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Process and practice of knowledge management at a large technical consultant company

Master's Thesis in the Master's Programme International Project Management

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Abstract

In the current era of technological and business disruption, it is important for an organization to be innovative more than ever. That being said, there is no simple formula to become innovative and the ability to become innovative depends on the individual knowledge of an employee and collective knowledge of an organization. Therefore, managing knowledge becomes an important step in order to become innovative and survive in the competition. It even becomes more crucial for a technical consultant company to manage knowledge more strategically, as knowledge is the “main resource” for such knowledge intensive firms.

Accordingly, the purpose of this thesis is to investigate Knowledge Management (KM) in a technical consultant company. This study comprehends the process and practice of KM, barriers of KM and approaches to overcome the barriers of KM in a large technical consultant company.

A case study of a large technical consultant company is conducted in order to fulfill the purpose of the study. Literature studies were conducted in order to gain knowledge on the research subject and to provide potential solutions for the research questions. Data was gathered by conducting pre-study, semi-structured interviews and participant observations. The research questions were answered by compiling, coding and analyzing the collected data against the theoretical framework.

The results of the study indicate that personalization strategy is the most effective way of sharing knowledge in a technical consultant company. The process of managing knowledge in a large technical consultant company is very complex due to certain unique structural, cultural and behavioral issues; lack of shared identity, geographical co-location of the on-site consultants, legal restriction to share clients' knowledge are the barriers, which are found to be unique for a technical consultant company. However, there are certain actions which could facilitate the company to overcome most of the barriers and therefore, it is recommended to implement these actions for effective knowledge sharing across the organization.

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Preface

This study has been conducted as a part of the master's program, "International Project Management" at the Technological University of Chalmers. This study was conducted at a large technical consultant company in Gothenburg.

First, we would like to thank the case company and our company supervisor for providing us the opportunity to conduct this study. We would also like to thank all the participants involved in this study for taking time and providing insights for our questions.

Next, we would like to express our gratitude to Petra Bosch, our supervisor at Chalmers University of Technology, for the support, timely feedback and motivation to move forward with our work.

Last but not least, we would like to thank each other for all the fun and food that we had during this time and for the excellent team work.

1. INTRODUCTION

The current chapter aims to provide an introduction on innovation with a focus on knowledge management. This chapter begins by a background to innovation and its importance of knowledge management. This is followed by the purpose, research questions and objectives of this study. Lastly, the limitations and the structure of the thesis are also presented in the following chapter.

1.1 Background

In this present era of post industrialization and globalization, an organization's ability to survive in the market and to reach or retain the competitive advantage depends on its ability to be creative and innovative (Martins et al., 2003). Innovation can be seen as one of the cornerstones for continuous growth and sustainable competitive advantage in a global consulting firm (Mors, 2010). There are many organizational factors affecting innovation: Knowledge management, management style and leadership, resources, corporate strategy, organizational culture, employees and organizational structure (Shukla and Singh, 2015; Smith et al., 2008). Of these factors, knowledge management (KM) has gained most attention of the scholars and has even been mentioned as the predominant factor, which determines the innovative ability of an organization (Brooking, 1996; Carneiro, 2000; Navimipour & Charband, 2016; Nowacki, 2016; Frey et al., 2009). Aujirapongpan et al. (2010, p.192) conducted a literature study about the influence of KM on innovation and found that *"innovativeness of organizations depends on the amount and effectiveness of knowledge and knowledge management in an organization"*.

The process and practice of sharing and converting the individual knowledge into organizational knowledge and vice versa is called knowledge management (Nonaka and von Krogh, 2009). An individual's knowledge is defined as *"an individual's perception, skills and experience, which are all dependent on what experiences the individual's worldview contains in the form of meanings"* (Koskinen and Philanto, 2008, p.43). An organization's knowledge can be understood as *"a learned set of norms, shared understandings and practices that integrates actors and artefacts to produce valued outcomes within a specific social and organizational context"* (Newell et al., 2009, p. 6). The individual knowledge is converted into organizational knowledge when the organization takes efforts to create, store, use and share the knowledge across the organization for the benefit of the organization (Linder & Wald, 2010).

The consulting market is growing rapidly and in the year 2015, the Nordic consulting market and Swedish consulting market grew by 3.2 percent and 4.9 percent respectively (Source Global Research, 2016). Knowledge management is crucial for knowledge intensive firms such as technical and management consultancy firms as their core competitive strategy lies in the knowledge of the consultants and collective organizational knowledge (Tseng, 2011). Knowledge management is one of the main factors that contributes to the generation of innovation and affects the innovative ability of a consultancy firm, which in turn is vital for a firm's performance (Shukla and Singh, 2015). Sharing knowledge will not only contribute to

innovation capabilities but also be positively related to reduction in costs, team performance, faster completion of new projects and firm performance (Wang and Wang, 2012). It is important that an organization is able to manage diversified knowledge in order to cope with challenges such as rapid technological changes, product lifecycle shortened, downsizing and high market volatility (Bechina and Bommen, 2006).

The process of creating and sharing knowledge in a consultancy firm is different from other organizations as the consultants, the main knowledge capital of the firm, are located at the client sites (Hislop, 2013). Moreover, the sharing of knowledge at some level by the consultants to the organization is restricted legally if it involves the client's knowledge gained by the consultant. There is a plethora of studies which have investigated the KM in an organization, however, only a handful of studies were conducted to investigate the knowledge management in a consultancy firm and more specifically in a technical consultancy firm. Further, a study about the relevance of academic papers on knowledge management in the business world concluded that most of the studies are irrelevant to the practitioners and the complexities involved in dealing with knowledge management activities in the real environment are not reflected (Booker et al., 2008). Therefore, this study is conducted as an effort to close the literature gap and to provide a practitioner's view of KM in a technical consultant company.

1.2 Purpose and research questions

The purpose of this study is to investigate knowledge management (KM) in a large technical consultancy firm. The study focuses on knowledge management, the factors that influence knowledge management and strategies to improve knowledge management. Three research questions have been developed and are presented below in order to reflect the purpose.

1. How is knowledge management performed at a technical consultancy firm?
2. What are the barriers of knowledge management at a technical consultancy firm?
3. What approaches could be used to overcome the barriers?

In order to answer the research questions and thus fulfill the purpose, a case study is conducted at a large technical consultancy company.

1.3 Limitations

The case company is an international one with branches in 20 countries. However, this study only focuses on knowledge management of the case company in one of its branches in Sweden, Gothenburg. Further, the current study is from the perspective of middle managers and consultants and the perspective of top management is not considered. The issues pertaining to knowledge management in a large technical consultant company are considered to be general and not unique to the case company. Moreover, as it is hard to distinguish information from knowledge, everything is considered as knowledge in this study. The perspective of the client companies are not considered.

1.4 Disposition

This study includes six chapters and Figure 1 highlights the content of each chapter in order to facilitate the ease of reading.

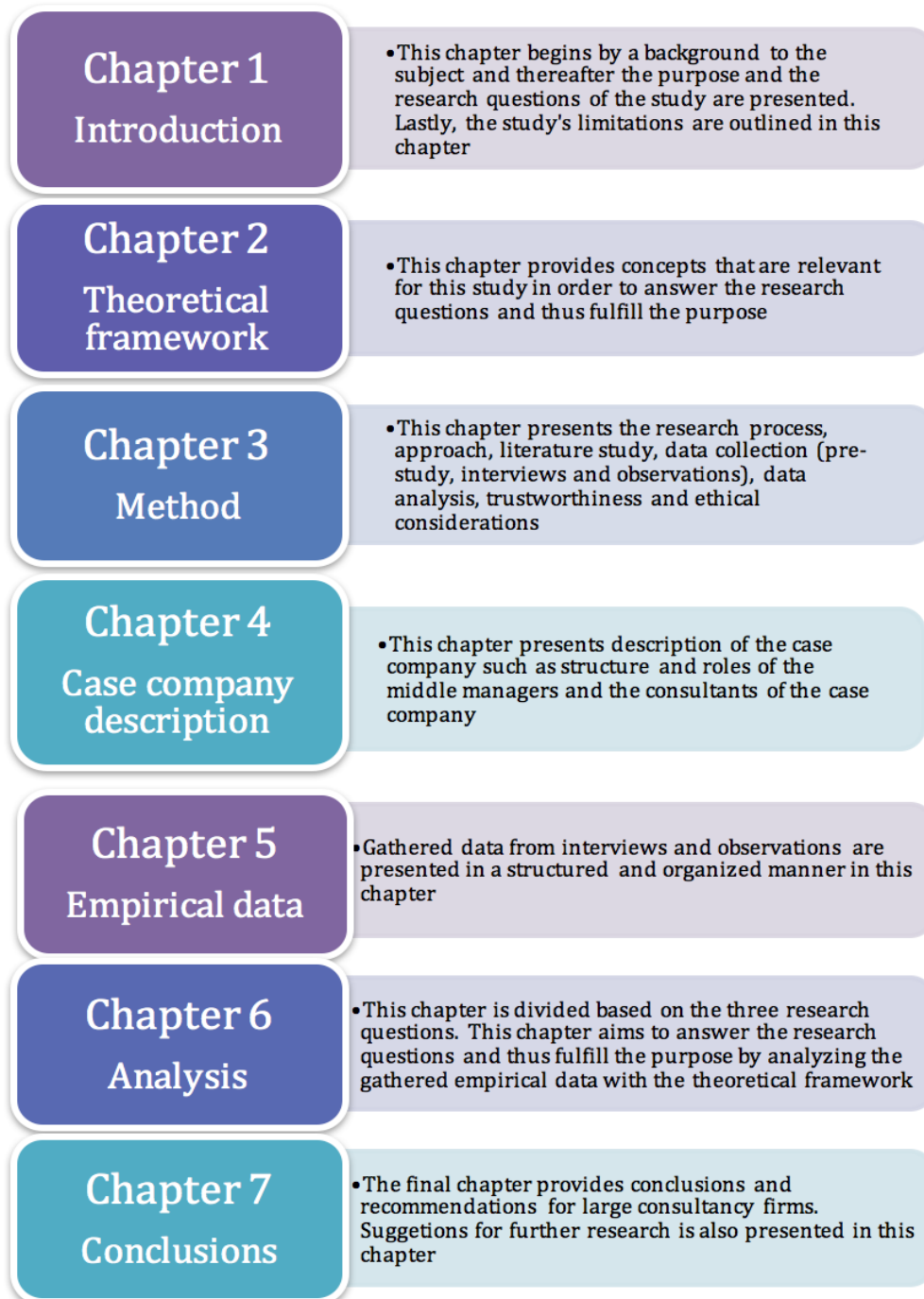


Figure 1. Thesis disposition

2. THEORETICAL FRAMEWORK

The following chapter aims to provide a theoretical background on knowledge management. This chapter begins by introducing the term knowledge and knowledge management. Later social capital, communities of practice and mentoring and coaching are discussed followed by the different organizational factors that influence knowledge management .

2.1 Knowledge

Knowledge is defined as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms” (Davenport and Prusak, 2000, p.5).

There are two types of knowledge, explicit and tacit knowledge and these knowledges could reside at an individual and/or group level (Hislop, 2013). Explicit knowledge can be articulated, written and documented and accessed through consciousness. Tacit or implicit knowledge is embedded in the experience and know/how and is hidden and hard to verbalize or write it down (Nonaka and von Krogh, 2009). The characteristics of each knowledge type are illustrated in Table 1.

Table 1. Characteristics of explicit and tacit knowledge (Hislop, 2013, p.21)

Tacit knowledge	Explicit knowledge
Inexpressible in a codifiable form	Codifiable
Subjective	Objective
Personal	Impersonal
Context- specific	Context dependent
Difficult to share	Easy to share

There are two perspectives on knowledge: objectivist and practice based perspective. As per the objective perspective or the epistemology of possession, knowledge is considered as an entity or commodity that is possessed by the people and at the same time knowledge is independent of people and could be codified and shared to others. The objectivist view on knowledge is widely criticized by the practitioner’s perspective of knowledge management as the practice view emphasizes that knowledge is something, which is ingrained within the processes, routines and practices and hence, cannot be separated from people (Hislop, 2013; Newell et al., 2009).

2.2 Knowledge management

The individual knowledge is converted into organizational knowledge when the organization takes efforts to create, store, use and share the knowledge across the organization for the benefit of the organization (Linder & Wald, 2010). This process and practice of sharing and converting the individual knowledge into organizational knowledge and the vice versa is called knowledge management (Nonaka and von Krogh, 2009). An effective knowledge management (KM) is beneficial to an organization as the effectiveness of KM is directly linked to improvement in the organizational performance; improvement in the efficiency, adaptability and innovativeness (Aujirapongpan et al., 2010).

For a knowledge intensive firm such as a consultant company, knowledge is the critical resource (Rosario Cabrita et al, 2012). The resource-based view of firms emphasizes that the competitive advantage of a firm depends on its ability to make its resources rare, valuable and non substitutable (Barney, 1991) and the importance of knowledge as a critical resource is also recognized in this view. Further, the knowledge-based view considers knowledge as the strategic resource that helps a firm to differentiate itself from its competitors and thus sustain the competitive advantage (Curado, 2006). Therefore, from both the resource based and knowledge-based view of firms, it is very crucial for a consultant company to manage the knowledge effectively and knowledge management becomes a “*strategic success factor and differentiator*” (Petter, 2014, p.18).

Michailova (2005) conducted a literature study to identify various behavioral issues associated with knowledge management processes. It is identified that the knowledge is not equally distributed in an organization and the one who hold knowledge will not be motivated to devote time and other resources for sharing knowledge if they don't see any value out of the KM process. It's the individual's choice if they want to share their knowledge or not, hence it's up to the individuals or the organization to either seek or share knowledge. Further, lack of awareness of specific knowledge prevents an employee from seeking that knowledge when required.

2.3 Technical Consultancy

The engineering consultancy companies engage in offering services to the clients (Mehri, 2015), such as “*provision of advice, preparation of feasibility studies, preparation of preliminary and final plans and designs, provision of technical services during the construction or installation phase, inspection and evaluation of engineering projects, and related services*” (SICCODE, 2018). The different types of services that are offered by an engineering consultancy firm is illustrated in Table 2.

Table 2. Services provided by an engineering consultancy firm (Mehri, 2015)

Engineering consulting firm services

Customer needs	Engineering consultancy service
High technology products	Transfer technology to design products with value-added technology, or provide a design that meets customer needs
Ownership over intellectual property rights	Transfer proprietary designs and technology that can be domestically designed and exported to global markets
Independent technology licensing network	Establish ties to MNC parts suppliers outside MNC assembler network of suppliers to license technology
Access to knowledge database	Provide access to a knowledge database that can be used for benchmarking customer designs
Increase in engineering team technical capacity	Provide access to consulting engineers with expertise in specific technology, increasing project team engineering capacity and speeding up design process
Access to testing equipment	Provide access to consultancy's high-tech equipment to test and improve designs

Engineering consultancy firms are categorized as Professional Service Firm (PSF) or Knowledge Intensive Business Services (KIBS), which is defined by, “*high knowledge intensity, low capital intensity and a professional workforce*” (Nordenflycht, 2010, p.156). The professional workforce of these firms are termed as “knowledge worker” or “intellectual capital”. An engineering consultancy company could be multi-disciplinary and the competences and skills of the knowledge workers should be developed on a continuous basis (Løwendahl, 2000).

In an attempt to identify the differences between various professional firms, Malhotra and Morris (2009) focus on three factors, knowledge, jurisdictional control and client relationships of legal, auditing and technical consultancy firm.

2.4 Knowledge management framework

The SECI model is a framework developed by Nonaka (1994) in which the knowledge creation process is represented as a “spiraling process of interactions between knowledge types” (Newell et al., 2009). In this model, four processes of knowledge conversion for knowledge creation and sharing is identified and is illustrated in Figure 2.

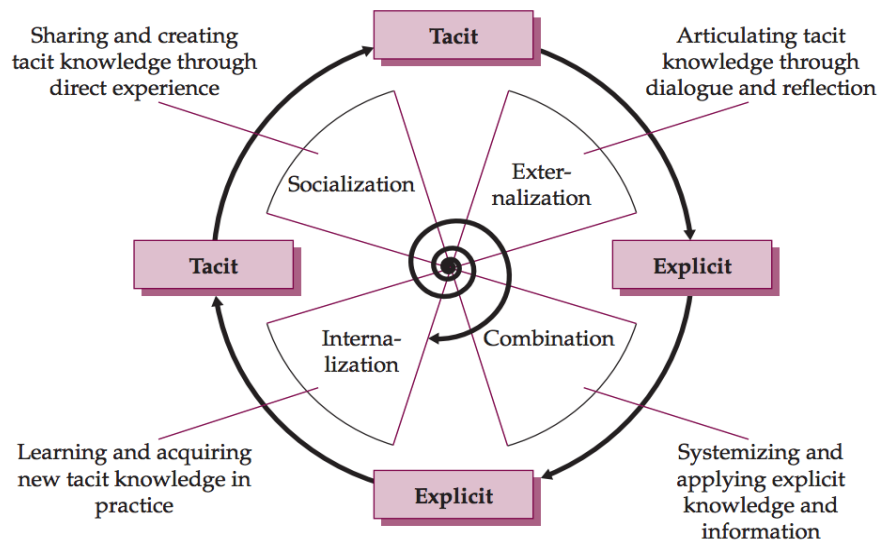


Figure 2. The SECI model (Shibata and Takeuchi, 2006, p.7)

The context or place for creation and sharing of knowledge for each of the processes is also emphasized in this framework. The processes of the SECI model and the contexts that are identified for each of the knowledge creation and sharing processes are described below (Nonaka, 1994 and Newell et al.):

- *Socialization*: is a process of tacit knowledge to tacit knowledge, where tacit knowledge is created and shared through interacting, observing, discussing, analyzing and also by sharing experiences (Nonaka, 1994). The socialization process takes place in an originating context where individuals can “develop empathy, share feelings, emotions, experiences and mental models” (Newell et al., 2009, p.9). This process happens through face-to-face contacts and one example is about sharing knowledge about a problem or an issue in an informal way (Newell et al., 2009).
- *Externalization*: is a process of articulating tacit knowledge to explicit knowledge by engaging in dialogues, exchanging ideas and visual demonstration (Nonaka, 1994). The interacting context is related to the externalization process where the tacit knowledge is created and shared into explicit knowledge. In this context, individuals can “get together to engage in dialogue, challenge ideas and reflect on their own ideas in the light of others’ idea” (Newell et al., 2009, p.9). This process happens in a formal place where the context is consciously constructed (Newell et al., 2009).
- *Combination*: is a process where explicit knowledge is created and shared as explicit knowledge itself, hence diffuse the explicit knowledge into organizational learning (Nonaka, 1994). This process takes place in a cyber context through a virtual context where the new and existing knowledge is combined and stored in the information communication technology (ICT) for later retrieval and use (Nonaka and Konno, 1998). For example, storing the post project review in intranet for reuse of knowledge. (Newell et al., 2009).

- *Internalization*: is a process where the formal explicit knowledge is created and shared into tacit knowledge, hence it is about learning and acquiring new tacit knowledge in practice (Nonaka, 1994). This process takes place in an exercising context where the knowledge is created and shared through training and active participation (Newell et al., 2009).

In order to create and sustain the knowledge spiral, as illustrated in Figure 4, a number of conversions and syntheses across the following has to take place and these syntheses will determine the effectiveness of KM in an organization (Shibata and Takeuchi, 2006, p.7):

1. *Tacit and explicit knowledge*
2. *Levels (individual, group and organization) within the company*
3. *Functions, divisions, departments within the company*
4. *Layers (top – management, middle manager, and front-line worker) within the company*
5. *Knowledge inside the company and knowledge outside the company created by suppliers, customers and competitors.*

2.4.1 KM strategies

There are two types of KM strategies: codification and personalization and an integrated approach of these two could also be adopted (Greiner, 2007). Codification strategy involves a “people to documents” approach where the explicit knowledge is captured and stored in the databases for re-use and increasing the organizational memory (Alex, 2012). This strategy is more suitable for the companies where re-use of existing knowledge is required. “*The design of databases, document management, and workflow management*” and standardization and routinizations are the aspects, which should be considered for the codification strategy (Greiner, 2007, p.5). Contrary to the codification strategy, is the personalization strategy and it emphasizes “person-to-person knowledge” with an objective to share the knowledge by personal communication via networks. Therefore, the focus is more on the individuals or a group rather than a system like an intranet (Greiner, 2007). The personalization strategy aids better in developing creativity in an organization and codification strategy helps an organization to become more efficient in its processes. The KM objectives and strategies are compared in Table 3.

Table 3. *KM objectives and strategies*

Objective	Creativity and knowledge creation (<i>Innovation</i>)	Externalization and re-use of knowledge processes (<i>Efficiency</i>)
Focus	People	Process
Strategy	<i>Personalization</i> Networking and dialogue	<i>Codification</i> Collect, store, and disseminate explicit knowledge
Problem	New, unstructured, not repetitive	Repetitive activities and similar processes
Knowledge Type	Tacit knowledge	Explicit knowledge

2.5 Social capital

Social capital is defined as “an asset embedded in relationships of individuals, communities, networks, or societies” (Leana and Van Buren, 1999, p. 538) and it exists when the humans interact (Choe and Chan, 2008). The interpersonal interaction depends on the social network that exists in an organization and the effect of the social network could be best understood from the social capital theory (Hislop, 2013). Cross and Prusak (2002) argue that the employees with strong personal networks have high job satisfaction and tend to stay longer in the company than their counterparts with weaker networks. In a consultant company, the consultants work with the clients or at the client site and the knowledge of consultants are shaped by continuous interaction, integration and application of different sources of knowledge from the employees of the consultant company and the client company. Further, the work of such consultants are very customer specific and therefore, the knowledge gained from such activities are very hard to be translated or coded into a document. In such a case, the interpersonal interaction is found to be more efficient in transferring knowledge at the consultant company (Hislop, 2013).

Parise et al (2006) found that most of the knowledge sharing in an organization happens through informal network, therefore it is very crucial for an organization to understand the importance of such networks. Cross and Prusak (2002) identified central connectors and knowledge brokers as the key role players who are critical for any social networks. The network connection of these key actors is illustrated in Figure 3.

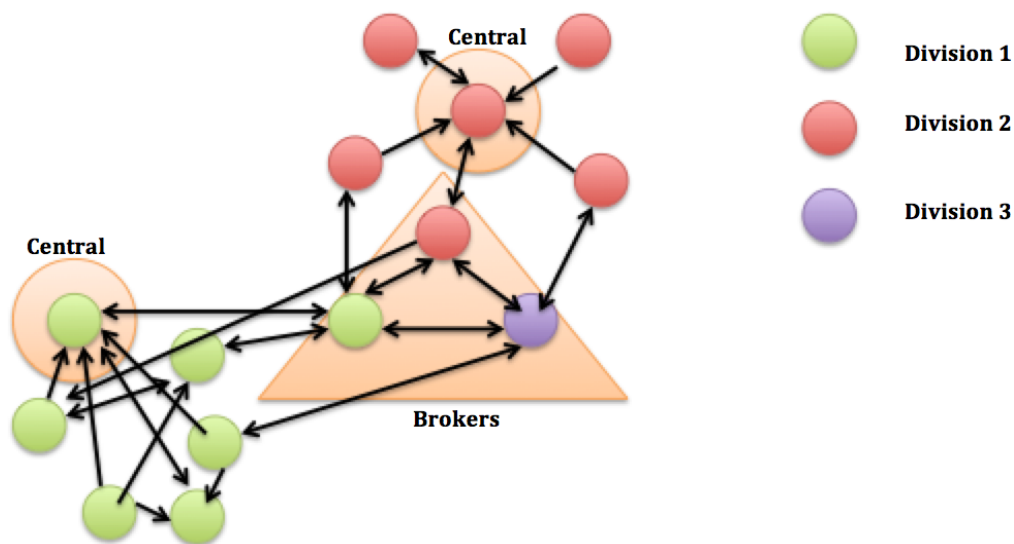


Figure 3. Key role players of social network (Model based on Parise et al, 2006, p.33).

Central connectors link people in an informal network with each other and it is not necessary that the central connectors are the formal heads within a division or department, but they know and can connect to the person who can provide critical information or expertise. Knowledge brokers “are those who have ties across subgroups and thus serve to integrate the entire network and some employees can serve as both central connectors and knowledge

workers in a network” (Parise et al, 2006, p.33). These actors could affect the knowledge flow of an organization, both positively and negatively. The set of actions according to each network role in order to transfer knowledge effectively (Parise et al., 2006) is presented in Table 4.

Table 4. Knowledge retention by network role (Parise et al., 2006, p.34).

Network role	Actions
Central connector	<ul style="list-style-type: none"> • Use personal network profiles in career development and onboarding practices to create network redundancies systematically where departures might dramatically fragment a network. • Reallocate information access and decision rights to ensure that one point does not become too vulnerable in the network. • Have central connectors lead communities of practice as a means of creating connections around them. • Require central connectors to help newcomers get acclimated through strategic introductions, “shadowing”, mentoring and joint projects.
Broker	<ul style="list-style-type: none"> • Identify and develop brokers through staffing and rotation across division, geographic and expertise groups. • Assign brokers strategically where information gaps exist or where ideas can move from concept to action. • Give brokers preauthorized decision limits to tap into network resources. Allow them to experiment to obtain real-time information.

2.6. Communities of practice

CoP is a social unit, which provides a context for a set of individuals to learn by engaging in activities and conversations and negotiate meanings and knowledge within the cognitive domain of the community (Bolisani and Scarso, 2014). The communities of practice (CoP) considers that knowing and doing are connected and the organizational knowledge resides in the group activities rather than in a particular individual. CoP can happen in both a physical setting and in virtual setting (Kietzmann et al. 2013). CoP is argued to be beneficial for an organization as it fosters a sense of community and belongingness of the members involved, which in turn improves the collective identity and a context to develop and exploit the knowledge and more specifically tacit knowledge. There are three important factors which have to be considered for a CoP: a common or shared knowledge within the group of CoP, shared value and attitudes, and a sense of communal identity. Further, the CoP should happen in an informal setting where informal learning by an employee from another group is the essential factor of a CoP (Hislop, 2013). The process of knowledge sharing in a CoP is represented in Figure 4. A CoP should be organic and informal with minimal or negligent support from the management with the people of the community taking up the role of organizers. However, the top management should support the CoP by encouraging and motivating the community without interfering.

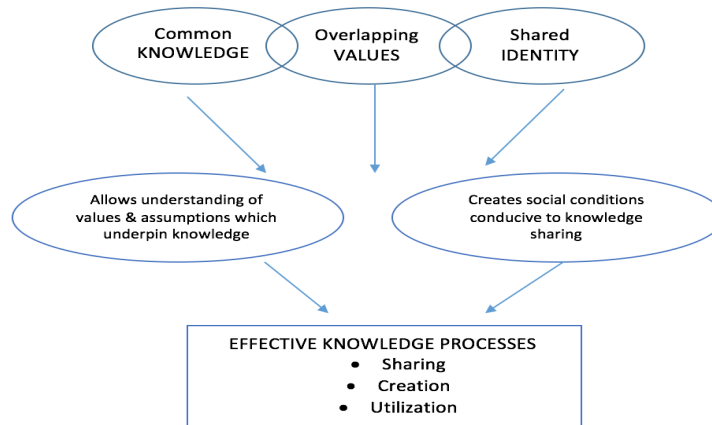


Figure 4. The process of knowledge sharing in a CoP (Hislop, 2013)

2.7 Mentoring and coaching

A number of studies have found that coaching and mentoring are useful to share tacit knowledge through informal knowledge sharing (Karkoulia et al, 2008, Harrison and Kessels, 2004, Hislop, 2013). The dimensions of coaching and mentoring are illustrated in Table 5. Hislop (2013) highlights the literature which argues that the cross project and interpersonal knowledge sharing could happen through mentoring.

Table 5. Dimensions of coaching and mentoring (Hislop, 2013)

Dimension	Coaching	Mentoring
Time- scale	Specific time scale	Indefinite time scale
Structured	Highly organized and more structured	Loosely structured
Skills	Focused on relatively narrow and specific skills	Focused on general aspects

2.8 Factors influencing knowledge management

Several studies have been conducted to identify the factors which hinders the knowledge management in an organization. Even though the factors are different from one study to another, due to differences in the investigated sector or nature of the organization, there is an evident degree of resemblance, which is prevalent in these studies. An overview of some of the literature which has identified the factors that influence KM in an organization is presented in Table 6.

Table 6. List of factors influencing KM in an organization

Author Name	Linder and Wald (2010)	Yu, Kim, and Kim (2004)	Jennex and Olfman (2005)	Hislop (2013)	Miklosik and Zak (2015)
Factors	Organization and process of KM	Organizational characteristics	KMS infrastructure	Organizational characteristics	Organizational control & Structure
	Systems & ICT	Information technology			
	Culture		Organizational and Knowledge culture		Information sharing culture
		Managerial support	Senior management support		Managerial command and control
			KM strategy	Business strategy	Business & technology strategy

Linder and Wald (2010) combined a literature review with a qualitative pre-study to determine the factors influencing knowledge management: organization and process of KM, systems & ICT, culture and leadership. Based on these factors, Linder & Wald conducted an empirical study in the project based organization to validate the relevance of the factors.

Similarly, Yu, Kim and Kim (2004) also conducted a study to identify the knowledge management drivers that are related to the organizational knowledge management performance. The main KM drivers that were identified are: *organizational characteristics* which include structure of the organization, *information technology* which includes knowledge management system (KMS) quality, KMS functionality, *managerial support* which includes top management support, KM reward and KM team activity. At the end of this study, it was concluded that an integrated KM approach should be implemented, which could comprehend most of the drivers that were identified.

A framework for assessing the knowledge management system was developed by Jennex and Olfman (2005) and in order to test the effectiveness of the framework, critical factors of a knowledge management project were identified by conducting a literature study: integrated technical infrastructure, knowledge management strategy, motivation and commitment, organizational culture, senior management support, measuring the KM impact, clear goal and purposes, work processes incorporating KM activities.

Miklosik and Zak (2015), in order to develop a framework for overcoming the KM implementation barriers have identified seven factors, both enablers and constraints: Business & technology strategy, organizational control, information sharing culture, knowledge representation, organization structure, managerial command and control and economic returns.

Hislop (2013) explores the relation between the organizations business strategy and its knowledge management approach. Further, the organizational characteristics of a firm such as organizational size, the geographical dispersion of the employees and the cultural diversity are analyzed.

2.9 A knowledge management framework

Based on the literature study in section 2.8, the comprehensive list factors which influence KM are identified: organizational characteristics, ICT, culture, top management support and strategy. These factors are interlinked to each other and in this section, each of the factors are examined more deeply and are used to analyze the current state of KM at the case company.

2.9.1 Organizational characteristics

According to Yu, Kim & Kim (2004), the structure of an organization influences the knowledge sharing activities. Zheng et al (2010) argues that the organizational structure influences the pattern and frequency of communication within the organization and therefore impacting the efficiency of knowledge sharing. Chen and Huang (2007) categorizes organizational structure into formalized, centralized and integrated. The extent of rules and procedures to promote behaviour decides the level of formalization in an organization; more the rules and procedures more formalized becomes an organization. Similarly, an organization is considered to be centralized if the level of concentration of right to make decision is more. Lastly, the degree of coordination among different areas and layers of an organization determines the integration of an organization.

The organizational structure influences the coordination of KM activities and level of embeddedness of KM activities in to work routines, therefore, the structure of the organization should be aligned according to the KM requirements. Further, enhanced organizational learning could be attained with a less formalized and more integrated organization (Mahmoudsalehi, 2012). Swart (2003), while studying the obstacles of knowledge integration in a knowledge intensive firm, identifies that “*organizational size is not necessarily an obstacle to sharing knowledge successfully, the people and knowledge management policies and processes will be of critical importance*” (Swart, 2003, p.73).

2.9.2 ICT

The importance of ICT is recognized in both the objectivist and practice- based perspective of knowledge although the role of ICT may differ and the purpose of ICT in each of these perspectives are presented in Table 7.

Table 7. Various approaches of KM with ICT (Hislop, 2013)

Perspective of KM	Purpose
Objectivist	Libraries of codified knowledge
	Task related codified knowledge embedded in documentation and standard operating procedures
Practice-based	Mapping of expertise
	Collaboration tools to facilitate communication and knowledge sharing

The underlying assumption of the role of ICT in the objectivist view is that knowledge could be codified and stored and shared through ICTs. Hislop (2013) highlights two main role of ICT's in the objectivist view: creating a searchable database and codifying and documenting the task specific knowledge. The first role is based on the logic that if employees are looking for knowledge on a specific topic or issue, they can search from the database and use it. The success of such knowledge repositories depends on three factors: employee's willingness to codify knowledge, a structured knowledge system and employee's willingness to search and utilize such knowledge. The second role of the ICT is creating and storing the task related knowledge documents such as decision- making process, best practices, troubleshooting procedures and other routines.

Similar to the objectivist perspective, the ICT can be utilized in two ways in the practice-based perspective as well. Expertise maps can be created where the employees can search for other employees based on the knowledge or expertise that they are looking for. This role of ICT is more related to the concept of transactive memory systems (TMS), which enables an employee to know the expertise of his/ her colleagues. Further, ICT could be used to enable a digital social interaction among the employees based on the competencies and knowledge, which would improve the interpersonal communication and interaction even between strangers in the organization. This network could be more useful in a geographically dispersed teams (Hislop, 2013). The ICT should provide a collective and user interactive platform where the employees can find and create useful network and create and share knowledge with each other.

Paroutis and Al Saleh (2009) investigated the factors influencing the employees' intention to share knowledge through ICT and found three main barriers. The first one is the lack of time. Further, "the risk of no one accessing the knowledge created or shared in the ICT" hinders one from posting or uploading information. The second one is the standard and amount of knowledge posted in the ICT; the redundancy of information posted also prevents the usage of ICT for KM activities. The awareness of the ICT is the third factor; the employees are not aware of the KM activities that take place through the ICT.

2.9.3 Culture

The knowledge culture comprises of the willingness of the employees to share knowledge and mutual trust, which will facilitate open knowledge transfer within the organization (Linde & Wald, 2010). It has a direct influence on KM and informal networks have an indirect influence on the effectiveness of KM. The policies and practices of HRM such as recruitment,

training and incentives, are important in creating and sustaining the knowledge culture in an organization and it should be in accordance with the KM strategy adopted by the firm. When an organization pursues a personalization strategy, the recruitment should consider the social networking ability and interpersonal skills of an individual as one of the factors and training should also be focused on developing these skills. Similarly, the reward system should also be linked to these skills (Hislop, 2013). However, when an organization pursues a codification strategy, then creation and updating of documents and notifying the errors or inaccuracies in the existing document should be recognized in the performance appraisal. (Miklosik and Zak, 2015).

The attitude of the employee in participating in the organizational knowledge management activities are affected by the relationship between the employees and the management and the extent of group identity of the employees. Developing a sense of group or team identity and increasing the trust of the employees in the organization are found to be effective in improving the culture and thus the organizational knowledge sharing activities among the employees. (Hislop, 2013). According to Brown and Malmi (2008), rewards and compensation are important in order to promote the commitment of the employees to actively participate in KM activities. It can be used as a tool to steer the direction, duration and intensity of effort of the individuals and groups towards KM activities.

Further, presence of strong subcultures and lack of organizational identity are the cultural other factors that influence knowledge management. The presence of sub-culture also prevent the employees from sharing the knowledge across the functional boundaries (Currie and Kerrin, 2003). It is crucial that such subcultures should be identified and aligned towards common goal and thereby improving the employee performance (Changi et al., 2016). Organizational identity is another main factor, which influence the knowledge sharing culture, especially of a consultancy firm. Organizational identity is the extent to which an employee identifies themselves to a specific organization. In an empirical study of an IT consultancy firm, it is observed that the consultants identify themselves more as a part of the client organization rather than the consultancy firm and therefore, were unwilling to participate in the knowledge sharing activities of the employer organization (Ravishankar and Pan, 2008). Such weak identity might undermine the knowledge management processes as the employees with varying identity have different interests, which in turn shapes the way the knowledge is shared by that particular employee or group and to whom the knowledge is shared (Hislop, 2013).

2.9.4 Top management support

The top management support for the knowledge management activities has a direct impact in the effectiveness of knowledge creation and sharing and has an indirect effect on the KM culture (Linder & Wald, 2010). The support from the top management should be continuous and practical and it would enable the organization to take concrete efforts, which in turn would contribute to the KM success (Wong, 2005). The top management should provide resources for the KM activities and at the same time communicate the importance of KM and motivate the employees to participate in the KM on a continuous basis (Linder & Wald,

2010). The middle and lower levels of the organization should be given freedom and space to find their own way of working (Miklosik and Zak, 2015). The top management should undertake a wide variety of efforts to improve the effect of KM by framing KM policies and processes to create, improve and sustain the organizational knowledge management infrastructure (Yu, Kim & Kim, 2004). According to Jennex and Olfman (2005, p.5), the management should support the organization *“through leadership, allocation and management of resources, and oversight of KM coordination and control of resources and the application of metrics to assess the success”*.

Kukko (2013), identifies the role of top management as one of the barriers for implementing KM in an organization. It is claimed that integrating the purpose of knowledge with the organizational goals and communicating the benefits of KM to the organization could be more challenging for the management and the risk of the whole knowledge sharing culture of an organization deteriorating is high if the management is inefficient in communication.

2.9.5 Strategy

A long term strategy and vision of knowledge management is important for an organization and it is argued that a leader of an organization should have a strategic/transformational perspective in order to facilitate knowledge management (Hislop, 2013). According to Petter (2014), the process of framing knowledge management strategy includes, developing a working definition of knowledge and knowledge management, conducting knowledge audit, defining knowledge management objectives and strategy approaches and implementing strategy with quality measures. Another important factor that should be noted here is that the knowledge management strategy should be aligned with the overall business strategy of the organization (Greiner, 2007; Hislop, 2013).

3. METHOD

The following chapter aims to provide a brief description of the methods and approaches used conducting the thesis. The chapter starts explaining the study’s research process and thereafter the research approach. Further, the literature study and the data collection procedures are described. Lastly, the chapter ends with trustworthiness and ethical considerations.

3.1 Research process

The working procedure of the study was divided into five different stages: Pre-study, Literature study, Empirical data collection, Analysis and Thesis writing. Figure 5 illustrates the different stages of the study’s working procedure.

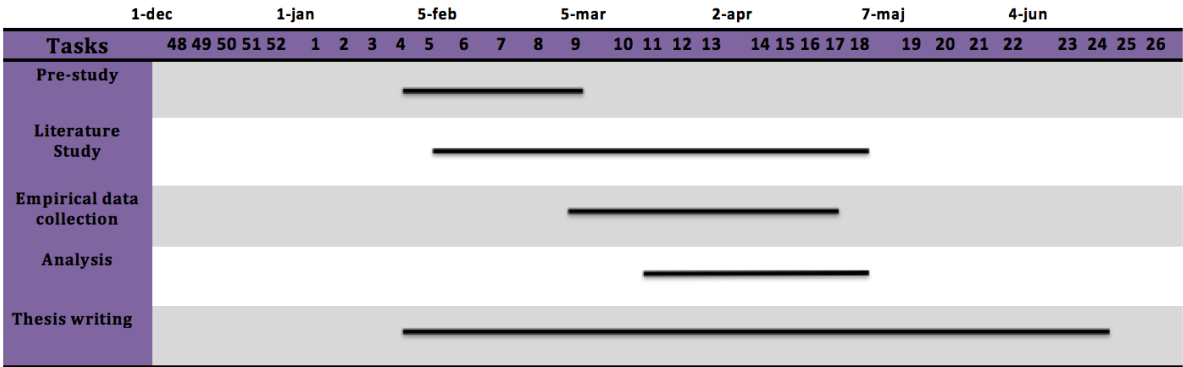


Figure 5. The working procedure of the study

The research process started with a visit at the case company, where the problem statement was discussed with the supervisor. This resulted in a deeper insight into the company’s view of innovation. The idea of investigating innovation was developed together with the supervisor at the case company. The subject of the thesis emerged from a pre-study at the case company. By doing a pre-study, the main factor influencing the innovative ability of a consultancy firm was identified as knowledge management, as the consultants are located at the client sites and not at the consultancy firms. Due to this temporary nature of the organization, where the knowledge is assembled within a consultant or a group of consultants and not pooled back into the organization, the decision was taken to focus on knowledge management. Thereafter, the process of formulating the background and the problem statement created a natural foundation to form the purpose and the research questions, which resulted in a good basis for the study.

The literature review on the subject started at the beginning of February and was ongoing till the end of April. The literature study was conducted to establish a theoretical framework but also to achieve a better understanding of the research area. New relevant concepts were obtained continuously during the time period of the literature review. The theoretical framework is based on previous research about knowledge management and innovation.

The empirical data collection started a short time after the literature study since data regarding knowledge management was required from interviews in order to move forward with the study. Participant observations were conducted continuously at the case company to obtain a better comprehension regarding knowledge sharing.

The analysis stage started a short time after that the empirical data collection started. The collected empirical data was analyzed and thereafter compared against the theoretical framework to develop recommendations for a large technical consulting firm. The thesis writing was ongoing along all the stages of the study in order to continuously keep a focus on the thesis.

3.2 Research approach

The research of this study is based on an abductive approach. New theoretical insights and empirical findings can make the original research questions change in an abductive study (Dubois and Gadde, 2002a). According to Patel and Davidson (2011), an abductive approach starts with an observation and thereafter proceeds to the likeliest possible explanation but does not guarantee conclusion. It enables the potential to combine a mixture of established theories and new concepts that have derived from the empirical findings (Dubois and Gadde, 2002a). This approach is most suitable for this thesis since the study started with an observation and thereafter proceeded from empirics to theory to empirics and vice versa. Also, there have been changes in the original framework due to unanticipated findings in the empirical analysis and because of new theoretical insights, which characterizes an abductive research approach. The abductive approach facilitated the process of obtaining in-depth knowledge of the studied phenomena by establishing a back and-forth process between the collection of theoretical data and empirical data.

Further, a qualitative approach is used for generating, processing and analyzing the collected information. The qualitative approach examines non-numerical data and hence requires verbal data analysis (Devaney and Yin, 2016). The reason of choosing a qualitative approach is because the subject KM is continuously evolving and is interpreted differently, which makes it difficult to quantify and categorize but also due to that the collected empirical data has required verbal data analysis. According to Bryman and Bell (2015), a study using a qualitative approach starts with words and observations instead of something measurable such as numbers. This kind of study is based on structured data that could be obtained from interviews and observations (Eriksson and Paul, 2011). The data obtained from the interviews with different persons from different positions contributed to a clearer picture of the study's problem area and thereof a qualitative approach was necessary. Ongoing analysis is very common for a qualitative study since it gives the author's an idea of how to further proceed (Patel and Davidson, 2011). According to Patel and Davidson (2011) new and unexpected information can enrich the study after conducting interviews and observations. It is appropriate to adapt to a qualitative approach when there is limited knowledge about the area being studied (Patel and Davidson, 2011). The problem area of this study is relatively new and unexplored, as there is limited literature study.

In addition to this, the research design of this study is a singular case study since the case study is conducted at one case company (Yin, 2007). The reason of choosing this design was to obtain a deeper understanding and research within the chosen area, knowledge management. The case study was a suitable approach in order to achieve the thesis research questions, thus fulfill the purpose. Further, the case study was conducted at a large technical consultancy firm in Gothenburg.

3.3 Literature study

The literature study is an important part of the thesis to build a theoretical foundation for the study but also for the authors to gain insights and knowledge about the subject. The literature study started by collecting information regarding innovation and the different factors influencing its ability to innovate. After knowing that knowledge management is the main factor influencing innovation for a consulting firm, more information was collected regarding knowledge management. The types of literature gathered included scientific articles, dissertations and books. The dissertations and books were sought from the library at the university. The relevant references within the scientific articles, books and dissertations were used for further literature research, so called snowballing. Databases used to retrieve scientific articles were Google Scholar, Primo, ScienceDirect, Scopus and EmeraldInsight. The keywords used for the research are illustrated in Table 8. The Swedish versions of the keywords were used as well to attain a more specific search within the field. Further, literature which investigates knowledge management in a project based firm is considered in this study considering the commonality of temporal differences in a consultant company and a project based firm; literature on knowledge intensive firms is also considered in this study.

Table 8. Key words

Area	Keywords
<p style="text-align: center;">Innovation and Knowledge Management</p>	<p>Innovation Knowledge management Leadership Culture Consulting firm Professional services firm Project based organization Temporary organization Knowledge culture Strategy ICT knowledge management system Key factors of knowledge management</p>

3.4 Data collection

Pre-study, interviews and observations have been the three different methods used to gather data for this study. The pre-study, interviews and participant observations have been carried

out at the case company, which is a large technical consulting firm. However, the different methods are described in more detail below.

3.4.1 Pre-study

As mentioned previously in section 3.1, the pre-study at the case company helped the authors to decide the subject of the thesis. By speaking to the different employees at the case company as shown in Table 9 during the pre-study phase, the main factor, knowledge management, which influences the innovative ability of a consultancy firm was identified. In addition to this, a deeper insight of how the case company operates when it comes to knowledge management was possible to understand by talking to the different employees at the case company.

Table 9. Conducted meetings during the pre-study phase

Role	Date	Time
Business Manager	2018-02-15	45min
Business Manager	2018-02-08	20 min
	2018-03-06	25 min
Technical administrator	2018-03-02	20 min
Technical Manager/ Project Manager	2018-03-06	20 min
HR	2018-02-05	30 min

3.4.2 Interviews

According to Yin (2007), interviews are seen as one of the most important sources to collect information since the focus of the interviews concerns people, their thoughts and experiences. According to Brinkmann and Kvale (2015), the process of interviewing is very active where both the interviewer and the interviewee have the opportunity to produce knowledge due to their relationship. The main purpose of conducting the 9 interviews as shown in Table 10 was to achieve a better insight and a deeper understanding regarding knowledge management and the different factors influencing knowledge management. Appendix 1 illustrates the interview questions that were prepared to some degree beforehand. However, the interviews were conducted in a semi-structured form, where the questions were prepared relatively open in order to make it possible for the interviewees to bring up with new ideas and be more reflective. In this way, it was easier for the interviewers to collect additional beneficial information that would not have been possible to receive with a more structured interview form. According to Patel and Davidson (2011), the questions for semi-structured interviews are usually asked in a specific order and the interview is of a high degree of standardization.

The primary sources for the interview questions were the pre-study, literature review and participant observations at the case company. This helped the authors to see if the current

information obtained from these sources was in coherence with the interviews. The interview questions were prepared based on the funnel technique, hence more open questions at the beginning of the interviews compared to the end of the interviews, so that the interviewee has the freedom to verbalize more openly at the start of the interview process (Williamson, 2002). According to Patel and Davidson (2011), the use of funnel technique makes the interviewee more motivated.

All the new information that was collected from the interviews was directly discussed between the authors and summarized in a common (Google Drive) document. According to Patel and Davidson (2011), using this strategy makes it easier to create a real connection to the collected material and if the interviews were not compiled directly it could be a chance that the new obtained information from the interviews could have been forgotten, hence a loss to the gathered material. Lastly, the interviewers got the permission from all the interviewees to record the interviews. According to Yin (2007), recording gives a more accurate and a more complete translation of an interview.

Table 10. Conducted interviews

Role and reference	Date	Time
Business Manager A	2018-03-06	30 min
Business Manager B	2018-03-06	25 min
Business Manager C	2018-03-13	40 min
Business manager D (consultant)	2018-03-28	50 min
Technical Manager	2018-03-06	15 min
Consultant A	2018-03-21	1h
Consultant B	2018-03-22	1h
Consultant C	2018-03-27	45 min
Consultant D	2018-04-03	25 min
Consultant E	2018-04-04	45 min

3.4.3 Observations

Observations are useful when gathering information within areas that concern behaviours and processes in natural situations. Behaviour in this context does not only involve physical actions but also verbal expressions, relations between individuals and emotional expressions. (Patel and Davison, 2011). For this study, participant observations have been conducted at the case company regularly and the authors have got the possibility to study the behaviours and processes in a natural context at the same moment as it has occurred (Robson, 2007). The employees at the case company were aware of that the authors are master students and had the

role to conduct a study regarding knowledge management. The participant observations created the authors own image of what actually is happening in reality and a deeper understanding and knowledge of the studied phenomena was also obtained. According to Patel and Davidson (2011), the observation method can be used to acquire knowledge and a better understanding, thus is the foundation for further studies with other techniques for collecting information. The participated observations have been a foundation for the interview questions but also used to supplement information that has been gathered with other techniques, thus increase the reliability of the study (Yin, 2013). The completed observations at the case company are presented in Table 11.

Table 11. Conducted observations

Area (what)	Method	Date	Time
Employees and the company culture	Participant	2018-01-30 to 2018-05-25	Every time working at the case company
Workshop - knowledge management	Participant	2018-03-12	3h
Breakfast meeting	Participant	2018-03-09	30 min
Knowledge management meeting	Participant	2018-02-20	1,5h

3.5 Data analysis

The research approach decides the process of data analysis and the data analysis of a qualitative data does not have a standardized approach (Saunders et al., 2012). The abductive research approach differs from the deductive- and inductive research approach in the sense that these approaches have more clearer connection with the choice of data analysis approach. However, according to Saunders et al. (2012) there is a general data analysis approach for an abductive research approach that has been used for this study. Figure 6 illustrates the process of data analysis for this study.

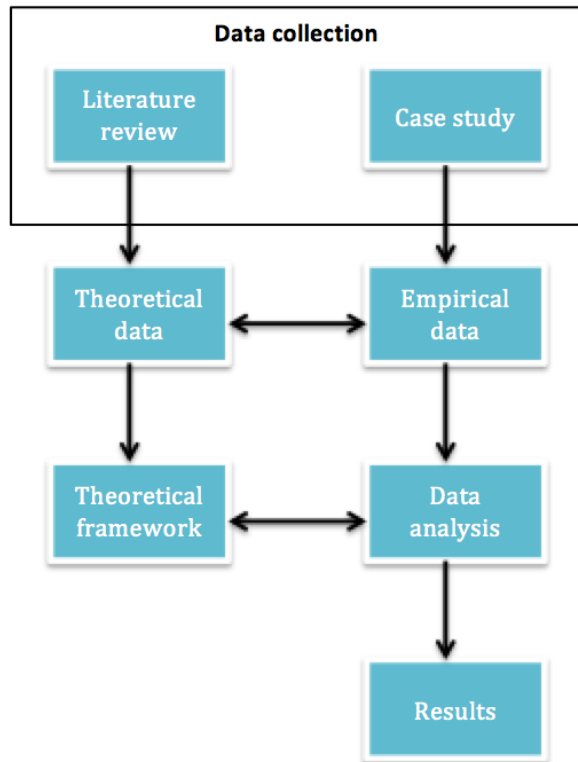


Figure 6. The study's data analysis

Data analysis has been a continuous process throughout the study. The literature review and the gathered empirical data from the case study created a foundation for the thesis. The gathered data from the literature review and the case study was compiled to theoretical data and empirical data, hence a theoretical framework was developed. Literature studies have generated the theoretical framework and the case study has generated the empirical data through interviews and observations. The theoretical framework has been adjusted based on the gathered empirical data by means of pattern matching (Yin, 2013), hence referred to as abductive study. Further, data analysis was conducted with reference to the theoretical framework and empirical data, which entailed the results of the study.

Further, qualitative data such as interview transcripts and notes from observations tend to be voluminous (Robinson, 2007). Therefore, its volume needed to be reduced in order to organize and condense the data into something more manageable. The data analysis of interviews started by editing out the “dross”, hence parts of the interviews where the interviewees go off on an irrelevant topic. Thereafter, the data was summarized, which contributed the authors to attend to the data more closely. Further, coding was applied by splitting the data into different themes based on the literature. The strategy used for coding was to compare and contrast the data in order to find those things that were similar and those that were different. Also, memos were written in order to reflect insights and thoughts about the data. This was really helpful to ensure that no data was forgotten.

3.6 Trustworthiness

Lincoln and Guba (1985) has presented four main criteria that trustworthiness could be analyzed from. The four criteria that are used to evaluate the research quality of the qualitative research approach are credibility, transferability, dependability and confirmability. This study focuses on evaluating trustworthiness based on the four main criteria that Lincoln and Guba (1985) presents since this study adopts a qualitative research approach. The four criteria are explained below (Patton, 2015):

Credibility describes to what extent the data is trustworthy and has five sub-criteria, which are *prolonged engagement, persistent observation, triangulation, peer debriefing and member checks* (Patton, 2015). Prolonged engagement involves obtaining an understanding regarding the phenomena being studied and therefore participate in the empirical setting (Lincoln and Guba, 1985). The authors have continuously been involved in the empirical setting and spent a lot of time in talking to many different employees at the case company. The authors have obtained a deeper understanding regarding the phenomena being studied and the organizational culture. Persistent observation is important in order to enhance in-depth knowledge of the research (Lincoln and Guba, 1985), which has been applied to this study where the main aspects of the problem area has been identified and thereafter placed in focus. Triangulation, which is about using multiple techniques for data collection (Patel and Davidson (2011) was used for this study in terms of interviews and observations. It aims to ensure high reliability through results and conclusions that are based on different sources (Yin, 2013). Both authors have been involved during the various stages of data collection as well as data analysis, hence the risk of misinterpretations was reduced. Peer debriefing requires the researchers to work together in order to discover new aspects that may not have been considered by the researchers (Lincoln and Guba, 1985). This study has involved peer debriefs throughout the study to enhance credibility and ensure validity. Lastly, member checks is a technique used to improve the credibility of the study (Lincoln and Guba, 1985). Member checks has continuously been conducted by sharing the findings with the participants involved to ensure that the researchers interpretations are correct.

Transferability relates to how applicable the findings of the study are in a different environment, hence, if the findings can be generalized (Patton, 2015). According to Bryman and Bell (2015) it is necessary that the researchers describes the research process in detail so that it is possible to conduct a similar study in order to achieve good transferability. The methods used for this study as well as data obtained from different techniques such as interviews and observations are ways of enhancing the transferability. Another point to increased transferability is also that the respondents chosen for the collection of empirical data has roles within the company that are connected to the problem area being studied.

Dependability is about how consistent and repeatable the study's findings are (Patton, 2015). The dependability of the study can be assured since both the university supervisor as well as the case company supervisor have examined the processes of data collection, data analysis and the results of the study. The authors have also received feedback from a peer-review during the study, which increases the dependability of this study.

Confirmability concerns if the researchers have acted objectively and that bias is not added to the study's findings (Bryman and Bell, 2015). It is important that the different techniques chosen for the data collection are in coherence with the purpose and the research questions to enhance confirmability (Blomkvist and Hallin, 2014). Therefore, the interview questions were prepared properly to make sure that the gathered data is relevant for the study. Also, pattern matching has been used during the data analysis to ensure that the empirical data is consistent with the theoretical framework. In addition to this, the authors have acted objectively throughout the study, which enhances confirmability.

3.7 Ethical considerations

It is important to consider ethical issues when carrying out a research since it can have an effect on people in very different ways (Robinson, 2007). According to Robinson (2007) it is essential to respect the participant's rights, autonomy and sensitivities. For this study, ethical issues have been taken into consideration and the researchers have taken several steps in order to make sure that the thesis is ethically correct. The participants of the research have not been forced in any way instead it was informed that participation is entirely voluntary. The participants were well aware of what they were letting themselves in for and they have also given informed consent. Further, the participants of the research were informed about the phenomena being studied. Participants autonomy was respected and they were not treated unfairly, or with lack of consideration or respect. The participants were always asked before an interview for permission to record. Also, confidential information has been taken into consideration and not been included in the thesis. The findings that are presented in the thesis is used with permission from the supervisor and the participants at the case company.

4. CASE COMPANY DESCRIPTION

The case company is a part of a global company with branches in more than 20 countries. However, the current case study focuses on one of the branches of the global company. The case company which is located at Sweden, Gothenburg is engaged in providing consulting services in the fields of technology and IT. The largest customers of the case company are found in various sectors such as Telecom, Automotive, Energy, Defence & Aerospace, Life Science and other Industries. The case company works both in-house and on client sites. However, the case company do not have their own products, which means that the consultants in-house works with projects for their clients. Figure 7 illustrates the structure of the case company at Sweden, Gothenburg.

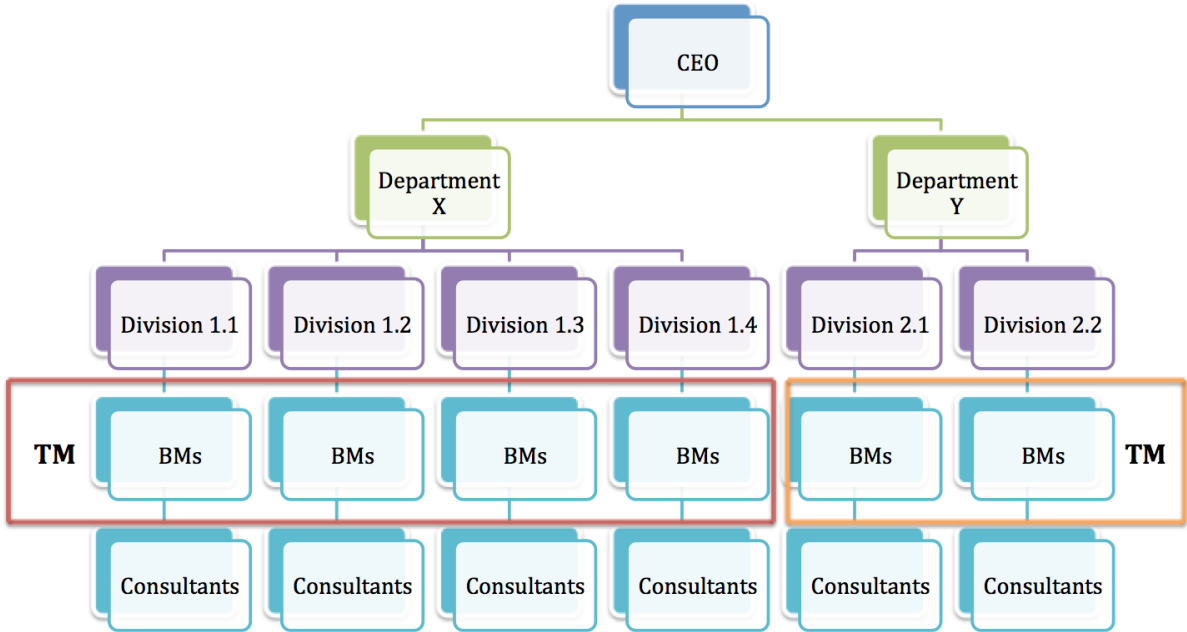


Figure 7. The structure of the case company

It is a matrix organization and is divided into two main departments based on the competences. Each of these departments are headed by the Department Directors (DD) and each departments are divided into different divisions based on the industry they serve. These divisions are headed by a Senior Business Manager (SBM) and has 4-5 Business Managers (BMs). Further, each BMs have several consultants. The middle management consists of Business Managers and Technical Managers (TM). The current study is limited to the role of BMs, TMs and consultants and therefore, the role of these three positions are briefed below:

Business Manager: BM role involves selling projects to the clients, recruiting the consultants and taking care of the consultants. The consultants under each of the BMs range from 5 to 30 consultants.

Technical Manager: TMs are responsible for creating a work package (a package for the client projects where the projects are conducted internally at the case company or the

consultants split their days between the case company and at the client site), managing the internal and work package projects and helping the BMs in the recruiting process if required.

Consultants: Consultants are the knowledge workers and the main capital for the case company and they are either engaged at the client site or at the case company depending on the nature of the project. There are three different types of project to which the consultants are assigned to: on-site (the consultants will be placed at the client company), work package (the consultants will split their working days between the client site and the case company) and internal project (the consultants are located in-house of the case company working on the client project). Irrespective of the type of projects that the consultants are assigned to, every consultant have a dedicated BM based on the competency and the sector that the consultant is involved within. The type of first and present assignments of the consultants who were interviewed are presented in Table 12.

Table 12. First and present assignment of the interviewed consultants

Role and reference	Type of first and present assignment
Consultant A	Started with work package and is currently on-site
Consultant B	Started with work package and is currently on-site
Consultant C	Started at on-site and continues with it
Consultant D	Started at on-site and continues with it
Consultant E	Started at on-site and continues with it

5. EMPIRICAL DATA

The following chapter provides findings from the pre-study, interviews and observations that has been conducted at the case company. The collected data is described in this chapter in order to provide answers for the research questions, thus to fulfill the purpose of this study.

5.1 Knowledge sharing between BM and consultant

According to most of the BMs, the first and foremost important knowledge that they want to share with their consultants is about the case company itself. In the case of consultants who are assigned to internal projects and work packages, there are well established routines and procedures where the BMs are able to share the information about the ways of working at the case company and other administrative details. However, for the consultants who are assigned to on-site projects who might be reporting to the client company on their very first day, the BMs depend on other existing consultants who already work at the same client company. As Business Manager B said:

“We provide the consultants with booklet which contains basic information about their role and other administrative issues..... then we also appraise them about the company culture... if a consultant take an on-site assignment on the first day, I connect the consultant if there is an existing team at the client location...”

The second important knowledge that the BMs want to share is the client and project information. BMs provide overall information about the client and projects that they receive from the client itself and they also try to connect the consultants with other consultants who are engaged with the same client. However, the case company does not have a common policy for the BMs specifying the ways to share knowledge about the clients. As Business Manager B stated:

“.... then maybe I'm doing it in my own way and someone else in this position for 10 years will be doing other way....”

Business Manager B mentioned that they have to improve the way of sharing the client knowledge to the consultants and said that his department has a USB stick where they have important information about some large client companies that could be helpful for the consultants to know beforehand. It is updated by a BM or a consultant who worked with the same client / department / project but the BM was not sure when the information was last updated and by whom and agrees that it is an “*area for improvement*”. Business Manager C mentioned:

“I think it (updating of client knowledge) is an area of improvement... I am not really sure who updates the information....”

Even though the BM claimed that he provides this information to his consultants, both of his consultants, D and E, who were interviewed were not aware that his BM has such a tool.

Most of the BMs are of the opinion that it is the client's responsibility to provide deeper information about the project. However, the consultants, at least most of them, have a different opinion; they feel that the BMs should appraise them more about the client and projects before going to the client site and taking up the assignment. This opinion is found to be common with both the consultants who were assigned on-site projects and work packages. As Consultant E states:

“... with prior knowledge (about the client and project), it would have been easier for me... the details received (from BMs) are not really accurate ”

Similarly, Consultant C commented that she took on a managerial assignment, as a project manager, on the first very day of her work with a new client company even though she did not have any knowledge about project management; therefore, she had to depend on the client team and other project managers from the client company to receive the required knowledge on that subject. Consultant A mentioned that he was “*pretty much thrown into the water*” on his first assignment even though he was engaged in a work package.

The consultants who are engaged in the projects, both internal projects and on-site projects, are engaged in knowledge sharing activities at the client site. Depending on the clients, they are provided trainings and they also participate in other KM activities such as post project reviews and regular stand up meetings. However, such knowledges that are acquired is not shared with the BMs or other consultants of the case company. Consultant B mentioned that he is engaged in the project lessons learned meeting every week where they have a short discussion about the mistakes made during the project and future remedial measures and he finds such discussions very useful.

“...we had a sort of knowledge gathering session with the whole team or project team..... we discussed what can we learn, what are the strengths, what do we need to think about if we do a similar project again.... it was good”

5.2 Communication between BM and Consultants

As per the case company's policy the BMs are supposed to meet their group of consultants once every six months, however, the BMs usually meet their consultants more often, at least once every month or two months. All the BMs have the practice of having lunch meetings with their consultants, however, the purpose of such lunch meetings are not the same for all the BMs. For one BM the primary purpose of having such meetings is to provide a platform for the consultants to socially interact with each other, however for another BM, the primary purpose is to meet his consultants and to get to know them better. Irrespective of difference in the perception, the meetings provide a platform for social interaction among the consultants and between the BMs and consultants as well.

There are some challenges in arranging such meetings, as mentioned by a BM, and one such challenge is that some of the consultants do not actively participate in the meetings and it is hard for the BMs to motivate them to take part. Business Manager C stated:

“Sometimes the consultant won't show up and all of a sudden it can be like five or six months between a meeting. But it's also, I have consultants talking to me every week”.

The same BM mentioned that if he has a stronger relationship and good communication with his consultants then there is a higher chance that they would stay longer within the company. Another challenge that threatens the relationship between the BM and the consultant is frequent reassignment of consultant groups to different BMs. One of the BMs mentioned that he has been assigned to different group of consultants and the number of instances are “*way too many to count*”. The reasons for such change is due to organizational changes at the BM level such as BMs quitting the company, reassignment of the working areas of the BMs and consultants changing the assignment as well. Some BMs see it as a challenge. Business Manager C said:

“..... it is more likely that the consultants might quit the company if their BMs are changed often”

Whereas, other BMs think that it is the nature of a consultants job and therefore is not a problem. As Business Manager B opined:

“.... consultancy firm doesn't work like a line production... here everything is agile, so it is quite natural to change BMs...”

Consultant B who has been assigned to three different BMs in a span of 18 months do not see it as a challenge as he knows most of the BMs when he was working in a work package assignment.

Besides, the lunch meetings the BMs also engage the consultants outside their client assignments by arranging afterwork activities and the purpose of such activities are clear at both the BM and the consultant level, which is to provide a platform for the consultants to socialize with each other. The consultants who are working on-site mentioned that they do not have any opportunities to meet and network with other consultants except during these monthly lunch meetings and other activities. As Consultant C stated:

“.... it's only in this lunch meetings, I meet my colleagues of my parent company....”

Most of the consultants agreed that they try to get in touch with their informal networks if they want to know any information, both technical and administrative. Mostly the consultants contact their BMs to get clarification on the administrative issues and they seldom call to ask or discuss about their projects. Consultant C mentioned that once she called her BM because she wanted an expertise guidance for one of the technical processes, which even the client company was not aware of, the BM then connected her to another consultant who is an expert in the process that she was looking for. However, the BMs mentioned that it is harder to know exactly who knows what especially when they have many consultants in their group. Business Manager A that,

“You don't know what you need to know... that's the hardest part”.

5.3 Knowledge sharing at the middle management level

The knowledge sharing activities at the middle management level of the case company are discussed in the following section.

5.3.1 Knowledge sharing between different departments and divisions

Knowledge sharing between department: As mentioned in Chapter 4, the BMs are divided into six different divisions within two different departments, X and Y, which are located at different floors. The BMs from the different departments have different practices, hence different ways of working. The department X, has a daily standup meeting where the BMs along with the HR- recruitment assistants (HR-RA) discuss about the available assignments, potential candidates and the consultants without assignments. They try to find a match between the assignments and the consultants. Besides that the BMs also discuss about other things and as Business Manager D mentioned:

“..... we discuss everything from smaller problems, but also the larger picture and focus on different areas depending on the needs”.

Whereas, the department Y, has the BM standup meeting for three days in a week and they also discuss the issues somewhat similar to the department X. However, the consultants who are unassigned to any projects also participate in one of the meetings every week where they let the consultants know about the available assignments and the consultants also discuss about their expectations from an assignment. Similarly, they also have a competence day once in a year (it was twice a year until last year) where the consultants of department Y meet at the case company and present about their projects. The BM from department Y mentioned that this activity is very much appreciated by the consultants and it is always fully booked. However, the department X does not have any similar activities. Business Manager A from department X mentioned that:

“ we had a discussion about whether they should also have a similar competence day and after much deliberation such as whether to compensate the consultants for taking part in such activity and how to compensate them, the topic was dropped and not discussed any further”

Even though the BMs agree that they have different practices at different departments, they do not agree that there is a sub-culture present in the case company. However, the authors observed that there is a distinction of culture and lack of communication between the departments.

Knowledge sharing between divisions: When it comes to knowledge sharing within the same division, the BMs are not aware of the way of working of other BMs. For example, BMs coach the consultants in their own way as they have the freedom to have their own way of working. However, they are not aware of each others ways of working and coaching. Business Manager C mentioned:

“we share a lot of things since we do have weekly meetings, but of course I coach my consultant in the way I think it should be done and I'm sure other BMs are coaching someone else in another way”.

Regional level knowledge sharing: All the BMs together have a yearly formal get together where they have a discussion about the previous year performance of the company and ways to improve in the upcoming years. Further, they also take part in the workshops that are arranged during the get together. This get together is for all the offices in the Scandinavian region of the company. At the Gothenburg office level, all the BMs together take part in yearly afterwork as a social activity.

5.3.2 Knowledge sharing between TM and BM

TMs also have weekly meetings to discuss about the status of different projects that are managed by them. If any projects are completed, they also discuss about the lessons learned from the projects. However, this meeting is only for the TMs and the BMs are not involved in these meetings. Business Manager A mentioned:

“I don't have any communication with TMs as I don't have any internal projects...”

This BM voluntarily went and found the function of the TM. He feels that it would be useful for him if he knows about the different projects that are handled by TMs, as it would increase his knowledge about the various projects.

5.4 Intranet

The case company has an intranet to which all the employees have access to. However, the intranet is designed to be used differently based on the role of the employee. The technical administrator who runs and administers the intranet is in the process of developing new features for the intranet.

BMs use the intranet to publish the department news and activities that the respective BM organizes and post the job openings. In addition to the intranet, the BMs have a career portal site, where they update the information about the candidates who don't have any assignment at a given point of time. This information is open for all the BMs from the different divisions and this feature is very appreciated and found to be useful by the BMs as it helps them to find the suitable candidates for the assignments quicker. However, one BM mentioned that the tools (search option) in the career portal are not effective to be able to search the right candidate. Business Manager C mentioned:

“..... intranet is not really up and running, at least not in many areas”.

TMs also have access to the intranet where they can access all the information. Besides that, the TMs create documents such as project plan and budget pertaining to the in-house projects which they manage and they also update the project lessons learned template once the project is completed. This information about a particular project could be viewed only by the employees who are/were involved in that project, and therefore the other consultants cannot

access the information if they are not involved in that project. The TM who was interviewed mentioned that there is no standard template to write about the project lessons learned in the intranet. He uses his own template at the moment and he updates the information only about the bigger in-house projects that he manages and he doesn't feel that the documents are really useful because no one looks into these documents once it is created. TM stated:

" the project template is updated depending on the project. If it's a big project, you have a burden to their fix.... even I don't check the previous project templates when I start a similar project"

Consultants use the intranet to view published news about the company and their specific department, trainings that are offered, workshops and activities outside the work, new job assignments and so on. Further, the consultants who are on-site at the client companies do the weekly time reporting in the intranet. There is an open community feature in the intranet where the employees can open a topic and ask questions or share knowledge on that topic. As per the company policy, the consultants are expected to access the intranet on daily basis. However, most of the consultants who were interviewed mentioned that they only view the intranet once a week in order to do the time reporting. They mentioned that they don't access the intranet of the case company because it's not in the priority due to lack of time and also the information posted in the intranet are not relevant to their work at the client site.

The consultants who work on-site cannot upload any information about their project due to legal restrictions from the client side. A tripartite non disclosure agreement is signed among the case company, the consultant who takes part in the project and the client, where the consultants are restricted from sharing any sensitive information of the project which might affect the client's business. However, two BMs mentioned that if the case company could be able to differentiate the knowledge that they can share from the knowledge that is restricted, then it would be very beneficial for them as it would make the knowledge sharing much easier and improve the knowledge capacity of the organization.

5.5 Knowledge creation

The case company has a dedicated training academy where the consultants can take courses. The academy offers both technical and managerial courses to the consultants. The information about the courses that are offered by the academy could be accessed through the intranet. Two of the consultants that were interviewed mentioned that their BM suggested some courses for them and others mentioned that they did not get any suggestions from the BM. However, two of the consultants who did not receive suggestions from the BM mentioned that it is up to them to show interest in those courses and if the BMs see the potential in a consultant, then they will suggest them to take some specific courses based on their interest. Consultant B mentioned:

"I attended two or three courses provided by the training academy and I took them myself"

One of the BM also commented in the similar line saying that if they see a potential or interest in the candidate, then they recommend courses to them. Business Manager D, who previously worked as a consultant at the same company mentioned:

“it was one of the other consultant doing some in-house project recommended to take online courses”

Further, the consultants who are from different countries and cultural background are provided with courses by the academy about the Swedish work culture and other soft aspects and this course was very much appreciated by the consultants who took part in the training.

In addition to the regular lunch meeting, the consultants meet their BMs once a year in the career meeting where they discuss about the performance of the consultants and negotiate salary. The BMs discuss about the future goals of the consultants. Business Manager A said that he also tries to guide the consultants towards their goal:

“if the consultants say that they want to be a project leader, then I suggest them to take project management courses. Similarly, if I find that they are interested in working for a specific client in a specific role, I recommend them to learn the software that would be useful for them to get the assignment”.

Of the six consultants interviewed, only three consultants have been to the trainings offered by the Academy and there is a mixed opinion about the quality of the training by those who attended. Consultant B who was appointed as project manager without relevant background or experience mentioned that her BM suggested her to take a Project Management course that was offered by the academy; however, she couldn't attend the course as it was during the weekends. Similarly, consultant A also mentioned that he is interested in taking some courses from the academy but couldn't as most of the courses are offered in the evenings or weekends. On asking about the quality of the trainings, Consultant B mentioned that most of the courses were not useful at all. Consultant A said:

“ it is a bunch of powerpoint slides..... not related to what is practiced in the real work environment....”

However, consultant B was very much satisfied with the training quality. Both the consultants B and A observed that it would be interesting to listen to someone who is practically experienced and could share their knowledge from the experience rather than listening to theories. Some of the clients offer training to the consultants when they are assigned to the project. Information about the client company, the ways of working, tools and software used at the client site are some of the aspects, which were included in the training offered by the clients.

5.6 Strategy

The general business strategy of the case company is to have committed employees and customers, which would lead to profitability for the case company. Further, the company wants to provide new and challenging assignments to its employees by improving its ability

by adding more customers. Another part of the strategy is to support the customers' business strategy within different areas such as IT systems, innovation and R&D, however, the company does not have a specific strategy for knowledge management. Most of the BMs are aware that they don't have an exclusive KM strategy and one of the BMs was not sure if the company has a knowledge management strategy and mentioned that the "company might have a KM strategy". According to one BM, the ability of being dynamic and changing according to the customer requirement differentiates the case company from its competitors.

5.7 Top management support for KM activities

Most of the BMs agreed that the top management has put the required efforts for KM and they, in the middle management, also have the freedom to work in their own ways. Further, the employees of the company have the freedom to arrange activities or form a forum. Business Manager A mentioned that, he formed an innovation forum with a group of consultants who volunteered to be a part of it and this group works towards making the organization become innovative. When the BM communicated his idea to form the forum to the top management, they supported his idea by allocating some funds for the activities, however, the top management themselves did not push the idea to the rest of the organization.

"When I pitched the idea about the innovation forum, top management said OK go... And then I got small budgets for get together, buying some food for everyone, ...They encourage it... I can say that everyone knows about the innovation forum Top management think it's a good thing as long as I do my job, then they don't see a problem with me doing that..... but they're not following up on it or anything like that ..."

Under this forum, monthly breakfast lectures are arranged, where the groups that work in exciting internal projects presents their work to other consultants who are interested. Further, some workshops are also arranged to find ways of improving the innovation ability of the company and one such workshop was about improving knowledge sharing in the organization. However, all these events are voluntary and the turnout for the events are rather low due to lack of time and the consultants do not see the value of knowledge received from such events. However, the BM who coordinates such activity feels that the turnout would be much higher if the top management could take some initiatives and push through several layers.

5.8 Knowledge culture

In this section the incentives of the BMs and consultants, motivation and the organizational identity of the consultants are presented.

5.8.1 Incentives

Currently, the case company does not have an incentive, which recognizes the knowledge sharing activities of its employees. The current incentive system of the BMs are based on the number projects they bring in (sales) , number of consultants they interview, and number of consultants they recruit. As a part of the performance appraisal of the BMs, they get rated by

their group of consultants, a peer BM and the divisional manager. Business Manager A, mentioned that the role and incentives of the BMs are too narrow and do not encourage knowledge sharing initiatives. The performance of the consultants is appraised based on the client satisfaction index and based on which they engage in salary negotiation with their respective BM once a year.

Most of the consultants explained that they are motivated to access and share knowledge if they are sure that it would be beneficial and make a difference for both the knowledge diffuser and knowledge receiver. Moreover, they are interested and willing to engage in such activities only if it is during the working hours and they are not ready to invest additional time. However, consultant B mentioned that he is ready to be engaged in such activities even outside the working hours, however, it should be recognized in his performance appraisal and during the salary negotiation.

5.8.2 Organizational identity

Consultants who started their first day at the client on-site projects identify themselves with the client company rather than the case company as they spend all their working hours on-site at the client site. The consultants who start their career at the case company within the work packages or internal projects identifies themselves with the case company more even though few of them are assigned to on-site projects later on. They feel more comfortable to ask questions and interact with the case company BMs and consultants compared to the former set of consultants. Furthermore, the latter group of consultants' network more within the case company compared to the former group.

6. DISCUSSION

The following chapter provides a discussion and answers the study's three research questions by comparing the theoretical framework and the gathered empirical data.

6.1 Knowledge management process at a technical consultancy firm

This section is divided into two parts: in the first part the empirical data about the processes of KM is analyzed in comparison to the SECI model. This is followed by analyzing the KM strategies in relation to the respective theory.

6.1.1 Processes and contexts for creation and sharing of knowledge

Nonaka (1994) proposes four different processes for effective knowledge creation and transfer and the contexts for such knowledge creation and transfer is proposed by Newell et al. (2009). Shibata and Takeuchi (2006) argues that it is essential that a number of conversions and syntheses across different types of knowledge, levels, functions and layers of the organization should take place within the organization and from outside the organization as well. The case company utilizes all the four processes of knowledge creation and sharing and provides suitable context for each of the processes with respective to different roles.

6.1.1.1 Socialization process

Nonaka (1994) describes *Socialization* as a process of creating and sharing tacit knowledge through interactions, discussion, analyzing and sharing experiences and this process takes place in an “originating context” through face-to-face conversation in an informal setting (Newell et al., 2009). Such a context is provided for the consultants in the form of monthly group lunch meetings and after work activities where they can discuss about their projects and experiences in an informal way and thus sharing the tacit knowledge with each other. The process of socialization enables the BMs to gain external knowledge i.e., about the clients that the consultants are involved with. However, not all the BMs have a similar understanding about the purpose of such meetings. Fahey and Prusak (1998), advocates that a shared understanding of knowledge management should be developed across the organization for effective KM. Such shared understanding should be translated across all the levels, functions and work routines of the organization. Therefore, if the BMs have a common understanding about the purpose of the monthly lunch meetings, they will be able to seek the relevant and required knowledge from the consultants. For instance, the BMs will actively seek information about the future projects of the clients from the on-site consultants, which will help the BMs to get more business. Besides, by gaining such client and project knowledge, the BMs can become the knowledge provider for the consultants who take up similar projects in the future.

An informal platform for socializing is provided for the BMs of different departments. This provides an opportunity for the BMs to interact with each other and gain knowledge about each other's way of working. However, since the frequency (once in a year) of such socialization process is less, it becomes challenging to have effective knowledge transfer

across different BMs. As a result of which the BMs are not aware about each other's way of working. Interestingly, a context for socialization process is not present for knowledge sharing between BMs and TMs. From the BMs point of view, the knowledge possessed by TMs could be beneficial if it gets shared to the BMs as it would increase their knowledge about different projects and the capacity of the company, which would help them in better pitching of sales.

6.1.1.2 Externalization process

Externalization is a process of articulating tacit knowledge through exchanging ideas, visual demonstration and engaging in dialogues (Nonaka, 1994) and this process takes place in an “interacting context”, which takes place in a formal setting (Newell et al., 2009). There are formal platforms for the consultants to come together and exchange ideas and engage in dialogues and the monthly breakfast lectures, workshops and competence day at department Y are some examples of such contexts. However, most of these contexts only involve the consultants who are located in-house and the consultants at the client sites are not provided much opportunities to engage in the externalization process except during the competence day arranged by department Y where both the in-house and on-site consultants of that department are provided the opportunity to articulate knowledge in a formal setting. Moreover, such participations are voluntary and the turnout for certain events is low. The main reasons for such lesser turnout is lack of time and uncertainty about the usefulness of the knowledge that may be gained from such activities. These reasons confirm with the difficulties of knowledge sharing highlighted by Michailova (2005), that knowledge sharing is voluntary and the knowledge diffuser and seeker will not invest time in the KM activities if they do not see the value of the knowledge. Due to lack of interest, the customer knowledge is retained by the consultants and is not integrated back into the organization. Therefore, motivating the consultants to take part in such activities and making them aware of the benefits is crucial for a consultant organization.

The tacit knowledge is transferred by the BM to the consultant when they join the case company or take up a new assignment and the BM shares knowledge about the client and the projects and also about the culture of the case company. The knowledge transfer in this context is “one way”, as the tacit knowledge is transferred by the BM to the consultant and not vice versa. However, one might also wonder whether such tacit knowledge transfer from the consultant to BM is required at all.

The interaction context is provided for the BMs and TMs separately when they have their respective group meetings. In the daily stand up meetings of the BMs in the respective department, they are able to discuss about their ideas and come up with a concrete plan. Similarly, the annual workshop that is arranged for the whole Scandinavian region also enables the BMs to bring in new ideas and thoughts to the Gothenburg office. The TMs in their weekly meeting discuss about the projects and lessons learned. However, as in the socialization process, the BMs and TMs do not have any common formal platform to have discussions and reflections. According to Shibata and Takeuchi (2006), it is crucial to have knowledge spiral across different levels and functions of the organization and therefore, it is

important to integrate the technical knowledge possessed by the TMs and the business knowledge possessed by the BMs as it would increase cross functional knowledge sharing.

6.1.1.3 Combination process

The combination is a process of systemizing and applying explicit knowledge into organizational learning (Nonaka, 1994) and this process takes place in a cyber context through a physical or a virtual media where knowledge is combined and codified to create new knowledge (Newell et al., 2009). The consultants of the case company do not create any codified documents and they are given access to documents selectively. The BMs creates certain documents based on different projects. TMs creates project lessons learned template in the intranet and the same can be accessed by the employees who were involved in the projects. However, the TMs do not codify the project lessons learned template regularly as the codified knowledge is not reused by anyone and resources are not allocated for documenting the knowledge for the smaller projects. This is in line with the claim that the scarcity of the resources and not knowing the value of the knowledge sharing activities prevents one from investing time to share knowledge (Michailova, 2005). Nevertheless, it is eminent that the size of projects does not quantify the amount of knowledge that could be gained. In contrast, codification of knowledge which no one uses is a waste of resource and therefore, it is very crucial to identify the knowledge that would be valuable for the organization instead of following routines, which might not create any value.

6.1.1.4 Internalization process

According to Nonaka (1994), the process of learning and acquiring new tacit knowledge in practice is called internalization and this process takes place in an exercising context where the explicit knowledge is created and shared into tacit knowledge through training and participation (Newell et al., 2009).

Internalization is a process of utilizing the explicit sources of knowledge and internalizing into tacit knowledge thus becoming a crucial asset for the organization (Nonaka, 1994) and this process takes place in an “exercising context” which is similar to learning by doing (Newell et al., 2009).

The trainings provided for the consultants at the case company provides a platform for conversing explicit knowledge into tacit knowledge, however such a conversion in practice is really questionable as some consultants find it hard to internalize the knowledge from the training. This is due to lack of connection from what they do in their job and what they learn from the trainings. Dalto (2014) stipulated that the trainings should be aligned with the business goal of the organization and should be related to the tasks of the employees therefore the employees will be motivated to attend the trainings. The approaches towards training the employees contradicts the overall differentiation strategy of being “dynamic and changing according to the customer requirement” as the trainings at the case company are planned ahead and not customized according to the different roles and backgrounds of the consultants. This is contradicting with the differentiation strategy of the company, which is about being dynamic. Even though it is a far-fetched conclusion, it is important that the knowledge of the

consultant who are the main intellectual capital of the firm should be updated according to the environment. Further, not all the BMs suggest trainings to the consultants and they are also not aware of the ways of working of other BMs. It indicates a lack of best practices due a to lack of knowledge sharing among the BMs. Organizational performance could be improved by identifying and implementing best practice and CoP is one of the methods to identify the best practice in an organization (Reddy and McCarthy, 2006).

The company has both ICT based CoP and the social interaction CoP to encourage internalization of explicit knowledge, however, ICT is more predominant than the social interaction CoP. The CoP based on ICT is open to everyone irrespective of the roles, however, not everyone is motivated to utilize the available knowledge and the reasons for not utilizing the sources are the same as previously described in 6.1.1 and 6.1.2: uncertainty about the value of the knowledge that may be gained from such activities and lack of time. The workshop organized under the innovation forum is a social interaction CoP, however, besides that the case company does not have any other CoP initiatives.

6.1.2 Codification and personalization strategy

It is crucial for an organization to have a clear approach about the strategy they use for knowledge management (Greiner, 2007) and interpersonal interaction is found to be more efficient for a consultant company (Hislop, 2013). Even though the case company does not have an explicit knowledge management strategy, in practice they have a combination of personalization and codification strategy with more importance given to the personalization strategy which is in coherence with the claim of Hislop (2013). When it comes to codified knowledge, the case company has a USB stick with client knowledge in it, however, the information is redundant as no one takes ownership of that data and makes sure that it is transferred to the required parties. Moreover, since the consultants are unaware about the existence of such codified knowledge, they do not actively seek for it and according to Michailova (2005), it is up to the individual or organization to seek or share knowledge. The issue of redundancy of knowledge and lack of awareness can be overcome by having a knowledge owner who takes the responsibility to identify and share the relevant knowledge to the right person on time.

The KM strategy should be customized according to different roles as the knowledge type and the activities and processes performed by the employees are very role specific. It is very hard to codify the knowledge of the consultants as it is very client specific, therefore the company prefers to have personalized approaches for knowledge management, which is in line with the statement of Hislop (2013). Nevertheless, codification might be important for the BMs and other middle managers as some of the activities and processes could be repetitive.

It is interesting to note that few BMs of the company try to connect the knowledge seeker to the knowledge provider through their network, which could be connected to the concept of central connector and knowledge brokers (Cross and Prusak, 2002 and Parise et al., 2006). It is natural for BMs to be the central connectors and knowledge brokers since BMs have bigger

network due to their nature of work. A simplified illustration of the role of BMs in a network is represented in Figure 8.

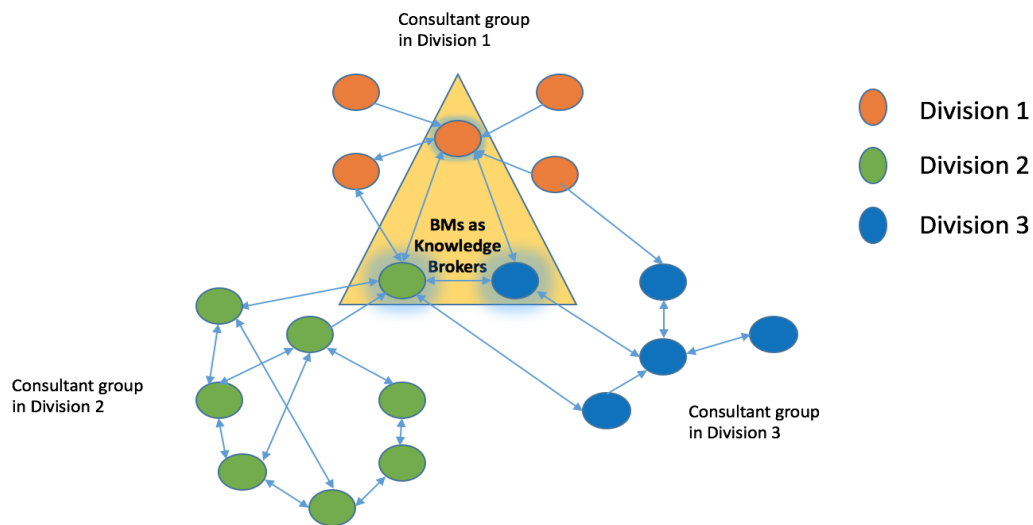


Figure 8. BMs as knowledge brokers

For most of the consultants who have worked with only on-site projects, BMs are the only contact to the parent company. Therefore, the relationship between the BM and the consultant is crucial as any strain in the relationship could probably make the consultants quit the company therefore resulting in knowledge loss.

To summarize, the section 6.1, even though the case company has consciously constructed several contexts for knowledge creation and transfer across different levels and functions, knowledge conversion and synthesis does not happen across all the layers of the company. The literature recommends that conversion and synthesis of knowledge across different layers of the organization should take place (Shibata and Takeuchi, 2006), however, practically it is not feasible as KM activities consume time and require other resources. Unless the benefits of KM are perceived, the company will not invest in KM. Further, the process, context and strategy of knowledge management should be customized according to different role in order to have an effective and cost-efficient KM.

6.2 Barriers of knowledge management at a technical consultancy firm

The different factors which influence the KM of the case company at different levels (organizational, group and individual) are discussed and presented below.

6.2.1 Organizational characteristics

The nature of the case company, such as organizational size and structure and the geographical distribution of consultants are found to be major barriers for successful knowledge management.

The size of the case company hinders the knowledge sharing as it is hard for the employees to know who knows what and what knowledge is to be shared. However, Swart (2003) argues that the size of the organization is not necessarily a barrier to sharing knowledge successfully and having a sound knowledge management policy and process are of critical importance for successful knowledge sharing. It could be interpreted that even if the size of a company is a barrier in sharing knowledge successfully, it could be overcome by having proper knowledge management policies and processes. However, the case company does not have a common KM policy. For example, there is no explicit policy of sharing the client knowledge by the BMs to consultants and the vice versa. Since organizational size is the barrier for KM at the case company it could be overcome only with clear KM policies and processes. Further, having an expertise map in the intranet with a search feature will help the employees to know the expertise of their colleagues and according to the needs they will be able to search for the employee with relevant knowledge thus overcoming the barrier of organizational size (Hislop, 2013).

Integration of knowledge at the middle management level is hindered due to the structure of the organization. Steiger et al., 2014, examined the influence of the organizational structure on knowledge management practices in an organization and identified that a matrix structure exhibits high level of knowledge management compared to other organizational structures such as functional and adhocratic. However, despite the case company having a matrix structure, it is found that the middle managers are more compartmentalized and less integrated. According to Mahmoudsalehi (2012), the levels of KM would be increased if the organizational structure were less formalized and more integrated. Therefore, it is important for an organization to be more integrated and communicate with different departments and divisions in order to enhance knowledge sharing.

Integration of on-site consultants' knowledge is hindered due to geographical dispersion of such consultants. Further, they are not inclined to prioritize KM activities over the daily work as well. Even if the consultants are inclined to prioritize KM activities, the case company has to pay them for such activities and the project estimate does not allow them to do so. Geographical dispersion also poses to be a problem for the personalization strategy adopted by the company. Despite, the company's effort to create a network of consultants through socializing on events, the group stops networking once the event is over and therefore the network is not sustained. However, according to Cross and Prusak (2002), the employees with strong personal networks have high job satisfaction and tend to stay longer in the company than their counterparts with weaker networks which is agreed by one of the BMs. Therefore, it is very crucial for a consultant company to sustain the networks created among the on-site consultants in order to avoid knowledge loss due to consultants quitting the company.

6.2.2 Top management support

According to Jennex and Olfman (2005), the top management should support the KM activities by allocating and managing resources, supervising and coordinating the KM activities. The top management of the case company is open and encourages its employees to come up with their own ideas and therefore, indirectly recognizing the different KM activities

by allocating funds for such activities. However, such recognition by top management is not visible across different layers of the organization and this lack of recognition does not motivate the employees from participating in KM activities. According to Miklosik and Zak (2015), the top management has to empower the middle managers to initiate and actively participate in KM activities. However, the middle managers at the case company are not very active in pursuing KM. This could be because of the narrow role of the BMs and lack of established incentives for activities outside their role. The incentives of the middle managers are based on hard business parameters such as number of sales and projects made during a particular period and it makes them to go after getting further businesses, hence they tend not to focus on other organizational developmental aspects such as integration of knowledge.

6.2.3 Intranet

According to Hislop (2013), a company could utilize ICT to create a searchable database and codify documents if they follow an objective perspective of KM and create an expertise map and promote social interaction if they follow a practice based perspective of KM. At present the case company has a functional intranet and follows both objective and practice based perspective; for example, the post project reviews for the large projects are updated in the database and an open community forum is also present in the intranet where employees can interact with each other. However, it is observed that even though the company has an intranet it is seldom utilized by the employees for knowledge sharing activities, especially by the on-site consultants due to lack of time and lack of relevant information in the intranet.

Knowledge sharing through intranet requires a network effort; both the knowledge seeker and knowledge sharer should be involved in order to promote knowledge sharing activities through intranet. Further, just the presence of an intranet will not promote knowledge sharing in an organization; there should be a driving factor, which motivates the employees to utilize the tool in order to enhance knowledge sharing in an organization. Therefore, nonetheless the intranet is a facilitator for knowledge sharing, however, it is found to be a barrier in the present case. Intranet has to be improved across different levels and functions and management should motivate the employees to use it in order to enhance the knowledge sharing within the organization.

6.2.4 Sub-culture in the middle management

The presence of strong subcultures in an organization prevents the different groups from sharing the knowledge across functions (Currie and Kerrin, 2003). In the case company, each department has its own way of working and so does each BM. However, they are not aware of each other's ways of working and it causes confusion for the consultants when they are assigned to a different BM due to change of assignments as the BMs have different ways of working. The presence of subculture is a barrier that holds back the BMs from sharing knowledge and finding best practices with other departments.

6.2.5 Shared identity

Ravishankar and Pan (2008) identified that lack of strong organizational identity among the consultants who are assigned to on-site client project is a major factor that hinders knowledge management. From the empirical data it is found that the consultants of the case company who are assigned to on-site projects on their very first day and who still continues in similar projects identifies themselves to the client company more than to the case company. As a consequence of lack of shared identity, the consultants are not inclined to participate in the events that are organized by the case company and the risk of such consultants quitting the company is also high. Further, as shared identity is one of the factors which has to be considered for a successful CoP, the lack of shared identity among the group of on-site consultants might affect the organization's effort to encourage CoP. Therefore, a strong sense of association to the parent company than the client company will make the consultants more inclined to participate in the KM activities such as utilization of intranet, trainings and other events organized by the parent company.

6.2.6 Legal restriction to share client knowledge

Legal restriction to share the customer knowledge of the on-site consultants is one of the major barriers for knowledge sharing in the company. On one hand, the business of the company can be improved by sharing the client's knowledge and on the other hand there is a risk of losing reputation in the market and existing business if any sensitive information of the client's is compromised. A way to overcome this issue is to identify the critical knowledge of the client and develop KM activities with the help of clients. However, it is complex to solve as the client companies will not be inclined to invest resources for development of an external consultant company.

To summarize the section 6.2, the KM process at a consultant company is very complex as there are many factors which hinder the KM process and certain factors, such as geographical distribution, shared identity and legal restriction are found to be unique barriers for a technical consultant company.

6.3 Approaches to overcome the barriers

In this section, different solutions to overcome the barriers, which prevent effective KM in a large technical organization are discussed and presented in Table 13.

Table 13. Solutions for the barriers

Solutions for the barriers	Barriers that will be solved
Cross functional work	<ul style="list-style-type: none"> - Organizational characteristics (Structure) - Subculture within organization
KM activities embedded in work routines	<ul style="list-style-type: none"> - Organizational characteristics (Geographical distribution)
Knowledge broker	<ul style="list-style-type: none"> - Organizational characteristics (Size) - Shared identity
Motivation	<ul style="list-style-type: none"> - Intranet - Top management support
Mentoring and coaching	<ul style="list-style-type: none"> - Shared identity
CoP	<ul style="list-style-type: none"> - Shared identity
KM strategy	<ul style="list-style-type: none"> - Top management support

6.3.1 Cross functional work at the middle manager level

In order to overcome the structural barrier at the middle manager level, cross functional (divisional and departmental) work should be encouraged. Instead of disconnecting cross functional communication from normal daily work, it should be integrated into the work routines. Therefore, the managers are inclined to communicate with other divisions and departments resulting in knowledge integration at the manager level (Mahmoudsalehi, 2012). Further, another barrier which hinders KM across different departments, presence of subculture, could also be overcome through communication across different divisions and departments. In addition to that, there is a scope for emergence of best practices as well.

6.3.2 KM activities embedded in the working routines

By including the cost of KM activities in the budget of the strategic projects and therefore making it into a legitimate work routine, one of the barriers of KM due to geographical dispersion of on-site consultants could be overcome. Therefore, the reasons such as lack of time or budget will not be cited for unwillingness to participate in the KM activities. Post project review is another way to integrate the knowledge sharing activities into the routine; the consultants who are engaged in the client project and both the BMs and TMs along with the consultants who are in the same field or similar projects should also be encouraged to participate in such reviews. This would improve knowledge sharing across different levels, functions and layers and create knowledge spiral across the organization (Shibata and Takeuchi, 2006).

6.3.3 Knowledge broker

The consultants of the case company first turn to their informal network to seek knowledge, which is in coherence with the claim of Parise et al. (2006) that majority of knowledge sharing within an organization happens through informal network. Therefore, it is crucial for the management of the consultant firms to recognize the presence of key players who influence such informal networks as they could both enable the knowledge flow or create a bottleneck for knowledge flow. However, identifying such role players in the consultant group might be difficult in a technical consultant firm as most of the consultants are located on-site. Nevertheless, the management should take actions to identify the key role players and use them to the advantage of the company. Identifying central connectors and knowledge brokers at the middle manager level could be the starting point for such action. The knowledge retention strategy with set of actions provided by Parise et al (2006) as mentioned in Table 4 could be implemented to improve the knowledge transfer through the key players of informal network. These set of actions will improve the networks in the company and make them stronger, which in turn will overcome the barriers of organizational size and shared identity. A stronger network makes it easier for the knowledge seeker to spot the knowledge resource irrespective of the company's size. Further, with stronger network, the employees feel more connected towards the consultant company, thereby increasing the shared identity of the on-site consultants.

6.3.4 Motivation

Rewards and compensation are important in order to promote the commitment of the employees to actively participate in KM activities. It can be used as a tool to steer the direction, duration and intensity of effort of the individuals and groups towards KM activities (Brown & Malmi, 2008). At present the case company does not have any rewards for KM and by establishing rewards and incentives, the employees will be motivated to utilize the intranet for both seeking and sharing of knowledge, which in turn will increase the network effect in the intranet. Further, by setting out rewards and compensation, the top management will be able to send an indirect message to its employees about its stand on KM activities. This will make the employees committed towards KM. However, since the consultants are located at different client companies, there is a risk of the knowledge sharing activities of the on-site consultants not being visible to the management of the parent company. Further, if the KM efforts are not recognized by the management it could lead to demotivation of the concerned employees. Therefore, proper system is needed to ensure that all the KM efforts of the employees, despite their location and role, is properly rewarded.

6.3.5 Mentoring and coaching

Karkoulouian et al. (2008) highlights that mentoring and coaching would enable tacit knowledge transfer in an informal environment and Hislop (2013) mentions that mentoring would encourage cross functional interpersonal knowledge sharing. Therefore, it is important to have a mentoring and coaching culture in an organization and especially in a consultant company as it will improve the networks of both the mentor and mentee. Further, the shared identity

among the on-site consultants will be improved towards the parent organization. However, the company should evaluate the personality of the mentor and assign the mentee accordingly in order to avoid any conflicts.

6.3.6 Communities of Practice

CoP is a way to encourage tacit knowledge sharing in an informal setting (Bolisani and Scarso, 2014) and CoP could be both ICT based or social interaction based (Kietzmann et al. 2013). As discussed in 6.2.5, lack of shared identity is one of the factors which hinders the success of a CoP. On the contrary, it is also argued that CoP develops a strong sense of community and increases the collective feeling and association to an organization (Hislop, 2013). Therefore, CoP could become a solution to improve the shared identity among the employees, especially the on-site consultants. However, it should be the responsibility of the management to identify the context for such CoPs and motivate the employees to participate until the formation of further CoPs becomes organic. By developing a strong sense of association to the parent company, the consultants will be more inclined to participate in the KM activities such as utilization of intranet, trainings and other events organized by the parent company.

6.3.7 KM strategy

It is argued that a clear long term strategy and vision of KM is crucial especially for a knowledge intensive firm (Hislop, 2013) and such a strategy should be in line with the general business strategy of the company (Greiner, 2007). By having an explicit KM strategy, it sends out a clear message to the middle managers and consultants about the company's stand on KM. Further, the strategy will act as a guideline for the middle managers to organize KM activities. Since, the codification strategy is not found to be effective for a technical consultant company, the time and effort spent on codification activities should be diverted to personalized knowledge management activities. The knowledge management activities at the company should be recognized and motivated by the management by making their efforts visible across different layers and functions.

To summarize the section 6.3, several actions to overcome the barriers and reduce the complexity of KM at a consultant company were proposed in this section. These actions will improve the process of KM at different layers and functions and would enable knowledge spiral across the organization.

7. CONCLUSION AND RECOMMENDATION

This chapter aims to conclude the thesis by providing answers for the research questions. Further, recommendations for the company and scope for future research will be discussed.

7.1 Conclusion

Knowledge is the critical resource for a knowledge intensive firm like a technical consultancy firm. Even though there are several studies about knowledge management, only a few studies are relevant to the practitioners. Therefore, the purpose of this thesis was to investigate the process and practice of KM at a consultant company, with the aim to contribute to the KM practice of a consultant company. The answers for the RQs, which were formulated for this study are summarized below:

How is knowledge management performed at a technical consultancy firm?

The company has different contexts for knowledge sharing to take place across different roles. However, the present contexts are not sufficient to set off a knowledge spiral across different roles, layers and functions. It could be concluded that, practically it is not feasible to make knowledge conversion and syntheses happen across different levels, functions and layers as recommended in the literature since the process of managing knowledge demand resources. Further, the “one size fits all” approach towards knowledge management is not an effective way of managing knowledge in a technical consultant company as the roles, experiences, knowledge, location and requirements of the knowledge workers are versatile. Personalization strategy is found to be more effective and preferred by the technical consultant company for sharing knowledge across the company compare to the codification strategy.

What are the barriers of knowledge management at a technical consultancy firm?

Managing knowledge at a large technical consultant company is a complex issue due to unique obstacles that prevent effective knowledge sharing in the organization. Lack of shared identity, co-location of the on-site consultants and legal restriction to share clients’ knowledge are some of the factors, which are unique for a technical consultancy firm. It is found that the roles and responsibilities, and incentives determine the middle managers’ interests and efforts towards organizational development activities such as knowledge management.

What approaches could be used to overcome the barriers?

There are means to reduce the complexity of knowledge management in a consultant company by overcoming most of these barriers. By having a clear KM strategy, in line with the business strategy of the company, as a guidance for the middle managers and with adequate top management support, it would be possible to overcome these barriers. Other approaches, such as knowledge broker, mentoring & coaching, CoP and intranet are the complementary approaches to improve the KM in a consultant company. Further, it is important to integrate the KM activities into regular work of both the middle managers and consultants.

7.2 Recommendations

In addition to the solutions provided in section 6.3, few recommendations, which are specific to the case company is listed below:

- At present, the KM activities at the company are not coherent and there are few links which are missing. For example, there is neither a formal nor an informal platform for the BMs and TMs to share knowledge with each other. Therefore, it is recommended that a context for knowledge sharing between these two roles should be provided.
- The routine activities at the BM level are not standardized. For example, there is no common understanding or practice of meeting the consultants. It is recommended to discuss and determine the best practices for routine activities and ensure that the practices are followed by all the BMs.
- Further, the BMs should be made aware of the knowledge connector concept, so that they can actively play the knowledge broker role between different consultants.
- If the consultants do not see any value in the training, they will not be inclined to take part. One way to motivate them to take part in the training is by customising the sessions according to the roles, experiences and requirements of the consultants by the academy. Further, participation in the training should be connected to the career plan of the consultants. For example, a few set of trainings should be made mandatory in order to become a senior consultant.
- Communities of Practice should be encouraged among the consultants. Since, having a common shared understanding is one of the main criteria for a successful CoP, it is recommended to form CoPs based on similar competences or roles. For example, the consultants with the role as a project manager, irrespective of their background, could be brought under a common CoP platform to share knowledge.
- Finally, it is recommended to have an integrated knowledge management system where all the activities are connected and focused towards one common goal, which should be according to the main business strategy of the company. By improving the organizational, group and individual knowledge, the company will have an advantage over its competitors.

7.3 Further research

The current study has investigated the process and practice of KM at a large technical consultant company. The results of this thesis could be utilized by other technical consultant companies, which have similar organizational characteristics and operate in a similar environment. This study could be further extended to investigate the implications of practical implementation of the proposed solutions. Another scope for further research could also be to examine the ways to solve the paradox of integrating knowledge for betterment of the company without compromising the clients' sensitive information. Further, it would also be interesting to conduct similar studies in another knowledge intensive sector such as architectural firm or management consultancy and compare the results with the current study in order to identify best practices in each sector. Since innovation was the starting point of this thesis, with focus on knowledge management, it would be interesting if any other factor

that influence innovation in a technical consultant company is taken as a focal point and further investigated.

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Appendices

Appendix 1. Interview guide (Business Manager)

Appendix 2. Interview guide (Consultants)

Appendix 1 - Interview guide (Business Manager)

1. What is KM according to you?
2. How important is knowledge management for your company?
3. How is the consultants knowledge that are engaged in the client's project shared in the organization?
4. What works very well at the company when it comes to knowledge management and what are your main challenges?
5. How is the intranet used for KM?
 - a. In what way are the consultants aware of it?
 - b. How do you motivate them to use it?
6. What tools are used at the company for Knowledge creation and sharing? Which tool is the most effective according to you? (Examples of tools are ICT, communities of practice, social interaction, post project meetup)
7. Does the top management have a KM strategy and is it communicated to you?
 - a. If so, what is the strategy and what action has been taken to implement it?
9. How could the consultants be motivated to share knowledge? Would intrinsic or extrinsic incentives work? In that case what kind of incentives?
10. How do you ensure that a consultant's knowledge is transferred back to the organization or to another consultant when he or she is quitting the company?

Appendix 2 - Interview guide (Consultants)

1. How were you trained when you joined the company or when you were assigned to your first project?
2. What do you do in order to gain knowledge when you are in need for it? for example knowledge about the clients or projects (both hard and soft aspects)
3. What kind of support was provided by the company when you had lack of knowledge in your work, for example knowledge about the client or project? (maybe a negative experience as well)
4. What difficulties or hindrances do you face when accessing knowledge?
5. How are you involved in knowledge sharing activities (like training, lessons learned from the project, uploading information on the intranet, workshops) at the client level?
6. Similarly, can you explain your knowledge sharing activities at your company?
7. What difficulties or hindrances do you face when sharing knowledge?
8. What are the factors that hinder you from sharing or accessing knowledge from the Intranet?
9. What would motivate you to access or share knowledge?
10. What kind of actions should your business manager or top management take in order to help you to share or create knowledge?
11. Do you have any ideas or suggestions on how knowledge could be shared?
12. Can you tell us the knowledge sharing activities that you are involved at the client company?