Towards a network-based knowledge culture

An exploratory case study of cross-functional integration in new product development teams

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Abstract

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Background: The reason for conducting this master thesis within the field of knowledge management derived from the realization that there was a need for an increased understanding of the socio-cultural dynamics of the integration and transfer of knowledge in cross-functional new product development projects. Research advocates that organizations with organic project-based environments with fluid team boundaries may aggravate routine-based work and organizational memory, which in turn may lead to an organizations’ inability of capturing and storing existing personalized knowledge for internal storage and future transfer (Koskinen, 2004). For this reason, the conversion of knowledge for re-use between and within projects in an organization is not supported in a natural way (Lindner and Wald, 2011). To this end, organizational culture is critically important in facilitating a knowledge transfer culture within an organization that supports such knowledge conversion processes (Davenport and Prusak, 1998a). Thus, an increased understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects is viewed as an opportunity to contribute with findings with interest in both industry and academia. Increasing the understanding of organizational culture’s role in knowledge conversion facilitation is particularly seen as an important research area in existing knowledge management research. The study aimed to produce a deeper understanding of these social processes by exploring and interpreting them in their real-life social contexts.

Research question: How does organizational culture and knowledge management strategies support as well as hinder knowledge integration and transfer between cross-functional product development teams and specialists in a project-based organization?

Purpose: To increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects. In order to study the socio-cultural elements, a case study in a global Swedish company engaged in new product development was conducted during the spring of 2016.

Method: The research design of the study was case study. The empirical data was collected through face-to-face interviews, observations and studying of internal steering documentations. The author found it necessary to adopt an interpretivist epistemological position with a qualitative focus in alignment with employing abductive reasoning in order to understand the collected data and to explore the posed research question. Quality measures with respect to qualitative research studies were cautiously considered.

Conclusion: This study found that an organization with a network-based knowledge culture and a standardized process with standards and routines for effective knowledge conversion processes are two sides of the same coin that can support the knowledge integration and transfer between cross-functional product development teams and specialists in a project-based organization. Further, both a single dominant organizational culture and multiple local cultures within an organization can both support and hinder the integration and transfer of knowledge. In extension to this finding, inconsistencies in the knowledge integration and transfer processes may evolve across these different cultural interpretations which may further support or hinder the social dynamics in an organization. Moreover, my study suggests that a network-based knowledge culture can interact with a standardized process in order to enable effective knowledge integration and transfer routines.

Keywords: Network-based knowledge culture, cross-functional projects, knowledge management, organizational culture, new product development
List of abbreviations

CFI- Cross-functional integration
KM- Knowledge management
MNC- Multinational corporation
NPD- New product development
OC- Organizational culture
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1 Introduction

The purpose of this study is to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects. This chapter begins by introducing the background of this topic followed by a problematization that discusses that both organizational culture and knowledge management strategies are significant in the integration and transfer of knowledge between cross-functional product development teams and specialists in project-based organizations. Next, the related research question is unfolded followed by the limitations and the disposition of this master thesis.

1.1 Background

The industry trends in new product development call for high-quality products in short times and at low development costs (Edmondson and Nembhard, 2009). New product development routines are identified as a key dynamic capability inside an organization to be able to meet these requirements and to remain competitive on the market (Eisenhardt and Martin, 2000). The new product development process is integrative and typically involves stages such as ideation, concept development, business analysis, technical implementation, commercialization, industrialization and so forth. To this end, these projects call for integration and transfer of knowledge from all disciplines in order to achieve the common objective of the team, to develop the new product. In correlation with the rapid globalization, shorter product lifecycles and the explosion of new technical knowledge, cross-functional project collaborations have become the method of choice by which companies meet these requirements (Keller, 2001). Using cross-functional integration in project-based work environments has intensely been put forward by the extant literature to accomplish organizational new product development tasks in more efficient and effective ways (e.g. Edmondson and Nembhard, 2009, Gemser and Leenders, 2011, Nakata and Im, 2010, Felekoglu, 2013, Hirunyawipada et al., 2010).

However, there are challenges associated to this way of working, too. Team diversity, temporary team memberships in complex projects and fluid team boundaries are examples of this. Cross-functionality may result in negative cognitive, emotional and behavioral consequences since professionals that work together in these teams perceive each other as different from oneself (Gemser and Leenders, 2011). Not only are cross-functional teams already diverse by nature, additional and temporary team members are
often added to the team when required due to project complexity (Lindner and Wald, 2011). These temporary team members, called ad-hoc specialists in this thesis, are typically involved in projects on an adjunct basis (Edmondson and Nembhard, 2009). These fluid team boundaries are flexible in many practical ways, however, the cooperative behavior in the projects may suffer since the working group is not familiar with one another (Slotegraaf and Atuahene-Gima, 2011). These fluid team boundaries with compositions of permanent and temporary team members may contribute to less group cohesiveness and decreased project performance since a sense of involvement and belonging may be lost in such organic organizational structures (Edmondson and Nembhard, 2009). Both permanent and temporary project team members typically participate in multiple parallel projects simultaneously.

Given that new product development is one of the most knowledge-intensive processes in business (Söderquist, 2006), there is a need to secure the creation, storage, transfer and application of knowledge for organizational learning and future re-use. For these reasons, managing knowledge within new product development firms has gained much strategic interest in large manufacturing firms lately (Söderquist, 2006). In this context, the theory of knowledge management originated in the 1990’s when Japanese companies realized the importance of knowledge as a strategic organizational asset and how firms could effectively use it as a part of business strategies and human resource management (Nonaka and Takeuchi, 1995). Further, the management of intellectual capital supports strategic advantages (Gold et al., 2001) which constitutes the fundamental principles of the knowledge management theory. Further, organizational culture has a major influence on the implementation of knowledge management strategies (Alvesson and Kärreman, 2001, Alvesson, 2013). Organizational culture is typically interesting when integrating knowledge management initiatives since it is the organizational culture that influences the knowledge integration and transfer culture within the firm by affecting employee behavior and attitudes. Moreover, ‘a positive set of values, attitudes and expectations towards knowledge facilitates the willingness of people to share knowledge and to trust in knowledge from other persons’ (Lindner and Wald, 2011, p. 886). Thus, organizational culture is at focus in knowledge management strategic implementations (Nonaka and Takeuchi, 2005).
Knowledge management models often call for flat networks based on fluid, cross-functional coupled teams rather than hierarchical departmentalized organizational structures (Van Beveren, 2003). Such an organic project-based structure with fluid cross-functional teams is the reality for the case company where this case study degree project was carried out. The company is based in Sweden with a strong proclaimed Swedish identity and organizational culture. The firm carries retailing operations in up to 40 countries worldwide making it a multinational corporation, however, its product development is located in Sweden. The case company is growing at a fast pace and it is in a transformation phase where they are moving from a product development process characterized by entrepreneurship and functional, department-bounded and spontaneous activities towards a strategic knowledge management process based on cross-functional teams working in projects where many tasks are planned for and executed concurrently. The organization is now composed of cross-functional product development teams which are supported by surrounding specialists on specialized and knowledge-intensive tasks. When designing an organization this way, achieving common and systematic ways of working across the entire business is challenging where it may not always be clear what to deliver, when and to whom in the process. Thereof, both new and existing knowledge within the many ongoing projects can be difficult to integrate and transfer for re-use across the organization.

1.2 Problem discussion

Project-based organizations can be structured in a more or less organic or mechanic nature (Koskinen, 2004, pp. 16-18). In organizations where the projects are composed of fluid team boundaries, as is usually the case in product development, the knowledge within the firm is said to be in more multi-dimensional form since this knowledge is typically implicit and highly individual (Koskinen, 2004). That is, knowledge that comes from individuals’ own experiences and sits in the minds and hands of its beholder (as opposed to explicit knowledge where the knowledge resides in pre-coded instructions or manuals that can be easily stored and transferred) (Koskinen, 2004). The transformation of implicit to explicit knowledge, the process of knowledge conversion, can be very difficult. This is particularly challenging in organizations with fluid team boundaries since tasks often

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1 The identity of the organization where this case study was carried through will not be revealed and henceforth be referred to as the case company
involves inconsistent situations where the project contributors act on ‘the basis of mental models born of their intuition and experience’ (Koskinen, 2004, p. 18). As project teams often are strengthened by temporary team members and that both permanent and temporary team members are involved in more than one project simultaneously (Edmondson and Nembhard, 2009), some research even suggests that new product development projects tend to become ‘patchworks of ad-hoc initiatives’ (Söderquist, 2006, p. 499). Further, some research suggests that project-based organizations of mechanic structures ‘provides greater lateral support to specialist staff and in the development and sharing of implicit expertise’ (McMahon et al., 2004, p. 311) than do organic project-based environments with fluid team boundaries. However, knowledge management models often prefer organizations based on fluid cross-functional coupled teams (Van Beveren, 2003) as interdepartmental knowledge integration and transfer can occur continuously through networking and interactive dialogues.

There are both benefits and challenges to this non-systematic and non-routine based work environment in relation to knowledge integration and transfer (Gross, 2014). On the upside, improvisational ad-hoc behavior expresses an organization’s capability of solving problems when needed. However, on the down-side, the lack of applying routine-based work may result in the inability of capturing and storing existing project knowledge for internal organizational storage for future transfer. Hence, organizational memory rarely evolves (Lindner and Wald, 2011, Koskinen, 2004). Particularly the knowledge that is implicit, project-specific, experience-based and built on face-to-face interaction is difficult to capture for storage and future re-use (Koskinen, 2004). Moreover, the complex flow of knowledge in organic project-based organizations is crucial yet very difficult to organize and manage in new product development projects (Söderquist, 2006) as the knowledge conversion from, between and within projects is not supported in a natural way (Lindner and Wald, 2011).

Further, large organizations can usually be considered as ‘mini-societies’, where there are sub-cultures that are potentially in conflict with each other. These sub-cultures are formed according to functional borders, professional occupation or job rank etc. (Alavi et al., 2005, p. 196). According to some research, these sub-cultures are not only influenced by values delivered by leaders but by for instance a technology used by the employees or by external factors like changes in the environment of the company (Alavi et al., 2005). In
extension, Lindner and Wald (2011) emphasize that knowledge culture is the most important success factor for managing temporary project constellations. In order to enable effective knowledge integration and transfer between individuals, groups of roles, temporary and permanent project members or matrices, both organizational culture, management commitment, supporting communication systems and the storage and retrieval of knowledge should be carefully employed. Currently there is a lack of how to best influence and develop knowledge cultures inside organizations (Oliver and Kandadi, 2006). Further, empirical evidence that supports the creation of effective structures for knowledge cultures within organizations is not existing in literature (Oliver and Kandadi, 2006). Keeping in mind that cross-functional projects consists of mainly experience-based knowledge and requires face-to-face interaction to transfer, Hirunyawipada et al. (2010) found that socialization is a central and underlying factor in exploiting the full capacity of knowledge conversion within projects and between its contributors. Here, the socialization process refers to social meetings where mental models and mutual trust is converted (Nonaka et al., 2000). The socialization process occurs beyond organizational boundaries as well since much implicit knowledge is embedded outside the core project team (Nonaka et al., 2000). Basically, socialization in cross-functional projects is what primarily contribute to the creation, transfer and application of usable knowledge within an organization.

To summarize, a new product development project is ‘part of a dynamic collaborative journey’ (Edmondson and Nembhard, 2009, p. 123) where specialized professionals from different functional backgrounds need to collaborate in order to successfully manage an integrative product development process. When working in organic project-based environments with fluid team boundaries, companies often rely on their own judgment of how to manage large bodies of individual and collective knowledge between and within different teams and individuals. Successful strategic knowledge management implementation requires company-wide strategies which secures that the demanded knowledge is available when and where it is needed (Burström and Jacobsson, 2013). Extended research where new product development project teams engage with both internal and external functional sources of knowledge in practice is lacking (Burström and Jacobsson, 2013). Further, Brahma and Mishra (2015) agree with foregoing authors that there is a need for increased learnings of knowledge management processes from present-day contexts in specific sectors from industry. Since it has been advocated that it
can be hard to integrate and transfer new and existing project knowledge in organic project-based organizations, that also are composed of various cultural interpretations, the importance of successful knowledge integration and transfer within and between cross-functional project collaborations is highlighted as an important research area. Particularly, an increased understanding of the socio-cultural dynamics of knowledge integration and transfer within cross-functional projects is viewed as an opportunity to contribute with findings for future research with interest in both industry and academia.

1.3 Research question
Based on the problem discussion, the following research question was defined and aims to be answered: How does organizational culture and knowledge management strategies support as well as hinder knowledge integration and transfer between cross-functional product development teams and specialists in a project-based organization?

1.4 Purpose
The purpose of this master thesis is to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects. In order to study the socio-cultural elements, a case study in a global Swedish company engaged in new product development was conducted during the spring of 2016.

1.5 Limitations
This case study is based on a single new product development company and their current situation, product development process and internal ways of working. To this end, there are no guarantees that the results and recommendations are applicable and generalizable to other companies seeking to support knowledge management within projects consisting of multi-skilled roles, although some similarities may be present and valuable for both practitioners and researchers.

1.6 Delimitations
Due to the time constraint of 5 months, the results of the research were not capable of being tested/piloted or measured in terms of actual impact on the case company.
1.7 Disposition

Chapter 1 Introduction: The introductory chapter discussed the topic of study; the complex socio-cultural dynamics of knowledge integration and transfer in cross-functional projects. To this end, the research question as well as the initial purpose of the thesis was provided, followed by the de- and limitations.

Chapter 2 Theoretical framework: This chapter consists of the theories employed in this study; knowledge management, organizational culture and cross-functional integration in new product development. The chapter presents key concepts related to the theories. The importance of knowledge management and organizational culture in relation to knowledge integration and transfer between cross-functional project teams are discussed.

Chapter 3 Methodology: This chapter describes how the study was conducted through discussing the applied research methodology. The research design of this study is a case study. Beyond the literature review, data was collected through face-to-face interviews, observations and studying of internal steering documentations. An interpretivist epistemological position with a qualitative focus in alignment with abductive reasoning was employed in order to understand the collected data and to explore the posed research question. To reduce the risk of harming someone through the research process, ethics and moral is considered. Lastly the quality measures are treated.

Chapter 4 Empirical analysis: This chapter dissects the viewpoints, information and knowledge gathered from the empirical investigation in this case study. The chapter primary consists of interviews and direct and participant observations from inside the case company which are further analyzed with significance to the theoretical framework.

Chapter 5 Discussion: This chapter discusses the key findings revealed in the previous chapter. The accomplished work of this master thesis is demonstrated here and discussed with its significance to the conclusion.

Chapter 6 Conclusion: This chapter gives the reader the key points to take home from reading this thesis. The final conclusions are clearly demonstrated with close connection to the research question and are drawn based upon the discoveries from the empirical analysis. The findings are synchronized in both managerial implications and suggestions for further research.

References: All citations in the body of text refer to the reference list at the end of the thesis. The Harvard referencing system was consistently applied.
2 Theoretical framework

This chapter treats the central theories and their related concepts applied in this study; knowledge management, organizational culture and cross-functional integration in new product development. The chapter begins with presenting the definition and key concepts applied in the study. To conclude the theoretical framework, the importance of knowledge culture for knowledge integration and transfer in cross-functional projects is highlighted.

The posed research question, ‘How does organizational culture and knowledge management strategies support as well as hinder knowledge integration and transfer between cross-functional product development teams and specialists in a project-based organization?’, should be kept in mind while reading the chapter to follow.

A flexible organizational structure encourages the implementation of cross-functional project teams in which the knowledge flow of ideas and innovative thinking can circulate across traditional disciplines and department borders (Bharadwaj et al., 2015). Moreover, this flexible structure of cross-functional team formations provides ways of informal communication across different disciplines, something that is encouraged in knowledge management strategies (Bharadwaj et al., 2015). The background to structuring organizations this way was to move away from permanent organizations where departments and divisions mechanically worked and acted as knowledge silos, and hence mechanisms for organizational learning and knowledge creation, storage and transfer were difficult to achieve (Lindner and Wald, 2011). Cross-functionality has become more or less the standard model for how organizations are structured. However, there are also challenges associated to this way of working. To this end, knowledge management strategies seek to identify where and what sources of knowledge that already exists within the organization, what needs to be known and how to create an organizational culture that promotes both learning, creation and transfer of new and existing knowledge within an organization. By integrating strategic knowledge management initiatives, organizations may learn how to promote knowledge conversion (i.e. the processes of creating, storing, transferring and applying knowledge) and hence increase the understanding of the challenges that arise in fluid and cross-functional project-based environments.
These knowledge conversion processes focus on the conversion of knowledge through strategies related to both technology and socialization. Organizational culture is believed to be the most significant input to successful knowledge management implementation in that it determines values, attitudes and working routines that either enable or prevent knowledge creation and transfer (Janz and Prasarnphanich, 2003). Here, organizational culture is critical to the reception of strategic knowledge management initiatives within an organization.

Hence, the theory of knowledge management in alignment with organizational culture will be addressed first to later be applied to my empirical setting; cross-functional teams in project-based organizations. To conclude the theoretical framework, the linkage between the theories are discussed with circumspectuality to my research question.

2.1 Knowledge management

The emergence of the theory of knowledge management is frequently reported as a quite recent development with its roots in the business world (Wallace, 2007). Moreover, the literature concerning the origin of knowledge management typically traces back to the early 1990’s when the Japanese management thinkers Nonaka and Takeuchi published their work *The Knowledge-creating Company* (1995). There is not a standard and recognized definition of knowledge management, as this is a subject with many multidisciplinary influences from for example philosophy, economics, education, psychology, library and information studies (Wallace, 2007). However, in broad terms, knowledge management is concerned with supplying the right person with the right knowledge at the right point in time. Moreover, knowledge management is a theory that involves practices within an organization to create, store, transfer and use knowledge (Nonaka, 2005). As the purpose of this study is to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects, the chosen definition of knowledge management naturally relates to organizations working in project-based environments. Namely, knowledge management is ‘the management activities required to source the knowledge stock, create the enabling environment, and manage the knowledge practices to result in an aligned set of project-based knowledges’ (Reich et al., 2012, p. 665).
2.1.1 Knowledge

As implied in the name, knowledge management is strongly correlated with the concept of knowledge. All organizations generate and use knowledge, and without knowledge organizations cannot organize themselves (Davenport and Prusak, 1998a). The term knowledge itself is a word that has been discussed widely in knowledge management and attributed with many different definitions since the emergence of the discipline (Al Saifi, 2015). Knowledge is distinguished from data which consists of raw and unprocessed facts, and from information which is commonly defined as meaningful aggregations of data (Ajmal and Koskinen, 2008). In correlation, knowledge is an individuals’ processing of information nuanced by personal experiences and perceptions (Koskinen, 2008). Thereof, information has little meaning before it has been converted inside the mind of an individual. Further, ‘knowledge, unlike information, is about beliefs and commitment and is usually associated with actions and particular business processes’ (McMahon et al., 2004, p. 309). This thesis committed to the following definition of knowledge:

‘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, 1998b, p. 5).

To this end, Polanyi (1966) further discussed and coined that there are two types of knowledge, implicit and explicit knowledge.

2.1.1.1 Implicit knowledge

Implicit knowledge, called tacit knowledge interchangeably in literature, is knowledge that comes from individuals’ own experiences (Koskinen, 2004). Implicit knowledge is typically hard to express in just words, as it resides in the hands and in the mind of a certain individual. Moreover, this type of knowledge is expressed by its ‘owner’ in the forms of points of view, commitments, attitudes etc. Practically, these experts have a hard time expressing what they know and what they are capable of performing. Implicit knowledge is difficult to share to others unless sharing experiences by for instance face-
to-face communication is possible (Koskinen, 2004). Some researchers even claim that implicit knowledge is not substitutable (Lopez-Nicolas and Meroño-Cerdan, 2011).

2.1.1.2 Explicit knowledge

Conversely, explicit knowledge can easily be imitated and shared across an organization. Further, explicit knowledge can be ‘embodied in a code or a language’ which may be expressed as words, numbers, manuals or other mathematical abbreviations (Koskinen, 2004, p. 15). Explicit knowledge has the potential to describe why things work the way they do, as opposed to tacit knowledge that disseminates how things work (Koskinen, 2004).

2.1.2 SECI-model

Nonaka and Takeuchi (1995) introduced how implicit and explicit knowledge can be shared and created within a company through their SECI-model. Moreover, the model appreciates the dynamic nature of knowledge creation and shows how knowledge is created and transferred within organizations. Knowledge is created through interacting between explicit and implicit knowledge, and this interaction is called ‘knowledge conversion’ (Rai, 2011). Through this conversion, knowledge grows in terms of both quality and quantity (Nonaka et al., 2000). This applies to both implicit and explicit knowledge. According to the model, there are four processes that simultaneously and complementarily entails the knowledge management theory; socialization, externalization, combination and internalization (Nonaka and Takeuchi, 1995).

2.1.2.1 Socialization- Implicit to implicit knowledge

This is the process where implicit knowledge is converted through personal experiences and face-to-face interaction. Moreover, knowledge is created and transferred through hands-on experiences rather than through formal and codified manuals. Implicit knowledge is most of the time specific to a certain time and space, for example a specific project, which makes it hard to formalize. Thus, the socialization process involves social meetings where mental models and mutual trust can be created and transferred (Nonaka et al., 2000). To this end, the culture within an organization becomes significant since the ‘organizational culture is believed to be the most significant input to effective knowledge management and organizational learning in that corporate culture determines values, beliefs, and work systems that could encourage or impede knowledge creation and
sharing’ (Janz and Prasarnphanich, 2003, p. 353). Moreover, firms seeking to implement knowledge management strategies have to overcome many challenges, organizational culture being one of the largest (Alavi et al., 2005). To this end, research advocates that when an organization is aware of their culture, the likelihood of organizational learning becomes natural (Ajmal and Koskinen, 2008). On this note, the organizational culture consists of peoples’ interpretations of situations, activities and social relationships which in turn forms the basis for collective action (Alavi et al., 2005). These interpretations develop over time and are successively passed on to new employees and team members through socialization processes. Thus, knowledge cultures take form over time when ‘groups, regardless of size, embrace similar interpretive schemes’ (Alavi et al., 2005, p. 194). On this note, organizational values can be viewed upon as social norms which are the basis for internal social interaction, which in turn heavily impacts the social behaviors of the employees by pre-defining which behaviors and attitudes are accepted in the organization (Alavi et al., 2005). Every organization has its own unique organizational culture, moreover, ‘organizational culture is not something that an organization has, a culture is something that an organization is’ (Oliver and Kandadi, 2006, p. 7). To this end, it is the ‘shared philosophies, assumptions, values, expectations, attitudes, and norms’ that are included in what couples an organizational culture together (Oliver and Kandadi, 2006, p. 8). Ultimately, organizational culture come down to explaining social group behaviors in one way or another within an organization (Alavi et al., 2005), and these social behaviors have major impact on building organizations’ knowledge integration and transfer cultures. Moreover, organizational culture is capable of serving as either an enabler or a hinder when implementing knowledge management strategies (Bharadwaj et al., 2015).

Implicit knowledge can be embedded and acquired through socialization processes where involved project contributors regularly interact with each other, moreover, socialization ‘brings together novices and experts so that the former can benefit from the latter’s experiences’ (Allal-Chérif and Makhirouf, 2016, p. 1540). Here, it is the knowledge culture within the organization that heavily determines whether knowledge integration and transfer behaviors are encouraged or impeded.
2.1.2.2 Externalization- Implicit to explicit knowledge

Further, the externalization process transforms implicit knowledge into explicit knowledge, which in turn can be stored in the organizational memory. Thus, the knowledge is made available and allowed to be shared by others. An example of this knowledge conversion process is concept creation in new product development (Nonaka et al., 2000). Here, one employee develops a concept for a new product. He or she then shares the idea to the organization and makes it accessible to whomever is interested through technology (which can be in the form of uploading documentations, drawings or tables in a database). Now, this knowledge is stored and available for re-use in other similar development projects.

2.1.2.3 Combination- Explicit to explicit knowledge

Combination is the process where explicit knowledge evolves into new and more complex knowledge (Allal-Chérif and Makhlouf, 2016, p. 1540). This is where explicit knowledge is collected and thence combined, edited and processed in order to generate new knowledge (Nonaka et al., 2000). This newly created knowledge can once again be transferred within the organization. Typically, information technologies facilitate this knowledge conversion process which enables large-scale knowledge transfer within and between project teams. An example is the breakdown of product concepts in new product development where new, systemic knowledge can be created and later transferred inside the organization to be reused in similar development projects (Nonaka et al., 2000).

2.1.2.4 Internalization- Explicit to implicit knowledge

Internalization transforms explicit knowledge into implicit knowledge. Through this process, this knowledge conversion occurs by individuals. The internalization process is commonly referred to as ‘learning by doing’, meaning that a task has to be actualized by practice and action in order for a person to absorb the knowledge (Nonaka et al., 2000). A practical example of the internalization process is that a person can read formal documentation and manuals about any given task, and then internalizing this explicit knowledge into personal implicit knowledge. When this knowledge conversion occurs and takes form in personal mental models or for instance technical know-how, a valuable organizational asset is just created (Nonaka et al., 2000). When this internalized knowledge is then transferred with others in the organization through socialization processes, the organization applies and takes advantage of knowledge management.
principles. See Figure 1 for an illustration of the four knowledge conversion processes which interact in a continuous spiral of knowledge creation and transfer.

(Nonaka and Takeuchi, 1995)

**Figure 1: SECI-model**

Beyond the SECI-model, the discussion about the distinction between explicit and implicit knowledge further led researchers to develop concepts, strategies, stages and procedures within the knowledge management subject which now serve as a concrete foundation of the theory (Brahma and Mishra, 2015). This discussion took two directions, which resulted in two different knowledge management strategic typologies (Hansen et al., 1999). The two strategies distinguish between explicit and implicit knowledge as well as the use of information technologies (e.g. Hansen et al., 1999, Lopez-Nicolas and Meroño-Cerdan, 2011, Koskinen, 2004). Moreover, knowledge management has evolved to be particularly associated to computing techniques, however the subject is much broader than only information technologies (McMahon et al., 2004). The first one, codification, has its roots in information technologies and information control. The other, personalization, concentrates to the management of know-how, skills and social capital and takes on a people and organizational perspective (Koskinen, 2004). Thus, projects can utilize two different types of knowledge management strategies, both are addressed next.
2.1.2.5 **Codification**

In the codification strategy, the knowledge at task can be made independent of whomever created it and be made accessible and reused for any other given purpose (Lopez-Nicolas and Meroño-Cerdan, 2011). In other words, explicit knowledge is handled in this type of knowledge management strategies. The codification strategy typically requires heavy IT investments that enables the re-use and transfer of knowledge within the firm. Knowledge can be stored inside databases in the form of documentations, drawings and tables and can be accessed and understood by any other authorized employee (Koskinen, 2004). Codification strategies has a person-to-document focus. Many knowledge management initiatives are primarily characterized by information systems (Zack, 1999). According to Gold et al. (2001), this may be so since technology provides the platforms and tools needed in order to mobilize social capital. Information technologies simply provides a way to reliably store, code and share knowledge. The technological infrastructure is completely tangible and serves to enable knowledge management initiatives internally (Bharadwaj et al., 2015). Moreover, hardware, software and protocols that encode and exchange knowledge electronically are examples of technology infrastructures when employing strategic knowledge management initiatives. It is found that information technology largely enables the development of a knowledge culture by influencing internal corporate habits of ‘communication, collaboration, information sharing, learning and decision-making (Oliver and Kandadi, 2006, p. 17). However, many codification knowledge management strategies have been reported as unsuccessful or inefficient, partly caused by an over focus to the use of Information technologies (Lopez-Nicolas and Meroño-Cerdan, 2011). Actually, the use of IT tools is only capable of codifying a fraction of what experts know, and ‘after being entered into knowledge databases, the knowledge is often out of date within months’ (Chai and Nebus, 2012, p. 33). Thus, dual processes of codification and personalization strategies are viewed as necessary for successful knowledge management implementation. In other words, codification and personalization strategies are highly complementary to each other.

2.1.2.6 **Personalization**

The codification approach is ineffective when it comes to handling implicit knowledge, which is often embedded in the minds of individuals, in a culture or in a specific context (Chai and Nebus, 2012). It has even been found that when obtaining knowledge for use in projects, the primary means of social interaction with people is preferred over using
pre-codified databases (Cross and Sproull, 2004). Suchlike interpersonal communication may help overcome barriers associated with implicit knowledge transfer and knowledge that is concentrated to a specific context or situation (Chai and Nebus, 2012). Thus, this strategy initially focuses around individuals and social face-to-face interaction. It is defined as ‘knowledge re-use that transfers knowledge from people to people, who know each other, or at least know each other’s identities’ (Chai and Nebus, 2012, p. 34). The interpersonal communication is tailored to meet the needs of a specific person rather than making the knowledge generally accessible to the entire organization. Rather, the personalization strategy is concerned with upholding an interactive dialogue between people in order to share and create knowledge (Lopez-Nicolas and Meroño-Cerdan, 2011). The use of IT and enclosed investments are small in comparison to codification strategies. Here, computers and IT related tools are only seen as a mean for communicating knowledge and not to store it (Koskinen, 2004). In summary, the personalization strategy concerns implicit knowledge which manages un-codifiable knowledge and has a person-to-person focus (Koskinen, 2004).

A pronounced challenge in personalization strategies are that they can be very costly in terms of the inefficient use of time (Chai and Nebus, 2012). To exemplify, a temporary team member might be trying to solve and respond to multiple similar queries coming from different development projects simultaneously. At the same time, this person needs to progress in his or her own workload. Thus from an organizational perspective, this employee may not be able to make the most efficient use of his or her time due to these personalization knowledge management strategies, which in turn may turn out to be uneconomical for the company. In prolongation, there are circumstances where personalization strategies are not practically possible. These situations may derive from employees sitting in geographically diverse working locations and time-zones, or simply in which an employee possessing important knowledge leaves or retires from the company. In large companies, there may also be situations where employees with previous knowledge in a given context has moved on to take on a new assignment and hence does not remember nor have time to assist with his or her implicit knowledge. This dilemma relates to the overall issue where employees typically have ‘different agendas and self-serving economic priorities during the knowledge-exchange process’ (Chai and Nebus, 2012, p. 33). The priorities of the employees are not necessarily in harmony with those of the organization at large when it comes to exchanging personalized knowledge.
Mukherji concludes that the long-term success in knowledge management implementation lies in a ‘balanced mix of knowledge exploitation and exploration, which needs to be supported by the dual processes of codification and personalization rather than providing cookie-cutter solutions for standardized problems’ (Mukherji, 2005, pp. 38-39). In other words, he means that it is time to go beyond the debate whether codification or personalization is the correct knowledge management strategy to go for. Only when organizations realize that it is not a question of either or but rather a combination of both, will organizations not limit the scope of knowledge management capabilities and start moving towards creating strategic advantages instead. Now that we have distinguished the differences between knowledge as either IT-driven and codifiable (explicit) versus personal, interaction-driven and dependent on social and interactional relationships (implicit) it is time to further clarify how knowledge can be categorized and mobilized on an organizational level with respect to knowledge management processes. The collection name for these processes is knowledge conversion.

2.1.3 Knowledge conversion processes

According to Nonaka and Takeuchi, knowledge management emerged out of the realization that knowledge had begun to ‘replace land, labor and capital as the key source of wealth in modern-day societies’ (Nonaka, 2005, p. 1). In relation to business organizations, knowledge was started to be viewed upon as the most important resource and learning capability (Zack, 1999). The exploding amount of available data, information and knowledge through information technologies is claimed to be a central reason for this development (Brahma and Mishra, 2015). Thus, companies nowadays identify themselves as being knowledge-based in the new economy, meaning that the knowledge asset is seen as the most important resource for achieving a competitive advantage (Nonaka, 2005). However, in order to sustain such competitive edge, firms can learn to absorb knowledge, that is, ‘to use prior knowledge to recognize the value of new information, assimilate it, and apply it to create new knowledge and capabilities’ (Bharadwaj et al., 2015, p. 422). In broad terms, organizations integrating knowledge management strategies identifies where and what kind of knowledge that already exists within the company, what needs to be known and how to create an organizational culture that promotes both learning, sharing and the creation of new knowledge. To that end, Nonaka and Takeuchi (2005) suggests conscious management of the organizational
knowledge flows, and hence knowledge management strategies were developed. Further, firms have started to recognize the need for knowledge management, and have therefore started to settle strategic knowledge management related processes and systems (Gold et al., 2001).

In order for an organization to be able to leverage knowledge management processes and systems, it is firstly needed to categorize the different processes that supports the mobilization of managing social capital. Moreover, these processes help firms formulate the strategies, and in making decisions related to strategic knowledge management (Zack, 2002). Technology, processes, people and culture are dimensions that all have to be considered (Burström and Jacobsson, 2013). In order for a firm to organize itself to make the most efficient use of its individual and collective knowledge, the knowledge management practices have been divided into four categories (Kayworth and Leidner, 2004). These categories relate to a lifecycle approach of knowledge management where both internal and external knowledge is considered valuable to be made available inside the organization (Bharadwaj et al., 2015). The lifecycle starts with knowledge creation (acquisition, generation and capture of knowledge are terms used interchangeably in literature) where new knowledge and/or the replacement of existing knowledge takes place within the implicit and explicit knowledge of the organization (Ling-Hsing and Tung-Ching Lin, 2015). Next, knowledge is stored, by means of structuring both explicit and implicit knowledge acquired by individuals and groups of individuals within the firm (Ling-Hsing and Tung-Ching Lin, 2015). Thence, knowledge is transferred (shared and disseminated are terms used interchangeably in literature). This is an important process in knowledge management, as knowledge is made available to those who need it and can use it to create organizational value. Particularly, aspects of implicit knowledge into explicit knowledge is important or the implicit knowledge may be lost (e.g. Gold et al., 2001, Ajmal and Koskinen, 2008). Finally, the knowledge is applied (used, reused are terms used interchangeably in literature). This process actualizes the knowledge by means of using it for strategic direction, problem-solving, cost-reduction etc. (Ling-Hsing and Tung-Ching Lin, 2015).

2.1.3.1 Knowledge creation

This is where the development of new knowledge takes place, both implicit and explicit (Ling-Hsing and Tung-Ching Lin, 2015). This is done through social and interactional
processes between employees as well as through cognitive processes of individuals. Moreover, the collaboration between employees is the foundation for socialization as Nonaka and Takeuchi described it in the SECI-model (1995). The dynamic interaction between implicit and explicit knowledge is what collaboratively creates new knowledge (Nonaka and Takeuchi, 2005). Noteworthy to say here is that knowledge is not only created internally in an organization. Knowledge is many times created both internally in the project team or by outside sources (Bharadwaj et al., 2015, Kosinen, 2004). All necessary knowledge may not be found within a single project team or in a single organization, and hence external ad-hoc expertise is often a large contributor of knowledge creation (Gross, 2014).

Further, organizational structure is an important part of the knowledge creation processes inside a company. This concerns the degree of which working relationships and decision-making are governed by formalized rules and procedures. Some argue that knowledge creation is supported by a high degree of standardizing working relationships and assignments. On the other hand, it is argued that organizations that to a lower degree stresses the implementation of rules and procedures, co-workers’ ability to freely collaborate and dynamically interact with others is what is vital to the creation of knowledge (Al Saifi, 2015).

### 2.1.3.2 Knowledge storage

Knowledge storage processes are concerned with storing existing knowledge at common platforms where all authorized persons can access it. Without standards for knowledge storage, there would be no consistency in communicating knowledge across the organization (Bharadwaj et al., 2015), and hence the knowledge asset could potentially be completely lost. Knowledge about specific subjects resides in many different parts of a large organization and in the minds of many individuals. By storing and making this knowledge available to everyone, ‘redundancy is reduced, it enhances consistent representation, and improves efficiency by eliminating excess volume’ (Bharadwaj et al., 2015, p. 427). Thus, by storing knowledge an organization can make the most efficient use of it.

Notoriously from the discussion around codification and personalization strategies, explicit knowledge can easily be stored in databases. Suchlike stored explicit knowledge
generates thinking as well as working routines, which in turn makes ‘relatively unskilled workers productive on a higher skill-level more or less instantly’ (Alvesson and Kärreman, 2001, p. 1007). Further, Oliver and Kandadi (2006) found that technology can not only promote knowledge storage, but significantly promote an organization’s knowledge culture as well by influencing employee habits when it comes to communication, collaboration, information sharing, learning and decision-making. Implicit knowledge is harder to store since it does not easily translate into codifiable and formal words, numbers, symbols or manuals. Rather, tacit knowledge typically stores itself within an organization through face-to-face interaction by experience sharing, observations and imitations (Koskinen, 2004).

2.1.3.3 Knowledge transfer

Knowledge transfer ultimately means to provide knowledge to others and to receive knowledge from others (Davenport and Prusak, 1998a). Particularly project-based organizations struggle with effective knowledge transfer (Ajmal and Koskinen, 2008). Moreover, if project-based organizations fail to transfer knowledge, then the implicit knowledge may be lost (Ling-Hsing and Tung-Ching Lin, 2015), which partly refers to missing out on integrating the knowledge of ad-hoc expert involvement. Many project-based organizations fail to learn from past projects, and thus increases the likelihood that the same mistakes will be repeated project after project (Ajmal and Koskinen, 2008). Various reasons are believed to contribute to the failing knowledge transfer within organizations, including organizational, technical and cultural issues (Ajmal and Koskinen, 2008). As previously stressed, organizational culture in particular plays a vital role when developing an efficient knowledge culture (Davenport and Prusak, 1998a, Oliver and Kandadi, 2006, Alvesson, 2013). This is believed to be so since knowledge transfer processes to a large extent relies on a culture of socialization, recall to the SECI model, where people exchange their knowledge, experiences and skills throughout an entire organization by social interaction. To this end, it is firstly the organizational culture that creates the context for how knowledge will be exchanged through social interaction. Secondly, it is the organizational culture that ultimately shapes the process of how knowledge is created and transferred throughout the organization (De Long and Fahey, 2000).
2.1.3.4 Knowledge application

Knowledge application are the processes actually concerned with applying and using the existing knowledge. Moreover, knowledge application initiatives involve using the knowledge in decision-making, problem-solving, designing teams to enhance productivity and develop trainings, that is to deal with human problems (Davenport and Prusak, 1998a, Al Saifi, 2015). Naturally, there is no use for knowledge management systems if the organization fails to apply the knowledge to its everyday working routines (Bharadwaj et al., 2015). In other words, knowledge itself does not guarantee firm performance, thus the knowledge ought to be applied and used in effective ways to achieve this.

Research advocates the advantages of conducting an analysis of the impact of organizational culture in developing knowledge management strategies that encourage knowledge conversion processes within an organization. Moreover, ‘by focusing on the cultural antecedents that define an organization’s culture, an organization can take small steps towards enhancing its knowledge-centered culture’ (Al Saifi, 2015, 2015, p. 181). Now, the relevant concepts and processes of knowledge management related to this study have been promoted. The next section addresses cross-functional integration in new product development and why this theory is relevant to this thesis.

2.2 Cross-functional integration in new product development

With the rapidly changing retail environment, effective new product development routines are identified as a key dynamic capability inside an organization to remain competitive on the market (Eisenhardt and Martin, 2000). In response to this, fast-paced and interdisciplinary-oriented work where different functions come together in teams have been revealed to get the job done more effectively than ‘highly structured functional organizations’ (Edmondson and Nembhard, 2009, p. 124). Thereof, cross-functional (multi-skilled, interdisciplinary or multidisciplinary are terms used interchangeably in literature) project teams and collaborations has become the standard by which companies develop and generate new products to the market (Keller, 2001). Not seldom are successful new product development project outcomes accredited to cross-functional project team constellations (e.g. Im and Workman, 2004, Nakata and Im, 2010, Hirunyawipada et al., 2010, Edmondson and Nembhard, 2009, Gemser and Leenders,
According to literature, the definition of cross-functional project work in new product development is defined as ‘the magnitude of interaction and communication, the level of information sharing, the degree of coordination, and the extent of joint involvement across functions in specific new product development tasks’ (Song and Montoya-Weiss, 2001, p. 65). Hence, simultaneous and interrelated assignments in joint new product development projects are nowadays ‘coordinated and negotiated as part of a dynamic journey’ (Edmondson and Nembhard, 2009), by composing cross-functional integrated project teams. Cross-functional project teams that relate to new product development typically refer to functions and roles such as research, design, engineering, marketing and sales, quality and production. To this end, a new product development project calls for integrating and sharing deep knowledge from each of the participating actors in the development process. The challenge lies in integrating all this diverse functional expertise within and between projects. As previously noted, the organizational culture influences whether knowledge transfer and organizational learning is encouraged through values, beliefs and work-systems (Janz and Prasarnphanich, 2003).

There are three major organizational benefits of implementing cross-functional teams in new product development: team implementation, integrating expertise and obtaining and using distributed information (Edmondson and Nembhard, 2009). But first, the challenges: project complexity, team diversity, temporary memberships and fluid team boundaries (Edmondson and Nembhard, 2009, pp. 127-130) are addressed.

### 2.2.1 Project complexity

New product development is one of the most knowledge-intensive processes where new knowledge continuously expands and changes (Söderquist, 2006). Further, Söderquist highlights that new product development projects typically are large-scale with a list of complex technical and organizational questions to be addressed and solved within a pressed time-frame. These questions take time to solve, and the solutions many times depend on compromises between requirements posed by both internal and external actors within the project. Moreover, all these cross-functional players have ‘different priorities, professional backgrounds and cognitive frameworks’ (Söderquist, 2006, p. 498), and reaching compromises can be both difficult and time-consuming. The many complex knowledge flows in new product development projects are crucial for creating successful products, thus they are difficult to manage. In compilation, the knowledge that is created
practically along the way in a new product development projects should desirably be integrated and transferred with already existing knowledge in order to secure the continuous expansion and development of knowledge for future projects.

2.2.2 Team diversity

Although the implementation of cross-functional project teams yields valuable benefits, there are also associated negative effects to this way of structuring an organization. Some research argues that team diversity and team performance have a negative relationship (e.g. Schippers et al., 2003, Gemser and Leenders, 2011, Hirunyawipada et al., 2010). This is particularly true when a team is exposed to crisis, change and uncertainty (Williams and O’Reilly, 1998). Noteworthy here is that the problems involved within the context of team diversity not only refers to differences in functional backgrounds. Age, gender and ethnicity are also dimensions that fall under the challenges of implementing diverse working teams (Gemser and Leenders, 2011). Nevertheless, cross-functionality may result in negative cognitive, emotional and behavioral biases since professionals that work together in a team perceive the others in the team as different from themselves (Gemser and Leenders, 2011). These effects are associated to the group and organizational culture within the company (Edmondson and Nembeh, 2009), meaning whether there is a culture within the company that is open towards working in cross-functional projects characterized with high diversity.

2.2.3 Temporary membership

As previously stressed, the typical cross-functional new product development team consists of a pre-defined group of key people. Nowadays, the prevalence of temporary team members in project-based teamwork is increasing (Lindner and Wald, 2011). That is, external specialists with expertise in specific areas, i.e. temporary project team members, are often included temporarily to support the project team on complex tasks. These temporary team members are typically involved in projects on an adjunct basis (Edmondson and Nembeh, 2009). New product development projects tend to become ‘patchworks of ad-hoc initiatives’ since they join projects for shorter times when their particular expertise is needed and stay until their task is completed when they move on to the next project (Söderquist, 2006, p. 499). In this dynamic way of working, the constellation of specialists working with the core development team resolves after a project is completed. To this end, the knowledge culture may be impacted as temporary
organizational routines and memory rarely emerge in such temporary project collaborations (Lindner and Wald, 2011). Another challenge of this organizational arrangement is that the temporary nature of the team can be both timely and problematic, since people need to familiarize themselves with each other before they can start to work effectively together (Goodman and Leyden, 1991, in Edmondson and Nembhard, 2009). Thus, the benefit of team longevity may be absent when integrating temporary team memberships as the standard way of working.

2.2.4 Fluid team boundaries

Given that new product development is mainly project-based nowadays and that some actors work on the project until its completion whereas others are active on an ad-hoc basis, the team boundaries are more or less fluid. Synonymously, the organizational structure of projects is organic. This claim is further supported by the fact that many project actors are engaged in more than one project simultaneously (Söderquist, 2006). Those firms adopting such an organic project structure considers it being efficient for ‘inter-functional knowledge sharing and for keeping knowledge management initiatives focused on the operational needs of each project’ (Söderquist, 2006, p. 509). However, this structure also provides challenges in the knowledge culture routines as there are ‘few incentives for knowledge transfer between projects and product families (Söderquist, 2006, p. 509). Project team stability (i.e. the extent of which the team members remain on the team over the course of a project) is said to maintain its stability the less team memberships changes during the project (Slotegraaf and Atuahene-Gima, 2011). In turn, project teams that are bounded (i.e. clearly defined and known by all team members) are likely to share a sense of belonging and identity which in turn motivates cooperative behavior (Edmondson and Nembhard, 2009). The less team stability and boundedness experienced within a project team, the less group cohesiveness, team performance and positive internal dynamics there is (Edmondson and Nembhard, 2009). Overall, fluid team boundaries are flexible and effective in many practical ways, thus, the internal collaboration and cooperative behavior may suffer do to these project constellations (Slotegraaf and Atuahene-Gima, 2011).

Now, the benefits of structuring organizations this way will be discussed.
2.2.5 Team implementation

Using cross-functional integration in project environments has intensely been put forward by literature to accomplish new product development tasks in more efficient and effective ways (e.g. Edmondson and Nembhard, 2009, Gemser and Leenders, 2011, Nakata and Im, 2010, Felekoglu, 2013, Hirunyawipada et al., 2010). Edmondson and Nembhard (2009) establish that the advantages are both internal and external. Internally, the development cycle becomes shorter, development costs decrease and the quality of the products increase. Further, creativity, open communication, consistency in decision-making and a shared understanding of the product under development are internal benefits of implementing cross-functional teams (Sethi, 2000, Genc and Di Benedetto, 2015). Externally, new product success on the market has proven to be associated to the use of new product development project teams (Edmondson and Nembhard, 2009, p. 125). Further, Bharadwaj (2015) claims that the organizational structure determines the degree of teamwork within the firm. Moreover, teamwork is encouraged if the organization is matrix-based as opposed to a structured with a bureaucratic hierarchical base. In this way, the formation of cross-functional teams can ‘ease the flow of ideas across departments, or provide venues for employees to communicate informally’ (Bharadwaj, 2015, pp. 424-425). In turn, this organizational structure provides basis for an effective knowledge sharing culture since knowledge can be exchanged interdepartmentally through socialization and personal networking.

2.2.6 Integrating expertise

The value of the team approach is that every team member brings his or her expertise to the team’s collaborative tasks. Mainly, the outcome of cross-functional teamwork collaborations is positive on project performance since ‘functional heterogeneity enables organizations to tap into and integrate a broader array of information and knowledge, enhancing their creativity, innovation and renewal’ (Gemser and Leenders, 2011). By working this way, crucial input from different fields work as an efficient mechanism for generating new and innovative thinking that leads to new products (Qiu et al., 2009). However, cross-functionality does not only refer to the integration of project team member’s expertise. Temporary team members constitute an important portion of knowledge in project-based organizations as well.

*Ad-hoc expertise*
Organizational rules and routines are fundamental for problem-solving in large organizations (Lazaric, 2000). However, when organizations are confronted with unexpected or new problems, improvisational ad-hoc resolution may be necessary (Gross, 2014). In this context, ad-hoc involvement of additional and temporary team members is not uncommon in new product development projects when the situation calls for it (Söderquist, 2006). Allowing cross-functional project teams to integrate this type of non-systematic and non-routine based temporary expert involvement can be beneficial in the perspective of knowledge management initiatives (Gross, 2014). Moreover, this type of organizational structure is believed to ‘positively affect new product success because the improvisational capability might enable the firm to effectively respond to changes in customer needs or in market demands’ (Gross, 2014, p. 726). Thereof, Gross (2014) concludes that organizations should develop capabilities for improvisational ad-hoc expert involvement and not only rely on prior routines and existing knowledge. Further, this type of improvisational behavior may lead to new and innovative solutions in problem-solving tasks (Gross, 2014). Another benefit of ad-hoc expert involvement is that since these people contribute to the knowledge sharing culture remarkably since they jump from project to project and hence secures the transfer of their knowledge immediately within and between teams (Söderquist, 2006).

2.2.7 Obtaining and using distributed information

As noted in the paragraph above, cross-functionality provides access to more and different sources of information and knowledge within a new product development project, and therefore enhances information processing capabilities (Gemser and Leenders, 2011). Benefits that stem from this opportunity include ‘heightened, high-quality learning experiences and facilitated interdepartmental product transfer’ (Edmondson and Nembhard, 2009, p. 126). Not only do the team members access information and knowledge from their own functional backgrounds and departments, they access knowledge from diverse external personal networks as well (Edmondson and Nembhard, 2009). Obtaining, using and distributing this external information within the rest of the firm is crucial, that is, to enforce an effective knowledge sharing culture through knowledge management strategies. Further, Gemser and Leenders (2009) found that team openness towards this external information and knowledge increases new product development performance. In the absence of cross-functional teams, this important interchange of information and knowledge is unlikely to occur. According to Hauptman
and Hirji (1996), two-way communication between different departments occur significantly more often when professionals are team members as opposed to when they work in independent functions. By integrating cross-functionality, hence, critical issues concerning the development can be addressed early in the process before it is too late and too costly. In summary, cross-functionality results in a knowledge culture characterized by increased information processing and absorption capabilities. Lastly, the overall effectiveness of cross-functional teams largely depends on how successfully all diverse functional expertise is integrated within the team (Qiu et al., 2009).

It is now time to conclude this theoretical framework by highlighting the importance of having an effective knowledge culture for integrating and transferring knowledge between cross-functional product development teams and specialists in project-based organizations.

2.3 The importance of knowledge culture for knowledge integration and transfer in cross-functional projects

Retentively, it is widely accepted in literature that knowledge is nowadays viewed as the most important resource in knowledge-based companies (e.g. Nonaka, 2005, Alavi et al., 2005, Bharadwaj et al., 2015, Zack, 1999, Gold et al., 2001). However, the possession of knowledge alone does not ensure improved organizational performance (Al Saifi, 2015). As many product development companies are managing some of the most knowledge-intensive processes in business (Söderquist, 2006), knowledge management in project-based organizations has become a complex but crucial task to manage (Ajmal and Koskinen, 2008). This is partly due to the prevalence of temporary team members in project teams, since in such organic project environments it can be hard to capture and re-use new and existing project knowledge since this knowledge is typically implicit. For this reason, the role of the knowledge management task force focuses on ‘grasping potentially useful knowledge, storing, transferring and supporting its sharing’ which needs to occur dynamically and ad-hoc during the life of the projects (Söderquist, 2006, p. 509). Failure to effectively do this causes project-based organizations to repeat the same mistakes project after project (Ajmal and Koskinen, 2008). As mentioned, this challenge is difficult to approach since the actors in new product development projects come from different disciplines and hence have their own cultures with different ways of
thinking and working (Kleinsmann et al., 2010). These individual cultures are not necessarily in harmony with each other, nor in harmony with the prevailing culture of the project in which they are working (Ajmal and Koskinen, 2008).

The integration of temporary team memberships complicates the knowledge creation and transfer processes further since some of those persons have never previously worked together nor expect to do so again in the future. Recalling to Lindner and Wald (2011), in such temporary and organic project structures with flexible team boundaries, organizational routines and memory is difficult to systematize. In this context, effective working groups are often characterized by having a ‘collective mind’ meaning that continuous cooperation, coordination and having collective views of the project outcome is desirable (Weick and Roberts, 1993). This team characteristic is particularly desirable in the context of knowledge creation and knowledge transfer processes since when project teams work cooperatively, the contributors develop and transfer implicit knowledge while completing their working tasks (Janz and Prasarnphanich, 2003).

Referring back to the SECI-model by Nonaka and Takeuchi (1995), project teams in new product development are highly engaged in the socialization mode of knowledge creation (implicit to implicit knowledge) as well as the externalization mode by transferring knowledge to other team members (implicit to explicit knowledge). To this end, knowledge management processes are ‘heavily influenced by the social settings in which they are embedded and are subject to various interpretations based upon organizational norms and social interactions among individuals’ (Alavi et al., 2005, p. 193). Further, organizational culture has major influential impact in affecting employee behavior (Ling-hsing and Tung-Ching Lin, 2015). In other words, it is the individuals within and in cooperation with the cross-functional project teams that influence the ways in which knowledge creation and transfer is carried through over time in organizations. In order to better understand knowledge management, more knowledge is still needed around how to best create and transfer knowledge between and within cross-functional project teams in new product development companies (Kleinsmann et al., 2010). To reach a collective mind in a cross-functional project cooperation, a strong directional organizational culture which is capable of synthesizing the various individual cultures within a project is required (Ajmal and Koskinen, 2008).
To summarize, organizational culture is critically important in facilitating a knowledge culture within an organization by means of influencing strategic knowledge management processes of knowledge creation, storage, transfer and application (e.g. Leidner and Kayworth, 2006, Ajmal and Koskinen, 2008, Davenport and Prusak, 1998a, Oliver and Kandadi, 2006, Alvesson, 2013). Ultimately, organizational culture and knowledge management strategies in synergy have the power to both support and hinder knowledge integration and transfer between cross-functional product development teams and specialists working in a project-based organization. Moreover, as the knowledge culture is ‘a way of organizational life that enables and motivates people to create, share and utilize knowledge for the benefit and enduring success of the organization’ (Oliver and Kandadi, 2006, p. 425), it can strongly influence its employees to pursue or to not pursue strategic knowledge management initiatives.

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We have now reached the end of the theoretical framework. The next chapter, Methodology, progresses to explore how this study was conducted from a scientific point of view.
3 Methodology

This chapter gives a detailed description of how the study was conducted through discussing the applied research methodology. The chapter motivates the case study research design and describes the applied data collection methods: interviews, observations and internal documentations. To avoid the risk of harming someone in the research process, ethical and moral considerations are discussed. Lastly, measures of quality are treated to secure the quality of the research.

3.1 Scientific aspects

The purpose of this master thesis, to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects, should be kept in mind while reading the chapter to follow.

According to Bryman and Bell (2015), researchers typically chose one of two dominating approaches to conducting research, qualitative or quantitative. The general orientation to conducting this business research is a qualitative research strategy. Qualitative research is typically distinguished from quantitative by referring to meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of a phenomenon rather than counts and measures of things (Berg, 2009). In addition, the qualitative approach concentrates to viewing social life in processes (Bryman and Bell, 2015, p. 407), which was the decisive factor when choosing between qualitative and quantitative research strategy in my case. Qualitative research was found suitable for this thesis simply because the phenomenon being studied could not be meaningfully expressed in numbers and measures. A great deal of descriptive detail concerning the studied phenomenon of the socio-cultural dynamics in cross-functional projects was reported from the data collection process, and the empirical results required to be observed and understood in practice where the relevant social structures and social roles of interest were interacting. As my task was to examine relevant social settings within the case company and the individuals inhabiting within it, the research included conducting in-depth interviews as well as direct and participant observations. Hence, the application of typical qualitative research methods enabled my understanding of the unquantifiable facts about the social roles and how structural events and patterns evolved over time inside the case company. Thereof, research methods aligned with the qualitative tradition were established as the central
research strategy. In addition to undertaking a qualitative research strategy, the research process was characterized by abductive reasoning, that is, the research searched for and selected the best possible explanation to the stated research issue. Further on this account, there were three essential differences that motivated the choice of applying a qualitative research strategy as opposed to a quantitative. The three fundamental differences comprise of the ontological orientation, the epistemological orientation and the principal orientation in the relationship between theory and the empirical investigation. The discussion below further justifies the configuration of the suitable research approach for this study.

3.1.1 Constructionism orientation

Ontology is about how we perceive the world around us (Bryman and Bell, 2015), and there are two dominating perspectives within it: objectivism and constructionism. A constructionism ontological perspective was chosen as this position is represented by the statement that ‘social properties are outcomes of the interactions between individuals’ (Bryman and Bell, 2015, p. 392), which was a critical part in conducting my research. The constructionism approach basically views individuals and their interactions between each other as what builds an organization. Moreover, without individuals constructing social codes within an organization, there would be no organization at all. Hence, the study of how reality is socially constructed is crucial in constructionism (Alvesson and Sköldberg, 2009). This brief explanation of constructionism is in consistent alignment with the nature of this thesis, as the aim was to increase the understanding of the socio-cultural dynamics in cross-functional projects in new product development. Within social relations in suchlike projects, the actors were observed when creating habits and routines in their everyday work actions, and their fixed patterns of thought and action were revealed. Within institutions, Alvesson and Sköldberg (2009) mean that its internal actors create different roles for themselves and for others. Further, institutions ‘cannot exist without being realized by human enactments in roles’ (Alvesson and Sköldberg, 2009, p. 27), and hence the roles come to represent the institution. Similarly, my appointed case company, my institution, was constructed by people, their created roles and their social actions. My task as a researcher was to study, understand and increase the knowledge of how the reality was socially constructed within these projects between these employees. Since I conceive knowledge as something that can emerge from social actor’s practices in interaction with their social realities, I position myself ontologically with a
constructionist stance. It is my understanding that it is a question of positioning myself philosophically when I commit to constructionism as opposed to positivism, and in all honesty, my further reflection of the matter is quite limited. However, my commitment follows my choice of study and method of analysis where I am a firm believer that all knowledge can be constructed in social processes within any given community.

3.1.2 Interpretivist orientation
An interpretivist epistemological position was chosen over adopting a natural scientific model as typically done in quantitative research projects. By taking the interpretivist approach, ‘the stress is in understanding the social world through an examination of the interpretation of that world by its participants’ (Bryman and Bell, 2015, p. 392). The basis for interpretive research is that knowledge is gained through observing a certain phenomenon in practice, and this can be achieved through studying the social context of the phenomenon only where it influences and is influenced by its social context (Rowlands, 2005). As I approached this project with an interpretive viewpoint, I did not aim to predefine variables or hypotheses about the phenomenon in order to understand it. Rather, I aimed to produce a deeper understanding of the social context and social processes influenced by the project contributors by exploring them from a close-up range inside my institution. My research interest was in the experience of how co-workers within cross-functional projects interacted with each other within complex social structures. Hence in my study, knowledge was gained through the intimate interpretation of the phenomenon in its real-life social context.

3.1.3 Abductive-oriented research
This section determines how the empirical investigation and its collected data was viewed upon, either by employing inductive or deductive reasoning. The qualitative research approach is typically associated with an inductive reasoning view of the relationship between theories and the empirical investigation, in the sense that it normally uses a grounded analysis of interview data and participant drawings to develop a theoretical understanding of the studied phenomenon (Bryman and Bell, 2015). Moreover, employing inductive reasoning seeks to generate theory based on the empirical investigation. On the other hand, deductive reasoning is commonly associated with quantitative research methods which refer to theory of what is already known, and from there designs a hypothesis to be subjected empirically (Bryman and Bell, 2015).
It was not easy to identify which of these two ways of reasoning perfectly suited my research since a mixture of both procedures seemed reasonable. Thereof, this research undertook an abductive reasoning which incorporated tendencies and characteristics of both approaches. Abductive reasoning is an important type of reasoning within qualitative research projects that refers to how ‘technical concepts and theories are derived from lay concepts and interpretations of social life’ (Ong, 2012, p. 422) while concurrently allowing dynamic interplay between the selected theory and its related concepts. This process describes my research process precisely; I bounced back and forth between known theory and my empirical observations made inside the case company up until the day my final conclusions were written. Moreover, it was my role as a researcher to understand, balance and use the knowledge obtained from observing the research phenomenon empirically and simultaneously utilizing relevant theory.

For example, I started with employing knowledge management as the primary theory for this thesis. However, as the research process evolved and I collected more and more empirical data, I realized that much of the collected data circulated around organizational culture and its impact on knowledge integration and transfer processes. Therefore, I realized that I needed to study knowledge management in synergy with the theory of organizational culture after some time. Hence, I practically made use of the abductive reasoning approach by bringing in the theory of organizational culture in order to complete both the theoretical framework, empirical analysis and discussion. Moreover, as was demonstrated here, theory and empirical data were complexly interrelated and thereof approached by allowing a process of ‘weaving back and forth between empirical data and theory’ (Bryman and Bell, 2015, p. 25). This mentality was performed continuously throughout the entire research process by maintaining a dialogical process between identified theory and the empirical data I collected in the form of interviewing co-workers, participating in matrix meetings and through other observations etc. As my empirical data required much attention to interpreting the meanings of the employees’ actions and behavioral patterns, I commit to the statement that ‘abduction is probably the method used in real practice in many case study-based research processes’ (Alvesson and Sköldberg, 2009, p. 4). As the results of this study indicated that knowledge management and organizational culture should be studied in synergy, the choice of employing abductive reasoning turned out to be successful since the relationship between theory and the empirical investigation was capable of both generating theory and using theory as a
background to conducting the study. The next section motivates the case study-based research design.

3.2 Research design

There are multiple research methods in the social sciences that are applicable to specific research issues. Some well-known research methods to choose from are experiment, survey, history, archival analysis and case study (Yin, 2014). The research method found suitable for this study was to conduct a case study. In alignment with the view of Merriam (1998) and Miles and Huberman (1994), case study-based research is appropriate when a phenomenon of interest occurs within a bounded context and the researcher is capable of specifying their phenomenon of interest. Further, it is important in case study research to collect data across various sources in order to be able to catch the complexity of the case and its entirety (Merriam, 1998, Yin, 2014, Alvesson and Sköldberg, 2014). As I was after studying the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects, I was both looking at a specific phenomenon within a bounded system and needing to draw data from multiple data sources in order to increase my understanding of the research issue. The motivations and justifications behind choosing to conduct a case study were primarily based on the reasoning and advantages contributed by Bryman and Bell (2015), Alvesson and Sköldberg (2000, 2009) and Merriam (1998). Minor inspirations came from contributions by Yin (2014). I selected these authors to base my work upon since they provided different step-by-step procedures to follow when designing a case study. I selected pieces from each author that were most appropriate and functional for my purpose of research. Moreover, Bryman and Bell (2015) largely inspired my sections of sampling, data collection process and choice of quality criteria. Alvesson and Sköldberg (2000) and (2009) were identified as appropriate role models as they highlight the significance of interpretation in qualitative research. Further, these authors encourage active interaction between the theoretical framework and empirical investigation, something that I found valuable in my own research process. Merriam (1998) and her epistemological stance was in alignment with my own commitment to constructionism, and hence she was identified as an important supporting source for me. She believes constructionism is the relevant epistemological orientation since reality is constructed by the interaction of individuals within their social worlds. Further, she claims that these realities cannot be viewed upon objectively as there are always multiple interpretations of realities (1998), which I adhere to myself. I affiliate with this view as
my main interest with this qualitative research was to understand the meanings and knowledge constructed by individuals in their social worlds. Also, Merriam’s step-by-step process of conducting literature review and theoretical framework as well as analyzing data largely inspired me during my own research process. Lastly, Yin (2014) brought smaller contributions to the table by means of helping me to distinguish between different research methods and clarifying pros and cons of conducting case study based research. However, as Yin commits to positivism in terms of epistemology, I could not apply his case study model to this particular research project as I undertook a constructionism view. Moreover, Yin demands that both qualitative and quantitative evidence should be combined in a case study. I did not include any quantitative sources in my research. Further, Yin emphasizes the necessity to include theoretical propositions before collecting any data (2014). This collided with my abductive reasoning approach, since I collected data and developed my theoretical framework in an integrative manner throughout the research process. In the next section I will describe how I designed my case study.

3.2.1 Case study

Case studies can be applied to many objects and contribute with knowledge of phenomenon of individuals, groups, organizations, social and political objects. Regardless what the field of interest may be, case studies derive from the desire to increase understanding and knowledge of a given social phenomena, as was the case in my thesis subject. My case study typology was intrinsic, meaning that my interest was only in one specific case. This design is the classic, single-case design (Johnson and Christensen, 2012). Further, case studies explore issues within a bounded system in a social context (Creswell, 2007). As the initial purpose of this thesis was to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects, there was heavy rationale for choosing this method in order to understand the social complexities around this phenomenon. Linking back to Creswell (2007), the bounded system in my case refers to the interaction between individuals that were part of the cross-functional projects in the case company, either as team members or as specialists. The study was defined as a single-case study as it focused on demonstrating the interaction within the research phenomenon inside one single case organization as opposed to multiple. Next, there were three approaches to case study design to consider: Descriptive, explanatory or exploratory. This project was exploratory
in its nature, as the purpose was to explore the situation inside a case company where the phenomena being studied had no single or clear outcome. Namely, exploratory research focuses on unfamiliar research issues where little is known about the phenomena, and that the main task as a researcher is to gain first knowledge and ideas about the issue (Krishnaswamy and Satyaprasad, 2010). In contrast, this study did not aim to explain how or why a condition became what is was (explanatory), nor to just describe the phenomena in its real-world context (descriptive) (Yin, 2014). In order to find solutions to the intended research question, extensive data collection efforts in the form of in-depth interviews and observations were necessary. Fortunately, the strengths of case study research include its ability to deal with various sources of evidence simultaneously (Alvesson and Sköldberg, 2014). Next, the sampling process is described.

3.3 Sampling

As this study was conducted at a new product development company located in Sweden, this is where the empirical data was collected over the course of approximately three months. Core members of the product development teams and temporary team members that were connected to the teams on a temporary basis were identified as the sample group for conducting interviews. Purposive sampling strategy was applied mixed with snowball sampling strategy.

3.3.1 Purposive sampling strategy

This thesis applied purposive sampling which is ‘a strategic way, so that those sampled are relevant to the research question being posed’ (Bryman and Bell, 2015, p. 429). In opposition, quantitative researchers emphasize probability sampling meaning that research participants are sampled on a random basis. Purposive sampling is concentrated to the selection of relevant units, which typically includes people, organizations, documents or departments (Bryman and Bell, 2015). As my research question suggested a particular category of people to be sampled, namely cross-functional project team members and specialists connected to the team temporarily, there was not a case for random sampling. Thereof, probability sampling could be dismissed immediately as an alternative sampling method. Following this, it was indicated in direct link to my research question that people inside the case company were the unit to be sampled. Hence, my category of people was based on qualitative interviewing of multiple key actors
participating in the projects. Emphasis was given to selecting subjects who represented the relevant sample group to interview, thereof I chose 3 team members and 3 specialists from different project teams. Emphasis was given to selecting interviewees that had different lengths of experience within the company, gender, roles etc. I tried to reach a broad array of perspectives to the phenomena being studied, and ‘a wide range of individuals relevant to the research question(s) enables this’ (Bryman and Bell, 2015, p. 428). The identity of the roles nor the teams of where the interviewees are employed will not be revealed for anonymity reasons. Furthermore, the purposive sampling embraced a sequential approach, where the initial sample group was gradually extended as the course of the research proceeded. Although the criteria for selecting interviewee participants was established at an early stage in the project, additional persons of interest with relevance to the posed research question were sequentially brought into the project as the empirical investigation process evolved. Thus, snowball sampling complemented the purposive sampling strategy in the search for relevant employees to be interviewed within the frame of the research issue.

3.3.2 Snowball sampling strategy
A snowball sampling strategy was utilized as a complementary approach to purposive sampling. First, employees with interesting attributes and professional roles with regards to the research subject were identified and interviewed. Thence, additional employees with similar attributes and relevant roles to the research issue were identified with help from the first interviewees’ and matrix managers’ referrals. I was provided with the email-addresses to potential interviewees, and then I contacted them directly and asked if they were interested in participating in my study. Some were able to participate whereas others could not participate due to tight time schedules. Because of these respondent-driven chain referrals, additional and necessary employees were located and added to the sample group. Moreover, some additional team members were brought in to the sample group as they were found to be relevant to my research topic. This way of sampling is sometimes the best way to locate necessary subjects with respect to the study (Berg, 2009), which demonstrably proved to be true in my case.

3.3.3 Sample size
‘As an investigation proceeds, it may become apparent that groups will need to be interviewed who were not anticipated at the outset’ (Bryman and Bell, 2015, p. 436). As
put forward here, this was the situation faced as the investigation process evolved. The data collection process was executed with an iterative mentality, that is, by allowing the interplay between the amount of sample representatives inside the case company to be decided along the way. After some data had been collected, the content of that data shaped the forthcoming steps of the data collection process. At last I reached a point where I had to set an end to the data collection process due to time constraints. Despite the fact that the time constraint forced me to proceed in the research process, I had gathered an extensive amount of useful empirical data from various sources. 7 face-to-face interviews were conducted.

3.4 Data collection

The process of collecting data throughout this project can be thought of as a circle of activities consisting of a set of interrelated activities. These activities were part of an integrative process, meaning that both small and large components of data was integrated successively with the aim of producing a rich array of data. Before moving on to describing the data collection process, it should first be declared that this thesis was conducted in cooperation with a co-researcher, Victor Svensson, from the Faculty of Engineering at Linnaeus University. We wrote two different theses that were independent of each other and our research purposes were not the same. However, we were both sitting at the same department at the same case company and studying the same process. As the case study research design required exploration of social interaction between employees within the case company in order to describe my specific research phenomenon, it should be mentioned that some empirical material was collected collaboratively. The material we gathered collectively accounts for some direct and participant observations. All interviews were carried out individually. Figures 4, 5 and 6 were produced collaboratively and can therefore (in slightly different designs) be found in both our theses. Now, a description of the various data sources utilized and the course of action when gathering its content is provided below.

3.4.1 Literature studies and theoretical framework

Merriam (1998) highlights the importance of conducting a literature review and constructing a well-structured theoretical framework in qualitative case study research. Moreover, literature review is an essential phase that contributes to the theoretical framework development and overall research design. In the literature review phase, this
thesis started by investigating existing scientifically peer-reviewed articles with correlation to the appointed field of research. OneSearch, EBSCO, Business Source Premier and Emerald online databases were utilized when discovering relevant articles for the research field. Boolean database searches were used in this process, and keywords such as ‘knowledge management’, ‘knowledge’, ‘implicit and explicit knowledge’, ‘new product development’, ‘cross-functional team’, ‘cross-functional integration’, ‘CFI’, ‘multi-skilled’, ‘multidisciplinary’, ‘organizational culture’ and ‘ad-hoc’ were entered. The different constellations of these keywords generated, at times, lists of dozens of articles of potential interest for the case. In order to navigate these lists, the executive summaries were browsed which resulted in eliminations of articles that were irrelevant to the research issue. At last, a relevant assortment of articles was settled and could be organized and synthesized for use in the theoretical framework development. The articles were collected across various academic journals. Worth mentioning is that the complete list of unreduced articles with belonging bibliographies served as inspiration in many cases for new articles for exploration. The citations in the text body refer to the reference list at the end of the thesis. After the literature review phase, the theoretical framework was settled with the employment of three main theories: knowledge management, organizational culture and cross-functional integration in new product development.

3.4.2 Data

Common sources of data used in a case study are: interviews, direct and participant observations (Creswell, 2007). The various sources applied in this project were viewed as highly complementary to each other.

3.4.2.1 Interviews

The primary means of collecting empirical data was through employing semi-structured in-depth interviews, as this method is valuable when collecting information and viewpoints from people living in the reality of interest (Alvesson and Deetz, 2000). The semi-structured interview type was identified as the relevant interview structure, which is a technique that embodies a presentational structure somewhere in-between the extremes of completely structured and completely un-structured interview techniques (Berg, 2009). My interview guide was composed of a set of predetermined questions which were posed in a systematic and consistent order. However, I had an underlying strategy when conducting the interviews with the semi-structured presentation structure.
The questions were formulated in words that allowed, and almost expected, the interview respondents to depart beyond the pre-determined questions. By employing this rather flexible semi-structured interviewing structure, I was able to capture spontaneous perspectives concerning socio-cultural characteristics influencing the individuals in their work activities, routines and patterns. Particularly, cultural tendencies that affected the working environment were revealed during the interviews.

The semi-structured interviews also demonstrated to be a successful choice as the pre-determined series of structured questions enabled comparisons between the many interviews that I conducted (Bryman and Bell, 2011). I started with an informal interview concerning process development inside the case company to better grasp the current situation of the working process and its recent transformation. Next, I interviewed employees which were members of the initial product development teams as well as temporary members working in the process. They represented different teams and different business areas. All interviews lasted approximately 45-60 minutes. See Table 1 below for a summary list of the interview respondents.

Table 1: Interviews

<table>
<thead>
<tr>
<th>Classification by Assignment or Department</th>
<th>Location</th>
<th>Date</th>
<th>Number of interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process developer</td>
<td>Head office, Sweden</td>
<td>May, 2016</td>
<td>1 á 45 minutes</td>
</tr>
<tr>
<td>Team members- Sales and market responsibles or controlling responsibles</td>
<td>Head office, Sweden</td>
<td>May, 2016</td>
<td>3 á 45 minutes</td>
</tr>
<tr>
<td>Specialists- Communication responsibles</td>
<td>Head office, Sweden</td>
<td>April, 2016</td>
<td>3 á 45 minutes</td>
</tr>
</tbody>
</table>

The next table demonstrates the interview guide employed during all interviews except the single interview regarding the development of the working process. The interview questions were designed and sorted by theory and belonging concepts. Practical themes and wordings were produced with the purpose of applying familiar language commonly used inside the case company. By using these common and familiar themes and wordings, expressions and responses in much detail could be extracted from the interviews. Since the data provided by the interview respondents was rich and thick, the groupings of
questions by theory and concepts supported me in the process of sifting through the narrative responses in order to fully reflect the overall perspectives of the responses.

Before reading the interview guide, the order of the questions needs to be explained. In order to start the interviews naturally, I decided to begin with broad and familiar questions closely related to how the case company is structured. This way I was able to achieve flow in the conversation at an early stage. Therefore, these questions (1, 1a, 1b, 1c and 1d) centered around the cross-functional way of working in projects with its perceived benefits and challenges. