Knowledge Management and Sharing Within Project Teams:
A qualitative Study of Ericsson

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Abstract

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Purpose:
The goal of this study is to describe and analyse the knowledge management and sharing in a project team.

Research Question:
How is knowledge managed and shared within the project teams at Ericsson?
How do time constraints, communication, project structure and motivation affect knowledge sharing in project teams at Ericsson?

Method:
Primary data collection was done through semi-structured interviews with a project team at Ericsson. The interview questions were based on knowledge management and sharing literature, and a framework we developed through contemporary research.

Conclusion:
The investigated project team at Ericsson manages knowledge gained from their project within knowledge management systems. However, the practices used by the project team in order to manage knowledge have risks of inefficiency. The major shortcomings in project knowledge management were noticed in knowledge presentation, validation and distribution process. The main source for sharing knowledge within the project team is through project meetings before, during and after the completion of project apart from Scrum meetings, communities of practice, and pair programming. Additionally, the project specific factors showed their potential to really influence the knowledge sharing within the project team.
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1. Introduction

Knowledge is, according to Wang and Noe (2010), a critical organizational resource that provides a sustainable competitive advantage in a vital strategic asset for organizations to gain and sustain their competitive advantage over their rivals. At the same time, the management and sharing of such precious knowledge can be a challenging task for an organization in order to capitalize the benefits of it in the most appropriate way. The sharing of knowledge occurs on a continuous basis within an organization at different levels both intentionally or unintentionally. However, when organizations have specific goals and their existence is merely relying upon the basic input of knowledge, they need to develop a certain mechanism in order to make sure there is the smooth flow of knowledge required across the organization (Nahapiet & Ghoshal, 1998; Smith & Bollinger, 1996; Spender & Grant, 1996 and Ipe, 2003).

The importance and value of knowledge in modern economy is well described by Beijerse (1999) and then followed by Stewart (1997: 6) and Leibold, et al., (2005: 16), among other scholars, as follows: previously, the world economies heavily relied upon physical assets, such as land, labour and financial capital, as the main source for gaining competitive advantage and capturing the market in order to enhance their productivity. However, in this modern era the trend has been changed and the main ingredient for gaining competitive advantage, and thereby capturing the market, is termed as intellectual capital or in other words knowledge.

Lawton (2001) describes there being roots of knowledge management within the software industry as early as from the 1980’s. Knowledge management emerged due to the needs for keeping track of the knowledge learned from different project teams in order to utilize the previously gained knowledge in order to save both time and money. Rus, et al., (2001) point out that the emergence of knowledge management in the software Industry is a result of a process started by the artificial intelligence community for the storage and application of data. However, the revolutionary milestone in the history of knowledge management took place in 90’s when the main source for managing and storing the knowledge was converted to technology-based equipment, such as computers, internet, intranet, portals and data warehouses (Lawton, 2001). Furthermore, Lawton (2001) explains that more than 80% of world’s largest organizations have implemented knowledge management systems in order to facilitate their daily operations. However, Eppler and Sukowski (2000), among many other scholars, believe that taking effective or desired use from accumulated organizational knowledge is often a tricky challenge.

1.1 Background

The software industry can be characterized as a knowledge-based industry since most of the output heavily relies upon the intellectual capital of the organization. This means that the input required for getting output is the knowledge residing inside the minds of the employees and, alternatively, the firm’s ability to maintain its competitive advantage solely remains dependent upon the employees (Walz et al., 1993; Rus et al., 2001). It also means the software industry can be conceptualized as both a human and knowledge-based industry (Birk et al., 1999). Consequently, software organizations require some special treatment for knowledge management as compared to any other industry (Rus et al., 2001).

Furthermore, the software development process requires coordination and cooperation of different employees: experts in different areas such as architecture, algorithm, coding, testing, and debugging,
in order to develop quality software (Walz et al., 1993; Rus et al., 2001). Hence the software development process can be seen as a process where employees require sharing their expertise on a frequent basis with each other in order to accomplish the task in hand (Walz et al, 1993). The way many organizations within the software industry develop products is by dividing the task into different project teams, therefore it makes sense to stress upon the need for an efficient knowledge management system in order to store and retrieve data that has been gained or achieved by such project teams. Another important reason to focus on capturing and sharing of project team knowledge is the very nature of project teams. The project team members work for a specific short period of time in order to reach a particular goal. However, when the project is accomplished the team members return to their departments or are assigned to a new task, they carry along the knowledge learned from the project. According to Schindler and Eppler (2003), for knowledge-based organizations, it is necessary to harvest the project knowledge and make it available for the whole organization through sharing in order to sustain organizations competitive advantage. Additionally, in order to accomplish the task in question, the project team member needs to share their expertise and knowledge with each other (Hendriks, 1999).

Davenport et al., (1998) argue that traditionally the knowledge management phenomena was dominated by the technology driven tools and technology was considered as the focal instrument for knowledge management, as was later agreed by Gourlay (2001). However, other scholars, such as Earl (2001) and Stenmark (2001), highlights the importance of role-playing by individuals (employees) in order to successfully proceed with knowledge sharing within the organization. Thus, the result oriented knowledge sharing can be seen as relying upon both technology and the individuals working for the organization (Mcdermott, 1999). This leads to the point that, knowledge is held by the employees within the organization (Spender & Grant, 1996) and for organizations to gain competitive advantage the individual knowledge must be circled and passed on to group and organizational level through knowledge sharing (Nonaka, 1994). This will help the organization to, not only to reach the organizational goals, but also establish vitality for the creation of new knowledge that will enhance the individual competencies.

1.2 Problem Formulation
The knowledge gained from projects in project-based organizations risks getting lost after the completion of project if a proper knowledge management system is not established that can support smooth knowledge sharing (Schindler & Eppler, 2003). Eppler and Sukowski (2000) describe knowledge management within project teams as a biggest challenge based upon their study of various companies. This is due to the temporary nature of the project. According to Ayas and Zeniuk (2001), most of the valued knowledge is produced by the project teams while working on a project. Although, the knowledge gained from projects becomes part of the group knowledge, it remains either unknown or useless for the rest of the organization, even though the lessons learned are shared through knowledge management systems (Ayas & Zeniuk, 2001). Many scholars, such as Gherardi (2000), (Scarborough et al., 2004) and Huber (1999) describes this problem as either a matter of practice or the nature of a project itself due to limiting factors, such as time constraints, communication, project structure, and motivation. Schindler and Eppler (2003) however, tried to briefly bridge the current gap in research, in this regard, by discussing the discrepancies regarding how project teams manage knowledge learned from the projects. Our research is an effort towards identifying the discrepancies in knowledge sharing by the project teams.
In order to conduct our research concerning knowledge sharing within project team we decided to choose Ericsson. The company was founded in 1876 and, today, is a market leader in communication technology and networking. Additionally, Ericsson is a project-based multinational company that undertakes technology-based projects ranging from telecom to networking which includes the development of software (This is Ericsson, 2013). Hence making it an interesting and relevant case company for analyzing the knowledge management and sharing among employees working in project teams.

1.3 Research Question
How is knowledge managed and shared within the project teams?
How do project specific factors (time constraints, communication, project structure, and motivation) affect knowledge sharing in project teams?

1.4 Purpose of the research
The goal of this study is to describe and analyse the knowledge management and sharing in a project team.

1.5 Target group
The audiences expected for this thesis are the academics and practitioners, for their understanding of knowledge management and knowledge sharing at the project team level of a software development organization, and the factors that affect both management and sharing. In addition, this thesis should also stand as an analysis and recommendations for management in an organization like Ericsson’s.

1.6 Limitations
This study is limited to the project team level of a software development organization in Sweden. We are only drawing empirical findings from one project team, which is satisfactory for our case study, but limiting when compared to the potential of studying several project teams or several organizations for that matter.

Additionally, the scope of this thesis is limited to the extent of examining the practices adopted by the project team in order to capture and manage project knowledge into knowledge management systems that further affects knowledge sharing through knowledge management systems. Furthermore, this thesis also investigates the importance of micro articles, storytelling and project review meetings in managing and sharing knowledge and the influence of project specific factors such as time constraints, communication and motivation on both management and sharing of knowledge at Ericsson.
2. Theoretical Framework

This section presents the theoretical framework constructed around theories behind knowledge management and knowledge sharing in the context of project teams. All of the theories have been collected from different academic sources and literature.

2.1 Project teams

The Project Management Institute defines a project as “a temporary group activity designed to produce a unique product, service or result.” (Project Management Institute, 2013) In recent years, project-based organizations have received growing attention as an emerging organizational form being used to bring unique and specialized knowledge resources into integration (Thiry & Deguire, 2007). The reason being that project teams respond quickly to the ambiguities in this competitive environment.

In order for a project-based organization to function, teams conduct the activities designed to create the valued results. A project creates a threshold through which the knowledge of the team can be more readily accessed and transformed by the team members (Lampel et al., 2008). These projects constitute most of the business being functioned within project-based organizations (Hobday, 2000). The value of a project for organizations is that they offer a means of empowering decentralized processes of “self-organized problem solving” (Lindkvist, 2004). The length of a project is limited and often predefined, often ceasing after a specific goal is achieved.

According to Kotnour (2000), Project teams are grouped according to their specific functions; they are assigned with specific tasks and evaluated with reference to predefined performance goals or expectations. Apart from these performance goals set by the company, individuals also have their individual learning goals. As the project proceeds, team members are facilitated by the project tasks, from which their job knowledge can be inspired and enhanced.

According to Hobday (2000), Project based organizations create and recreate new organizational structures around the needs of each product and each major customer. By this, Lindkvist (2004) and Hobday (2000) mean that within project based organizations, there is potential for flexible problem solving.

Although project based organizations originated from a need for more effective project management without disturbing the traditional organizational model, according to Thiry & Deguire (2007), the issue is that the results of a flexible organization, like project teams, are not as easily prototypical. Project based organizations are fundamentally flawed in coordinating processes if the resources and capabilities that result in Individual project success and efficiency do not support the organization as a whole with success (Hobday, 2000).
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2.2 Knowledge

Project teams are dependent on managing and sharing knowledge in order to achieve their goals and prevent mistakes. The following subheadings break down knowledge and build up a framework for describing the managing and sharing of knowledge within a project team.

2.2.1 Knowledge Concept

As with many other technical terms, the word knowledge is derived from the Latin language. The word knowledge is divided into two parts and the prefix “know” is derived from Latin word “noscere” meaning “to know”, the suffix “ledge” is assumed to have originally meant “process” or “action”. In short knowledge can be defined as “the capacity for effective action” (Call, 2005). Smith and Bollinger (2001) describe certain characteristics of knowledge as follows:

- Knowledge is intangible asset and this characteristic makes it difficult to measure it.
- The volatility characteristic of knowledge causes an increase in knowledge level with its usage.
- The flexibility to use in different processes by different people at the same time (Spender, 1996), long lead time, embodied in agents with will, and having a huge impact on the organization.

From the knowledge-based theory of firm, knowledge is “residing within the individual and the primary role of the organization is knowledge application, rather than knowledge creation” Grant (1996:109).

There are many scholars who defined knowledge in different ways, among them Davenport and Prusak (1998:5) define knowledge as, "a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of the knower." However, in the context of software industry Davenport & Prusak (1998) extend this definition further as, “In software organizations, it often becomes embedded not only in documents or repositories, but also in organizational routines, processes, practices, and norms.”

Additionally, Rus et al., (2001) state that knowledge also replicates the relevant information along with its original source and meta data. Furthermore, knowledge can be classified into two parts. Knowledge can either be in tacit or explicit form (Nonaka, 1994; Spender, 1996; Smith & Bollinger, 2001 and Rus et al., 2001).

2.2.2 Explicit and Tacit Knowledge

One of the well renowned scholars in the field of organizational theory, Nonaka (1994), describes explicit knowledge as the form of knowledge that “can be expressed in formal and systematic language and shared in the form of data, scientific formulae, specifications, manuals and such like.” The different attributes of explicit knowledge include the ability to store, process and transition upon need basis. Smith and Bollinger (2001) recognize explicit knowledge with its ability to be stored in databases in codified form apart from being distributed without misinterpretation to the potential receivers. Thus the explicit knowledge can be conceptualized as the information or individual skills, which can easily be transferred, communicated, stored and reused upon need (Rus et al., 2001).
Tacit knowledge can be described as the form of knowledge that is difficult to describe, communicate and store in any kind of database or media. Such kind of knowledge can, however, be gained through experience by repeating the steps shown by the mentor in his presence. Rus et al., (2001) describes tacit knowledge also in the same manner, gained through experience, but adds the impact of individual’s (both mentor and learner) characteristics on such knowledge that may vary from individual to individual. Thus, the tacit knowledge can be seen as more personal skills or individual knowledge (Nonaka, 1994). According to Nonaka (1994), tacit knowledge owned by individuals actually comes from “action, procedures, routines, commitment, ideals and emotions” while performing their duties for a certain period of time.

