Syndication) informs users of updates to blogs or Websites they're interested in. Feed reader or aggregator programs can check a list of feeds on the user's behalf and display any updated articles they find. RSS automatically filters the topics of interest of the reader. (Levy, 2009, p. 125; Murugesan, 2007, p. 35).

2.1.4 Workspace

Workspaces create a communication platform, a knowledge market, for a certain predefined group of employees. Within the workspace the knowledge seekers and knowledge senders can exchange knowledge. According to Guzzo and Dickson (1996) this exchange in turn can lead to superior performance. Workspaces can be created based on function, like sales or technical support, or based on customer accounts. The balance between quality and quantity of people has to be evaluated separately according to the objective of the workspace. Too broad an audience does not invite the true experts to contribute if the discussion takes place on a generic level. On the other hand if the workspace does not have sufficient amount of active users the collaboration within the workspace can easily fade away.

Pinelle, Gutwin and Greenberg (2003) believe that there is a set of basic actions that take place in shared workspace collaboration. These basic actions are of mechanical nature like communicating with other employees, following what others are doing, finding access to shared tools or discovering empty spaces in the workspace, and transferring objects and tools to others. Even though these actions of collaboration are widespread in real-world shared workspaces, Pinelle et al. (2003) argue that they are

often difficult in virtual workspace. This partially because in human contact employees have more cues to interpret the message. Virtual communication is never as rich medium of communication as face-to-face communication is and this creates challenges for virtual work. The richness of different mediums is elaborated in Chapter 3.

2.1.5 Profile page

Like social network sites that are used for non business purposes, EWEs also have a profile page where employees can share relevant information about themselves. Most commonly this is a listing of vital statistics, knowledge base, interests or a photograph (Golder, Wilkinson & Huberman, 2007; McAfee, 2009). The function of a profile page is to help people find the right information on other people when they search it. Less obvious is the function of a profile page in larger organizations, where employees do not know each other. On occasion it may be needed to present an overview of the knowledge worker's relevant skills along with previous professional experiences and credentials (Lunce, Iyer, Courtney & Schkade, 1993) in order to build trust and enable an appropriate atmosphere for effective knowledge sharing.

2.1.6 Instant Messaging (IM)

IM is described by Jackson (2007) as a communication technology that facilitates instantaneous communication by allowing employees to send and receive short text-based messages in real-time and to see who else is online and currently accessible to receive messages.

The research by Turner, Grube, Tinsley, Lee and O'Pell (2006) suggests that multicomputing may even be the standard for communication in some firms that value the potential efficiencies created by accomplishing more than one interaction task within a certain span of time. In their study Turner et al. (2006) found that employees who followed organizational norms in their use of instant messaging and e-mail were awarded higher performance evaluations from their supervisors.

One of the most useful features of IM is the concept of presence. Employees can tell if a colleague is in, available for incoming calls, or busy (Fichter, 2005, p. 50). Muller, Raven, Kogan, Millen and Carey (2003 p. 52) found that the most important reasons for using IM were to get a quick response to a question, avoid using the phone, know who is available and to clarify a question. Muller et al. (2003, p. 52) also discovered in the results of the study support to the claim that IM reduces the use of other means of communication.

2.1.7 News Feed

The activities of the employees are listed on their own profile pages. The other users see the recent activities and content that others have modified in the News Feed. As per name, News Feed is technologically a feed based on the content uploaded by other users in workspaces or groups of which an employee is a member.

Sun, Rosenn, Marlow and Lento (2009) have identified an important feature of News Feed to be that it allows passive information sharing. Users can broadcast an action to their entire network of friends through News Feed in a passive manner, instead of active that would mean sharing using a private message where a user picks a specific recipient or recipients.

2.1.8 Tagging and folksonomy

Tagging according to Panke and Gaiser (2009, p. 318-319) is the common indexing of objects from a free-subject catalogue. In other words there is no predefined list where one has to choose from, instead an employee can tag an item based on the perceived use or meaning of the document, post or picture. The advantage of tagging is in that the content is easier to search when the cues are provided by several users. A typical quality of a tagging system is a tag cloud, an alphabetical listing of all the tags belonging to a certain user or a user group, where popular tags are highlighted typographically, and a tag browsing function in which a individual tag serves as a hyperlink to other resources that previous users have entered into the system. The motivation for tagging, explained by Chi (2008, p. 88), is that users want to make finding relevant content easier for

themselves or others. In an organizational framework, tags are part of the creation of social reality. Schiltz, Truyen, and Coppens (2007, p. 107) argue that tagging actually links a concept to its social practice, in a way that tags connect the items involved and the correlated concepts to activity clusters within the organization.

Folksonomy is described by Marlow, Naaman, Boyd and Davis (2006, p. 32) as “a folk taxonomy of important and emerging concepts within the user group”. It is an ad hoc classification system that employees create as they tag the content they find online, as described in the previous paragraph. Folksonomy uses collaboratively generated, open-ended tags or labels that categorize content such as Web pages, online photographs, and Web links (Marlow et al., 2006).

A special feature of folksonomies is that they do not have a hierarchy as professionally developed taxonomies do with controlled vocabularies. Hence folksonomies are inherently open ended. Taxonomies were widely used in the previous generations of knowledge management systems. Folksonomies can, because of this feature, respond quickly to changes, innovations, and to the ways how users categorize content on the Web (Murugesan, 2007, p. 37). This is an important feature for firms because employees can tag documents according to the perceived use and meaning, and not by hierarchical system as before.

As mentioned earlier, blogs and discussion forums are time-indexed. Hence, new topics ultimately push older topics out of the focus of attention (Wagner & Bolloju, 2005, p. vi). The time indexes create another dimension of searchability to folksonomy. As Chi (2008) states, the benefits of the collaborative work using Enterprise 2.0, like tagging, are visible when participants use the information structure that they have co-created to navigate and search the content. And as Teece (1998, p. 63) puts it, “the more a given item of knowledge or experience has been codified, the more economically it can be transferred”. Again the usage becomes more pleasant and economical with extended use.

The more accurate the tagging, the higher the level of codifiability. According to Kogut and Zander (1992, p. 387) codifiability refers to the capability of the firm to structure knowledge into identifiable rules and relationships that can be easily communicated. Coded knowledge is not tied to the employee who wrote the code and thus properly coded knowledge can be used by all employees who have access to EWEs and are capable of using them effectively by creating intense communication patterns.

Although EWEs offer a wide range of benefits and advantages for organizations that apply them widely, they are not unproblematic. Like all information systems, employees need to be educated to use the system. In case of EWEs, the learning curve is not as much technological as it is cultural. The culture of the firm has to support openness and trust for any substantial benefits to take place. McAfee (2009) describes among the risks of using Enterprise tools the risk that there might be embarrassing information spread using these platforms or that the information is inaccurate. Also the risk of inappropriate behaviour and content has to be considered. At the same time it has to be noted that many employees are part of virtual world whether the firms like it or not. Reflected on the use of social medias in employees' private life, there is demand for transparency for the corporations that recruit knowledge workers.

To end this section, the driver to implement EWEs in organizations comes from the studies that have shown that organizations have actively pursued ways of making more effective use of the knowledge and expertise, that is, the "intellectual capital," that already exists within their current employee base (Alavi & Leidner, 2001; Grover & Davenport, 2001; Davenport & Prusak, 1998). Due to the swift evolution of technologies used, the research cannot yet show whether or not the Enterprise 2.0 applications are the answer for some.

2.2 Knowledge

“Who knows useful things, not many things, is wise”

-Aeschylus-

Knowledge management like knowledge itself is difficult to define (Earl, 2001, p. 215). Leonard and Sensiper (1998, p. 113) define knowledge in the business context as "information that is relevant, actionable and at least partially based on experience". Davenport and Prusak (1998, p. 5) speak of knowledge as "a fluid mix of framed experience, values, contextual information and expert insight". Leidner and Jarvenpaa (1995, p. 267) suggest that knowledge is created, or constructed, by each individual.

Some scholars, taking a collective-level perspective, also emphasize the socially constructed nature of knowledge (Nahapiet & Ghoshal, 1998; Nonaka, 1994; Tsoukas, 1996). These scholars argue that knowledge is created and held collectively; people learn and create knowledge through continuous social interactions (Nonaka & Peltokorpi, 2006). In an environment where the majority of knowledge workers are dispersed geographically, enabling the social interaction is the task that is being targeted with enterprise 2.0 tools.

To be able to discuss knowledge certain definitions are needed. Nonaka and Peltokorpi (2006, p. 75) describe the contrary views of knowledge using a subjective–objective continuum. “Positivism has long had a dominant position in the social sciences with its objective view of social reality. In contrast, interpretative philosophies, such as phenomenology and pragmatism, place an emphasis on subjectivity.”

In the other end of the continuum is the realistic ontology that has adopted the Cartesian body-mind split. This view proposes that knowledge is objective, exists separately and independently from humans. The positivist ontology is based on the view that there are objective facts about the world that do not depend on interpretation or even the presence of any person. Theories that are based on positivism are constructed on *a priori* notions,

in which humans and social entities composed of separate parts operate the same as the parts in unison. As Nonaka and Peltokorpi (2006) state, according to positivists human behaviour is a physiological response to an external stimulus explicable by scientific laws.

The contrasting view is based on the interpretative philosophies. Scholars from this tradition have a contextual, subjective and relational view of knowledge, humans and social entities. Nonaka and Peltokorpi (2006) argue that phenomenological philosophers like Heidegger propose human knowledge to be subjective, situational, relative and interpretational. As meanings emerge from subjective experiences that people have, tacit knowledge is held to be more important than explicit knowledge (Polanyi, 1966). According to Husserl (as cited in Nonaka & Peltokorpi, 2006) it is impossible for humans to attain objective social knowledge existing separately from subjectivity. Nonaka and Peltokorpi (2006) conclude that human knowledge is more like interpretations and not representations like positivists claim, since they depend on time-space.

As stated before, knowledge is useful for the firm when the knowledge is put to work in an effective way. To further expand on the different dimensions of knowledge, Dixon (2000, p. 11) defines common knowledge as being knowledge that employees learn while completing the tasks within the firm. Dixon (2000) makes a difference between “book knowledge”, knowledge which could also be called generic knowledge, because it is independent of the context in which it occurs. Dixon (2000) states, that company-specific knowledge is more likely to be the source of competitive advantage, because it is generated internally. This home grown knowledge is only available to the firm, while the more generic knowledge is also available to competitors. According to Dixon (2000, p. 13) common knowledge is the source of “know how”, as opposed to “know what”. This “know how” is the part of knowledge that has to be utilized in order to accomplish the objectives of the firm.

The complex nature of knowledge has been discussed extensively in knowledge management literature. One of the most common ways to describe knowledge is to distinguish it from data and information (Nonaka, 1994). Data can be classified as raw numbers, images, words, and sounds derived from observation or measurement. Information represents data arranged in a meaningful pattern. Nonaka (1994) argues that unlike information, knowledge is about beliefs, commitment, perspectives, intention and action.

Dalkir (2005, 2) proposes knowledge to have the following features:

- Knowledge can be used unlimitedly
- Transferring knowledge does not reduce the amount of knowledge
- Knowledge is all around us but the ability to use it is rare
- Most of the knowledge in organisations is lost after employees leave their work

All of these features presented by Dalkir are relevant to this thesis. The use of knowledge is a key driver in enhancing the value that EWEs offer to the firm. Sharing and transferring of knowledge is in the essence of EWEs, and the focus is in the usability of knowledge. And possibly when used widely enough, EWEs have the potential to store knowledge beyond the time when employees are with the company. The last point is meaningful only if sharing of tacit knowledge can be primed by using EWEs. The differences of tacit and explicit knowledge will be elaborated next.

The term tacit knowledge was introduced by Polanyi (1966, p.17-18) and defined as “we know more than we can tell”. In the knowledge management literature, Nonaka (1991) has made the distinction between explicit as formal, systematic, easily codified and communicated, and tacit as highly personal, context specific, difficult to codify and communicate (Nonaka, 1991). By tacit is meant something that is “not easily visible and expressible” and extremely personal (Nonaka & Takeuchi 1995; Polanyi 1998). Explicit knowledge, on the other hand, is something quantifiable, or something that can be

processed into information. According to Leonard and Sensiper (1998) explicit knowledge can be articulated and is, thus, accessible to others.

Berry (1987) makes a distinction between tacit and explicit knowledge using a three-stage model of learning based on cognitive, associative, and autonomous stages. Berry (1987) suggests that these different stages of learning support diversely the ability to obtain explicit versus tacit knowledge. In the cognitive and associative stages, employees learn through instruction, observation, and practice. In these stages, explicit knowledge can be effectively transferred in written form, through training programs, and through other media such as databases.

According to Von Krogh, Nonaka and Ichijo (1997) knowledge activists help in establishing the right enabling context the essential space and relationships that allow tacit knowledge to be unleashed. Nonaka (1994) suggests that tacit knowledge is transferred among individuals who are working closely together through socialization processes such as on-the-job training, apprenticeship, and direct observation (Nonaka, 1994). This would imply that only little, if any, tacit knowledge can be directly shared on EWEs even with the collaborative nature they possess.

Contrary to the view presented by Nonaka and Takeuchi (1995, pp. 62-63) who see tacit and explicit as separate entities, Tsoukas (1996) argues that tacit and explicit knowledge are mutually constituted and they should not be viewed as two separate types of knowledge. According to Tsoukas (1996, p.14) tacit knowledge is a necessary component in every kind of knowledge.

In context with EWEs, Hansen, Nohria and Tierney (1999) have classified an organization's primary approach to knowledge transfer into two distinct strategies: codification and personalization. The codification strategy suggests that learning is reliant on the utilization of knowledge databases and connecting people with reusable, codified knowledge. In contrast, the personalization approach of knowledge transfer examines more the direct interaction between individuals where learning occurs through

direct collaborative interaction with experts and peers in small groups of people (Hansen et al., 1999; Kogut & Zander, 1992). As such, collaboration is much more similar to this latter approach.

According to Nonaka and Toyama (2005, p. 422) knowledge creation starts at the individual and subjective level and it is made explicit and objective by overcoming individual borders through social interaction. Davenport (2005, p.88) suggests that the ideal that knowledge itself — typically unstructured, textual knowledge — could be easily captured, shared, and applied to knowledge work is not reality today. He argues further that progress is being made but it has taken much longer than anyone expected. Organizational learning literature acknowledges that knowledge generation and knowledge sharing are the two major elements of the learning process (Huber, 1991; Schulz, 2001). In relation to the literature on learning, autonomy is considered an important facilitator of knowledge flow among individuals and units in organizations (Nonaka, 1991; Schulz, 2001).

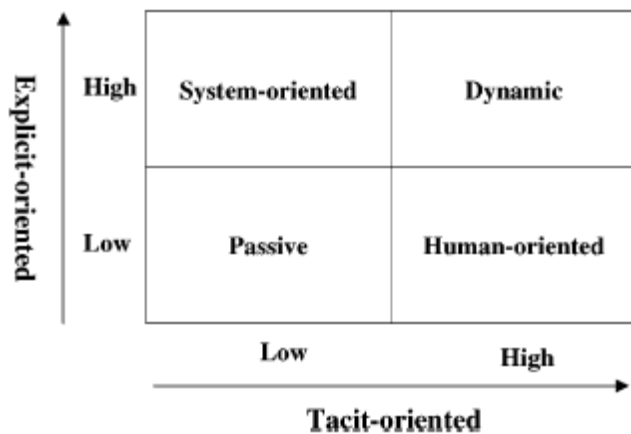


Figure 4. Knowledge Management Styles

Choi & Lee (2003, p. 406)

A matrix of knowledge management styles is presented in Figure 4. Within knowledge management styles, EWEs are best suited for human-oriented and dynamic style. Companies that have adopted a system-oriented style, emphasize more codifying and

reusing knowledge. According to Hendriks and Vries (1999) they aim to decrease the complexity of accessing and using knowledge by excessive codifying and IT-systems.

The emphasis of the human-oriented style is on obtaining and sharing tacit knowledge and interpersonal experience. Knowledge originates from informal social networks; standard procedures may be ignored to discover better ways of operating. According to Lang (2001), human dimensions are critical for effective knowledge management. Thus, as McDermott (1999) puts it, meaningful knowledge may not be simply retrieved from the database or repository, it has to be shared informally. Companies of the dynamic style emphasize both explicit- and tacit-oriented activities, and are thus, integrative and aggressive. They manage tacit and explicit knowledge in a dynamic fashion. Blackler (1995) suggests that they are similar to a communication-intensive organization. According to Sieloff (1999) these companies knowledge and information systems are introduced to support group work among individuals separated in time and place.

Even when online knowledge platforms like EWEs are implemented with proper structure, individual knowledge does not transform easily into organisational knowledge (Bock, Zmud, Kim & Lee, 2005). And as Davenport and Prusak (1998) point out, knowing is not the same as doing, and they argue that it is meaningless if knowledge and learning are gained, but not applied to generate benefits for an organization. This is a paramount observation, for the mere existence of knowledge is not sufficient. The right people have to connect the knowledge to have a value driving effect on the company. As Janz and Prasarnphanich (2003, p. 361) state, organizational performance depends more on the ability to turn knowledge into effective action than knowledge itself.

To conclude this section, knowledge resides in all organizations. The factor that differentiates firms is their ability to recognize and use relevant knowledge. The link between knowledge and knowledge sharing comes from Murray and Peyrefitte (2007), according to whom a firm has to first recognize the relevant knowledge to be able to choose an appropriate medium for knowledge sharing.

2.3 Knowledge Sharing

Knowledge sharing is only valuable for the firm if it creates value for the customers of the firm (Malhotra, 2005). The driver for knowledge sharing is that the better the knowledge of the firm is available and actually used, the better its performance. Malhotra (2005, p. 16) claims that the outcome driven view of knowledge management has its main focus on business performance. The emphasis of knowledge sharing is on strategic execution, selecting and adapting processes, activities, and technologies. Malhotra (2002) argues further, that activities in a collaborative community have to contribute to the key customer value propositions or business value propositions of the enterprise, if not such activities are replaced with others that are more directly relevant to business performance. Davenport and Prusak (1998, p. 18) support the idea that the value of knowledge increases with its accessibility and the frequency with which it is shared within the company. According to Glazer (1998) the value of knowledge lies in how accessible it is and how it is used, rather than its ownership and control.

Knowledge sharing presumes a two-way relation between at least two subjects capable of knowing, of which one communicates knowledge either consciously or not, and the other should be able to perceive knowledge expressions and make sense of them (Hendriks, 1999). For this reason, knowledge sharing involves interpretation. As Tsoukas states (1996), the way in which codified information is interpreted and turned into knowledge is further dependent upon both the social context and the individual backgrounds and experiences. Venzin, von Krogh and Roos (1998, p. 58) make a difference between transferring and sharing knowledge, saying that “knowledge cannot be directly transferred, it is always created anew”. This view supports the use of collaborative technologies, where employees discuss and reflect the knowledge that they already have to the knowledge of others, as described in the previous chapter.

Internal communication has been identified to be essential to the company’s knowledge sharing capabilities (Ghoshal & Bartlett, 1988, Ghoshal, Korine & Szulanski, 1994) and it has been investigated from many perspectives. Language and cultural issues in knowledge sharing have been addressed by many researchers (Piekkari, Vaara, Tienari

& Sääntti, 2005; Lehtonen, 2009) and are not the focus of this thesis. Von Krogh, Ichijo, and Nonaka (2000) state that trust and openness in the business culture are preconditions for knowledge exchange. First the existence of trust is a precondition for open communication and willingness to share and create knowledge through personal collaboration (Ichijo 2007, p. 88). Second, trust operates as a feedback system within the organization and therefore allows individuals to move their inner and outer boundaries through sharing of tacit knowledge (Nonaka & Konno 1998). Nonaka and Kanno (1998) claim that “during the externalization stage of the knowledge-creation process, an individual commits to the group and thus becomes one with the group.”

As Mäkelä et al. (2007) found in their study, people tend to share knowledge with the ones they resemble. Brown and Duguid (2000) note that common practices, whether at business or out of office activities, help people to form social networks along which knowledge about that practice can both travel rapidly and be assimilated readily. Enterprise 2.0 supports this among other things by the profile page, where employees can share information on their interests.

A significant view on knowledge sharing on EWEs is that the sharing process is visible to all users of the platform. Raban and Rafaeli (2007) found that people are more inclined to share information if the request is made in private. Raban and Rafaeli (2007) have also recognized challenges in sharing knowledge in a firm context and argue that in systems where information is shared directly between people, a problem may arise when those contributors, whose contributions are of high quality, will be inundated with more and more requests to share their knowledge. Eventually they may see this as a disturbance to their work or even a blunt attempt by free riders to evade their work (2007, p. 2369). Easy access to knowledge might create a barrier to users who are not comfortable sharing their knowledge publicly.

Constructivist learning theory based on Piaget’s work (Leidner & Jarvenpaa, 1995) propose that the process of expressing knowledge helps people to construct it as the conversation helps in refining the knowledge. As a result, Enterprise 2.0 applications

that allow conversational knowledge sharing technologies should yield benefits at numerous stages of the knowledge management process, beginning with knowledge creation and ending with knowledge use and refinement (Wagner & Bolloju, 2005, p. ii).

Tacit knowledge is difficult to communicate (Nonaka & Takeuchi 1995; Leonard & Sensiper 1998, 113). Davenport and Prusak (1998, 2003) state that high levels of trust between individuals decrease risks and uncertainties in tacit knowledge transfer. Primarily, the sharing of tacit knowledge requires time for contacts and personal interactions (Leonard and Sensiper, 1998). Another significant factor for tacit knowledge transfer is language. Szulanski (1996) suggests that during tacit knowledge transfer there cannot be a breakdown of communication between the receiver and the source. Tacit knowledge is stored in a non-verbal form and thus knowledge workers are often unaware of the knowledge they have or are incapable of communicating something that, for them, is natural and apparent, no matter how competent and experienced they are (Davenport and Prusak, 2003; Leonard and Sensiper, 1998). This implies that EWEs, where the majority of media used are text based, cannot effectively share tacit knowledge directly. But as trust and personal interaction are needed in order for tacit knowledge to be shared, EWEs can serve these purposes, especially in an organization that is geographically dispersed and the communication is based on virtual tools.

The difference between a traditional knowledge sharing approach and that of Enterprise 2.0 is that as transactional costs to information sharing have dropped, the new ways of knowledge sharing have become practical on a large scale (Shirky, 2008; Tapscott & Williams, 2006; Surowiecki, 2005). The cost efficiency alone is not enough. Schulz (2001, p. 661) notes that knowledge sharing is of limited value also if there is no knowledge worth sharing. According to Schulz (2001) knowledge production by individuals or subunits of the firm is of limited value if they do not share the resulting knowledge with other parts of the organization. Duane and Finnegan (2003) suggest that encouragement to share information within the firm by the management is part of

successful implementation of intranets and the same can be assumed to be true with EWEs.

According to Nonaka and Toyama (2005, p.432) leadership plays a crucial role in knowledge sharing. Storytelling is found to be a powerful tool in learning and sharing ideas. As Barker and Gower (2010, p. 307) point out, using others' stories and applying them to the firm is an excellent way to share knowledge. In this case, stories are not necessarily being used to generate action but, rather, to show cause and effect (Denning, 2006). But to support storytelling, the leaders have to take initiative. Also it has to be noted that knowledge sharing can occur differently between, for example, organisational units (Gupta & Govindarajan, 2000) or different hierarchical levels (Mäkelä et al., 2007). Thus, as Liebowitz (2008) states, knowledge-sharing culture should be used as part of the human capital strategy for it to be part of the organization culture

O'Dell and Grayson (1998) suggest that the best reward for sharing knowledge is if the practice helps people do their work better. If users can achieve their project and work objectives more successfully, more easily, and more efficiently, they eventually will share their knowledge. According to Alavi and Leidner (2001) bringing knowledgeable people together in a collaborative environment, so that knowledge can be shared and enhanced, is imperative for knowledge management.

Numerous barriers to knowledge sharing have been identified. These include, perceptions of competition by knowledge providers (Hansen, Mors, and Lovas, 2005), limited absorptive capacity of knowledge receivers (Szulanski, 1996), lack of trust between providers and receivers (Levin and Cross, 2004). For those who share knowledge that they have, it can mean a loss of influence, professional respect and job security (Davenport and Prusak, 2003; Disterer, 2003; Szulanski, 1996). Szulanski (1996, p. 31) has also identified reasons why employees might not be willing to share knowledge. These include, but are not limited to, the fear of losing ownership, a position of privilege or superiority, or they may feel that sharing knowledge is not sufficiently rewarded. The fundamental barrier, according to Davenport and Prusak

(2003), derives from people who believe that they have more to gain by hoarding their knowledge than by sharing it.

Although Hansen and Haas (2001) have found that knowledge-sharing increases task effectiveness, measuring the success of knowledge sharing is difficult. Grover & Davenport (2001) define a knowledge outcome as the process involved in creating value for the recipient of knowledge and ultimately the firm. This aspect is important because all actions and processes in a firm should directly or indirectly add value to the firm. Previous metrics of success of knowledge sharing have included worker satisfaction with his or her job, personal evaluation of work performance, and stakeholder perceptions of team performance (in terms of efficiency, effectiveness, and timeliness) were considered as evidence that knowledge was gained (Janz & Prasarnphanich, 2003). The problems associated with measuring knowledge sharing include the fact that value of the knowledge gained is difficult to measure directly and tends to be context specific (Cohen, 1998). In previous studies, e.g. Hult et al. (2000) measured learning in the purchasing process and used the cycle time as the outcome of learning. Slater and Narver (1995) proposed in the context of marketing that customer satisfaction, new product success, sales growth, and profitability can be used as the outcomes of learning organizations. As knowledge is context specific, also the metrics by how knowledge sharing is measured should be tailored to each firm. The guideline is, as earlier mentioned, that the action should directly or indirectly add value to the firm. Teece (1998, p. 60) notes that knowledge sharing itself can be the basis of competitive advantage for the firm.

As previously mentioned, in Wikis, identifying the author is important. Bock et al. (2005) found that in knowledge sharing getting feed-back influences positively to a person's self-worth and encourages him/her to share more and more often. Without identifying the authors this is not possible. Author recognition is even more important in the context of weak and strong ties.

The term “weak ties” is introduced together with its importance to knowledge sharing in EWEs. Granovetter (1973) introduced the term “weak ties”. The basis of weak ties is the social network theory developed by Granovetter (1973, 1983). Hansen (1999, p. 84) argues that interunit relations are of different value for the search process. Strong ties are those close friends and family who people meet or are in contact with often. Weak ties, or acquaintances, are less likely to be involved within the social network than strong ties. The importance of weak ties in a firm setting is that weak ties, according to Granovetter (1973), are more likely to be the source of radical innovation and progress than strong ties. Hansen (1999, p. 84) states that teams that have variety of weak ties are likely to have a more advantageous search position in the firm compared to teams with strong interunit ties because their contacts are less likely to provide redundant knowledge.

In context with knowledge sharing in EWEs, weak ties are more likely to share aspects of knowledge that is previously unknown to the community of strong ties. McAfee (2009) argues that known authors of Wikis are helpful in developing non-existent ties into weak or strong ties and especially in geographically dispersed organizations in transforming weak ties into strong ties. This is why understanding communication practices of knowledge workers on Enterprise 2.0 applications is important for international business communication. McAfee (2009) claims that the most significant outcome of knowledge sharing where authors are identified is not knowledge but that people with similar interest find each other in the nets of weak ties and start to create knowledge together. This is presented in the McAfee’s bulls’ eye model:

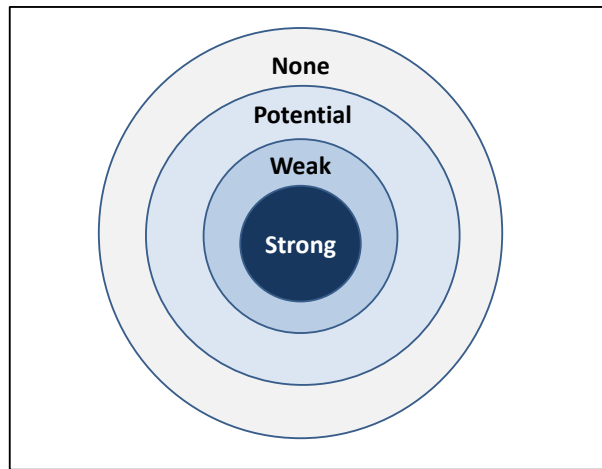


Figure 5. Weak and Strong Ties

McAfee (2009)

To summarize this Section, knowledge sharing is the process by which existing knowledge is made available to those who can utilize it to enhance the performance of the company. The incentives and possible barriers of knowledge sharing were also discussed. The main take away is that knowledge sharing is only valuable for the firm if it creates value for the customers of the firm.

2.4 Organizational Culture

This Section will present dimensions of organizational culture that are relevant for knowledge sharing using EWEs.

A possible barrier to the adoption of EWEs as knowledge management technologies is the potential mismatch with a particular organizational culture. The Enterprise 2.0 technologies need people to share their knowledge to be effective; they call for critique, present multiple points of view, and seek to challenge others' ideas. Wagner and Bolloju (2005, p. vii) suggest that organizations that do not value such open-minded and non-hierarchical idea exchange in reality may find conversational technologies not to be a proper fit.

For the purpose of this thesis, the term organization refers to the company or firm. According to Teece (1998, p. 75) the essence of the firm is its ability to create, transfer, assemble, integrate, and exploit knowledge assets. As stated by Daft and Lewin (1990, p. 2), organizations are complex. The behaviour of complex systems is surprising and hard to predict, because it is nonlinear (Casti, 1994). In nonlinear systems, a small change in one or two parameters can radically change the behaviour of the whole system. Daft and Wiginton (1979, p. 182) state that as the complexity of a system increases, it is difficult to make precise yet significant statements about its behaviour. Complex systems change inputs to outputs in a nonlinear way because their components interact with one another via a web of feedback loops (Casti, 1994). This is important to understand with respect to the present thesis because implementation of an EWE has an effect on multiple dimensions of an organization.

Grant (1996) describes an organization as an institution for integrating the knowledge that resides in individuals. Therefore, teams are essential in the organizational structure in creating value through knowledge utilization. Castells (1996) adds that the organizational boundaries are blurring. These trends suggest building a sensemaking platform. A sensemaking platform can be defined as a communication environment where firms could gather their existing knowledge, create new knowledge and enable conversational collaboration. As Alavi and Leidner (2001) state, learning, knowledge creation, and knowledge sharing take place at individual, team, and organizational levels. To be effective, the organization has to address each of these levels. Especially teams play a critical role in a knowledge-creating company according to Nonaka (1991) because team members create new ideas through dialogue and discussion. One purpose of EWEs is to enable dialogue of the teams in a dispersed organization.

Culture, according to King (2008) and Liebowitz (2008) is important in knowledge sharing. Schein (2004) defines culture as something that embodies the deeply held, shared beliefs of an organization and is slow to develop or change over time. Kettinger and Grover (1995) claim that the culture of the organization influences its ability to learn, share information, and make decisions.

Literature argues that knowledge without communication is equal to society without language (Nonaka & Takeuchi 1995; Eppler 2007). And as with any culture, a shared language is essential for knowledge sharing. Several authors (Szulanski, 1996; Davenport and Prusak, 2003; Disterer, 2003) argue that an adequate level of common language is essential for tacit knowledge transfer within an organisation. Many companies value technical knowledge and the acquisition of knowledge, instead of sharing it and disseminating it within the company (O'Dell & Grayson, 1998). Janz and Prasarnphanich (2003, p. 35) argue that organizational culture is the most significant input to effective knowledge management and organizational learning.

Von Krogh et al. (2000) point out that one of the five knowledge enablers in organization is mobilizing knowledge activists. Levy (2009, p. 129) suggests that younger people adopt changes faster, not only technology changes, and thus should be considered as potential role players in the change management effort. Web 2.0 applications are used widely by the younger generations (Zajicek, 2007). This would imply that by encouraging younger workers to act as knowledge activists could be a part of the efficient culture change, creating social norms that benefit the firm. According to Bettenhausen and Murnighan (1991), social norms influence the way employees perceive and cooperate with one another, from what angle they approach decisions, and solve problems.

Chatman and Cha (2003) elaborate that there is irony in leadership through culture, because the less formal direction is given by the managers, the more ownership the employees take over their actions and the better they perform. This is relevant in the context with EWEs, because as earlier literature in Section 2.1 showed, the emergent structure is essential for EWEs to be highly beneficial for the firm. The autonomy in the culture should thus be embedded in both, the structure and the use of EWEs.

When discussing culture, it should be noted that some authors see that culture can be divided into numerous levels (Schein, 2004) while others claim that cultures or cultural

dimensions per se do not exist (Hofstede, 2002). This is an important view, in order to understand why certain choices concerning the interviews were made. The present author's view is more aligned with Schein's.

Weick and Roberts (1993, p. 368) state that narratives skills (Weick & Browning, 1986) are important for the organization, because stories organize know-how, tacit knowledge, nuance, sequence, multiple causation, means-end relations, and consequences into a memorable plot. EWEs can be used as a tool for narrating through blogs and wikis. Weick and Roberts (1993, p. 368) studied aircraft carriers and found that the attitude of insiders towards the newcomers has a strong effect on learning within the organization.

Allen (1984) found that physical proximity is the most significant indicator of increased communication, making a point that when people are more than 50 feet (17 meters) apart from each other, the likelihood of them collaborating more than once a week is less than 10%.

Co-operation, coordination, and collective views to work are all features that are needed in knowledge creation and sharing (Gold et al., 2001; Hansen et al., 1999; Nonaka, 1991). Especially working in teams emphasizing collaboration and cooperation is a significant factor in organizational learning (Hult, 1998; Hult, Hurley, Giunipero & Nichols, 2000).

The firm's paradigm has to be in accordance with individual employees' personal beliefs for knowledge sharing to take place (von Krogh, 1998, p. 136). Chatman and Cha (2003, p. 22) argue that culture that aims to deliver outstanding results cannot be relying on formal rules, policies, or procedures. Tushman and O'Reilly (1997) propose that the firm's culture should cherish autonomy by social control systems that rely on employees' judgement. This is especially important in complex, uncertain and changing work environments. In context with EWEs, the initiative to use EWEs cannot come from the top management, but by creating ambience where constant, wide ranging use is part of the "how we do things around here", as described by Weick and Sutcliffe (2007,

p. 115). In the learning and knowledge management literature, an open and caring climate has been discussed as the paramount attribute that encourages interaction between individuals, thus leading to learning and knowledge sharing (Cohen, 1998; Davenport & Prusak, 1998; Gold et al., 2001). Enterprise 2.0 tools, when correctly applied offer the openness if the culture of the firm allows it.

The importance of a knowledge-centred culture has been elaborated by Janz and Prasarnphanich (2003, p. 353), who suggest that an organization's culture should support and incentivise as well as encourage knowledge-related activities by creating environments for knowledge exchange and accessibility.

Tacit knowledge, being personal and subjective, is highly ambiguous and open to different interpretations and views. The organisational culture must foster debate and understanding for knowledge for ambiguity to be reduced. Media selection should assist in processing rich information. Daft and Lengel (1986, p. 560) view information richness as the ability of information to change perception within a certain time interval. For these reasons, media richness theory will be presented in the following chapter and it will form an essential part of the theoretical framework of the thesis.

To conclude, Chapter 2 reviewed literature related to EWEs, knowledge, knowledge sharing, culture and organization. The objective of this chapter was to introduce the relevant discussion on these areas and create a backdrop for the theoretical framework.

In the first section the most important features of EWEs were posted as

- 1) The structure of EWEs is emergent
- 2) EWEs are collaborative by nature
- 3) Human interaction prevails information systems

The second section presented aspects of knowledge, noting that knowledge is always subjective and relies heavily on preceding views, experiences and mental models. Knowledge is created by each individual in social interaction with others, and therefore it cannot be directly transformed. Knowledge in itself does not create value.

The third section was about knowledge sharing, that is the necessary function to create value from knowledge. If the division of knowledge is done on the tacit-explicit continuum, then it can be stated that explicit knowledge can be more easily shared in virtual environments. In the context of tacit knowledge sharing, EWEs have the potential to create trust that is a fundamental building block of knowledge sharing. Knowledge sharing always involves interpretation and interpretations are context-dependant.

The fourth and final section defined organizations as complex adaptive systems and claimed that they act in a nonlinear manner. The Section also discussed organizational culture in the firm context. Openness and autonomy were the most important attributes that arose from the discussion. Culture has a vast effect on the ways people face challenges in knowledge sharing.

3. Theoretical Framework

This Chapter presents the theoretical framework for this study and identifies the reasons for researching the role of communication in knowledge sharing.

In communication research the focus is often on communication professionals. This study however is interested in knowledge workers, of whom some might have managerial tasks, but the main focus is in the knowledge sharing between employees who are not communication professionals and do not have superior-subordinate relationships.

As was described in Chapter 2, use of EWEs can create intense communication patterns. Gupta and Govindarajan (1991, p. 778) suggest that intense communication patterns create higher information processing capacity. Ghoshal and Bartlett (1988) support the view that internal communication is paramount for the firm's ability to create, adopt, and diffuse knowledge. To be able to share knowledge, the media used for communication within an organisation has to be effective. The media choice depends on the nature of the knowledge that is being shared (Daft & Lengel, 1986; Murray & Peyrefitte, 2007). Daft, Lengel and Trevino (1987) suggest that knowledge sharing within organisations has two basic origins, namely uncertainty and ambiguity.

Firms reduce uncertainty by acquiring information through periodical reports, rules, operational standards, procedures and data analysis in an objective manner (Daft et al., 1987). To reduce uncertainties firms need to share explicit knowledge, which can be formalised and easily understood. By ambiguity is meant the existence of multiple and conflicting interpretations of any given situation. According to Daft and Lengel (1986) high level of ambiguity can lead to confusion and to a breakdown in understanding within an organisation. Ways to solve ambiguous situations include call for suggestions and discussions. These should lead to an exchange of subjective opinions with the aim to define the problem and resolve disagreements (Daft et al., 1987).

The effect of media choice, often referred to as channel choice, has been studied widely. Within the context of EWEs for example Turner et al. (2006, p. 224) suggest that the medium through which conversations take place serves as a metamessage, signalling employees of the firm the appropriate ways to interact. Again, the conventions reflect back to the culture of the firm, how things are done here. Unsurprisingly, Tidwell and Walther (2002) found that people who used computer-mediated communication had a more direct communication approach than people in face-to-face conditions. Face-to-face communication offers most cues, and as such is the richest of mediums. According to Ngwenyama and Lee (1997) media are rich to the extent that they provide communication along multiple channels simultaneously.

The technological environment where the phenomenon of knowledge sharing is observed is virtual, based on computer mediated communication, specifically on EWEs. In the communication research the medium where communication takes place has gathered a fair amount of interest. The media richness theory has been criticized by Ngwenyama and Lee (1997) for focusing on the medium, which is why it is especially appropriate for the present thesis.

According to Daft and Lengel (1986) the basic assumptions of media richness theory are

- organizations process information to reduce uncertainty and equivocality
- communication mediums vary in the capacity to process rich information
- organizations are open social systems that must process information, but have limited capacity

Uncertainty is defined by Galbraith (1977, in Daft & Lengel, 1986, p. 556) as “the difference between the amount of information required to perform the task and the amount of information already possessed by the organization.” Organizations that face high uncertainty have to ask many questions to acquire more information to learn the

answers. Daft and Lengel (1986, p. 556) note that the important assumption underlying this approach is that the organization and the managers work in an environment where questions can be asked and answers obtained. In other words, when uncertainty is high the group knows the question but lacks the necessary information.

Equivocality is defined as the ambiguity of the task, caused by conflicting interpretations about a group situation or environment. Equivocality means that asking a yes-no question is not feasible. High equivocality can be defined as confusion and lack of understanding. Therefore, when equivocality is high, an individual does not know what questions to ask. In conclusion it can be said that as information increases, uncertainty and equivocality decrease.

Daft and Lengel (1986, p. 560) view information richness as the ability of information to change perception within a certain time interval. This suggests that communication used to share undefined knowledge should be rich and that it should facilitate understanding (Daft and Lengel, 1986; Daft et al., 1987). The richness of the media used could be characterised by its capacity to allow sharing of visions, insights, swift understanding and the use of a variety of languages (Daft and Lengel, 1986; Daft et al., 1987).

Information richness is defined as the ability of information to change understanding within a time interval. Communication transactions that can overcome different frames of reference or clarify ambiguous issues to change understanding in a timely manner are considered rich. Communications that require a long time to enable understanding or that cannot overcome different perspectives are lower in richness. In a sense, richness pertains to the learning capacity of a communication. (Daft & Lengel, 1986, p. 560)

According to Daft et al. (1987, p. 358) the richness of each medium is based upon a blend of four criteria. First is the level of which the medium makes receiving and giving feedback possible. Instant feedback allows questions to be asked and corrections to be made. The second criterion is the amount of cues. An array of cues may be involved in the message, including physical presence, voice, physical gestures, words, numbers, and graphic symbols. The more cues the medium offers, the richer it is. The third dimension is the language variety. It can be defined as the range of meaning that can be communicated with language symbols. Numbers convey greater precision of meaning than natural language. Natural language on the other hand can be used to communicate understanding of a broader set of concepts and ideas. The fourth dimension is personal focus; how much a message offers in terms of feelings and emotions has a significant effect on the communication. As Daft et al. (1987) state, some messages can be tailored to the frame of reference, needs, and current situation of the receiver.

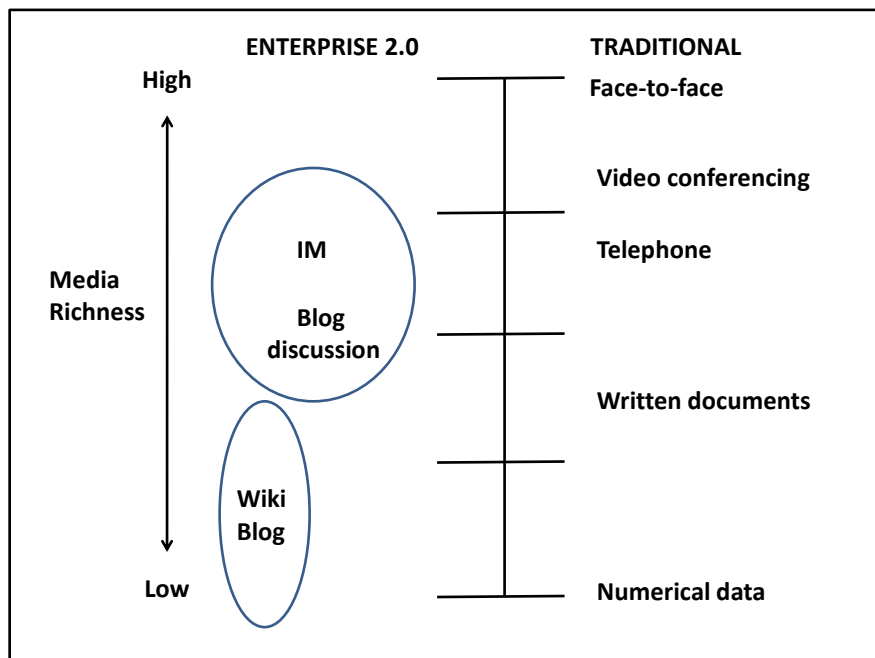


Figure 6. Hierarchy of Media Richness

(adapted from Daft et al., 1987)

Figure 6 was modified from Daft et al. (1987) to suit the purpose of the present study by adding the Enterprise 2.0 applications.

As can be seen from Figure 6 in the order of decreasing richness, the traditional media classifications are

- 1) Face-to-face
- 2) Video conferences and telephone
- 3) Personal documents such as letters or memos
- 4) Written documents
- 5) Numeric documents

The Enterprise 2.0 applications are not fixed to any exact level of richness, as described by the oval shapes, because the amount of cues depends on the general level of communication including previous contributions to discussions, amount of information provided on the profile page and comments and contributions to Wikis. However EWEs provide possibilities to enrich the communication due to the conversational nature that they offer.

In media richness theory Daft and Lengel (1986) claim that the performance of the individuals in a communication context derives from the fit between the qualities of the medium and the type of the task to be achieved. Matching the task to the respective medium, channel or a platform, is vital according to the theory.

The framework of this thesis includes the media richness theory described above. In addition the framework synthesizes the literature on technology, knowledge and knowledge communication as well as organization and culture to one model.

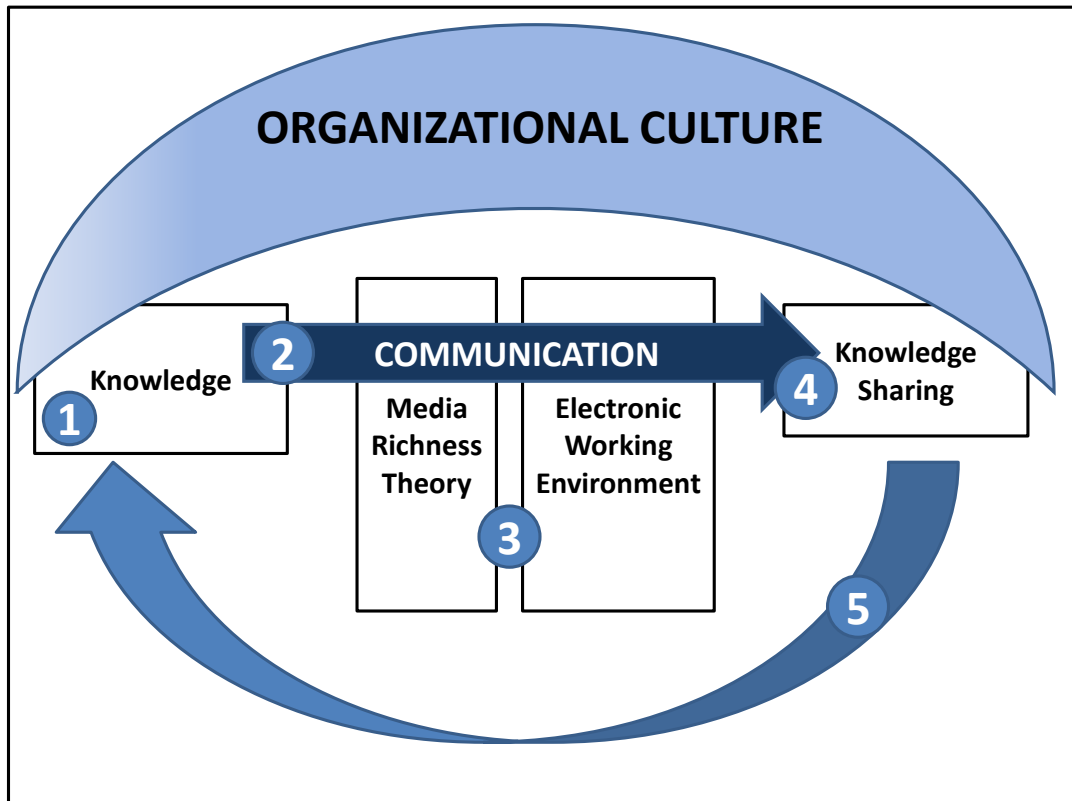


Figure 7. Theoretical Framework for Knowledge Sharing in EWEs

The basic assumption of this theoretical framework is that organizational culture affects all the aspects of the firm. In addition the framework consists of the following elements:

- 1) Knowledge by definition has to exist for any knowledge sharing to be possible
- 2) Knowledge is shared through communication
- 3) Communication consists of the choice of the proper richness of the medium and the channel or platform to be used
- 4) Communication leads to knowledge sharing, with the earlier mentioned prerequisite of a two-way relation between at least two subjects
- 5) Knowledge sharing shapes existing knowledge, creating also new knowledge and there is also a loop back to organizational culture as well.

The framework was developed based on the literature studied for this thesis and the background interviews that were conducted before the actual interviews. The focus of this thesis is the communication and knowledge sharing in EWEs. The dimensions of knowledge and knowledge sharing together with the technological aspect provide the framework of the thesis. The actual use of EWEs in communicating knowledge and perceived benefits are then analyzed in the context of the case company.

This concludes the Chapter 3 on theoretical framework of the thesis. The following chapter will present the findings.

4 Research Methodology and Data

This chapter introduces the research methodology of the study, presents the research design and justifies the use of the chosen research methods. First, the research design for this study, a qualitative single case study, is presented in section 4.1. Second, the primary method for data collection, semi-structured interviews, is introduced and the interview themes clarified in section 4.2. Third, the data collection process is discussed in section 4.3. Fourth, an analysis of the interview data is described in section 4.4. And finally, validity and reliability of the study are discussed in section 4.5.

4.1 Qualitative Single-Case design

This section justifies and describes the methods used in this research. A single-case design (Yin, 2009, p. 47) is used to understand the uses of EWEs in the case company.

According to Yin (2009, p. 18) the case study method investigates a contemporary phenomenon in depth and in the real-life context where the boundaries between the phenomenon and context are not clearly visible. The phenomenon is studied through different methods of data and using prior theoretical perspectives to guide the data analysis (Yin, 2009). A case study is regularly chosen as the research approach when studying a single organization and if the research questions include “how” questions (Ghuri & Grønhaug, 2005). The approach in the study is qualitative as it emphasises words rather than quantification in the collection and analysis of data (Bryman & Bell, 2003). According to Maykut and Morehouse (1994, pp. 43–44), qualitative research is exploratory and descriptive, which means that it aims to discover what can be learned about the phenomenon of interest; in this thesis knowledge sharing through using EWEs. As Ghauri & Grønhaug (2005, p. 112) state, a qualitative data collection method allows the researcher to explore deeply into attitudes towards behaviour, which for the purpose of this thesis was extremely valuable because the tool-like nature of EWEs.

The single-case design (Yin, 2009) is used to conduct a case study where the circumstances and conditions of knowledge sharing are captured in the actual working environment.

The process of the case study is illustrated in the Figure 8 below.

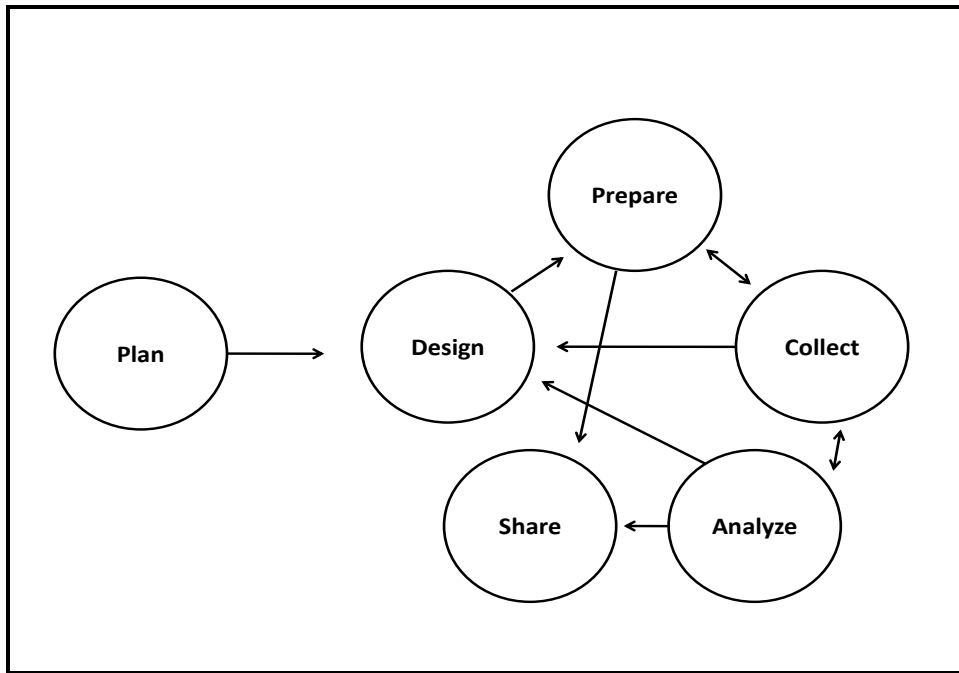


Figure 8. Case Study Process

(Yin, 2009, p.1)

Figure 8 explains the process of case study research, the iterative nature leads to the design of the study constantly throughout the process when new information is gathered.

4.2 Semi-Structured interviews and interview themes

This section first describes the background interviews and second, the qualitative interviews, which were conducted using a semi-structured interview methodology. A semi-structured interview has a certain amount of structure and themes are previously decided but a semi-structured interview also allows the researcher to ask unplanned questions (Gillham, 2005, pp.70-80).

Before the actual interviews, the researcher made four background interviews within the company, first in March 2010 and the rest during the summer of 2010. The aim of these interviews was to gather information on the company, knowledge sharing and EWEs in use. This was done to better understand the phenomenon (Marschan-Piekkari, Welch, Penttinen, & Tahvanainen, 2004).

Yin states (2009, p.106) that in a qualitative research interviews are more like guided conversations than structured queries. Hirsjärvi and Hurme (2008, p. 48) explain that instead of fixed interview questions, semi-structured interviews follow certain themes. Semi-structured interviews, when properly applied, are a good way of finding answers to certain themes without a detailed plan of questions. This method highlights the interviewees' perspectives and concentrates to the views of different interviewees.

Studying individuals is justified on the importance of socialization among individuals in knowledge creation and transfer. Taking an organization as the unit of analysis would fail to take into account the fact that organizational knowledge is created through the interaction of individuals and, as a result, would provide little guidance on how management can influence the learning process (Grant, 1996; Janz and Prasarnphanich, 2003).

The semi-structured interviews were categorised into three themes that were based on the research questions. The themes were not revealed beforehand to the interviewees because this might have biased the answers. The reason for categorising the interviews was that according to Hirsjärvi and Hurme (2008, p. 147) categorisation helps the researcher to stay on top of the phenomenon under research.

The interview themes were selected based on the three themes presented in the literature review in Chapter 2. As Section 2.1 elaborated, EWEs can be valuable tools for managing and sharing knowledge in a firm. And as described in Sections 2.2 and 2.3, knowledge and how it is used, knowledge sharing is a defining competency for a firm.

The practices in day to day activities are of paramount interest of this study. Therefore, the interviews were conducted with the employees of the case organization to explore the knowledge sharing and benefits of EWEs.

Saturation of the sample was reached when employees from several organizational levels were interviewed; this was also done to further expand the research context (Marschan-Piekkari et al. 2004). Selecting interviewees from every level of the team is a form of data triangulation which in turn increases research validity (Mäkelä et al. 2007, p. 6).

As a result of the literature review about knowledge, knowledge sharing and Electronic Working Environments, the framework for the interviews was built on the following three main themes

- 1) Usage of Electronic Working Environments
- 2) Knowledge sharing using EWEs
- 3) Benefits of the use

The first theme was chosen to explore the actual usage of EWEs. When possible the interviewee was asked to show the researcher what the latest activity they had concluded using EWEs was. Questions within the main theme were:

- What the latest use was
- How often they use
- What the most frequent use is

The second main theme concentrated around knowledge sharing within the organization. This part included questions based on the information from the first theme.

- What and how they gather and share knowledge
- What are the options for using EWEs
- If they do not find what they are looking for what is the procedure

The objective was to find out what the actual usage patterns are by asking various ways of usage. This was done to get answers that are aligned with everyday working practices.

The third theme was again based on the information from the two previous themes and focused on the perceived benefits of the use.

The interviews started with some basic questions about the interviewee. As Hirsjärvi and Hurme (2008, p. 107) note, a research interview normally begins with broad questions that are later on followed by more specific ones. The purpose of this practice is to assist the interviewee to feel confident that the questions can be answered based on his/her experiences, skills and interests. Hirsjärvi and Hurme (2008, p. 104) suggest that flexibility is important in carrying out the interviews. These guidelines were followed and each interview began with some general questions about the interviewee's work followed by more detailed questions. In the end of each session, each interviewee was given an opportunity to ask questions or add to the matter at hand.

4.3 Data Collection

This section elaborates on the interview process and the data gathered for the thesis.

Background interviews were conducted in March, June and July 2010. The purpose of these background interviews was to gather case specific information that the researcher could then use to create the structure of the actual interviews accordingly. All interviews were conducted in Finnish, for it is the native tongue of all of the interviewees and the researcher. All quotations from the research interviews in this thesis are translated from Finnish by the researcher. A total of 10 qualitative research interviews were conducted, with each lasting approximately 20 minutes.

The case company proposed a date for the interviews; a time window between the end of the second quarter and the holiday season. The interviewees were told in the beginning that the interview will take maximum of half an hour. They were also asked if it was suitable for them that the interview will be recorded and that the data will be treated in a manner that no individual answers can be identified. No one of the interviewees felt the recording to be disturbing. As Hirsjärvi and Hurme (2008, p. 92) suggest, recording allows a fluent and continuous interview as it enables the researcher to focus on the interview, gives time to make relevant questions on topics that arise during the interview and ask for clarification when needed. And naturally recording increases the reliability of the interview data and makes it possible for the researcher could to go back to the results at any time. The transcription of the interview recordings was done by a professional.

On the 8th of July the present author interviewed employees at the office of the case company. Sample was based on availability and willingness to participate into the study. A message was posted on the News Feed the day before the interviews. The message gave basic information about the interview. Of the participants some had seen the notice on the News Feed and had thus had time to prepare. Depending on the environment, interviews were either conducted at the office where the interviewee was able to use the computer and show the last activity on EWEs or if the interview would have bothered others around, the interview was conducted in a nearby meeting room. Observation was carried out for those interviewees who were at their desk during the interview.

Hirsjärvi and Hurme (2008, p. 74) propose that the location for a semi-structured interview should be one where the interviewee feels comfortable and which enables undisturbed communication. For the purpose of this thesis, where one of the research phenomena is the actual usage patterns, the location of the computer was preferred when possible to observe the actual latest usage of EWEs. As this thesis focuses on authentic workplace communication and knowledge sharing, the methods of data collection reflected this feature and the qualitative nature of the inquiry. As Maykut and

Morehouse (1994, p. 45) emphasize, the importance of data collection in the natural setting is inherent for qualitative research.

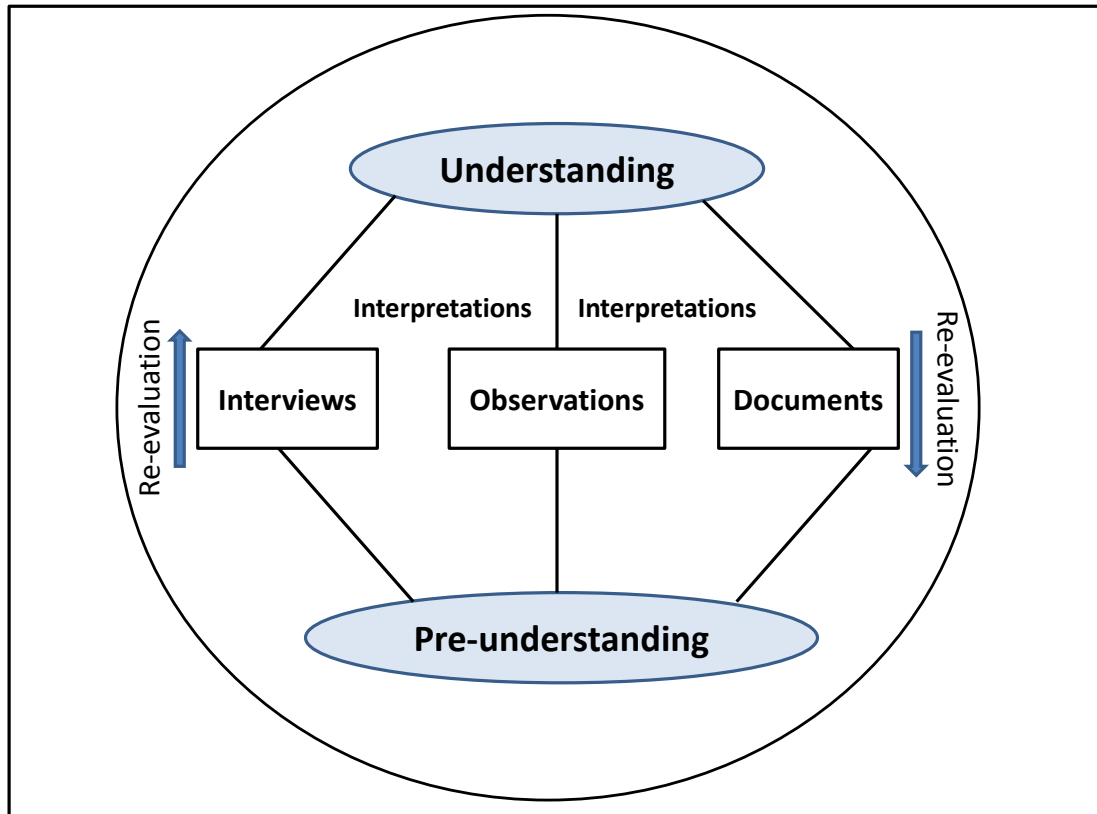


Figure 9. Hermeneutic Circle

(De Geer, Borglund & Frostenson (2004, p. 326)

Figure 9 shows how observations are part of understanding the phenomenon at hand. When relevant information is connected with the previous understanding, the new view of the phenomenon is used to interpret existing and new information. The iterative process continues to develop understanding. Observations offered the present author the possibility to widen the scope of knowledge of the usage of EWEs in the case company. Observations were used as an additional source of information as proposed by De Geer, Borglund and Frostenson (2004, p. 331). Yin (2009, p. 110) supports this view especially if the phenomenon under study is about a new technology, as is the case with the current thesis: “If a case study is about a new technology (...) observations of the

technology (...) are invaluable aids for understanding the actual uses of the technology and any potential problems being encountered”

The last of the background interviews was considered as a pilot interview. After the first part that included discussion on the implementation of the EWEs, the present author used the interview framework to interview this participant in the EWEs user role. This is how the interview framework was assessed before the actual interviews as Hirsjärvi and Hurme (2008, p. 72) suggest. This pilot interview was a valuable experience, as it gave the researcher the chance to improve the questions for the actual interviews. The original framework proved to be suitable for the most parts, but some of the questions were modified to better match the research problems.

4.4 Data Analysis and Basic Information on the Interviewees

According to Ghauri and Grønhaug (2005) data analysis is the process of studying the acquired data to find meaning and answers to the research questions posed. The first phase of data analysis is editing and coding; editing as confirming that the answers respond to the questions asked and coding as a way to try to determine categories for the acquired data (Ghauri & Grønhaug, 2005). Interviews were edited by checking that the interview answers matched the questions presented. Coding was done by dividing the answers to categories presented in Chapter 5 (Ghauri & Grønhaug, 2005). Ghauri and Grønhaug (2005) suggest a data reduction method, which means that information that is relevant for the study is selected and simplified.

Due to the anonymity that was promised to the employees, individual information on each interviewee is not detailed here. The interviewees had experience in the case company from three months to 10 years. Organizational position varied from customer service staff to VP and gender representation was three females and seven male interviewees.

4.5 Trustworthiness of the Study

According to Yin (2009, pp. 40-45) validity and credibility determine the quality of the research. Yin (2009, p. 41) presents four categories that can be used to test the quality: construct validity, internal validity, external validity and reliability. Yin (2009, pp. 42-43) states that testing internal validity is not relevant in a descriptive research. As this research is a descriptive analysis of a phenomenon, the usage of EWEs, within a context, the case company, the internal validity is not further discussed.

Table 2. Case Study Tactics for Design Test

Tests	Case study tactic	Phase of research in which the tactic occurs
Construct Validity	- Use multiple sources of evidence - Establish a chain of evidence	Data collection
External Validity	- Use theory in single-case studies	Research design
Reliability	Develop case study database	Data collection

Source: Adapted from Yin (2009, p. 41)

As can be seen from the Table 2, the quality of the present study is based on three tests. Construct validity is reached using multiple sources of data: interviews and observations. Chain of evidence is discussed later in this Section together with reliability. External validity is based on the results of the study that are generalized to the theories of knowledge, knowledge sharing and media richness theory. The objective of reliability, as described by Yin (2009, p. 45), is to be sure that if a later investigator followed all the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusions. The goal of reliability is to minimize the errors and biases in a study. To enable a later investigator, a proper documentation of the questions asked are provided together with detailed descriptions of circumstances of the research as well as processes for data collection and methods of data analysis.

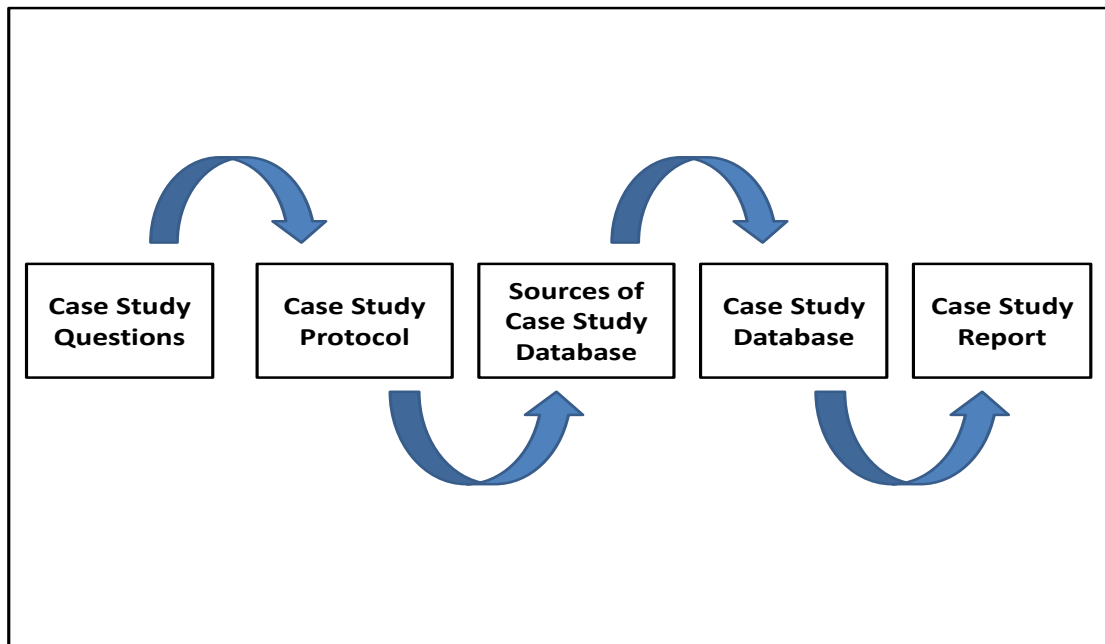


Figure 10. Maintaining Chain of Evidence

(Yin, 2009, p. 123)

Yin (2009, p. 123) recommends that a chain of evidence is maintained. Using this method the reader can follow the derivation from questions to the final report. The chain of evidence is an avenue for the researcher to increase the reliability of the study. Yin (2009, p. 123) suggests that by following the chain of evidence the methodological problem of determining construct validity is addressed and thereby the quality of the study increased. In the present thesis the chain of evidence is as follows

- 1) Research questions are based on literature presented in Chapter 2
- 2) Interview questions are presented in Appendix 1
- 3) Methods used and background of the interviews are explained
- 4) Interviews were recorded and then transcribed by a professional
- 5) All the above are collected and presented in this thesis

To summarize this chapter, the methodology used for this study was presented; a single-case study, the method of data collection, which were semi-structured interviews and observations. The analysis of the data was conducted using a qualitative approach by matching the earlier literature and theoretical framework with the data collected. And finally, the trustworthiness of the study was examined through reliability and validity. The following chapter will present the findings on how EWEs were used and how knowledge sharing took place in the case company and what were the perceived benefits of its use.

5. Findings: Knowledge Sharing using EWEs in the Case Company

This chapter presents the findings from the empirical part of this study; the semi-structured interviews with case company's employees, which were based on media richness theory, knowledge sharing and culture literature presented in Chapter 2. The findings are classified and divided into three Sections in order to provide answers to the three research questions of this study:

5.1 How do the employees use the Electronic Working Environments?

5.2 How do they share knowledge using EWEs?

5.3 What are the perceived benefits of the use?

Section 5.4 presents the suggestions that were made during the interviews and how to enhance EWEs in order to make EWE more effective for the interviewees' work. Section 5.5 ends this Chapter by introducing the relevant cultural implications found in this study.

5.1 The Use of EWEs in the Case Company

This Section will elaborate on the findings on the use of EWEs.

5.1.1 The most recent use of EWEs

All the interviewees were asked what their latest use of EWEs was. This was done in order to collect actual uses and not such usages that would be socially acceptable. Those who were interviewed at their desk were also asked to show what they did, and what route they used to navigate in EWEs. Often the most recent action was related to interviewees' profit driving tasks, in other words this would implicate that EWEs are used by the majority as a tool to create profits.

Table 3. Most recent use of EWE

Interviewee	Most recent use of the EWE
P1	Collected information for a tender
P2	Checked a sales metric
P3	Collected pricing data for a tender
P4	Read News Feed
P5	Viewed the lunch menu
P6	Searched a document for customer service
P7	Checked a sales forecast of a business unit
P8	Searched a template for a tender
P9	Modified project reports
P10	Checked if a recent press release is added to EWE

Source: Interview data

As can be seen from Table 3, the recent uses varied greatly. The most recent use of EWEs seemed to be an accurate indicator of the usage pattern of the interviewee. The ones who were able to show right away what they did and what route they used, proved to be the ones who use the most features and find most benefits from the use.

Right now I'm working on a bid, (before that) I glanced on internal communication, and searched from couple of colleagues' profiles for documents, such that I could benefit from. – P1

Those using multiple browser windows at the same time, in other words multitaskers, were the ones who also were able to report more benefits. The findings are aligned with the research by Turner et al. (2006) whose research was presented in Chapter 2. They suggested that multicomputing might be the standard way to communicate in some firms that value the potential efficiencies created by accomplishing more than one interaction task within a certain span of time.

5.1.2 How employees search and find what they are looking for

All the employees interviewed in the sample used the search function. Majority of them searched using the tag related to the item they were looking for or the search was based on people:

I'm looking for a person named (...) in our support services. Here you can see all the documents he has updated. Then I need an English-language general description. And then I went to apply for one, and then only scrolled through these. I found one, in fact the one I was looking for. It's very simple. – P1

According to the interviews, the search is often conducted so that the exact outcome, the exact document is known before the search takes place. It is obvious that a search conducted in this manner is not utilizing all the dimensions of EWEs. A basic search in EWEs offers only incremental enhancement when compared to the hierarchical structure whereas the major upgrades to finding items comes when a search is utilized to find undefined knowledge.

The basic search is at the moment prevalent practice in the case company. This is the case where an employee searches for a document that he or she has worked with earlier on:

Yesterday, as I searched for an offer that I wanted to update for the customer, I searched it from EWE. – P2

It has to be noted that a search into shared documents might offer quicker execution of tasks that have predefined outcome, but it will not utilize nearly all the features of EWEs.

I was just looking for some pricing information for a bid yesterday and I found it by using word search. It found only one document, right away. – P3

These document based searches could be done in a hierarchical system as quickly and accurately as in EWEs. The benefits that EWEs offer are visible when the document is not specific, but the search is based on a problem at hand:

So, I need one specific document, on a support service related issue, and then I could not find the document directly by its name. I found it through the fact that I knew who those people who are working on it are, and then I found the document. (...) I use the search based on people and also the document search. – P1

It can be argued that a higher frequency of problem based searches might result in new usage patterns that again could guide the knowledge worker to approach the problem from different angle.

5.1.3 The applications used

The applications used were not specifically asked. The results presented in the Table 3 are based on what the interviewees spontaneously mentioned during the interviews.

Table 4. Applications used by the interviewees

	Wiki	Blog	RSS	Work-space	Profile page	IM	News Feed	Tagging
P1		•	•	•	•	•	•	•
P2		•		•	•		•	•
P3		•	•	•			•	•
P4		•	•	•	•	•	•	•
P5	•						•	•
P6	•	•		•	•		•	•
P7		•	•	•	•		•	•
P8		•		•				
P9		•		•			•	•
P10	•	•		•	•		•	•

As can be seen from Table 3, the use of EWE applications varied greatly between the employees interviewed. The most active employees mentioned seven applications, where the smallest amount of applications was two. It has to be noted that the use was not asked application by application and that the results in the Table 3 do not tell anything about how frequently the employees use each of the applications.

This section elaborated the uses of EWEs within the case company. The usage patterns were somewhat as predicted, with the exception that searches were almost purely based on existing knowledge. Significant progress is not likely to occur if habits are not changed to support the new possibilities that EWEs offer.

5.2 Knowledge Sharing

This section will present the findings related to knowledge sharing. The section is divided into subsections based on the applications that EWE of the case company has. With each application, the type of knowledge shared is explained.

5.2.1 Wiki

The use of Wikis in the case company is mainly by technology department or customer service. Technical personnel who are responsible for software development use it, as well as customer service. Wikis contain specific information that is used like a blueprint:

But this [Wiki] is, however, the primary way trying to find the information that is needed, so that we wouldn't need to ask the questions concerning a detail. – P6

Somewhat surprisingly, knowledge workers who are in sales roles do not even have a Wiki. Why this is noteworthy, is that literature (e.g. McAfee, 2009; Levy, 2009) suggests that wikis are a way to share business critical knowledge within the company. It is unknown if all the employees have the possibility to gain access to a Wiki platform for their subgroup, or if the practices of using Wiki just are more driven by tradition in the groups where a Wiki is used.

According to the interviews, Wikis seem to be of conversational nature for those employees who use it. Customer service personnel add content and comment existing knowledge in Wikis. This naturally places Wiki higher in the ladder measuring the richness of the media, if content is constantly updated to match the existing reality of the firm. Also the customer service department reported that the relevance of the knowledge in the Wiki high.

5.2.2 Blog

In general the blogs written by employees are followed widely in the case company. Of the interviewees only two did not spontaneously mention that they read blogs. The interview data shows that people choose the blogs they read based on either the author or the heading of the blog.

Especially the employees who have been a longer period with the company used the author-based criteria:

Almost anything that some people write, I read it – P2.

This implies that characteristics outside the medium used have a strong influence on how much people are followed. The trustworthiness of a person can add to the informal power position within the organization so much, that everything written by that person is read by some. Again this is in accord with the literature that suggests that trust is a key trait that has to exist between communicators.

It is relevant to understand why people choose what they read based on the author. Mäkelä et al. (2007) found in their study that the more people resemble each other the more they tend to share knowledge with each other. This thesis is not able to address the question whether the chosen authors are considered to be similar to the reader of the blog or such that the reader would like to resemble.

Blogs are rarely conversational in the case company based on the observations of the present author. This is due to the lack of commenting to blogs. Employees read the blogs but they do not comment frequently. This lowers significantly the richness of the media and is slightly contrary to the expectations. That the whole company works in the same building might have an effect on this dimension, because employees can comment the blog postings to the author face-to-face. In geographically dispersed organizations the commenting on EWE directly might be the only option to give feedback to the blog posting.

The heading of the blog is another resonant cue for many. This would suggest that in order for the reader to choose to spend time with a posting the heading has to have certain appeal:

I browse the blogs based on the headings, if the blog has a lot of abbreviations; it's likely I won't read it. – P2

I always read the headings. –P3

Blogs were seen as a way to catch up and used somewhat as the minutes of the meeting if the person had not attended a weekly meeting due to a customer call or some other reason:

If I can't make it to the weekly meeting, I read the blogs and use other features of the EWE. –P3

The blogs were partially used similar to what Fichter (2005, p. 49) describes as the main uses of blogs; spreading ideas quickly, as in the last example. Also sharing what was discussed and agreed on meetings was one of the uses.

The material that employees searched from the blogs varied from general interest to specific tasks like learning:

If I recognize something that would be useful or something new that I want to learn, that's one criterion how I choose the blog posts I read. – P4

This approach is close to the optimal use that EWEs offer when reflected on the literature. The blog informs about something that the employee wants to learn; she or he can then comment the post and search other blogs with similar tagging.

5.2.3 RSS

According to the interviews, RSSs are used only by the advanced users in the case company. The benefits were visible for those who subscribed to feeds:

Sure I get direct feeds and from there good ideas, [...] and the people whose writings, comments and documents I should follow. – P1

The case company's knowledge workers are often on customers calls most days of the week. The nomadic nature of the work sets some challenges for following the blogs, news feeds and alike. Advanced users found the RSS to be a tool with which they can effectively follow what is going on in the firm during the days when they are not at the office.

Usually I'm quite a lot on customer calls, so it [RSS] is a good way to get feeds of information, because I wouldn't necessarily otherwise dig up that information. – P1

As RSS is not a medium per se but more of a transmitter of mediums and cannot be mapped according to the richness of media.

5.2.4 Workspaces

The case company has created workspaces for several functions like sales, customer service and software development. These workspaces seem to be a widely used application in the case company.

Then we have our own workspace for customer service, there is all the internal information related to customer relationships and maintaining those things. – P6

The workspaces are created based on different functions. Eight out of ten employees who were interviewed were in the sales. It has to be noted here that the case company

describes itself to be a sales driven organization. Also, unlike in many firms, even the executives have sales responsibility. This might partially explain why the sales approach is very vivid in the answers:

What I am looking from the sales workspace, above all, is presentations, tender templates, and this type of [material] for a variety of sales-related cases. – P1

It seems that due to the frequent use the workspaces offer a wide array of cues in written and visual form. While observing the knowledge workers when they were working in workspaces, most often the documents were either Word or PowerPoint documents that were segmented according to use, tenders, presentations and project proposals.

One aspect why workspaces are a standard working procedure in the case company is that metrics are located there. All the employees have access to sales forecast and other performance metrics. The case company is well known in the industry for being extremely particular in measuring all results.

In fact, last I looked from the sales workspace. I looked at our shared billing, which is one of our measurements. – P2

The workspace functions also as a document repository for daily documents that the employees need.

Yes, it is certainly one [that generates most value for me] is this sales workspace, and there all the time these documents that are available easily, all the offers and the latest versions of documents. The fact that they are not in any e-mails anymore and at the hard drives on someone's own computer, but that the latest versions are here. It is quite clearly one important thing. – P2

There is a discrepancy on utilization of technologies in the case company. Based on the observations some knowledge workers are using hardly any other dimensions of EWEs than document repository, while others are using them as a multi-tool to produce results in business tasks:

This morning I went over there to check the latest forecast on the billing for our project activities. [...], we use the workspace in a process where each week we aim to predict what our have a turnover will be for the month. – P7

5.2.5 Profile page

A profile page offers rich media experience. Though not collaborative by nature, a profile page when properly used has picture of the employee, knowledge base in business related issues and possibly a list of a person's interests or hobbies. All these together create familiarity which is a common ground where weak ties can be strengthened to a more active relationship.

The culture of the organization has a determining role in how profile page activity spreads. It can be assumed that there are employees who are not thrilled to post the photo or any non business related material to a corporate system. The way these arguments are handled is important for the success of EWEs.

In the case company a profile page was considered useful especially for two functions; first employees who had not been with the case company for extensive periods, looked at the profile page to see a person's face to recognize them if they needed a hand with a problem they were working with.

[the profile page] makes it a lot easier for me, when I need to visit someone and I know what he or she looks like, if they have the photo on the profile page – P6

Second, there was a group that stood out, the experienced users, who were looking for case or customer specific knowledge that colleagues had posted on their profile pages:

The search using the knowledge base [on the profile pages] is really useful. –P1

Again there was a clear distribution to active users of profile pages and those who were not using them at all. Background interviews offered an interesting industry specific detail. Knowledge workers in consultancies are occasionally interviewed on their previous careers and this data is added to the profile. When a customer or a prospect is from an industry where the organization has not previously consulted, it might be useful if any of the knowledge workers have experience in the field. With a steady amount of career changers in any given industry, this might be a noteworthy practice to adopt.

5.2.6 Instant Messaging (IM)

The primary benefit of this type of communication was considered to be the efficiency deriving from simultaneous presence of the communicators.

At the same time, now when I'm in EWE, I will make another support related search. So, when we have IM, I use it here, so I immediately put this message because I'm looking for a document, he has answered right away. – P1

IM was mentioned by only two of the interviewed employees. It is interesting that the richest of channels, when measured by the swiftness of response, is so underutilized

within the company. It is possible that the age structure of the case company partly explains the use of this medium. Almost all of the personnel of the case company are older than the so called digital natives³ and IM might not be considered to be a natural choice for communication.

5.2.7 News Feed

News Feed was among the most actively used Enterprise 2.0 applications among the interviewees. It serves also as the internal communication channel of the firm. This can be considered as the traditional intranet landing page approach where the most relevant new information is located on the front page.

As mentioned with workspaces, the case company measures the progress of sales daily. An indicator of an open culture is that the metrics are located on the News Feed page. This is also the default home page in the browsers.

I read the News Feed page daily, often several times during the day I check if there is anything added. –P3

Offering mainly text based resources; the News Feed cannot be thought to be a rich media. This should be noted by the management in internal communication, sensitive items need a richer environment than the casual notifications for which the News Feed is a proper medium.

Based upon the answers from the interviews, the home page approach so that News Feed serves as the portal, is a feasible solution. This way all of the employees who use a computer are immediately exposed to News Feed.

³ Digital native refers here to a person who has grown up using digital media and never had to switch from analog devices like the so called digital aliens had to.

5.2.8 Folksonomy and tagging

Out of all the applications that were studied for the thesis, tagging was the most commented of all. Everybody seems to agree that the culture of tagging would make like easier for all. Still very few tag actively or have created a strategy.

What the current version of EWE brings more is that the tagging is more advanced; it's easy to find [what you are looking for]. – P1

The following comment captures the essence of tags, why they are used and what the consequences are if employees continue to act like the documents are still located at the hard drive of their computers.

If the document lacks proper tagging, it disappears into thin air. [...] tagging would make the search so much easier. – P6

Saving time was recognized as a definite benefit of tagging by many.

Then you use x-amount of time, to look for who has done something similar. Usually you end up finally creating that yourself and using 11-fold time over that, doing the same. –P8

Similar to RSS, tagging is not a medium in itself and cannot be measured on a scale of richness.

To summarize, this section offered a view to the applications of EWEs and how they were used by the employees of the case company.

5.3 Perceived Benefits

This section introduces the benefits of using EWEs that the interviewees pointed out in the interviews.

Clarity and speed [are the most important benefits]. –P3

Time consciousness can be sensed from the spectrum of answers. Using less time to a given task than was needed before the implementation of EWEs seems to be the most notable benefit recognized. Clarity, as mentioned above, was interpreted to mean the structure of EWEs and the ease of use that is valued by the employees. Both aspects are aligned with the literature.

Also features that are fundamental for EWEs were visible. Enhanced searchability was mentioned several times; naturally this is closely linked to time aspect mentioned above.

I guess currently finding people and their knowledge is the most useful thing for me –P 1

Company specific benefits were mainly either related to the sales process that has changed after the shared documentation was implemented or the visibility of the direction in terms of metrics. It has to be noted once more that the case company has an open culture in releasing all existing sales data, everyday to all employees. This is considered to be of importance by the employees.

Comments that mention the sales aspect of EWEs were representative of the whole.

EWE is my tool mainly on sales related topics. My favourite benefit is precisely the fact that I can find the right people on the basis of knowledge. – P1

Because it doesn't make sense to start everything from scratch, so we can exploit this and use it for another bid. And, of course, it must be legally correct, the document, so whenever it is by [colleague x], I know it is OK stuff. – P1

The aspect that EWE enhances the meaningfulness of the work, because employees can utilize previously produced material on their projects is noteworthy.

Open culture of the company allows knowledge workers to access most tenders and agreements. Also that employees can see where the firm stands compared to the target setting, because the sales metrics and other short term forecasts are visible to all in EWE, is considered important.

The most tangible benefit is that I get a lot of satisfaction when I know what's going on, that drives me. On top of that is when I can learn.– P10

The sales group and there all these documents that are available easily, all the offers and the latest versions of documents. –P2

Some viewed the advances that EWE has brought from a process based approach. The wisdom of the crowds, where people tag the documents they are working with and afterwards those can be found without extensive search was mentioned several times.

[We tried earlier to collect] the best deals thematically, but now this tool, allows also everything else, but that it was understood that the productivity increases. –P8

When I am able to use the tools very effectively in order to reach the goals, I don't need to search for the latest bid or the draft of the latest case, they are all there, when you know how to use the platform.–P10

To conclude this section, benefits of EWEs that the knowledge workers of the case company mentioned most frequently were:

- Saving of time
- Reduction of unnecessary repetitive tasks
- Enhanced searchability

5.4 Suggestions How to Enhance the EWEs

This section introduces the proposals for improvement of the EWE that were recognized by the employees. The enhancement propositions were asked in order to understand how employees perceive EWEs in general. By articulating the missing applications, employees express what kind of tasks they would like EWEs to enhance.

Several interviewees (P2, P3, P6) mentioned that the documents are not organized logically into one place, but that different practices prevail. This might be partially due to the implementation process, some divisions of the case company implemented the EWE earlier than others. Having all the documents in one place, after a certain date, was suggested to be the solution for this.

Everyone can modify their own EWE to match their needs. This is in line with the autonomy of structure that was discussed earlier. This enables the emergent organization of work, so that applications that are needed often are easy to find. At the same time the users have more responsibility on their user experience. The same pattern can be found in tagging, creating folksonomies. The value of EWEs is created by the users, using applications actively and at the same time contributing to the content.

Active users were also able to identify specific, performance driving upgrades that would make the use more fluent:

Clearly now when collaboration workspaces and their use has become widespread, so there should be a customization option. Either you could arrange collaboration workplaces so that they are always on the landing page or in alphabetical order. – P7

So when you enter the forecast portal workspace, you would see the most recent changes to the documentation. – P7

These comments are in perfect unison with the literature that demands firms to provide emergent structure, autonomy also to the planning phase of the knowledge work. This is also important to note by those who make the buy-or-make decisions for EWEs. The interface has to be so easy to use that it can be learned quickly. This can be reached easily if elements are benchmarked from forerunning Web 2.0 applications. As the applications are trying to make reinventing the wheel every time unnecessary, the same is true when building EWEs.

Ease of use was specifically mentioned with the measurement systems that, as mentioned previously, are innate in the case company. Currently the shortcuts on the front page open a spreadsheet document that has the most recent data. This data is in a number format and thus has to be interpreted and, as mentioned in previous sections, interpreting requires a varying amount of existing knowledge to be effective. A proposition to visualize the data, possibly a basic traffic light format, was brought up. This is again noteworthy, for workers in all industries are under tight time constraints.

A few users argued that the management should adopt a more assertive approach in encouraging all the employees to use EWEs throughout the spectrum of applications. One of the interviewees emphasized that with everybody using the platform, the benefits would compound for the whole organization. This is a matter of cultural fit that will be discussed in the following section.

5.5 Cultural Implications

Literature on organizational culture is one major part of literature review for this thesis. Culture is seen as an important part of knowledge sharing, as stated by King (2008) and Liebowitz (2008). The interview question patterns did not include specific, direct questions on the culture *per se*. The reason for this is based on Schein's (2004, p. 36) perspective: "To understand a group's culture, one must attempt to get at its shared basic assumptions and one must understand the learning process by which such basic assumptions come to be." And as Weick and Sutcliffe (2007, p. 114) point out, culture

is equally embedded in the practices and actions as it is in the mind-sets. Studying the practices by which the employees use EWEs was the method how culture was examined. Schein states (2004, p. 338) also that group interviews are a more appropriate and valid vehicle for collecting data on culture than individual interviews. Since the aim of this thesis is to focus on those knowledge sharing actions and learning processes of the individual employees within the company, group interviews that would have focused purely on culture and would have had relevance, were out of the scope of this thesis.

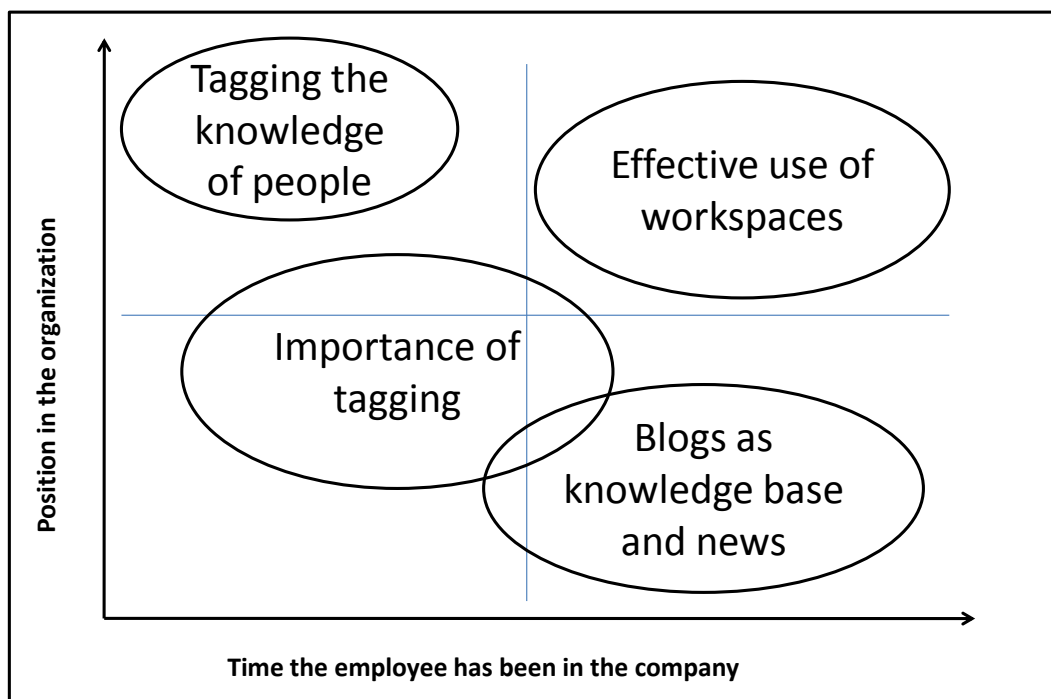


Figure 11. Matrix of organization level and time in organization

Figure 11 describes the matrix that shows how long an employee has been part of the organization had implications on the use as well as organization level. The matrix presents views that were presented by employees with different background in terms of organizational position and time they had been with the case company. A slightly

surprising finding was that the new employees working on lower level of the organization were the ones to articulate most tersely the need that was addressed somewhat softly by many others in the company. The expressed need was culture of proper tagging for all documents in EWEs. Other dimensions of the matrix were more predictable. For example experienced users on higher level of the organization were active users of workspaces. The present author does not suggest this to be common for all organizations. All seniors have sales responsibilities and to be effective in the case company one needs to use existing tools aggressively to succeed. And as mentioned with blogs, they were used as a learning environment even by people who had been years with the firm.

On a continuum from little of use to wide and deep use of EWEs, it can be noted that benefits multiply when the use is frequent. On the basis of both the interviews and observations it was obvious that even employees who had been a long time with the company, but were dedicated users of EWEs, found a variety of benefits.

As presented in the literature review, the barriers for knowledge sharing were also visible within the case company:

If a person is open and curious about new things and ready to share with others, then the benefits of social media are more readily available. One has to be bold and unconventional in some way. But then if you are by nature such that you do not want to share yours and you want to protect the information and keep it to yourself. If that is the case then the fact is that some might think you have done bad deals, or if you are good so you do not want others to pick your brain, in my opinion that guides people's behaviour very much. – P10

Some identified the case company to act somewhat paradoxically, when it comes to utilizing technology within the company:

[we are] terribly good at telling all the others [how to use EWE], but we ourselves are still operating from the Stone Age. –P8

On the other hand the same respondent also recognized that part of the fault is on each individual:

Maybe I haven't figured out the benefits, and then maybe being lazy and not producing anything self, from where the others would benefit. –P8

It was interesting, that on an intellectual level many of the respondents recognized the benefits of the widely spread use, but that did not translate into action. One respondent suggested that the management should be more affirmative in taking action:

Perhaps a stronger guidance to the new way of working and a strong sense that old habits have to be cut away, that some things are no longer approved. (...)Pull the plug (of the previous version) concretely when we will have a new tool. It is quite the same thing when you buy a new home, even though it would be nice to keep the old one, you have to abandon it, unless you happen to be in a situation where you have a lot of money so that you can live in two places. But it's when the situation is what it is, working methods and routines so they are given and then they should be monitored. – P10

Some knowledge workers who had been working for the case company several years, showed signs of rejection to EWEs and were not confident with its use and were thus not aware of the benefits that colleagues with the same job description found useful. Many of these veteran employees realized the advantages, but again lacked action. It is intriguing that even as these people train and coach other companies to change and are

surely aware of the phases that take place in a change management process, they themselves do not voluntarily adapt to substituting practices. Again one could argue that forcing the change on a tools-level, might be a drastic approach, but also one that would strongly encourage the change.

Because the EWE that the case company uses is also sold by the company to its customers, some were able to identify issues of EWE usage in organizations in general:

It is about the use, of which, 80% have never received any benefit from it because it is a cultural issue, and then it is working and then it comes on top, a technology, which would facilitate the people's everyday lives. – P8

This is well in consensus with the literature on culture. Technology is able to do various routines more effectively and even to discover new ways of getting things done, but the culture has to support such behaviour.

To lead from the culture, one has to recognize the special characteristics of the organization. One interviewee suggested a way for them:

It is culture-dependent, this is our culture and here walls of shame work. They work because we have a matter of honour that our standards are not standards for nothing but the way things are done, there is no other option. – P10

To conclude, this chapter presented the main findings to the three research questions. A summary is provided below after each research question.

1. How knowledge workers use EWEs?

EWEs are used by all of the interviewees, but the usage patterns are much dispersed. For some EWEs are daily tools in most actions, while for some they serve as a mere

support tool in non-profit driving use like checking the lunch menu. Thus the actual usage patterns were only partially in accord with the literature related to EWEs.

2. How they share knowledge while using EWEs?

The knowledge sharing takes place very much in the form of document and data depository. This somewhat surprising finding can possibly be explained through geographic unity, since all the departments of the case company are located in one building. Searching people using tags or profile page search and contacting them via either other EWE applications or face-to-face was another common way.

3. What are the benefits from using Enterprise 2.0 tools, as perceived by the knowledge workers?

Saving time while using EWEs was the benefit mentioned most often. Several interviewees mentioned that workflows are getting smoother when the adoption rates of EWEs are rising. It can be estimated that benefits will be more visible when the usage rate reaches levels near 100 percent.

6. Discussion

This chapter unites and discusses the main findings presented in Chapter 5.

The overall view of EWEs was consistent with the literature presented in Chapter 2. Centralized content management still has a role to play, but most often these are areas of notifying information on internal items than knowledge that would be crucial to the competitive advantage of the company. News of the organisation, HR-matters and market research are among the areas that still have to be signed as specific responsibility of a person or a function. Whereas business critical documents, discussions and blogs need to be based on voluntary contribution to produce maximum leverage for the company and value for the owners.

Conversational technologies bring knowledgeable people together in a collaborative environment so that knowledge can be shared and enhanced, and this according to Alavi and Leidner (2001), is imperative for knowledge management.

It is also the responsibility of the leaders to nurture a culture of safety, where it is safe for the knowledge workers to share even controversial views. Another dimension of safety is that employees should not fear that once their knowledge has been captured and transformed into a form where it can be used by any one they are let go. People have hidden agendas and occasionally the ones who have created an illusion of knowing and by sharing this non-existing or non-valid knowledge they would reveal themselves for the rest of the organization. Also, as Griffith et al. 2004 (p. 266) show, the individuals who are holding the knowledge might experience a loss even if the organization gains.

Jarvenpaa and Leidner (1999) introduced the phrase “swift trust” to explain how the time taken to build trust is no longer a part of the business. Employees were required to pass the standard face-to-face and time-consuming social exchange formerly used to establish a social context among other employees and instead develop “swift trust” based on the exchange of personal electronic communication. Jarvenpaa and Leidner (1999) found that those who established in the initial and in the final phase highest levels of trust were those who exchanged the greatest amount of social information early in the process. This would suggest that social aspects of Enterprise 2.0 is in itself a valuable tool for firms and that that the fear of employees having non business related exchange of information is actually good for the firm in the long run.

This Chapter is concluded with a quote from Hinchcliffe (2007) “The gap between what's technically possible and what the corporate culture is willing and able to accept — must less actively encourage — is often wider than many people automatically assume.” This seems to be more true than ever. Technologies are widely available for very low investments. Still the widest river to cross on the path to successful knowledge sharing using Enterprise 2.0 applications is the attitudes of managers of the companies.

These might not be downright against, but more on idling with the tools that are the common, trusted tools of the firm. Like always in the history of business, the time provides great opportunity for those who will pay the price ahead. With Enterprise 2.0 technologies the price is not paid in monetary terms but in efforts put to learn and support others to share what they know.

7. Conclusions

This chapter presents the conclusions to the present study. This chapter also provides a research summary, presents the main findings and elaborates on the practical implications that the results of this thesis have. The limitations of the study are specified and finally recommendations for future studies are made.

7.1 Research Summary

The purpose of this thesis was to study how EWEs are used in the companies and what are the benefits for the firms. The research was empirical, focusing on actual use, both what the interviewees reported as well as their actions that were observed when possible. This study was motivated by the lack of understanding how Enterprise 2.0 based technologies affect knowledge sharing and communication in firms. The research questions that this thesis answered were:

1. How do the employees use the Electronic Working Environments?

The objective of the first research question was to explore the actual usage of EWEs that the employees of the case company carry out in their everyday work. The purpose was to find out what the most commonly used applications are.

Based on the interviews and observations the employees of the case company have wide variety in the usage patterns. Many use EWE as a tool to drive profitability and their own performance while some use less EWE and in a way that does not directly support their tasks.

2. How do they share knowledge using EWEs?

The objective of the second research question was to identify the knowledge sharing practices within the firm. How knowledge is shared, what applications are used and what kind of knowledge is shared.

Blogs, Workspaces and News Feed were the most frequently used applications among the interviewees. The use of EWE as an electronic document file for tenders and other

project material was a prevailing practice. More experienced and active users gathered knowledge using searches and contacting other employees using the IM.

3. What are the perceived benefits of the use?

Employees seldom practice anything that does not add value to their individual tasks. The purpose of the third research question was to find out why employees use EWEs, in other words how the use makes their work easier, faster or more efficient in some other way.

The most frequently mentioned benefits of EWEs were.

- Saving of time
- Reduction of unnecessary repetitive tasks
- Learning new things
- Enhanced searchability

One notable view was that EWEs add to the meaningfulness of the work. When knowledge is close by when needed, it improves the contentment.

7.2 Main Findings

The previous experiences in using technology and tools seem to influence the perceptions of the usefulness of EWEs. More experienced users were able to identify greater amount and more important uses for the technology. All of the possibilities that EWEs offer are not put into use in the case company.

In accordance with the literature on knowledge sharing, culture seems to play a vital role in knowledge communication in EWEs. This is visible in two main areas. First as some interviewees mentioned, the case company has a slightly technology resistant culture. This can derive from a need to differentiate from the competition in the past,

when most consulting companies use PowerPoint, the case company relies heavily on flip charts. This attitude is still strong with some of the more experienced employees. Second, knowledge workers who are comfortable with virtual applications have adopted EWEs as profit driving tools and use them in a variety of ways every day. The mixture of corporate and personal culture heritage has a vast effect on the use and the benefits perceived from the use.

Knowledge sharing practices were based mainly on existing, explicit knowledge. As mentioned earlier, the fact that the whole organization is located in the same building probably has a major effect on this. If the organization was more dispersed geographically, the pattern might be very different.

7.2 Practical Implications

It is clear that electronic working environments are a useful tool to gain knowledge of worker productivity when implemented and used effectively. Effective use comes down to three main characteristics:

- Indexing, either by folksonomy, i.e. that it is executed by the users of more traditional indexing for those documents that are HR or general notice. As one of the interviewees mentioned, document that is not properly indexed and is therefore not properly searchable, does not exist.
- Customer service is a way to differentiate. Swift access to the relevant knowledge enhances the service experience vastly. This is one of the benefits provided by Enterprise 2.0 applications. Like the customer service representative noted, the best and latest knowledge was found from the Wiki and was accessible by all those who needed the information.
- Implementation phase of the EWE has to have an end state, by which date the previous version of document repositories are disconnected from the network and placed in a location that is difficult to use. As the example of the case company shows, a planned implementation is needed.

And even more than with any traditional tool, the frequent use of sufficient number of employees is paramount. Managerial implications are on the other hand in supporting the usage by example and education and more importantly in nurturing a culture where enterprise 2.0 way of working is the norm. This has to be also realized by companies that are marketing these tools to customers, introducing new technology does not change things by itself. The supporting culture has to be created by the management. As previously mentioned in chapter 2, Davenport and Prusak (1998, pp. 141-142) note that, technologies are only good for knowledge management and knowledge sharing when extensive behavioural, cultural and organizational change takes place. This is the responsibility of the management and can be achieved when the culture is supporting the whole process.

Literature suggests using ambassadors who are comfortable with the tools. By championing these employees, i.e. giving public praise for the people when they practice communication in a way that is aligned with the strategy, the culture changes toward one that encourages the usage of enterprise 2.0 tools. Based on the observations, many corporate blogs are updated less frequently. Although not the core of this thesis, noting and eliminating this indifferent practice should be taken as a basic step in Enterprise 2.0. A blog that does not initiate conversation or does not offer comments to readers' comments is not a collaboration tool. It is only a Web 1.0 technology in disguise and not part of the conversational convention. Mobilizing knowledge activists is also a practice identified in the earlier literature and could be used in the case company. This could be done by choosing employees from all departments and coaching them and guiding to the best practices within EWEs.

Effective knowledge sharing has useful functions for the company outside the direct value added. Alavi and Leidner (2001) showed in their study that the turnover of knowledge workers is high and one way to keep knowledge inside the firm is to keep employees happy. Smoother workflows following the use of EWEs could add to this. The other view is avoiding the loss of talent. As Janz and Prasarnphanich (2003, p. 362)

argue, in addition to work performance, work satisfaction is a critical and direct result of learning. All the time the guiding principle has to be the profitability of the actions taken, but it seems that knowledge sharing has several tangible benefits that it could offer to companies.

7.3 Limitations of the Study

This study has its share of shortcomings. First, the time frame when the interviews were made was brief, at another time or during a longer period to interviews the results might have been different. The scope of this thesis needed to be narrowed down into a specific, relevant phenomenon, which is why it was chosen to focus on the role of communication on knowledge sharing in EWEs.

Second, as that the study was a qualitative one and based on only one case company, is that the results may not directly apply to other firms. This naturally limits generalizing the results, but similar knowledge intensive firms have work flows that are not far from the case company's way of working and thus might have similar features. In addition, the fact that the case company is a publicly listed company may have some effect on the results obtained. If the same study was conducted in a privately owned firm, the results may differ from these. The size of the organization is one limitation, with 230 employees, the advantages of EWEs might not realize in the fullest extent. On the other hand similar technologies are used by most knowledge intensive companies and therefore, it is challenging to determine whether the results are applicable to other firms. Nevertheless, the results of this study can be used as a reference point to what effect communication in EWEs has on knowledge sharing within a firm.

There are at least three case company specific limitations. First, the current company was merged from two companies two years earlier; this might have an effect on the communication patterns within the firm. Second, EWEs are built by the company themselves. This might have effect on its usage and because no outside vendor exists, all the changes are done in-house and also the implementation is done by peers instead of being a bought service. Third, at the time of the study the company had only one office

location. This makes communicating tacit knowledge possible in face-to-face contact almost on a daily basis.

The sampling was done by the researcher and the interviews were conducted during one day. One could argue that this biased the sample, as only the employees present at the day of the interviews were able to be part of the sample. Observations were done by only one person, which is against what Yin (2009) suggests.

7.4 Suggestions for Further Study

At the time of writing, the majority of the most active communities in the web are based on Web 2.0 technologies, thus research on the use of Enterprise 2.0 applications is needed, especially on the actual benefits for the organizations. What these tools enable is less interesting than what is the actual business case for the companies using Electronic Working Environments.

Based on the results of this study, a few specific approaches for further research are presented and then elaborated below.

In terms of future research, a theme on tacit knowledge communication presents itself: there seems to be consensus among the researchers that virtual environments are a proper way of communicating explicit knowledge but not tacit knowledge. The present author would like to argue that this view is not totally true. As organizations are often dispersed, the conversational technologies offer one significant feature that might be of paramount importance in tacit knowledge sharing. When Wiki and blog authorship is identified, the participants can track who knows what and how they argue based on that knowledge. When the participants reach to each other using either channels or platforms they are already creating the trust that is widely recognized to be prerequisite for sharing knowledge.

The claim of the present author can be presented as follows:

- a) In geographically dispersed knowledge-dependent firms
- b) electronic working environments, unlike any other platforms so far
- c) can be used to prime the process of tacit knowledge sharing that will later take place in face-to-face encounters.

The case company had 230 employees and the benefits of EWEs in transforming weak or non-existing ties into strong ties were not researched. This is another aspect of knowledge communication that needs further examination. Being able to conduct a before-after study in a corporation that is highly dispersed geographically, would give answers to what the actual benefits in large organizations are. At the same time, when there are more users the number of active users is higher and this could create a positive cycle within the organization knowledge sharing.

As earlier mentioned, Mäkelä et al. (2007) found in their study that the more people resemble each other the more they tend to share knowledge with each other. Due to the limited resources, this study did not address specifically this within the case company. As noted in context of blogs, people tend to share knowledge with those they feel are similar to themselves. It might be interesting to study do the readers assess themselves to resemble the authors whose blogs they read or are they more as fans.

Quantitative approach on EWEs could study the actual uses and most used or retrieved documents using logs of the EWEs. This research would give data on frequency of use and give more perspective what practices actually prevail in the use of EWEs.

As a final thought, during the thesis project the Enterprise 2.0 applications proved to be forceful instruments in knowledge sharing when managed in a proper, mindful manner. Combined with what Davenport and Klahr (1998) have shown that besides a reduction in costs, improvement in the company's efficiency is recognized as an outcome of the

effective application of knowledge. Together these views present a strong argument for firms to adopt electronic working environments and lead the culture accordingly.

REFERENCES

- Aaltonen, M. (2007). Circular cause, time and narrativity. *International Journal of Management Concepts and Philosophy*, 2 (3), 183-193. DOI: 10.1504/IJMCP.2007.014995
- Alavi, M. & Leidner, D. E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25 (1), 107–136. <http://www.jstor.org/stable/325096>
- Allen, T. (1984) *Managing the Flow of Technology*. MIT Press, Cambridge, MA.
- Argenti, P. (2006). How technology has influenced the field of corporate communication, *Journal of Business and Technical Communication*, 20 (3), 357-70.
- Argenti, P. & Forman, J. (2002). *Power of Corporate Communication, Crafting Voice and Image of your Business*. New York: McGraw-Hill Companies
- Barabasi, A-L. (2002). *Linked – The New Science of Networks*. Cambridge, Massachusetts: Perseus
- Barker, R. T. & Gower, K. (2010). Strategic Application of Storytelling in Organizations : Toward Effective Communication in a Diverse World. *Journal of Business Communication*, 47 (3): 295-312. DOI: 10.1177/0021943610369782
- Berry, D . C. (1987). The Problem of Implicit Knowledge, *Expert Systems*, 4 (3), 144-150. DOI: 10.1111/j.1468-0394.1987.tb00138.x
- Bettenhausen, K. L. & Murnighan J. K. (1991). The Development of an Intragroup Norm and the Effects of Interpersonal and Structural Challenges. *Administrative Science Quarterly*, 36 (1), 20-35.
- Bidgoli, H. (1999). An Integrated Model for Introducing Intranets, *Information Systems Management*, 16 (3), 78-87. doi: 10.1201/1078/43197.16.3.19990601/31319.11
- Blackler, F., (1995). Knowledge, Knowledge Work and Organizations: An Overview and Interpretation. *Organization Studies* 1995 16: 1021. DOI: 10.1177/017084069501600605
- Bock, G.-W., Zmud, R.W., Kim, Y.-G. & Lee, J.-N. (2005). Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly*, 29 (1), 87-111.

- Boiko, B. (2005). Content management bible (2nd ed.). Indianapolis, IN: Wiley Publishing.
- Bougon, M., Weick, K.E. & Binkhorst, D. (1977). Cognition in organizations: An analysis of the Utrecht Jazz Orchestra. *Administrative Science Quarterly*, 22 (4), 606-639.
- Brown, J.S., (2000). Growing up digitally. *Change*, March/April, 11-20
- Brown, J. S. & Duguid, P. (1991). Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science*, 2 (1), 40-57.
- Brown, J. S. & Duguid, P. (2000). *The Social Life of Information*. Boston: Harvard Business School Press.
- Bryman, A. & Bell, E. (2003). *Business Research Methods*. Oxford: Oxford University Press
- Bukowitz, W. R. & Williams, R. L. (1999). *The Knowledge Management Fieldbook*. Harlow: Pearson Education.
- Campion, M. A., Medsker, G. J. & Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46 (4), 823–850.
- Chatman, J. A. & Cha. E. S. (2003). Leading by Leveraging Culture. *California Management Review*, 45(4), 20-34.
- Chi, E. (2008). The Social Web: Research and Opportunities. *Computer*, 41 (9), 88-91.
- Cohen, D. (1998). Toward a knowledge context: Report on the first annual U.C. Berkeley Forum on Knowledge and the Firm. *California Management Review*, 40 (3), 22-39.
- Creese, J. (2007), Web 2.0/Business 2.0: new web technologies, organisations and WCM, paper presented the 2nd Annual Web Content Management Symposium, *Organising Infinity: Web Content Management into the Future*. Brisbane: Queensland University of Technology. Retrieved on July 29, 2010 from <http://eprints.qut.edu.au>
- Daft, R.L. & Lengel, R.H. (1986). Organisational information requirements, media richness and structural design. *Management Science*, 32 (5), 554-71.

- Daft, R.L., Lengel, R.H., & Trevino, L.K. (1987). Message equivocality, media selection and manager performance: implications for information systems. *MIS Quarterly*, 11 (3), 355-66.
- Daft, R. L. & Lewin, A. Y. (1990). Can Organization Studies Begin to Break out of the Normal Science Straitjacket? *Organization Science*, 1 (1), 1-9. Stable URL: <http://www.jstor.org/stable/2634984>
- Daft, R.L. & Weick, K.E. (1984). Toward a Model of Organizations as Interpretation Systems. *The Academy of Management Review*, 9 (2), 284-295.
- Daft, R.L. & Wiginton, J. (1979). Language and Organization, *Academy of Management Review*, 4 (2), 179-191.
- Davenport, T.H. (2005). *Thinking for a Living*. Boston: Harvard Business School Press.
- Davenport, T. H. & Klahr, P. (1998). Managing customer support knowledge. *California Management Review*, 40 (3), 195–208.
- Davenport, T.H. & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Boston: Harvard Business School Press
- Davenport, T.H. & Prusak, L. (2003) *What's the Big Idea? Creating and Capitalizing on the Best New Management Thinking*. Boston: Harvard Business School Press
- Dalkir, K. (2005). *Knowledge Management in Theory and Practice*. Burlington: Elsevier Butterworth-Heinemann.
- De Geer, H., Borglund, T. & Frostenson, M. (2004) *Interpreting the International Firm: Going Beyond Interviews*. In R. Marschan-Piekkari & C. Welch (Eds.) *Handbook of Qualitative Research Methods for International Business*. Cheltenham: Edward Elgar Publications.
- Denning, S. (2006). Effective storytelling: Strategic business narrative techniques. *Strategy & Leadership*, 34 (1), 42-48. DOI: 10.1108/10878570610637885
- Disterer, G. (2003). Fostering knowledge sharing: why and how?, in Reis, A. and Isaias, P. (Eds), *Proceedings of the IADIS International Conference e-Society* (pp. 219-26), Lisbon.
- Dixon, N.M. (2000) *Common Knowledge. How Companies Thrive by Sharing What They Know*. Boston: Harvard Business School Press.
- Doz, Y. L., Santos, J. & Williamson, P. (2001). *From global to metanational*. Boston: Harvard Business School.

- Drucker P.F. (1999). Knowledge-worker productivity: the biggest challenge. *California Management Review* 41 (2): 79–94.
- Duane, A. & Finnegan, P. (2003). Managing empowerment and control in an intranet environment. *Information Systems Journal* 13 (2): 133-156
- Dunford, R. (2000). Key challenges in the search for the effective management of knowledge in management consulting firms. *Journal of Knowledge Management*, 4 (4), 295-302.
- Earl, M. (2001). Knowledge Management Strategies: Toward a Taxonomy. *Journal of Management Information Systems*, 2001, 18 (1), 215-233.
- Eppler, M. (2007). Knowledge Communication Problems between Experts and Decision Makers: an Overview and Classification. *The Electronic Journal of Knowledge Management*, 5 (3), 291-300.
- European Commission (2003). The new SME definition, User guide and model declaration. European Comission.http://ec.europa.eu/enterprise/policies/sme/files/sme_definition/sme_user_guide_en.pdf
- Fichter, D. (2005). The many forms of E-Collaboration: Blogs, Wikis, Portals, Groupware, Discussion Boards, and Instant Messaging. *Online*, 29 (20), 48-50.
- Ghauri, P. & Grønhaug, K. (2005). *Research Methods in Business Studies, A practical Guide*. Harlow: Financial Times, Prentice Hall, Pearson Education
- Ghoshal, S. & Bartlett, C. A. (1988). Creation, adoption, and diffusion of innovations by subsidiaries of multinational corporations. *Journal of International Business Studies*, 19 (3), 365-388.
- Ghoshal, S., Korine, H. & Szulanski, G. (1994). Interunit communication in multinational corporations. *Management Science*, 40 (1), 96-110.
- Gillham, B. (2005). *Research Interviewing: The Range of Techniques*. Berkshire: McGraw-Hill Education
- Glazer, R. (1998). Measuring the knower: towards a theory of knowledge equity. *California Management Review*, 40 (3), pp. 175-94.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of Management Information Systems*, 18 (1), 185–214.

- Golder, S., Wilkinson, D. & Huberman, B. (2007) Rhythms of Social Interaction: Messaging Within a Massive Online Network. In C. Steinfield, B. T. Pentland, M. Ackerman & N. Contractor (Eds.), *Communities and Technologies 2007*, Proceedings of the Third Communities and Technologies Conference, Michigan State University 2007 (pp. 41-46). London: Springer DOI: 10.1007/978-1-84628-905-7
- Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.
- Granovetter, M. (1983). The Strength of Weak Ties: A Network Theory Revisited, *Sociological Theory*, 1, 201-233.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17 (Winter Special Issue), 109–122.
- Grover, V., & Davenport, T. H. (2001). General perspectives on knowledge management: Fostering a research agenda. *Journal of Management Information Systems*, 18 (1), 5–21.
- Gupta, A. K. & V. Govindarajan (1991). Knowledge flows and the structure of control within multinational corporations, *Academy of Management Review*, 16 (4), 768–792.
- Gupta A.K & Govindarajan V. (2000). Knowledge flow within multinational corporations. *Strategic Management Journal* 21 (4): 473–496.
- Haas, M.R. & Hansen, M.T. (2007). Different knowledge, different benefits: toward a productivity perspective on knowledge sharing in organizations, *Strategic Management Journal*, 28 (11), 1133–1153.
- Hansen, M.T., (1999). The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly* 44 (1), 82-111. <http://www.jstor.org/stable/2667032>
- Hansen, M.T. & Haas, M.R., (2001). Different Knowledge, Different Benefits: Toward a Productivity Perspective on Knowledge Sharing in Organizations. *Academy of Management Proceedings MC: C1-C6*.
- Hansen, M.T., Mors, M.L. & Lovas, B. (2005). Knowledge sharing in organizations: multiple networks, multiple phases. *Academy of Management Journal* 48 (5), 776–793.
- Hansen, M., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, 77 (2), 106–116.

- Hearn, G., Foth, M. & Gray, H. (2009) Applications and implementations of new media in corporate communications, An action research approach. *Corporate Communications: An International Journal*, 14 (1), 49-61. DOI: 10.1108/13563280910931072
- Hendriks, P. (1999) Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and Process Management*, 6 (2), 91-100.
- Hendriks, P.H.J. & Vriens D.J. (1999). Knowledge-based systems and knowledge management: friends and foes? *Information and Management* 35 (2), 113–125.
- Hirsjärvi, S. & Hurme, H. (2008) Tutkimushaastattelu: Teemahaastattelun teoria ja käytäntö. Helsinki: Helsinki University Press.
- Hinchcliffe, D., (2007) <http://www.zdnet.com/blog/hinchcliffe/enterprise-20-as-a-corporate-culture-catalyst/105>
- Hofstede, G. (2002) Dimensions do not exist: A reply to Brendan McSweeney. *Human Relations*, 55 (11), p. 1355-1361.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2 (1), 88–115.
- Hult G.T.M. (1998). Managing the international strategic sourcing function as a market-driven organizational learning system. *Decision Sciences* 29 (Winter): 193–216.
- Hult G.T.M., Hurley R.F., Giunipero L.C & Nichols Jr. E.L. (2000). Organizational learning in global purchasing: a model and test of internal users and corporate buyers. *Decision Sciences* 31(2): 293–325.
- Ichijo, K. (2007) Enabling Knowledge-Based Competence of a Corporation. In K. Ichijo & I. Nonaka (Eds.), *Knowledge Creation and Management: New Challenges for Managers*. (pp 83–96), New York: Oxford University Press.
- Ihator, A. S. (2001). Communication style in the information age. *Corporate Communications*, 6 (4), 199-204.
- Jablin, F. & Sias, P. (2001). Communication competence. In F. Jablin & L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods* (pp. 819-864). Thousand Oaks, CA: Sage.
- Jackson, M. H. (2007). Should Emerging Technologies Change Business Communication Scholarship? *Journal of Business Communication*, 44 (3). DOI: 10.1177/0021943606295781

- Janz, B. & Prasarnphanich, P. (2003), “Understanding the antecedents of effective knowledge management: the importance of a knowledge-centered culture”, *Decision Sciences*, 34 (2), 351-84. DOI: 10.1111/1540-5915.02328
- Jarvenpaa, S. L., & Leidner, D. E. (1999). Communication and trust in global virtual teams. *Organization Science*, 10 (6), 791-815. DOI: 10.1287/orsc.10.6.791
- Kalla, H. (2006) *Integrated Internal Communications in the Multinational Corporation*. Helsinki School of Economics, A-Series Doctoral Dissertations, HSE Print.
- Kaplan, A.M. & Haenlein, M. (2010). Users of the World, unite! The Challenges and Opportunities of Social Media. *Business Horizons*, 53 (1), 59-68.
- Kettinger, W. J. & Grover, V. (1995). Toward a theory of business process change management. *Journal of Management Information Systems*, 12 (1), 9-30.
- King, W. R. (2008) Questioning the conventional wisdom: culture-knowledge management relationships. *Journal of Knowledge Management*, 12 (3), 35-47. DOI: 10.1108/13673270810875840
- Kogut, B. & Zander U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science* 3 (3), 383–397.
- Kogut, B. & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies*, 24 (4), 625–645.
- Kogut, B. & Zander, U. (1996). What do firms do? Coordination, identity and learning. *Organization Science*, 7 (5), 502-518.
- Kogut, B. & Zander, U. (2003). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of International Business Studies* 34 (6), 516–529.
- Kolbitsch, J. & Maurer, H. (2006), The transformation of the web: how emerging communities shape the information we consume. *Journal of Universal Computer Science*, 12 (2), 187-213.
- Komito, L. (2008). Information society policy. In G. Hearn and D. Rooney (Eds), *Knowledge Policy: Challenges for the 21st Century* (pp. 83-97). Cheltenham: Edward Elgar.
- Krogh, G. von (1998). Care in Knowledge Creation. *California Management Review*, 40 (3), 133-153.

- Krogh, G. von, Nonaka, I. & Ichijo, K. (1997). Develop Knowledge Activists! *European Management Journal*, 15 (5), 475-483.
- Krogh, G. von, Ichijo, K. & Nonaka, I. (2000), *Enabling Knowledge Creation*. New York, NY: Oxford University Press.
- Lang, J.C. (2001). Managerial concerns in knowledge management, *Journal of Knowledge Management* 5 (1), 43-57
- Lehtonen, M., (2009). Nonaka's knowledge creation theory revisited: A Semiotic Analysis of Communicating Knowledge in a Geographically Dispersed Team. Master's Thesis, Helsinki: Helsinki School of Economics
- Lee, S., Hwang, T. & Lee, H-H. (2006). Corporate blogging strategies of the Fortune 500 companies. *Management Decision*, 44 (3), 316-334.
- Leidner, D., & Jarvenpaa, S. L. (1995). The use of information technology to enhance management school education: A theoretical view. *MIS Quarterly*, 19 (3), 265-291.
- Levin D.Z. & Cross R. (2004). The strength of weak ties you can trust: the mediating role of trust in effective knowledge transfer. *Management Science*, 50 (11), 1477-1490.
- Leonard, D. & Sensiper, S. (1998). The Role of Tacit Knowledge in Group Innovation. *California Management Review*, 40 (3), 112-132.
- Levy, M. (2009). Web 2.0: Implications on Knowledge Management. *Journal of Knowledge Management*, 13 (1), 120-134. DOI: 10.1108/13673270910931215
- Liebesskind, J. P. (1996). Knowledge, Strategy, and the Theory of the Firm," *Strategic Management Journal*, 17 (10), 93-107.
- Liebowitz, J. (2008). Think of others in knowledge management: making culture work for you. *Knowledge Management Research & Practice*, 6 (1), 47-51. DOI: 10.1057/palgrave.kmrp.8500162
- Louridas, P. (2006). Using wikis in software development. *IEEE Software*, 23(2), 88-91 DOI:10.1109/MS.2006.62
- Lunce, S.E., Iyer, R.K., Courtney, L.M. & Schkade, L.L. (1993). Experts and Expertise: An Identification Paradox. *Industrial Management and Data Systems*. 93(9), 3-9.
- Majchrzak, A., Wagner, C. & Yates, D. (2006). Corporate Wiki users: results of a survey, *Proceedings of the 2006 International Symposium on Wikis, WikiSym'06*. Odense, ACM, Denmark. DOI: 10.1145/1149453.1149472

- Malhotra, Y. (2000). Knowledge Management for E-Business Performance: Advancing Information Strategy to “Internet Time”, *Information Strategy: The Executive’s Journal*, 16 (4), 5-16.
- Malhotra, Y. (2002). Enabling knowledge exchanges for e-business communities, *Information Strategy: The Executive’s Journal*, 18 (3), 26-31.
- Malhotra, Y. (2005). Integrating knowledge management technologies in organizational business processes: getting real time enterprises to deliver real business performance. *Journal of Knowledge Management*, 9 (1) 7-28. DOI 10.1108/13673270510582938
- Marlow, C., Naaman, M., Boyd, D., & Davis, M. (2006). HT06, tagging paper, taxonomy, Flickr, academic article, to read. In U. Kock Wiil, P. J. Nürnberg, & J. Rubart (Eds.), *HYPertext 2006: Proceedings of the 17th ACM Conference on Hypertext and Hypermedia*, 31-40. New York: ACM Press.
- Marschan-Piekkari, R., Welch, C., Penttinen, H. & Tahvanainen, M. (2004). Interviewing in the Multinational Corporation: Challenges of the Organisational Context. In R. Marschan-Piekkari & C. Welch (Eds.) *Handbook of Qualitative Research Methods for International Business*. Cheltenham: Edward Elgar Publications.
- Maykut, P. & R. Morehouse (1994). *Beginning Qualitative Research: A Philosophic and Practical Guide*. London: Falmer Press.
- McAfee, A. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration, *Sloan Management Review*, 47 (3), 21-28.
- McAfee, A. (2009). *Enterprise 2.0: new collaborative tools for your organization's toughest challenges*. Boston: Harvard Business School Press.
- McDermott, R. (1999). Why information technology inspired but cannot deliver knowledge management, *California Management Review* 41 (4), 103–117.
- Murray, S.R. & Peyrefitte, J. (2007). Knowledge type and communication media choice in the knowledge transfer process, *Journal of Managerial Issues*, 19 (1), 111-33.
- Mäkelä, K. Kalla, H. & Piekkari, R. (2007). Interpersonal similarity as a driver of knowledge sharing within multinational corporations. *International Business Review*, 16 (1), 1-22.
- Nahapiet, J. & Ghoshal, S. 1998. Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23 (2), 242-266.

- Ngwenyama, O. K. & Lee, A. S. (1997). Communication richness in electronic mail: Critical social theory and the contextuality of meaning. *MIS Quart*, 21 (2) 145-167.
- Nishida, T. (2002). A traveling conversation model for dynamic knowledge interaction. *Journal of Knowledge Management* 6 (2), 124-134.
- Nonaka, I. (1991). The knowledge-creating company. *Harvard Business Review*, 69 (6), 96-104.
- Nonaka I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5 (1), 14–37.
- Nonaka, I. & Konno, N. (1998). The Concept of “Ba”: Building a Foundation for Knowledge Creation. *California Management Review*, 40 (3), 40-54.
- Nonaka, I. & Peltokorpi, V. (2006) Objectivity and Subjectivity in Knowledge Management: A Review of 20 Top Articles. *Knowledge and Process Management*, 13(2), 73-82.
- Nonaka, I. & Toyama, R. (2005). The theory of the knowledge-creating firm: subjectivity, objectivity and synthesis. *Industrial and Corporate Change*, 14 (3), 419- 436.
- Nonaka, I. & Takeuchi, H. (1995). *The Knowledge-Creating Company*. Oxford: Oxford University Press.
- O'Dell, C. & Grayson, C.J. (1998), If only we knew what we know: identification and transfer of internal best practices. *California Management Review*, 40 (3), 154-74.
- OECD. (2007). Participative web and user-created content: Web 2.0, wikis, and social networking. Paris: Organisation for Economic Co-operation and Development. <http://213.253.134.43/oecd/pdfs/browseit/9307031E.PDF>
- Panke, S. & Gaiser, B. (2009). With My Head Up in the Clouds: Using Social Tagging to Organize Knowledge. *Journal of Business and Technical Communication*, 23 (3), 318-349. DOI:10.1177/1050651909333275
- Pfeffer, J. & Dutton, R. (2000). *The Knowing-Doing Gap: How Smart Companies Turn Knowledge Into Action*. Boston: Harvard Business School Press.
- Piekkari, R., Vaara, E., Tienari, J., & Sääntti, R. (2005). Integration or disintegration? Human resource implications of a common corporate language decision in a cross-border merger. *The International Journal of Human Resource Management*, 16 (3), 330-344

- Pinelle, D., Gutwin, C. & Greenberg, S. (2003) Task Analysis for Groupware Usability Evaluation: Modeling Shared-Workspace Tasks with the Mechanics of Collaboration. *Transactions on Computer-Human Interaction*, 10 (4), 281-311. DOI: <http://doi.acm.org/10.1145/966930.966932>
- Polanyi M. (1966). *The Tacit Dimension*. London: Doubleday.
- Polanyi, M. (1998). *Personal knowledge: towards a post-critical philosophy*. London: Routledge.
- Pór, G. & Molloy, J. (2000) Nurturing Systemic Wisdom Through Knowledge Ecology. *Systems Thinker*, October 2000.
- Prahalad, C.K. & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68 (May-June), 79-91.
- Probst, G., Romhardt, K. & Raub, S. (1999). *Managing Knowledge: Building Blocks for Success*, London: Wiley.
- Pullman, G. & Gu, B. (2008). Guest editors' introduction: Rationalizing and rhetoricizing content management. *Technical Communication Quarterly*, 17 (1), 1-9.
- Raban, D.R. & Rafaeli, S. (2007). Investigating ownership and the willingness to share information online. *Computers in Human Behavior*, 23 (5), 2367-82.
- Schein, E. H. (2004). *Organizational Culture and Leadership*. San Fransisco: Jossey-Bass.
- Schiltz, M., Truyen, F. & Coppens, H. (2007). Cutting the trees of knowledge: Social software, information architecture and their epistemic consequences. *Thesis Eleven*, 89, 94-114.
- Schulz, M. (2001). The uncertain relevance of newness: Organizational learning and knowledge flows. *Academy of Management Journal*, 44 (4), 661-681.
- Shirky, C. (2008). *Here comes everybody: The power of organizing without organizations*. New York: Penguin.
- Sieloff, C.G. (1999). If only HP knew what HP knows: the roots of knowledge management at Hewlett-Packard. *Journal of Knowledge Management*, 3 (1), 47-53.
- Slater, S. F. & Narver, J. C. (1995). Market orientation and the learning organization. *Journal of Marketing*, 59 (July), 63-74.

- Stenmark, D. (2002), Designing the new intranet. Gothenburg Studies in Informatics, Report 21, March.
- Sun, E., Rosenn, I., Marlow, C., & Lento, T. (2009). Gesundheit! Modeling Contagion through Facebook News Feed.. In International AAAI Conference on Weblogs and Social Media. Retrieved from <http://aaai.org/ocs/index.php/ICWSM/09/paper/view/185/428>
- Surowiecki, J. (2005). *The Wisdom of Crowds*. New York: Anchor.
- Szulanski, G., (1996). Exploring internal stickiness: impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17 (Special Issue: Knowledge and the Firm), 27-43.
- Tapscott, D. & Williams, A. D. (2006). *Wikinomics: How mass collaboration changes everything*. New York: Portfolio.
- Teece, D. (1998). Capturing value from knowledge assets: the new economy, markets for knowhow and intangible assets. *California Management Review*. 40 (3), 55-79.
- Tidwell, L. C. & Walther, J. B. (2002). Computer- Mediated Communication Effects on Disclosure, Impressions, and Interpersonal Evaluations. *Human Communication Research*, 28 (3), 317-348. DOI: 10.1111/j.1468-2958.2002.tb00811.x
- Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal*, 17 (Special Issue: Knowledge and the Firm), 11-25.
- Tuomi, I., (2002). The Future of Knowledge Management. *Lifelong Learning in Europe (LLinE)*, VII (2), 69-79.
- Turner, J. W., Grube, J., Tinsley, C., Lee, C., & O’Pell, C. (2006). Exploring the dominant media: How does media use reflect organizational norms and affect performance? *Journal of Business Communication*, 43(3), 220-250.
- Tushman, M.L., & Nadler, D.A. (1978). Information processing as an integrating concept in organizational design. *Academy of Management Review*, 3 (3), 613-24.
- Tushman M.L. & O’Reilly C.A. (1997) *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal*. Boston, MA: Harvard Business School Press.

- Vartiainen, M., (2006). Mobile Virtual Work — Concepts, Outcomes and Challenges. In J. H. Erik Andriessen & M. Vartiainen (Eds.) *Mobile Virtual Work — Concepts, Outcomes and Challenges*. Heidelberg: Springer Berlin DOI:10.1007/3-540-28365-X_2
- Venzin, M., von Krogh, G., & Roos, J. (1998). Future Research Into Knowledge Management, in *Knowing in Firms*, G. von Krogh, J. Roos & D. Kleine (eds.), Thousand Oaks, CA: Sage Publications, 26-66.
- Wagner, C. & Bolloju, N. (2005). Supporting Knowledge Management in Organizations with Con-versational Technologies: Discussion Forums, Weblogs, and Wikis. *Journal of Database Management*, 16(2), 1-8.
- Weick, K.E. (1995). *Sensemaking in Organizations*. Thousand Oaks: Sage Publications.
- Weick, K. E. & Browning, L. (1986) Arguments and narration in organizational communication. *Journal of Management*, 12 (2) 243-259.
- Weick, K. E., & Roberts, K. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 38 (2), 357-381.
- Weick, K. E. & Sutcliffe, K. M. (2007) *Managing the Unexpected*. San Francisco, Jossey-Bass.
- Yin, R. (2009). *Case Study Research, Design and Methods*. 4th edition. USA: Sage Publications
- Zajicek, M. (2007) Web 2.0: Hype or Happiness? ACM International Conference Proceeding Series, 225, Proceedings of the 2007 international cross-disciplinary conference on Web accessibility (W4A) table of. DOI: <http://doi.acm.org/10.1145/1243441.1243453>

Appendix 1.

INTERVIEW THEMES FOR SEMI-STRUCTURED INTERVIEWS

Interview framework for case company's employees

1. Background information

- Name
- Title
- Position

2. Usage of Electronic Working Environments

- Latest activity on EWEs
- When was the latest activity
- Frequency of use
- Most frequent use

3. Knowledge sharing using EWEs

- What and how they gather and share knowledge
- What are the options for using EWEs

4. Benefits of the use

- What is the main benefit for your job
- What could be done differently to help you be more efficient

5. Any comments