2.2.3 Knowledge Management

The primary objective of knowledge management is to combine and store the existing knowledge in a manner that makes it easier for employees and the organization to reuse it at an appropriate time, and also to create new knowledge. Beijerse (1999) describes knowledge management as a management tool used to reach organizational goals by adopting certain strategy (codification or personalization) to accumulate knowledge. Furthermore, it is also used for encouraging employees to make use of such knowledge through interpretation skills and experience in order to leverage added value to a product or services. When looking at knowledge from an organizational perspective it lies at various levels, such as individual’s knowledge, group (project team) knowledge, and organizational knowledge. In addition, the knowledge management within an organization provides an opportunity for management to make concrete decisions based upon solid facts (De Long and Fahey, 2000).

According to De Long and Fahey (2000) organizations need knowledge management systems in order to enhance organizational performance by using different tools and structures that can facilitate the knowledge creation and sharing process. Bhatt (2001) describes knowledge management as a gradual process towards fostering the knowledge sharing in the organization. This process begins with “knowledge creation, validation, presentation, distribution and application” (Bhatt, 2001).

In knowledge management process knowledge creation means the use of stored knowledge in a way to find new ideas or solutions to solve a certain situation (Bhatt, 2001). Knowledge creation process starts with the interaction of different individuals with each other or even with the organizational knowledge domain. Nonaka (1994) described the knowledge creation process as the interaction of tacit and explicit knowledge, and named different interactions as internalization, socialization, combination and externalization, through which individuals and the organization can create knowledge by sharing existing knowledge. Alavi & Leidner (2001) state that organizations use different tools to enhance and facilitate the knowledge creation process, especially the role of IT tools (Intranet, database, SharePoint etc.) as of great importance. Fong (2003) describes that the collaboration between the project team members is also a primary condition for the creation of new knowledge resulting from sharing of each other’s expertise.

Knowledge validation is the process of examining the relevance and importance of knowledge for the organization in order to determine if it can be used in order to create value for the product or process. Validation refers to the relevance or authenticity of stored knowledge and its usability in order to take advantage of it. This is necessary due to the fact that with the passage of time and advancement in technology some parts of the knowledge become irrelevant (Bhatt, 2001). Thus, the organizational knowledge base needs to be filtered after a certain time period (Nonaka, 1994).

Furthermore, in order to make a knowledge management system useful, the organizations needs to improve the quality of knowledge stored into it. Durcikova and Gray (2009) stress upon the need for a
proper check and balance when it comes to adding new knowledge into the knowledge management systems in order to avoid overflow of undesired knowledge, which consequently will affect the motivation of individuals to use a knowledge management system.

Knowledge presentation deals with the presentation of data and information in an appropriate form, which can be used for a required purpose. The knowledge management systems contain data from different parts or units of the organization, which may use particular terminology or standards to store data and information. Thus, it can create difficulties for reaching a concrete conclusion about the data and information, if not presented in appropriate manner. Hence standardize codification is a strategy for storing relevant data and information in order to avoid any misunderstanding in presenting the knowledge (Bhatt, 2001).

Additionally, the knowledge should be presented and placed under appropriate content in a sequence, which makes it easier for others to locate it upon need. The knowledge stored in a knowledge management system should be presented in a way that facilitates modifications by the prospective users, when needed. This would not only ensure the knowledge sharing but also will encourage the users to add new information to it in order to gain long lasting benefits (Zack, 1999).

McDermott (1999) describes the importance of knowledge presentation in the context of knowledge sharing by arguing that knowledge sharing is like guiding perspective knowledge users looking for solutions for problems towards one’s own thoughts. This implies that great considerations should be paid while coding knowledge into a knowledge management system, so that the other employees can easily understand it.

Knowledge distribution is another important element of knowledge management. It refers to the flow of knowledge throughout the organization. The organization cannot take advantage of the stored validated and presentable data or information unless it is accessible by the employees. Apart from the individual’s ability to interact with different technical tools (e-mail, intranet, bulletin board, newsgroup, wikis) and other colleagues, the organizational structure is also crucial to determine the extent of knowledge distribution within an organization (Bhatt, 2001).

Knowledge application refers to the capability of stored knowledge to be used in a productive and innovative way in order to add value to the product or service. The inability of employees to apply knowledge in new products or processes could mean huge losses for the company and, additionally, can deprive the company from gaining a competitive advantage (Bhatt, 2001).

According to Keegan & Turner (2001), the process of knowledge management differs between functional and project-based organizations. Within the vicinity of functional organizations, innovative and successful ideas get stored on knowledge management system and are available for the whole organization to take advantage of. However, when it comes to project-based organizations, it becomes difficult to store all the ideas, as they refer to specific type of task, as well as due to the time restrictions. Furthermore, the stored knowledge might get stuck within the specific project team. Consequently, it is of vital importance for organizations undertaking most of their work in different projects to adopt certain mechanism to capture, store and spread knowledge throughout the whole organization (Keegan & Turner, 2001), as will be discussed in detail later in this chapter.

Nonaka (1994) describes knowledge management as a way to secure and nourish the corporate asset organizational knowledge, which further could be used to enhance the organizational performance through sharing knowledge. In addition, much of the knowledge is owned and controlled by the
individuals, which can create hurdles for management to manage the knowledge, unless supplemented by a solid knowledge sharing culture (Gupta & Govindarajan, 2000).

2.2.5 Knowledge sharing

As earlier mentioned, knowledge is the strategic intangible asset for any organization and provides the opportunity to gain competitive advantage, but a large part of such knowledge lies in the heads of individual employees. In order to make effective use, and take advantage of, such individualistic knowledge, the employees need to cooperate with each other through sharing knowledge and expertise to further take part into the advancement process of organization. Ipe (2003) describes knowledge sharing as, “the process by which knowledge held by an individual is converted into a form that can be understood, absorbed, and used by other individuals.”

The unique benefit of sharing knowledge is that it makes it possible to share a common understanding about certain objects or subjects or tasks in hand, without depriving the sender from his knowledgeable asset. Knowledge sharing differs from knowledge exchange in a way as the earlier case occurs purely with volunteer consent of the individual whereas the lateral case requires some sort of procedural bindings (ibid). Moreover, knowledge sharing between individuals demands certain condition to be met, i.e., there should be a knowledge seeker and a knowledge holder to make the knowledge sharing process happen (Hendriks, 1999). In other words, when individuals within a project or department share knowledge, it would be considered simple knowledge sharing. However, when new knowledge is generated in the form of some routines or procedures, and delivered to another department or subsidiary under the guidelines of management decisions, it would be called as knowledge exchange.

The process of knowledge sharing is deemed necessary within an organization, as it paves way towards the customer satisfaction, cost reduction, excellence in business operations and, finally, to achieve competitive advantage while sustaining that advantage (ibid). Among other benefits of knowledge sharing, the interaction of different individual expertise also enables organizations to innovate new processes or technologies and lead the industry (Cohen & Levinthal, 1990).

The individual’s inability or unwillingness to share knowledge not only restrain their own knowledge but also poses barriers to the accumulation of organizational knowledge and the organization’s ability to gain competitive advantage. Such inability or unwillingness can be due to certain factors such as failure of communication, issues with time constraints, project team structure, or motivation (Smith & Bollinger, 2001; Hendriks, 1999). Thus it requires considerable attention from management to closely monitor above-mentioned factors, in order to foster knowledge-sharing culture within the organization.

2.3 Knowledge sharing in project teams

In the following chapters, we will be discussing the management and sharing of knowledge at the project team level. This includes the tools used and the factors that affect knowledge sharing within a project team.

In order for an organization to compete, they need to be constantly creating improvements. Project teams directly affect the performance of the organization (Poell & Van der Krogh, 2003). Therefore, great amounts of attention should be given towards knowledge sharing within project-
teams. According to Law and Chuah (2004), for the team to be effective, members must be able to share, adapt, learn and perform as a team.

The projects represent a level of the project-based organization involving resource recruitment, team building, strategy and leadership (Enberg et al., 2006). Within the project level, Project-related activities focus on internal processes that impact the efficiency of knowledge organization, formation and the incorporation of knowledge (Lampel et al., 2008).

According to Kotnour (2000), sharing and individual learning is expected to occur within the team for members to be able to fulfill the prerequisite performance goals. Mutual benefits can be achieved through such a cohesive relationship. Within a project, knowledge is created and shared by focusing on tasks. Learning occurs through the discussions and knowledge sharing between team members as they complete the tasks (Law & Chuah, 2004). Younger team members should be encouraged to learn from more experienced staff, for example, in order to gain new knowledge (Hobday, 2000).

Consistent monitoring, assessment, and evaluation are needed for measuring the sharing efficiency and employee's motivation (Law & Chuah, 2004). In projects, employees are learning how to use their expertise and knowledge in a practical context. Much of the knowledge generated within projects can be hard to formalize and incorporate into the review practices or any sort of written material (Lindkvist, 2004). The sharing process needs to be supported by an environment that allows team members to admit mistakes and openly discuss solutions to problems (Kotnour, 2000).

2.3.1 Tools for managing and sharing knowledge in project teams
The following headings represent different ways project teams can share knowledge. Although each organization may have its own unique title for these tools, they are all generally used for the same purposes. These are often used and stored in the knowledge management systems for other organization employees to gain access to. Schindler & Eppler (2003) describe these tools as a proficient way to share knowledge within and from project team.

Project Reviews

The knowledge gained from projects is often stored in databases or a knowledge management system. These systems contain tools that help to capture and articulate tacit knowledge from the project members (Smith & Bollinger, 2001). The problem is that project-based firms tend to focus their efforts on outcomes rather than on the processes when organizing this data (Prencipe & Tell, 2001). The knowledge captured should regard the processes of conducting the outcome instead of the actual outcome.

Project reviews can indicate the project team’s current position with a project. During this process, the project members are asked to capture the knowledge gained during the project. Project team members often find themselves being assigned to new projects as soon as a current project had been completed. Therefore, the end-of-project reviews compares project processes, problems and performance amongst team members (Hobday, 2000).

Often the project reviews occur throughout a project as well. There could be a routine reporting cycle, such as weekly or monthly reports, but also review meetings during major milestones in the
project (Kotnour & Hjelm, 2002). There are, however, both potential benefits and issues with the timing of these project reviews. Project reviews can be set up during specific points that determine progress in the project. Using milestones for review points has advantageous potential because team members can reflect the process while the project is still occurring (Scarborough et al., 2004). However, often the team members are only focused on being able to deliver their own achievements corresponding to the short-term goals (ibid).

It is important that the project team members reflect upon their mistakes. If learning can be done, then mistakes are worthwhile to make (Zedtwitz, 2002). With a routine reporting cycle there is potential to better represent the project in review, the issue, however, is in timing. If the project review comes too late, the project team could be less motivated to reflect on the knowledge gained or used for the project; if it is too early, there could be too little information available to reflect upon (Scarborough et al., 2004).

Another way project teams can reflect is through post-project reviews, although it is important that these are not being used for their own sake. The important value to be drawn from the post-project review process is a reflection on how the project team conducted their results. Any result of a post-project review should be an input to a succeeding project (Hobday, 2000). Project reviews can draw knowledge for the project teams for the organization.

It is important for team members to evaluate themselves and be motivated to act on those evaluations in order to change their approaches (Kwak & Stoddard, 2004). The project members can gain knowledge from working on the project together when it is shared in a way that will benefit each other with their work in the future. This is considered a way to reveal and store implicit knowledge for future use (Disterer, 2002).

In order to store this knowledge, communication and expression of the process for solving the project problem must be put into a format that can be later retrieved (Smith & Bollinger, 2001). Interpretation of experience can be a challenge since knowledge must be drawn from many observations within the dynamic project team environment (Prencipe & Tell, 2001). As well as the fact that most of these values and insights are difficult to document and transfer (Disterer, 2002).

**Micro Articles**

Team members can write small articles in order to document experiences from a project. These *micro articles* are usually written informally and limited to a half a page in length (Schindler & Eppler, 2003). There are many benefits to using micro articles. Because of how the details are organized, the knowledge captured can be explained and shared by the author through the combination of their own knowledge and the knowledge developed during the project (Linz & Resch, 2010). The original developer recommended that micro articles are stored in databases and made available through the company’s intranet. Schindler & Eppler (2003) also suggested that micro articles should avoid using only texts, and should have video clips and other multimedia content instead.

Another benefit micro articles have is in their sheer development of the project member’s documentation abilities. Because the author is using their own knowledge while writing and drawing conclusions for their micro articles, they are learning from the experience (Linz & Resch, 2010). This develops the project member’s ability to document knowledge while sorting out their solutions.
Furthermore, the micro articles benefit the project member’s community of practice (ibid). A community of practice is an organized group of employees that share similar roles on their project teams and a need to share knowledge with one another on a regular basis. The content documented can be organized by expert-matter so project members can learn from one another’s experiences and gain new knowledge.

**Storytelling / Storytelling workshops**

Another tool used to share knowledge is storytelling workshops. These involve a social environment in which project members can communicate and exchange stories they have experienced. It is from this exchange that project members can share knowledge and learn from one another. The Institute for Knowledge Management describes a story as “a tiny fuse that detonates tacit understanding in the mind of the listener.” (Knowledge Management Institute, 2013) When a problem is presented as a story, the respondent can understand the context much better (Linz & Resch, 2010). This is especially the case with more complex knowledge sharing.

Storytelling also occurs in the community of practice. However, the workshops more often lead to an oral culture of informal learning. Project members learn through mentoring from other members discussing practical problems (Styhre et al., 2004)

If the storytelling is compelling, the respondent is more likely to listen or receive the knowledge. However, a concern with storytelling is that the respondent can have difficulty critically evaluating the content if they are too distracted by the details surrounding the real purpose behind the story (Sole & Wilson, 2002).

**Learning history**

While storytelling involves a more oral communicative approach, learning histories are a more documented approach, but with very similar traits. This is a more reliable and extensive approach than both storytelling and micro articles. This is due to the more organized nature of the sharing tool, and the amount of content involved. The learning history contains a chronological document recording of the events occurring throughout the project.

Often “project historians” are appointed to evaluate the weaknesses of the learning histories written, and provide their own comments, especially regarding content with tacit knowledge (Schindler & Eppler, 2003). However, while the tool is carefully conducted and evaluated, this can be a time consuming process for both capturing and sharing knowledge.

**Scrum program**

Software development has offered companies new ways to plan and control the process of information systems. In particular, Agile software development is used for collaboration between self-organizing, cross-functional teams. This software works as a management enhancer for an existing system or production prototype by using existing design and code available in databases (Schwaber, 1997). Agile Software Development has gained the attention of organizations due to its
flexible approach and emphasis on extensive collaboration; an example of this is Scrum (Hossain et al., 2009). Self-management is a defining characteristic in Scrum, according to Moe et al., (2010), the program has a new approach towards planning and managing software projects, because it brings decision-making authority to the operational level. Scrum proposes knowledge sharing across projects and within teams, supporting team learning and offering benefits for project teams (Landaeta et al., 2011). Agile programs like Scrum can be beneficial in reviewing projects and establishing new knowledge. The Scrum master leads the Scrum meetings. He watches to see that everyone is making progress, while recording the decisions made at the Scrum meeting and keeping everything focused (Rising, & Janoff, 2000). Usually, the Scrum meetings last 15 to 30 minutes. In this time, the project team addresses issues, but does not necessarily brainstorm solutions (ibid).

2.3.2 Factors affecting knowledge sharing within project teams

Efficiency within the organization leads to long-term competitive advantage. In order to increase efficiency, project teams must be able to reduce project risks and potential mistakes, while solving new problems. When members of a project team gain new knowledge from their experience working on projects, as well as share with one another in the process, they are able to address these issues more effectively. However, there are adverse factors that project members must overcome to share knowledge. Smith and Bollinger (2001) and Riege (2005) describe that time constraints, motivation, communication and project team structure can also affect knowledge sharing among project team members.

Time Constraints

Project teams are constantly working against the pressure of time frames based around outlined objectives. This is a factor that continuously pressures the team members while carrying out a project. Because of these constraints, projects are delivered without enough time to discuss, reflect and share knowledge. This is especially the case when the complexity of the project increases. The more complex the project is, the more difficult it will be for the project team members to share knowledge (Janz et al., 1997). Because of time limitation, the review process is made difficult (Keegan & Turner, 2001) By reducing the reviewing time and the number of individual failures a larger percentage of projects in complex organizations could deliver more effective and efficient solutions (Bourne & Walker, 2004).

It is difficult for project members to share effectively when the way their organization is structured, everything is much more temporary. Often after a project is completed, the team is split up and working on new projects. Because of this, there is always a risk of loss of knowledge at the end of a project, or as Schindler & Eppler (2003) put it, “organizational amnesia”. If the knowledge is not captured from these experiences, it can often decays, which can be a serious problem for companies in knowledge-based industries.

Another factor regarding the temporary nature of project teams is changing roles and relationships. This can also have an affect on the project member’s ability to share with one another. While the team members go on to projects, there is a limited opportunity to share with these individuals’ minds and transcribe that knowledge in a more readily available form to be made available for future project team members (Huber, 1999).
Motivation

Another notable factor described in various literature reviews is the motivation of individuals, which can really affect the knowledge sharing between project team members (Szulanski, 2000). The lack of motivation to share knowledge, either from recipient or receiver side, can limit the precious knowledge to a certain person. This, in turn, can be problematic for the whole organization. There could be several reasons for lack of motivation from either side, such as the power which a knowledge holder feels due to the knowledge that he owns, that could prohibit him from sharing knowledge (Zander & Kogut, 1995; Katz & Allen, 1982). The possible reason for lack of motivation from recipient side could be due to lack of trust upon the knowledge holder (Szulanski, 2000).

Apart from the above mentioned personal elements affecting knowledge sharing, the organizational goals set by the management could also be a reason to make sharing expertise and information necessary for the successful completion of the project. Bartol and Srivastava (2003) consider rewards for sharing knowledge as a stimulator to encourage individuals to share their respective knowledge with their co-worker. Rewards could motivate sharing knowledge, however, stressing a monetary reward could adversely affect the knowledge sharing among individuals within project team depending upon the individual characteristics (Bartol & Srivastava, 2003).

Similarly, reciprocity could be another factor that can influence individual motivation to share knowledge within the project teams. Reciprocity, in the context of knowledge sharing, stands for what one receives from the correspondent by sharing his knowledge. Therefore, reciprocity can be seen both as a motivator to share knowledge but can also be a barrier if the knowledge sender does not receive the compensating knowledge (Ipe, 2003).

According to Hansen et al. (1999), the personal ties among the team members, and their external network, also plays an important role in acquiring the required knowledge for solving a particular task. This implies that the personal ties of an individual within a project team can be crucial for not only acquiring valuable knowledge, but also sharing knowledge (Hansen et al., 1999). Reagans and McEvily (2003) argue that the degree of strength in the relationship among individuals not only foster knowledge sharing, but also ensures the integration or comprehensive understanding of the shared knowledge and its context.

Trust develops with these personal ties during recurrent interactions between two members of the organization (Tschannen-Morlan & Hoy, 2001). When two members become familiar with one another they inaugurate social networks and it is through these networks that knowledge is more likely to be shared due to their established relationships. Because these collaborators value socialization, knowledge sharing is cultivated (Harrison et al., 2002).

Developing trust on a project team can be another barrier for project members to overcome. For employees, to develop trust involves an extended period of time that is not always available during a project. Another factor regarding the level of trust between the project members is its influence on whether or not the knowledge is shared to begin with. A project member is more likely to share knowledge if they consider the receiver to be honest (Bakker et al., 2006).

Benevolence-based and competence-based are two levels of trust revolving around different values (Levin & Huber, 2001). With benevolence-based trust, there is an expected altruism and cordiality between the member and the individual knowledge is being shared with. This is often a result of a common understanding more likely developed through previous socialization as previously mentioned. Communication is an important factor in benevolence-based trust (ibid). With
competence-based trust, the value differs; an individual is sharing knowledge based on how they expect the knowledge to be used. An example of this is through communities of practice. A project member is willing to share knowledge with a community of other employees whom they may not know personally. The reason being that the employee trusts that the other members of the community of practice have the integrity and competence necessary to use the information properly (Ardichvili et al., 2003).

**Communication**

If the company has a goal to capture and share knowledge, technology is necessary for providing a place for project team members to communicate, network and discuss the issues and topics regarding their projects (Bollinger & Smith, 2001).

Due to the complexity of these projects, the technology and systems required can act as a barrier to sharing knowledge. Often it is necessary to communicate using technology to share knowledge and with this dependency, there can be limitations. In order to share knowledge with one another, there are regulations and practices that must be conducted (Riege, 2005). This can limit the project member’s desire to share knowledge, thus acting as a barrier.

Face-to-face interaction is often considered the better alternative due to its immediate understandings and opportunities for proper clarification. When team members are side-by-side and together, the amount of interaction increases greatly (Abdinnour-Helm et al., 2003)

Language is also a factor to consider. Language can be an issue if the company’s native languages differ from that of the project members (Husted & Michaiova, 2002). This can affect the knowledge shared due to ambiguity and the general difficulty of communication that can occur.

**Project Team Structure**

As described before, the project teams are often comprised of team members from different expert backgrounds. These project members take on the responsibility of different roles on the project team. While there are advantages to this structure, they can also act as barriers to knowledge sharing. One example is that teams with different roles may work parallel alongside one another independently, as long as there is not a necessity for knowledge flowing between the two parties (Stotts & Williams, 2002).

However, this is not always the case in the software industry where information flow is often necessary between the project team members due to the intensive knowledge-based nature of software. This creates difficulty in sharing knowledge within the project team as knowledge is not properly shared among the different members (Chau, et al., 2003).

An issue that can affect the flow of knowledge shared is if the company suffers from a more hierarchal structure (Riege, 2005). Power and influence are more of a factor to an employee in this environment. If there is less structure involved, there is more of an opportunity for knowledge to be shared because employees are less concerned about their own position in terms of securing power (Wang & Noe, 2010). There is also less of a process involved with sharing knowledge in that case.
2.4 Summary of the conceptual framework

The diagram above gives an overview of how we plan on describing and analyzing the knowledge management and sharing in a project team. Initially, we will focus on the steps described in section 2.2.3 regarding knowledge management.

Knowledge management is the environment in which knowledge sharing occurs and is therefore essential for knowledge sharing to occur. The tool concepts analyzed in section 2.3.1 offer an interconnection between knowledge management and knowledge sharing, as they are often used to capture and store knowledge gained during projects. The project team members use these tools to share knowledge. In order to answer our first research question, we will be analyzing these concepts as well as the concepts in section 2.2.5 and 2.3 to develop an understanding about how knowledge is managed and shared within the project teams. Each of these sections are interdependent and necessary for this discussion.

Part C of the diagram refers to the theoretical concepts necessary for answering our second research question regarding the project specific factors that affect knowledge sharing in project teams. Time constraints, motivation, communication and project team structure not only effect the knowledge sharing that occurs between the project members, but also effects how the members use the tools mentioned in section 2.3.1. Each of these factors was discussed in detail in section 2.3.2, which will be used in our analysis in order to accomplish the purpose of this thesis. An additional note to point out is that each of these factors also affects one another due to their interconnected nature, much like the other aspects of our conceptual framework.
3. Methodology

_This chapter includes the methodological approach, reasons behind the data collection and a detailed description of the procedure used in the research._

### 3.1 Approach to Research

The purpose of this thesis is to describe and analyse the knowledge management and sharing in a project team. According to Yin (2003), qualitative research is an effective way to collect this data. Quantitative research is more appropriate when the researchers are testing theories with statistical data. We came to the consensus that a qualitative approach would be more suitable for the kind of answers we were searching for. Because they were more intimate and conversational, face-to-face interviews were chosen as the means of collecting the data. Furthermore, face-to-face interviews also help in stimulating more detailed responses. Generalizations cannot be made with qualitative research case studies.

There are two types of research, inductive and deductive (Yin, 2003). With a deductive approach, theory is used to form an analysis along with a compilation of qualitative data. In order to have an inductive approach, a theoretical framework is developed based on the researched primary data collected. The strategy used in this thesis is the deductive approach, since the literature was first conducted and then used to determine the scope of collecting primary data from the interviews. Through a deductive approach, the goal of this thesis is to answer research questions dedicated to how knowledge is shared within project teams.

### 3.2 Choice of company

The process of finding appropriate company to conduct research for this paper went through different stages. Initially the authors contacted number of large multinational companies directly, in order to get access to their project teams for conducting interviews, not only in Sweden but also internationally. However, companies denied giving access mainly due to the lack of time but also the nature of the topic required them to give information, which could possibly affect their competitive advantage. Finally, management at Ericsson in Stockholm was approached through personal contact in order to get approval for conducting interviews with one of the project teams working at Ericsson. Hence authors got approval from the Ericsson management after presenting the research purpose and basic idea about the research topic.

Although the choice was limited to one company for conducting our research, Ericsson fulfills the required criteria for the addressed topic. Ericsson has a knowledge management system where employees store and retrieve knowledge. Apart from that, management encourages employees to share knowledge with each other by providing them with good environment. Additionally, Ericsson is knowledge-based company and highly relies on the intellectual capital and capabilities of its employees. Furthermore, the studied project team at Ericsson deals with the development of software for various products. Each article of software is developed by different project teams consisting of different number of employees depending upon the nature of project (initial interview with the contact person).
3.3 Case study
A case study comprises of a comprehensive exploration of an organization, place, person or event. These studies are often utilized in comparisons amongst other case studies, and are not specifically limited to this (Bryman & Bell, 2007). For this report, a case study has been conducted on the knowledge sharing within a project team at Ericsson; the focus being to determine and analyze the different aspects affecting how knowledge is shared. To conduct this case study, data was gathered through semi-structured interviews with each of the project team members.

3.4 Literature Research
Literature research was one of the key stages in the process of conducting this research. Once the authors defined their purpose of research and formulated research question, an extensive search was conducted in order to find appropriate theories from scientific articles, journals and books. A lot of interesting books were considered to borrow ideas but the priority was given to journals and scientific articles as they present more information about the research phenomena.

However, the main source for finding relevant literature, which is presented in the frame of reference, was Mälardalen University’s library and database. The database was partly accessed directly in the university and partly from home. Apart from that Google was also used as search engine to find the relevant material when deemed necessary through using different data mining tools.

The keywords we used to optimize the search for relevant literature include: knowledge sharing, knowledge management, project teams, and learning in project teams. The keywords gave hits ranging from 182,000,000 to 285,000,000. However, we decided to look for the most relevant articles. Furthermore, the reference list of chosen articles also provides a guideline to dig deeper into particular concept in order to grab more knowledge about certain topic.

3.5 Data Collection and Analysis
The data collected comprises of fundamental facts for developing information (Armstrong 2009). Based on the research questions we constructed, data was collected for the necessary information (Ghuari & Grohaugh, 2005). There are two types of empirical data, according to Malhotra (2010), primary and secondary data.

We were given permission to record the interviews given with our cellphone or computer. Notes were also taken during the interview in case there was an issue with the recording system. All of the interviews were clearly recorded and made transcribing them to paper very manageable. As promised to each of the interviewees, we kept only the relevant material used and the rest of the transcripts were disposed of.

3.5.1 Secondary Data
The secondary data used to fulfill supplement for this research was obtained from the Ericsson’s website. This was used to further understand the background of the project members interviewed. Secondary data, according to Malhotra (2010) and Kotler et al., (2001), can either be external or internal, and describes facts about a particular issue. However, such facts or information can be
outdated or incomplete for a particular research purpose and hence requires more clarifications from responsible authorities.

3.5.2 Primary Data
Primary data was the principal source of data for the case study. The information gathered from Ericsson was specifically collected to aid in conducting the research project. Primary data was collected through interviews with individual members of a project team at Ericsson.

3.5.3 Interviews
As already mentioned the primary data was the basis for the analysis of selected theories, which was gathered through face-to-face interviews at Ericsson head office in Stockholm. The face-to-face interviews were considered necessary, as it provided the opportunity to get as much detail about the particular topic as is required by asking follow up questions. Another benefit of such type of interview is that the researcher can also observe the body language of the informant and see his expressions and passion for the research topic, which could really affect the outcome of the research.

The interviews were semi-structured, and the authors prepared a guideline for questions asked during interviews. Priority questions were chosen, as well as back up questions in case the initial questions did not gain the satisfactory data. The guideline was deemed necessary as the semi-structured interviews can go beyond the research limit and leading to unnecessary information. The guideline interview questions were carefully formulated according to the frame of reference and based upon the literature research. This in turn provides the opportunity to remain focus on the research purpose and get the maximum of required information from the informants (Yin, 2003).

The intention behind conducting semi-structured interviews was mainly to give the informants opportunity to describe about the phenomena in depth according to his experience. This was also effective because we could easily pick the interesting facts and ask follow up questions which otherwise could be difficult to get descriptive answer and reach a concrete conclusion.

Each of our five interviews were conducted face-to-face and independently as to refrain from any influence in one another’s opinions and answers. Each was initially approached with background questions about their roles on the project teams and experience. These initial questions were not considered in the interview times, but were necessary and noted for our thesis. This was followed by a discussion regarding the knowledge management and sharing within the project team. This discussion was based around several semi-structured, open-ended questions. The interviews were given in a private office at Ericsson in Stockholm. Each interview was conducted consecutively on April 23rd, 2013, starting at 13:00.
3.6 Choice of informants
The subject of this research deals with the investigation into the knowledge sharing within a project team and the only possible way to get concrete and factual information about the relevant topic was from the employees working within a team on a particular project. This was necessary to have information from operational perspective as well. To fulfill said purpose, as already mentioned, a project team was accessed and interviewed at Ericsson. However, in order to get a managerial perspective to balance the equation, and understand the issues related to the sources of knowledge management and knowledge-sharing environment (which have impact on sharing within project teams within Ericsson) the manager from the same unit was also selected for interview.

<table>
<thead>
<tr>
<th>Roles</th>
<th>Interview Time</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early System Tester</td>
<td>35 minutes</td>
<td>6 years</td>
</tr>
<tr>
<td>Scrum Master</td>
<td>35 minutes</td>
<td>17 years</td>
</tr>
<tr>
<td>Function Tester</td>
<td>35 minutes</td>
<td>5 years</td>
</tr>
<tr>
<td>Designer</td>
<td>35 minutes</td>
<td>25 years</td>
</tr>
<tr>
<td>First Line Manager</td>
<td>35 minutes</td>
<td>25 years</td>
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</tbody>
</table>

3.7 Data Analysis
The study of this thesis is using a deductive and qualitative research approach. By combining the theoretical framework and empirical data collected at Ericsson, an analysis was conducted. Each of the issues discussed in the literature review regarding knowledge sharing were compared with the results of the study. Any contradictions and similarities found in the literature and interviews were analyzed and commented on.

We were given permission to record the interviews given with our cellphone or computer as long as we were in agreement that we would delete the recordings as soon as we are done with the transcription process. Notes were also taken during the interview in case there was an issue with the recording system. All of the interviews were clearly recorded and made transcribing them to paper very manageable. As promised to each of the interviewees, we kept only the relevant material and the rest of the transcripts were disposed of.

Furthermore, when the transcription process was done it also provided us an extra opportunity to revise our memory from the interviews. The next step was to organize the primary data into different sections. We divided the data according to our frame of reference in order to utilize the primary data in a best way possible in order to gain the results for reaching a conclusion. Additionally, during this process the undesired information was deleted apart from analyzing the fact if we missed any important information that is necessary to fulfill the purpose of the case study. We were given the opportunity to contact the respondents for any follow up question.

The primary data collected from the interviews is presented in empirical section. We organized the data into three major subjects: knowledge management, knowledge sharing, and factors that affect knowledge sharing.
3.8 Validity
Validity is the integrity of the conclusions made by research (Bryman & Bell, 2007). Internal validity and external validity are the two perspectives of validity mentioned by Lundahl and Skärvad (1999). The extent in which theories are consistent with the method conducted is internal validity. The interviews used to gather the data must correspond with the necessary information. The interviews have been constructed in agreement with the theoretical framework in the report, thus realizing internal validity. By doing so, the issues addressed during these interviews were all relevant to the theoretical framework. The questions were developed to connect the research questions with the theories. These questions addressed factors like: what type of knowledge does their project team share, as well as questions regarding how is this knowledge shared and managed both formally and informally.

3.9 Reliability
We used our interviews from Ericsson as the source in order to collect primary data. The interviews were fully recorded and additional notes were also taken in order to address the contingencies with the permission and agreement of informers in order to ensure the consistency in our research. Additionally the interview guide was prepared in advance in a proper manner in order to ensure the maximum reliability. If the same research was to made by someone else in future as Bryman and Bell (2003) defines reliability, the possibility to attain same results if the research was subject to repeat.

According to Neuman (2003) reliability in the context of qualitative research means the “dependability of consistency”. Furthermore, he added that the researchers could use different techniques such as interviews, participations or documentation in order to record the events while gathering data consistently (Neuman, 2003: 184).

Silverman (2006) argues that the issue with consistency in qualitative research can be addressed to certain extent by “doing the analysis of the same findings by different observers” apart from adopting certain standards and keeping record of steps taken in conducting interviews and preparing transcripts (Silverman, 2003; 288). However, Bryman and Bell (2003) argue that there is always risk of subjectivity, causing the reliability of the research negatively, in a qualitative research partly due to the interpretation of the data and partly due to the fact that different people observe things from different angle while having same intention.

3.10 Operationalization
The following five steps (knowledge creation, validation, presentation, distribution and application) are the key factors for managing knowledge in projects teams. The literature review also suggests that each of these factors are interconnected and an issue with one step could lead to failure of knowledge management, which in turn will also affect the knowledge sharing. We will analyze the knowledge management as our reference point to see how the project team is receiving benefit from the existing knowledge in the knowledge management system of Ericsson. Furthermore, we will also analyze how the team members manage the knowledge gained from the project they are currently working on. More precisely we will analyze their practice of knowledge creation, validation, presentation distribution and application as this not only effects knowledge management but also knowledge sharing.
The literature review also showed that project reviews, learning histories, storytelling workshops and scrum meetings provide an excellent opportunity for the project team members to share their knowledge with co-workers. Project reviews provide an opportunity for project team members to harvest the new knowledge gained from the project and store that into knowledge management systems apart from sharing that knowledge with other team members during the meeting. Learning histories can be conceptualized as the lessons learned by different teams at Ericsson while working on projects and stored in the knowledge management systems in order to facilitate future projects through knowledge sharing. This alternatively implies that the practice of managing knowledge by the project team would affect the usability and benefit of project knowledge in the future. Micro-articles are also an important tool used by the project teams to capture and share important findings from the project. The focus of analysis would be to evaluate the practices adopted by the project team at Ericsson in order to capture, distribute and share project knowledge by using micro-articles. Storytelling practice allows project team members to share their experience not only with co-workers, but also with employees from other departments. An important aspect with storytelling workshops is the opportunity to make tacit knowledge explicit so that it can be accommodated into knowledge management system. Scrum meetings can precisely be understood as the platform for the project team members to discuss any issue they are facing during the process of working on project. The team members discuss their individual progress and shortcomings during Scrum meetings and ask for help from each other. These meetings also provide project team members an opportunity to evaluate the project progress apart from sharing knowledge.

In short, the above described tools, along with their pros and cons, will help us to analyze the knowledge management and sharing within the project team at Ericsson that we will investigate in order to find answer for our first research question. This corresponds with the first six questions we developed for our semi-structured interview (See appendix). The first three questions in the appendix were developed with the intention of gathering details about the knowledge management tools used by the project team members. However, some of the information gathered from these questions did end up corresponding with knowledge sharing and factors affecting knowledge sharing as well. The fourth, fifth and sixth questions in the appendix anticipated details regarding knowledge sharing that occurs within the project team. Like the first three questions, these developed material regarding knowledge management and factors affecting knowledge sharing as well. This can be expected as all of these concepts are interrelated.

Furthermore, we discussed the influence of various factors such as time constraints, motivation, communication and project team structure in order to evaluate how the said factors influence knowledge sharing within the project team. Particularly, when it comes to time constraints, we will analyze the knowledge sharing process from time limitation perspective due to the very nature of project itself. The literature review suggests that motivation affects knowledge sharing within project teams, we will analyze the motivation factor from different aspects such as rewards, reciprocity, personal ties among the team members, face-to-face communication opportunity, and trust in order to evaluate the influence of motivation on knowledge sharing. When it comes to communication, the literature review suggests that there are various sub-factors, such as language, technology, rules and regulations which affects communication within project team and, consequently, knowledge sharing. Hence, the focus will be to analyze the sub-factors in order to evaluate the influence of communication on knowledge sharing within project team. With project team structure, we investigated how unique expertise affected the knowledge shared amongst project team members, as well as the organizational hierarchy and its effect.
The final sixth and seventh questions (see appendix) were prepared with the factors affecting knowledge sharing within the project team in mind. Due to their interconnected nature, the factors will be analyzed individually as well as collectively. The data was uncovered in order to fully understand the factors’ influence upon knowledge sharing in project team in order to find the answer for our second research question.
4. Empirical Findings

This chapter contains a brief introduction of the interviewed managers and background information of the chosen company. The results from empirical studies are gathered here while summarizing the conducted and interpreted interviews. We organize the relevant data from our informants at Ericsson and present it according to the subheadings: knowledge management, knowledge sharing, and factors affecting knowledge sharing.

4.1 Definitions

The purpose of this definitions chapter is to introduce any concepts from the interviews the reader may not be familiar with.

Communities of Practice

Communities of practice are set up for project team members of specific roles to report to with any knowledge concerning the projects they are working on. This is often different than other groups as they often set their own guidelines for when and what knowledge is stored. It is the content being shared within the communities of practice that connect the members together, and it offers an opportunity for project team members to retrieve or gain knowledge regarding their roles (function tester, 2013).

Knowledge Management System

Companies can use different management tools and techniques in order to manage knowledge within the organization and project teams, apart from manual documentation (first line manager, 2013).

Main Knowledge Management System (Ericcall)

A Knowledge management system generally refers to the technical tools used by the organizations in order to store and manage the organizational knowledge, which further facilitates knowledge sharing apart from meeting other organizational goals relating to knowledge. Such tools includes intranet, Workpad documents, wikis, bulletin board, internal chat links etc. In Ericsson’s case, some of the above mentioned tools are managed and controlled centrally by an organization called Ericcall. This is Ericsson’s main knowledge management system, while different units manage with other tools, such as wikis, locally because they only contain data relating to each particular unit such as the project teams and communities of practice within Ericsson (early system tester, 2013).
Agile Method:

“The term “Agile” refers to a software development methodology which promotes a project environment of adaptation, teamwork, self-organization, rapid delivery and client focus.” (Agile Methodology, 2013)

Pair Programming

Pair programming is an Agile software development technique where two programmers work together on the same task sitting side by side with each other. This is a way for these team members to help each other by sharing expertise. (Scrum master, 2013).

4.2 Background

Ericsson is one of Sweden’s biggest companies and the world’s leading provider in mobile telecommunications networks. This multinational company employs around 92,000 people around the world, and particularly 18,000 employees in Sweden. The company also provides data communication systems and technological services such as mobile networks.

The project team of which each of the following interviewees is a part of was created in June last year. Their project is currently on a product called HSS, a large database. The team is part of the section UDM, which has split up some old teams and created these new teams, which also includes members of Ericsson from other sections, who are new to this section. Project details involve maintenance, making updates, and generally working with the project. The team is multinational, but communicates in English. There are two Swedish project team members and the rest are from India, England, Chile, and Greece. None of the teams at Ericsson are made up of strictly Swedish employees (Function Tester, 2013)

Scrum master

The scrum master’s role is to be a coach for the team. He uses an Agile program as a method of developing software and coaching techniques to manage this. The Scrum master guides the team in Agile development and even offers knowledge through teaching in some instances. He has been working at Ericsson for 17 years and has served on as many as 100 projects. The Scrum master was interviewed from 13:00 to 13:45 on April 23rd, 2013 at Ericsson in Stockholm. The initial five to ten minutes were spent on presenting the subject and gathering background information from the interviewee. We then spend the remaining time discussing the semi-structured questions extensively, as well as the follow-up questions if the opportunity presented itself.

Early system tester

The early system tester has been working for Ericsson in India since 2007 and joined Ericsson Sweden in July. Before he arrived at Ericsson Sweden, he worked on two products in India doing design maintenance. As the early system tester, his role is to take the completed work package and run a system test on it before the package is delivered to system testers in order to find any initial
problems related to performance. The early system tester was interviewed from 13:50 to 14:35 on April 23rd, 2013 at Ericsson in Stockholm. The initial five to ten minutes were spent on presenting the subject and gathering background information from the interviewee. We then spend the remaining time discussing the semi-structured questions extensively, as well as the follow-up questions if the opportunity presented itself.

**Function tester**

A function tester tests the quality of a product to see whether all the requirements have been fulfilled. The function tester we interviewed has worked for Ericsson for the last five years and has been a member of this project team since last summer. The function tester was interviewed from 14:40 to 15:25 on April 23rd, 2013 at Ericsson in Stockholm. The initial five to ten minutes were spent on presenting the subject and gathering background information from the interviewee. We then spend the remaining time discussing the semi-structured questions extensively, as well as the follow-up questions if the opportunity presented itself.

**Designer**

The designer we interviewed has been working at Ericsson for the past 25 years. He has also been working with this product for the past three or four years. As a designer his job is to use design tools for software development. The designer was interviewed from 15:30 to 16:15 on April 23rd, 2013 at Ericsson in Stockholm. The initial five to ten minutes were spent on presenting the subject and gathering background information from the interviewee. We then spend the remaining time discussing the semi-structured questions extensively, as well as the follow-up questions if the opportunity presented itself.

**First line manager**

For the past 25 years, the first line manager has been working for Ericsson. He’s been working with this product for four years now. A first line manager reviews and suggests design improvements in order to increase the product efficiency. They are constantly facing new challenges, preparing themselves to handle them and improving the project team’s work. The first line manager was interviewed from 16:20 to 17:05 on April 23rd, 2013 at Ericsson in Stockholm. The initial five to ten minutes were spent on presenting the subject and gathering background information from the interviewee. We then spend the remaining time discussing the semi-structured questions extensively, as well as the follow-up questions if the opportunity presented itself.
4.3 Perspective on knowledge management

According to the early system tester, individual project team members manage and share knowledge in a unique matter. One can choose to use the central knowledge management system in order to get some information and store knowledge. In addition to that, each department has its own unique knowledge system through wikis, where they input specific and relative information about their projects. Apart from that, most of the project members are part of communities of practice, which share their own knowledge through wikis. Members of these communities can get access to that particular knowledge through these systems as well. While describing the knowledge found in the central knowledge management system, the early system tester said, “we have one called Ericcall, where we put all the presentations about different products and projects, and things like that: from there we get the information,” (Early system tester, April 23rd, 2013).

The general impression from the interview with the Scrum master suggests that the project team uses knowledge management in order to provide a valuable source for tackling the many issues project team members must face during different projects. Knowledge is stored in different knowledge management systems in order to enhance organizational knowledge. According to Scrum master, his preferred tool to store and retrieve knowledge is the local wiki system. “I think wikis are good and quite easy to use in the sense that information is categorized accordingly.” However, the Scrum master added, “maybe if you are new, you use it more than if you have a lot of experience.” This corresponded with the other interviews with the first line manager and designer. This is mainly due to the system’s accessibility, both in terms of adding new information and with retrieving information (Scrum master, April 23rd, 2013). The function tester also uses Wikis, which he updates on a regular basis. He believes that the Wikis are the most reliable source for retrieving knowledge over other forms of knowledge management. Most of the material on the wikis is about how to set up the environment for a project. There is also information on issues with the environment, and knowledge on how to solve them. However, the knowledge is more specific to process and troubleshooting information (programming issues, coding, etc.) (Function tester, April 23rd, 2013).

The early system tester further explained about the importance and role of local wikis in knowledge management and knowledge sharing for the project team members by saying, “we have a starter level wiki where we put in data so it is accessible for the people in the team. There, we have our knowledge base of things.” However, he added that the scope of knowledge is limited when it comes to the wikis in comparison to Ericcall because they contain the knowledge from only one particular unit, “I think we have less information in the wiki, but the Ericcall contains all the presentations that we need. It explains about the data we work with, activities we do, the things we do in our activities. That mostly holds the information.” (Early system tester, April 23rd, 2013) The Scrum master seemed less interested in searching or putting new information into the central knowledge management system due to the complicated nature and scope, “Retrieving knowledge is bit difficult from central knowledge management system (Ericcall),” (Scrum master, April 23rd, 2013). This corresponds with the designer and first line manager in their interviews.

The first line manager explained that the issue is that there is no specific level of detail to which the document must be transcribed. By this, the manager meant that the level of detail project members must have while sharing knowledge is not based on any specific guideline or process. Without guidelines for documentation, the first line manager explains that the level of documentation tends to go in both ways: too detailed, or too few details. This is something he finds the project team often struggling with when sharing knowledge, and it can be difficult to find the balance or middle ground where they belong without guidelines (First line manager, April 23rd, 2013)
When asked about the frequency of his interaction with the knowledge management system in order to retrieve information, the early system tester said, “Usually, we use the knowledge management system as a reference point on a daily basis.” Furthermore, it is very simple to add new information to both the wikis and the central knowledge management system, but the formatting of this information is more difficult due to the procedures and unfamiliarity with the system. The early systems tester went on to explain that although the central knowledge management system includes a lot of information, it is also difficult to retrieve the required information from it, due to the amount of data. “I think, as of now, it is a bit difficult because the Ericall does not have a search within the documents, so sometimes we need to get the information from the people who know where it is exactly situated.” (Early system tester, April 23rd, 2013).

Additionally, according to scrum master, some of the information available in knowledge management system expires with the passage of time, but still remains, uselessly, in the system, “it happens, information gets old and not valid any longer, but nobody is in charge to fix that, there is no process.” He also mentioned that they try to capture and store as much knowledge as possible in the wikis and other knowledge management tools, but that the project team needs to be more efficient in this regard, “knowledge is captured all the time. I think we can be better. I think we do not focus; I mean we do it, but not everybody is committed to this I think. They need motivation.” (Scrum master, April 23rd, 2013). The function tester agrees and explains that there is outdated information on the wikis and many of details written there are not valid anymore. “I know who is responsible for the Wikipedia, that is the first line manager, and you could never have a manager refining this information because they are not working with these things.” Because of this issue, the knowledge stored on the wikis is left unrevised and are gradually going to become cluttered with invalid information (Function tester, April 23rd, 2013). The designer and first line manager also pointed out this issue.

4.4 Perspective on knowledge sharing

While discussing knowledge sharing, it was noted that knowledge is shared throughout the department on daily basis. In fact, the Scrum master relies more on asking other team members for help when he encounter a problem than the knowledge management system. The scrum master stressed the importance of knowing the specific person with the right competence to refer to, “I think the best way is to talk to other people who have had the same problem. Normally, I know a lot of people through networking who can help me. If you have a problem then you ask somebody then you get help. It is best when we are stuck or something is not working.” (Scrum master, April 23rd, 2013).

The general impression from the early system tester was that there were not significant issues for the project team members to share knowledge with their colleagues. However, he admitted that most of the knowledge sharing occurs outside the project team members, namely within the communities of practice (Early system tester, April 23rd, 2013).

The interview also gave an impression that the projects play an important role in building competencies and contributes to the sharing within project team. The early system tester further explained that working in projects has also helped him to develop his knowledge about other fields related to the task at hand, “projects are good for learning one area of interest, or area that we work in. With the design maintenance you work on reports on all areas and it is very helpful to learn as a system.” In response to a follow up question, he said, “It is mostly valuable to work with projects. In some projects there is not much new things to learn, but since I started working here since last July, I
think all the projects have been good for me to learn new things.” Additionally, the early system tester also mentioned that when the task is difficult, he learns more because he has to push himself to know other things (Early system tester, April 23rd, 2013).

It was also noted during the interview that communities of practice at Ericsson were not only a vital and important source for knowledge sharing, but also a place for members to share their views about particular experience they gain from a certain project. The early system tester explained that it becomes much easier to handle problems with confidence when perspectives are shared (problems and experiences) within the respective community of practice. “When we come to know what everyone thinks, it is easier to understand the problems... we have some communities: like me, there is a guy on another team who is doing early system testing, so we have a community within us. So when we face some problem we discuss it in our communities.” Furthermore, he added, “I think it is very good to get the information (about certain issues) at earlier stages through such discussions within communities so that I do not miss it,” (Early system tester, April 23rd, 2013).

According to the early system tester, the project teams at Ericsson have individual team pages inside the local wikis where they can put key information about the project, “In the team page we put in the information about what we are working on and the documents related to what we work on, so it is easy and accessible.” However, he admits there is a problem with storing such knowledge in local wikis and not making it available all over the organization, “I think we need to improve the network level knowledge, we need to improve the knowledge flow from external teams, not within the team,” (Early system tester, April 23rd, 2013).

The Scrum master further added that knowledge sharing within the project team leads to more efficiency. In response to a question regarding the process of knowledge sharing within his team the Scrum master said, “we have a daily stand up meeting in the morning when we come in, and if you have a problem then you can raise the question, “ (Scrum master, April 23rd, 2013).

The scrum master explained that the project team arranges meetings before the actual project starts where the team members can discuss their experience from previous projects, “We use our knowledge from the previous projects quite often, as it adds efficiency. So it is very similar things that we do, it is not completely different, so we can use it.” Particularly information regarding any mistakes made during previous projects. The project team members then discuss and make suggestions on how to improve on their abilities and avoid those mistakes. However, he went on to add, “the meetings are helpful, but It varies a lot in different teams. Some teams take the opportunity to really learn and make changes, and some other teams do not think it is so important, so it varies quite much,” (Scrum master, April 23rd, 2013).

It is worth mentioning that the project teams at Ericsson have project reviews at the end of each project where the project team members attempt to analyze the outcome of the project. Each member of the team shortly describes about his experience with the project work. Their discussion points include the hurdles that they face, how they solved the problems, who was essential in helping them with a crisis, and how they can better overcome these issues in future projects. The Scrum master mentioned that they have continuous meetings at different stages of project as well, in order to check the progress and take appropriate actions, “We think about how we work every two or three weeks inside the team. We do a retrospective, and we think about what happened during these two weeks, and what we could change to do better next time. We do it continuously, not one time when the project is finished.” According to scrum master, it is important to have continuous feedback loops in order to avoid misunderstandings and also to promote smooth flow of knowledge. Furthermore, he
went on to explain about the process of capturing and storing such information, “we put [the summary of discussions] in our team page... This mostly includes a plan for them for the next time.” The Scrum master also explained about the workshops that they use to arrange and discuss different aspects of outcomes from different projects. Different people from other departments also take part in such workshops, including management personnel who explain about their experiences from different projects. The Scrum master found this very helpful (Scrum master, April 23rd, 2013).

The function tester explained that when new members arrive to a section, they participate in many meetings with the intention to orient them with the products, processes and project members from many teams. While working for Ericsson, opportunities arise for courses that have been made available for the employees. The topics of these courses span from programming language to learning how to use Agile (Function tester, April 23rd, 2013).

While reflecting upon the frequency and importance of meetings before, during and after the project, in order to evaluate the project work the early system tester said, “we have this stand up meeting, which is a good way to understand something new. The initial meetings are very good. When we start the projects and we get together to understand what is required and things like that, and as we progress, we only meet to discuss issues, but I think the initial meetings are a good one to work in a project. We meet daily and discuss and those are very helpful. Otherwise it is more towards project orientation,” (Early system tester, April 23rd, 2013).

Furthermore, the early system tester pointed out two important aspects of post-project meetings. One is the technical part, which is more related to the community than the team. The second one is the project process, which is more relevant to the organizational process. Additionally, he said, “we look at what mistakes we made, and what needs to be done to improve the efficiency of the team, those sort of things, that helps, but mostly the technical part we do not discuss in those meetings,” (Early system tester, April 23rd, 2013).

Another system the function tester mentioned was the section meetings. These occur every Friday and the project members are encouraged to share any knowledge they have gained from their experiences working on projects. The only process involved is letting the manager know and the project member is given the opportunity to share their knowledge (Function tester, April 23rd, 2013).

The Scrum master also considered knowledge sharing as an integral aspect for software developers, since the technology changes over a short period of time and therefore requires developers to keep their knowledge updated in order to meet new challenges, “I mean this job is so complex and difficult, you have to keep learning all the time. It is not that you gain some knowledge and you are ok forever. Sometimes when you speak with people who are not part of the team it can be more difficult to get information.” Coming back to the original point of the research, when asked about the importance of sharing knowledge from previous projects, and their impact on other projects, the Scrum master explained, “I mean you always learn from what you have done before, but it is maybe not so systematic in a way... We are always trying to improve and do things better and we take time to do that. [Reflect], and take actions, we do that continuously.” (Scrum master, April 23rd, 2013).

However, the designer explained that the knowledge gained from previous projects is not always relevant for upcoming and future projects (Designer, April 23rd, 2013). This corresponds with what was said by the function tester.

Regarding the Scrum master’s thoughts about the “reflections and actions” in the project team he said, “If we have improvements that we want to try, we normally put them very visible in the team area and
try to work with them. It could be a paper on the wall or something in the wiki within team pages.” However, he also added that such data is not widely available to everybody in the organization (Scrum master, April 23rd, 2013).

4.5 Perspective on the factors affecting knowledge sharing within project teams

Time constraint was a major factor the Scrum master noted as a limitation for capturing, managing, and spreading knowledge properly. The main emphasis is to finish the project on time and deliver it accordingly. However, the Scrum master tries to make sure that the team competencies increases with each project, despite the shortage of time, “Only if it is something special or new, then we think about sharing it... It is more about finishing what we are doing and delivering it to the customer, and at the same time we are building up the team’s competence and learning,” (Scrum master, April 23rd, 2013). This corresponds with what was said by both the designer and the first line manager.

The early system tester explained that after a while it was also discovered that the team was not as efficient in capturing every important piece of information necessary for avoiding the most of the repetition in mistakes, “The other thing is, we select certain kind of things that we will put on visible places in wikis, but we do not take care of our other mistakes, we do not have the ability to improve so fast.” the early system tester also complained about the shortage of time not only in managing such lessons properly in wikis but also for retrieving the lessons as he said, “Time is a major factor, we just tell our problems and put it in one place and we do not categorize it. We do not want to waste time looking up all the details, that is one of the reasons it is time consuming because it is not categorized information,” (Early system tester, April 23rd, 2013).

According to Scrum master, project team members usually trust each other because they have worked together for a while and understand each other’s personality, perspective, and competencies, “Trust should not be an issue, I mean if you think like that, then you should not work here actually. You should be very open and sharing, that is a requirement. I think everybody is as open. I do not see people hiding things.” While discussing the role of technology in facilitating knowledge sharing, the scrum master said, “I think what I use quite a bit is this chat we have, Link it is called, a messenger. That I use quite a bit. It is easy to start a conversation. I think emailing sometimes is not so good. People put too much information on there, so it is not as effective.” Apart from that, the Scrum master was also convinced that face-to-face interaction provides an extraordinary opportunity for project team members to share knowledge and demonstrate processes more clearly. For supporting and encouraging team sharing in more live way the Scrum master explained, “It is important that we spread the competence [knowledge], so we do activities to do that. For example: we sit together (it could be two people) [and] we do pair programming. We do presentations inside the team if somebody has more knowledge, so I try to organize that and see that it happens,” (Scrum master, April 23rd, 2013).

As the discussion with the early system tester moved on it was also noted that communication within the team was not a problem, as each member can ask for help from each other without hesitation, “Within the team we can directly talk to them, we have these stand up meetings and then everybody is there (in the meeting) and you just talk about what we are doing on a daily basis.” Although most of the knowledge sharing occurs through face-to-face communication, technology (emailing and messengers) are also considered as popular tools to share information, knowledge and expertise with each other. As is evident from the conversation with the early system tester, “mostly we do it in a
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personal way, the second most common way is through email, [and] then we use Link, that chat/messenger tool to talk, “” (Early system tester, April 23rd, 2013).

While discussing knowledge sharing, it was noted that knowledge is shared throughout the department on daily basis. In fact, the Scrum master relies more on asking other team members for help when he encounter a problem than the knowledge management system. The scrum master stressed the importance of knowing the specific person with the right competence to refer to, “I think the best way is to talk to other people who have had the same problem. Normally, I know a lot of people through networking who can help me. If you have a problem then you ask somebody then you get help. It is best when we are stuck or something is not working,” (Scrum master, April 23rd, 2013).

When the function tester cannot retrieve the proper information from the wikis, he will approach his project team members. For questions that the wikis and his project team members cannot solve, the function tester will send an email to the other teams at Ericsson in order to find the knowledge he needs to retrieve (Function tester, April 23rd, 2013).

Another problem the function tester points out is about the timing of when knowledge is stored. There is “documentation that should have been written first in the beginning of the project, not at the end, because it is very hard to follow what you have done during this time”. When knowledge was not documented throughout the project, the function tester discovered that ambiguities rose and caused issues with the project that could have been prevented. In the cases when the function tester had documented from the beginning, he found that the knowledge was better captured, and more problems were prevented during those tasks (Function tester, April 23rd, 2013).

When asked if the function tester had ever felt a though he had missed the opportunity to share knowledge, he admitted that there are so many things to do during the project and time is a limitation, so sharing and capturing knowledge is often the part that is put aside. The function tester does not use any of the knowledge gained from his previous project experience with this new project because it is not applicable. But he believes it could be possible to use his knowledge with future projects (Function tester, April 23rd, 2013).

Due to their interconnected work, the function testers and designers must be in constant conversation and sharing knowledge with one another throughout the project. The function tester believes they have a strong dialogue with the designers and communication is often face-to-face and not through technology. However, technology was never a problem for communicating with project members when needed. While the team is multinational, the function tester never has trouble communicating with his project members in that respect (Function tester, April 23rd, 2013).

The early system tester, however, also gave an impression that the management of knowledge is good, but sometimes feels unnecessary due to the nature of projects and industry they are dealing with, “We are learning all the time and documenting stuff but sometimes we repeat mistakes. It is not due to the knowledge system, it is the process structure that leads us to the same mistake sometimes.” Another major issue that leads to repeated mistakes in the team is the different levels of understanding or interpretation of the information from shared knowledge, “sometimes understanding the requirements is varied in the team... so we need to talk, talk, talk and understand this is how it works, but sometimes we make a mistake when one person has one understanding and the other member has a different understanding.” (Early system tester, April 23rd, 2013).

While explaining about the limitations of knowledge sharing from his perspective within the project team, the early system tester said, “I think [the issue] would be basically between a designer and
tester, it is nothing more than that.” The early system tester added that experience from previous projects can also be crucial in enhancing knowledge sharing and competencies within the team, “I have been working as designer for some time, so I can handle some information when the designers tell about it to me, but, for the testers, I feel it may be a bit difficult for them to understand directly,” (Early system tester, April 23rd, 2013).

The major issue the early system tester pointed out was that the acquisition of knowledge from another department was difficult due to the involvement of hierarchies. As he said, “when we want to communicate with an external entity we need to go through the Scrum master or the manager and then they have to contact further... so we lose a lot of time,” (Early system tester, April 23rd, 2013).

According to the function tester, there are some issues regarding the knowledge management system. When it comes to documenting knowledge, the function tester pointed out that updating the wikis has been a problem. The project team members are often documenting information, but more specifically for the customers and not for themselves. He believes they struggle to capture knowledge that they can later use, and admits that even he has trouble making time to update the wikis with his own knowledge. With the information documented for customers, the project team has processes, rules and regulations implemented, but this is not the case with storing knowledge for themselves and their organization (Function tester, April 23rd, 2013).
5. Analysis

*This section presents the analysis, which indicates that while many of the topics discussed regarding knowledge sharing and management corresponded, there were also diverging opinions regarding certain matters, which could have an effect on the knowledge management and sharing. These findings are organized and analysed using the theories from the theoretical framework.*

5.1 Knowledge management

The project team members were well aware of how knowledge is managed and the different systems used for knowledge management purposes at Ericsson. However, their understanding of knowledge management reasonably differs from one another due to the fact that each project team member has different roles and competency which correlates the views of Eppler and Schindler (2003) who describes project team as a group of people with different expertise. Furthermore, the knowledge management system such as wikis and Ericcall, the central knowledge management system, contain useful and valuable information in explicit form, which in turn validates the concepts of De Long and Fahey (2000) and Alavi & Leidner (2001) whom all stress upon the needs for a knowledge management system which contains both organizational knowledge and information about the organizational practices.

Additionally, knowledge management helps the project team members to carry out their day-to-day tasks and overcome challenges more efficiently, which is also in accordance with Bhatt’s (2001) literature review where he points out the usefulness of knowledge management system. However, there are notable differences in informant’s opinions concerning the advantages of having the knowledge management systems. The advantages are dependent on the team member’s work experience within certain areas, as was noted during the interview with the Scrum master. The empirical findings shows that the more experience employees gain from work, the lesser they use knowledge management systems. However, there are notable differences in opinions concerning the advantages of having the knowledge management systems. Furthermore, the wikis contain an extensive amount of information regarding certain matters within each of the fields the project team is dealing with. This provides an opportunity to achieve operational excellence. This in turn validates the views of De Long and Fahey (2000) who admires the supporting role of IT in knowledge management and sharing for enhancing organizational performance.

Knowledge is managed at different levels at Ericsson by the project teams through wikis and other tools, but the amount and type of knowledge stored in the knowledge management system varies from department to department. This testifies the literature review of Alavi & Leidner (2001), which advocates the role of IT in knowledge management, creation and sharing. However, the project team members find themselves taking advantage of these aforementioned knowledge management systems. The wikis are the most popular and helpful system, both in regards to project work and enhancing their competencies as a result of the combination process described by Nonaka (1994), which according to him not only facilitate knowledge sharing but also supports the creation of new knowledge.

The wikis are easier for the project members to retrieve relevant information efficiently under appropriate contents, and the system is also easier for storing new information due to the absence of
any checks and balances, which partly contradicts the views of Durcikova and Gray (2009), who stresses upon the need for peer reviews of information before letting it add to the organizational knowledge.

When it comes to the knowledge validation process, all of the informants agreed that the information available in the wikis and central knowledge management system is useful for facilitating project tasks and their own knowledge. However, the project team members also mentioned that some parts of the stored knowledge are irrelevant or inappropriately placed in the knowledge management system which contradicts the views of Zack (1999), who suggests to present knowledge under relevant sections to facilitate its retrieval when browsed. This also contradicts the views of Bhatt (2001), who stresses upon the need for managing relevant information in order to foster effective knowledge sharing. This further strengthens the argument of Durcikova and Gray (2009) who calls for a controller to take care for the filtration of knowledge from the system. The team members had different views regarding the filtration of knowledge. Some of them agreed that it is the first line manager’s responsibility to filter knowledge, while the others had no clear idea about that. However, they did all agree that filtration from the wikis is easier due to the freedom of not needing to follow any particular process. Therefore, the project team is aware about the knowledge filtration problem as was identified by Nonaka (1994), who also calls for filtration of unnecessary data and information from knowledge management systems, but the reasonable actions are missing.

Additionally, the empirical findings suggest that the project team is reluctant to store and present knowledge in the knowledge management systems as suggested by the Mcdermott (1999) who recommends to store knowledge with as much detailed process as is possible to make it easier for the knowledge seeker to understand the information. The knowledge is managed by the project members through different wikis and at different places, which contradicts with the views of Bhatt (2001), who stresses the need for unified standards when it comes to the management of knowledge into systems.

When it comes to the distribution of project teams knowledge, the empirical findings shows that knowledge is stored in local wikis and not made available in the central knowledge management system which causes hoarding of knowledge at organizational level. Consequently, this goes against the recommendations of Bhatt (2001) who wants the project knowledge to be shared across the organization through central knowledge management system. However, the management of most of the project knowledge by the project team in local wikis validates the point raised by Keegan and Turner (2001), who argues that the knowledge gained from a particular knowledge might not be useful for the whole organization.

5.2 Capturing knowledge
The empirical findings from all the five interviews suggest that the investigated project team has continuous meetings during the different stages of project in order to examine the progress of the work. This is in accordance with the literature review of Hobday (2000) who points out that one of the ways to capture knowledge from the project is through project reviews at different stages of project.

Additionally, the project team conducted documentation of the proceedings of review meetings but not in proper way, which contradicts the views of Kotnour & Hjelm (2001) to a certain extent, as they recommend managing comprehensive documentation of the meetings, which can guide the followers in right direction when looking for instructions. The empirical findings also suggests that various meetings during the project process offer the opportunity for the team members to give suggestions to
one another in order to ensure the smooth flow of project work. This, in turn, testifies the literature review of Scarbrough et al. (2004) who is in favor of the reflections from various project team members as it ensures quality of the project. The project team in question has continuous review meetings throughout the project process that provide them an opportunity to demonstrate their views on the work already done, and also under process, which consequently overcomes the problem described by the Scarbrough et al. (2004), who says that project team members might just focus on their individual goals and not helping out each other. By talking about these experiences and the possible mistakes previously made, the project team is creating an opportunity to share and learn from one another (Zedtwitz, 2002). According to the Scrum master, this leads to added efficiency due to the project team members’ communication and sharing suggestions with one another on how to improve and avoid those mistakes in the future. This coincides with the theories of Hobday (2000), who believes in the value of mistakes made as opportunities for learning and sharing.

Furthermore, the project team members agreed that sometimes they repeat the same mistakes, as it is hard to avoid them due to the changing requirements. This coincides the views of Zedtwitz (2002), who argues about the importance of mistakes in both learning and sharing of knowledge. Additionally, the project team stores important proceedings of the meetings in the wikis, which could possibly be helpful for other employees in future, as suggested by the Disterer (2002). Although the lessons are stored in wikis, the empirical findings shows that detailed procedures to tackle those issues are missing, which goes against the instructions of Smith and Bollinger (2001), who wants knowledge to be presented in a proper understandable manner. Furthermore, the findings shows that incomplete information and presentation of information under irrelevant content makes it challenging to retrieve data from the systems, which validates the point raised by Prencipe and Tell (2001), who states that it could be challenging to interpret incomplete information in fruitful way. Hence causing hurdles for knowledge sharing.

The empirical findings shows that project team has post project reviews in their respective teams where they evaluate the outcomes of the projects, but they do not necessarily use the knowledge in other projects, which partly testifies the literature review of Hobday (2000) as he stresses upon the need of consistency in using such knowledge in succeeding projects in order to add value to them.

5.3 Knowledge sharing in project teams

The project team members each described a process where new employees are able to learn and orient themselves with the products, process and project members. The more experienced team members then share their knowledge with the new members, in accordance to Hobday (2000), who believed that the new members should take advantage of this opportunity. According to the interviewees, this is done through PowerPoint presentations, as well as through continuous opportunities to take courses in various career-related aspects at Ericsson. There are also section meetings, where project team members are encouraged to share their experiences.

Kotnour (2000) expects project team members to share with each other and learn in order to fulfill performance goals. The early system tester pointed out that the team studies all the mistakes each member had made in prior projects and the team discusses what needs to be done in order to prevent and improve this. He said that this improves the efficiency of the project team. Although this is true, the interviewees agreed that perhaps not everything shared was relevant in new projects. This can be a potential risk, according to Schindler & Eppler (2003), who believe that knowledge gained at the end of the project is potentially lost in the future.
The project members agreed that efficiency increased when the project members shared with each other. According to Law and Chuah (2004), for the team to be effective, members must be able to adapt, learn and perform as a team. The early system tester pointed out that they are sharing all the time and are constantly in communication regarding the project. Learning occurs through the discussions and sharing between team members as they complete the project (Law & Chuah, 2004). The Scrum master also considered sharing knowledge as an integral aspect for software developers, since the technology changes over a short period of time and, therefore, requires developers to keep their knowledge updated in order to meet new challenges.

The interviewees, including the Scrum master, agreed that any knowledge shared with the organization helps to develop the organizational knowledge and performance. However, the interviewees agreed that not all of this information is made widely available to the organization. Lampel et al. (2008) mentioned that there is a relationship between the project teams and the efficiency of the organizational knowledge, which is in correspondence with Poell & Van der Krogh’s (2003), who also believes in this relationship. The knowledge shared and kept from being shared by the project team affects the organization’s knowledge, further emphasizing the importance of sharing knowledge on the organizational level. The interviewees explained that there were difficulties with establishing knowledge generated, which agrees with Lindkvist (2004), who suggests that project members have trouble capturing and sharing knowledge when the knowledge generated is too difficult to formalize. The project team must cope with tacit knowledge corresponding to the project and this further lead to difficulties with reviewing.

5.4 Tools for sharing knowledge

The interview with Scrum master reveals the fact that the team puts some sort of information, particularly relating to projects, on walls and also in wikis to keep the team members memory fresh. This testifies the literature review of Schindler and Eppler (2003), who describes micro articles as short stories describing certain procedures. This also validates the literature review of Linz and Resch (2010), who refers to this as micro articles, a tool for facilitating the sharing for the team members. However, the only issue with the micro articles is that they are available only for the project team members and not for any other employee in the organization, unless communicated by the members in their respective communities of practice (ibid). The early system tester also pointed out that the management has started using audio version of such micro articles which points out the importance of technology in knowledge management and in turn testifies the views of the developer as described by the Schindler & Eppler (2003), who recommends to use both audio and video versions of micro articles alongside the written versions in order to enhance their advantages.

When it comes to storytelling the empirical findings shows that project team has workshops at the end of the projects where they can discuss complex issues relating to the project task which testifies the literature of Linz and Resch (2010), who deems such workshops as an important means to share complex knowledge about each other’s experience from the project. Additionally, the team members have discussion meetings in their respective communities of practice being the most valuable forum to discuss issues in this regard, coinciding with the views of Styhre et al. (2004), who describe it as a valuable way of informal oral sharing of knowledge. Additionally, the views of Scrum master, with respect to storytelling workshops, gives a more broad impression of knowledge sharing and learning at the same time. As he mentioned that in such workshops people from other projects are also there to share their experiences with certain problems while working on project, hence testifying the views of
Linz and Resch (2010), who stresses upon the need to share such lessons on organizational level and not only on unit or department level.

5.5 Factors affecting knowledge sharing within project teams

Because of time limitation, the review process can be difficult (Keegan and Turner, 2001). The project members agreed that time constraints were barriers that prevented them from sharing knowledge, as the function tester pointed out that when documentation was written later in the project, it became difficult to follow what has been done throughout the process. This coincides with Bourne and Walker’s (2004) theory about delivering effective solutions with proper review time. In the cases when the function tester had documented from the beginning, he found that the knowledge was better captured, and more problems were prevented during those tasks. Another struggle with this constraint occurs through project complexity, when sharing knowledge becomes more difficult (Janz et al. 1997), as was also mentioned by the project team members during the interviews.

The temporary nature of the projects have a direct affect on how much project team members gain and retain knowledge from their previous experiences. The project members admitted to losing use for knowledge gained from previous projects when it was not being applied to current projects. This can lead to Schindler & Eppler’s (2003) theory of organizational amnesia, which can occur if these project members lose track of the knowledge gained. Huber (1999) mentioned that if knowledge is transcribed during this temporary project state, the opportunity to retain knowledge is possible. As mentioned, the project teams use the project review tools to collect this kind of knowledge, which corresponds with what Huber (1999) is saying.

A project team member’s motivation to share knowledge has a direct affect on the knowledge sharing and management occurring within the project team (Szulanski, 2000). The project members agreed that there was a lack of motivation regarding sharing knowledge due to the fact that there is not any reciprocity involved. As the function tester explained, the project team members do not understand the benefit in sharing their knowledge with each other and the organization and this is an issue. The project team members also mentioned that when they had issues finding the correct information in the knowledge management systems, they referred to their personal ties for acquiring this information. This corresponds to Hansen et al. (1999), which implies that personal ties are essential for acquiring the proper knowledge.

Trust is another factor that was discussed with each of the project team members we interviewed. A project member is more likely to share knowledge if they consider the receiver to be honest (Bakker et al., 2006). The project members agreed that trust was not an issue on their project team. As the scrum master said, trust should not be an issue at Ericsson. The company holds value in being open and sharing and he believes everybody shares that perspective.

According to Husted and Michaiova (2002), Language can be an issue if the company’s native languages differ from that of the project members. However, this was also never an issue with the project team members. As the function tester pointed out, the team is multinational, but they never have trouble communicating in that respect.

None of the project team members interviewed had worked with one another prior to this project. However, they had no problem entrusting each other with knowledge developed throughout the project. This goes against the theories of Hansen et al. (1999), Reagans & McEvily (2003), Tschannen-Moran & Hoy (2001), and Harrison et al. (2002), who all believe that established
relationships and prior social networks create better trust among project team members. There is no fear of the loss in power sharing knowledge could create, as according to Zander & Kogut, (1995) and Katz & Allen, (1982). The motivation is still there in the project team to share new knowledge.

In regards to the Benevolence-based and competence-based trust theories according to Levin & Huber (2001), The project team members showed example of each. With Benevolence-based trust, the project team members trusted one another with their valued intention, which was to have success in finishing the project with the least errors. The function tester described this necessity to share knowledge in his interview. With competence-based trust, this was more apparent in the communities of practice. This coincides with Ardichvili et al. (2003)’s theory about trusting fellow employees even without knowing them. As the early system tester mentioned, as well as the other members interviewed, this was the best source for knowledge sharing and also the most trusted source for retrieving knowledge.

In the theory, Bartol and Srivastava (2003) suggest rewards as stimulation for project team members and motivating sharing knowledge. Not once did the project team members suggest a reward system, nor was the idea of one a considered motivation for sharing knowledge. Rather, the motivation for sharing knowledge could be found in other trade-offs. Reciprocity was another factor discussed by Ipe (2003), who believed sharing knowledge could be both a motivator and a resistance when reciprocity is considered. The project team members admitted that it was difficult to see the benefit in sharing some of the knowledge when the value is not clear. The Function tester for example, pointed out that sometimes it is not obvious what kind of information should be shared with the other employees until it is too late and mistakes are being made.

Sharing knowledge and lessons learned with one another is often facilitated through technology, which has regulations and practices that need to be taken care of in order to use (Riege, 2005). The project team members agreed that technology never necessarily constrained sharing knowledge. For example, the Scrum master pointed out his favorite communication technologies like Link, the messenger service at Ericsson. He did, however, admit that while these technologies are easy to use, face-to-face interaction and communication leads to more efficient knowledge sharing. The project members agreed with this statement, stating that the personal opportunity is not only more efficient but essential for sharing knowledge and lessons learned. This contradicts Bollinger & Smith (2001), who believe technology is a necessary aspect for communication. On the other hand, the project team interviews did, however, coincide with the theories of Lengnick-Hall (2003), who agreed that face-to-face interaction led to a more immediate opportunity to share knowledge.

One factor that was referred to as an issue by each of the interviews involved the various roles each of the project team members were comprised of and how this affected communication and knowledge sharing within the project team. Stotts & Williams (2002) explain that having these different roles creates opportunity for more efficient project work. However, because the project team at Ericsson is in need of constant knowledge sharing in order to complete their project, this theory fails to create efficiency on the project team. The reality is much more like the theory of Chau et al. (2003), which is that the project team has difficulties sharing knowledge when each member does not share the same expertise with the other members. This leads to extensive explanation and wasted time, as said according to our interviews.

It is common that a more hierarchically structured organization can cause problems for members of the organizational level when it comes to sharing knowledge through processes, as according to Riege (2005). At Ericsson, the project team members admitted to suffering from this factor. As the early
system tester explained, in order to share or communicate with an external person, they need to gain permission through the Scrum master or manager and, in this process, time is lost.
6. Conclusion

In this section, a conclusion is drawn from the results of the analysis in attempt to answer the purpose of this thesis. The results correspond with many of the theories indicating that there is an interconnected relationship between the knowledge management and sharing in the project team, and that they have an influence on one another through the tools and factors involved.

The purpose of this study was to analyze the management and sharing of knowledge within project teams. We fulfilled this task by examining a project team at Ericsson. The results revealed that knowledge is managed and shared by the team in different stages. The study shows that communities of practice play an important role for sharing and delivering required knowledge to the project team whenever needed, apart from the repository of lessons learned from previous projects. Additionally, the critical factors showed their potential to really influence the knowledge sharing within the project team. Furthermore, we realized some critical discrepancies both in various stages of knowledge management and sharing of knowledge gained from the current project.

An in depth conclusion is presented under their respective titles and then followed by a discussion and recommendations for further research.

6.1 Knowledge management

Each member of the studied project team had a different understanding of the knowledge management systems and their importance, which makes it difficult to capture, store, present, validate and distribute knowledge, consequently affecting the knowledge management and sharing. The detailed discussion about the knowledge management and sharing in examined project team at Ericsson is as follows:

6.1.1 Knowledge storage

This case study shows that although the examined project team at Ericsson is well aware of the importance of knowledge sharing and management, just realizing the importance of this phenomenon is not enough unless specific measures are taken. The knowledge is managed and stored at various stages by the project team members, however, there is no specific person allocated to capture and store knowledge into the knowledge management system. This is problematic for efficient knowledge management, as the project team members might assume that somebody else have already taken the responsibility of applying the same information into the knowledge management system. This in turn will result in loss of precious knowledge.

6.1.2 Tools for capturing knowledge

The practice of reviewing projects at several stages provides a good opportunity for project team members to manage knowledge from the project and discuss their individual issues. In this way, the project team shares and manages the knowledge gained from the project. Additionally, the practice of
having multiple meetings before, during and at the end of the project really helps them to share knowledge with each other and allows for consistent help with overcoming difficulties. Nevertheless, the way knowledge is captured during these meetings can be improved. The project team members capture and store key points of the meeting without explaining the process for solving the particular problem. This could be misleading for other employees in the team and organization.

6.1.3 Knowledge creation and distribution process

The study shows that project team members utilize much of the data stored in knowledge management systems in order to find ways to accomplish tasks. Additionally the communities of practice at Ericsson provide an opportunity for each team member to share new knowledge gained from their current project and also store within the community wikis. The knowledge managed and shared in the communities of practice provides vital resources for project teams in the organization for overcoming specific issues that teams cannot accomplish by themselves.

Additionally, the study shows that newly created knowledge is managed locally in wikis by the project team. Although such project knowledge is shared with communities of practice sometimes by the project team members but still remains undistributed throughout the organization due to not making it part of the central knowledge management system. Consequently, it limits the opportunity to share project knowledge at organizational level due to limited access, depriving Ericsson from potential advantages.

6.1.4 Knowledge presentation and validation process

The project team has the opportunities to store knowledge in certain knowledge management tools at Ericsson, but the team is not efficient in coding and storing the knowledge from the project in a proper way that could make it easier to locate and interpret the knowledge for seeker. In our view, the practice of coding incomplete information and by different team members who use different terminology downsizes the quality of knowledge managed and could discourage other employees in the future to interact and share knowledge through knowledge management systems.

Furthermore, when it comes to knowledge validation, although the team members update information in wikis from time to time but still there is a huge potential for improvement. The knowledge management systems contain a plethora of outdated and dispersed knowledge. There are several potential reasons for keeping outdated knowledge, but as it is at Ericsson, the information is just using unnecessary space and creating problems for project team members trying to find relevant knowledge when needed. This consequently affects knowledge sharing as well when looking for wanted knowledge into knowledge management systems. The first line manager should take this responsibility seriously and filter the knowledge base after a certain period of time. It would make it easier for the team members to find relevant knowledge more efficiently, which will counteract the time constraint factors.
6.1.5 Knowledge sharing

When it comes to knowledge sharing within the project team, the general impression from the case study is that knowledge is shared among the team members on a continuous basis. The personal ties and relations with communities of practice play an important role both for the acquisition, distribution, and sharing of knowledge. The practice of pair programming, although a big financial expense, is considered a useful tool to share knowledge among project team members. Apart from that, the official project review meetings and workshops are also proving to be beneficial for enhancing the capabilities of team members through knowledge sharing. The Scrum meetings also foster the knowledge sharing culture within the project teams at Ericsson. However, as the Scrum meetings last for only a short period of time, it might be better to make those limits more flexible in order to fully utilize those occasions for brainstorming and knowledge sharing.

The meetings held by the examined project team at the beginning of the project offer knowledge sharing prospects among the project team members and provide them an opportunity to look back into the knowledge gained from previous projects in order to plan for the new project. Although project team members at Ericsson have different opportunities frequently share knowledge, the most valuable knowledge comes from outside the project teams through communities of practice. This is mainly because of the established relation of the project team members with respective communities of practice.

The project team also uses certain tools such as micro articles and workshops in order to share and visualize the important outcomes from the project. The Project team has started using audio files to share their expertise and important lessons learned from a project, which is a good practice as the audio version includes more cohesive information and can easily be shared by the team members simultaneously when encountering a similar problem in future. Another important tool for the project team members at Ericsson are the workshops held at the end of the project. Here, the team members discuss the different issues they dealt with during the project. The knowledge shared by the project team members at this point lead to sharing within the organization through the workshop managers and other employees invited to listen and share their own experience from other projects.

6.2 Factors affecting Knowledge Sharing within project Teams

Time Constraints

Time constraints during the project have an affect on the knowledge sharing within the project team. This study shows that because of these limitations, there were situations where capturing and sharing knowledge was restricted. While interconnected with the other critical success factors, Time constraints in themselves restricted knowledge sharing despite whether or not the team members found value in capturing and sharing it. The issue not only affected the opportunity to capture and share knowledge, but also the quality of knowledge documented. This effect on the knowledge shared further portrays the barriers created by time constraints, errors could have been prevented when the project team members had more time to capture and share knowledge with other members.

The temporary nature of the project also has its effects on restricting knowledge shared and gained during the project. While the project team members get a chance to reflect on a project after it is completed, they are not expected to retain this knowledge for future projects. The team members that
start new projects soon after do not find themselves handling the knowledge gained from the previous project. This temporary nature of the knowledge being used leads to potential loss of knowledge in future projects, and repeated mistakes. However, the study shows that project teams at Ericsson review each member’s previous experience before a project begins. This provides the opportunity for knowledge to be shared amongst new partners, which can reduce the decay of knowledge lost from previous projects. The challenge is to properly store any knowledge gained from the project before the project team member moves on to a new project. This should further counter the barriers for knowledge sharing created by the temporary nature of project teams.

**Motivation**

Project member motivation is interconnected with other critical success factors affecting knowledge sharing within the project team. Due to the limitations with time, technology and processes, the project team members have trouble understanding the importance, and therefore acting upon sharing knowledge within the team. The issue is rooted in the nature of reciprocity, and a disregard for the value behind the knowledge needing to be shared. If project team members understood the degree in which the knowledge they have is beneficial to their team members, this resistance to knowledge sharing could be combated.

Unlike motivation and the other critical success factors, trust did not have a very negative effect on the knowledge sharing within the project team from Ericsson. Due to the organization’s sharing culture, it is expected that each of the project members participate in sharing knowledge with one another. Benefits were also seen from the organizational level, since trusting one another was integral to achieving project goals. Instead of acting as a barrier, trust assisted the knowledge sharing process in the project teams at Ericsson. This was also evident throughout the organization through communities of practice, where project members entrusted shared knowledge. Ericsson has succeeded in developing an environment where trust is not an issue that inhibits sharing knowledge within project teams.

**Communication**

Sharing knowledge at Ericsson is dependent on the interconnected critical success factors communication and technology. However, the consensus was that the technological aspect is not as essential of a factor as communication is independently. Face-to-face interaction is essential for the project team to share knowledge with one another. This lead to a great understanding and clarification, further benefitting the project team rather than hindering it. At Ericsson, Communication is necessary for sharing knowledge, and like trust, only further assists knowledge sharing on the organizational level. The underlying factors, like language, do not create issues that hinder knowledge sharing in project teams at Ericsson. The communication technology, while limiting compared to face-to-face interaction, also benefit the project team with sharing knowledge through their accessibility and efficiency.
Project Team Structure

It was concluded that the project team structure negatively affected the knowledge sharing within project teams at Ericsson. While having different roles often leads to greater efficiency for project teams in project-based organizations, for a knowledge-based organization like Ericsson, these roles are eternally more interconnected and dependent upon one another. Because of the limitations each member has through their specific expertise, knowledge sharing suffers within the project team. This leads to inefficiency and misunderstandings, which lead to mistakes. This apparent issue will lead to continuous struggling unless the project team members learn to better address one another with the necessary knowledge.

The knowledge sharing process is very dependent on the project team structure, as well as the structure of the organization. At Ericsson, project team members must participate in processes in order to participate in sharing knowledge, and this leads to inefficiency and lack of motivation in the project team members. The sharing processes could have a positive effect on the efficiency of knowledge shared, however at Ericsson they only hinder sharing and have a negative effect.

6.3 Managerial implications

When it comes to knowledge management the senior project team members should document their experience and learning from the project, not only for inspiring the junior members to efficiently capture and manage the knowledge, but also to enhance the organizational knowledge. This would also positively affect the knowledge sharing within the project team. The Scrum master is the most senior member, as well as the coach of the team interviewed, and should set an example by changing his attitude towards managing the knowledge in an appropriate way. Furthermore the management should particularly pay attention towards filtration of knowledge management system in order to improve the efficiency of the knowledge management tools in knowledge sharing. Additionally the knowledge from team pages and wikis should be linked with the central knowledge management system in order for other project teams to be able to utilize that.

The effect these critical success factors have on sharing within the project teams at Ericsson is entirely dependent on each factor's relationship with one another. Because of the limitations the project team faces with time constraints and temporary nature, project team members do not have enough time to communicate and develop personal ties with the other members. This leads to difficulties with communication between members of different roles and expertise that can affect trust and motivation. The processes implemented should help the flow of knowledge between these different roles, but without proper processes, the motivations suffer here as well. At Ericsson, the project team members interviewed found trust and communication to act as a benefit rather than an issue. This led to a better development of personal ties and understanding and counteracted the negative factors of project team structure and lack of motivation.

The best way Ericsson could counteract the barriers hindering knowledge sharing in the project team is through the critical success factors technology and knowledge sharing processes. With more efficient processes and by making knowledge sharing more accessible through technology, the project team members could overcome the barriers of their conflicting expertise and better share knowledge amongst one another. One of the interviewees noted that there is a lack of structure in the processes used to share knowledge. By addressing this disorder, Ericsson can better address the critical success factors negatively affecting the sharing within the project team.
6.4 Further research
Although a conclusion has been reached for our studies, there are still issues worth addressing with further investigations. We concluded that one important aspect about the project team was the conflicting nature between the unique roles. With this discovery, further studies could be done on the nature of these particular relationships and the integration of knowledge from their unique expertise. There are a number of theories regarding this subject and this could lead to a better understanding of project team relationships for Ericsson.

Another issue that could be considered for further studies would be the aspect of a reward system and how it affects the motivation of project team members and knowledge sharing. In our thesis, this subject was not studied since a reward system is not implemented in Ericsson, but perhaps through a further investigation, the impact of a potential reward system could be studied and considered.
Reference List


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Huber, G. (1999). Facilitating project team learning and contributions to organizational knowledge. Creativity and Innovation Management 8:70-76


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Interview References

Designer (2013, April 23). Personal Interview.

Early system tester (2013, April 23). Personal Interview.

First line manager (2013, April 23). Personal Interview.


Scrum master (2013, April 23). Personal Interview.
Appendix 1.
Semi-structured Interview Questions:

Background questions:
How long have you been working for Ericsson?
How many projects have you served upon?
What is your role in this project?

Questions:
1. Would you mind describing knowledge management system here at Ericsson?

2. What do you think about the knowledge management system?
   - How is the knowledge management system helpful?
   - How accessible is stored knowledge?
   - How does the knowledge management system help you to solve problems you're facing while performing a particular task?
     (When would you find yourself retrieving knowledge and lessons learned during a project?)

3. How is knowledge captured and documented during the project?
   - Does this typically occur at the end of project completion or throughout the process?
   - How often is knowledge captured?
   - What limitations prevent you from capturing knowledge?
   - How often do you delete information from the knowledge management system?

4. How valuable is the knowledge you retained from previous projects?
   - How much do you learn from these projects?
   - How useful are the lessons learned from projects?

5. How does the knowledge sharing affect your individual performance in the group?
   How does that contribute to the team performance as a whole?

6. How do you share certain knowledge with other members in the organization and vice versa?

7. Do you ever feel that you missed the opportunity to learn or share knowledge? How so?

8. What kind of difficulties do you face while sharing your expertise with the other members of the project team?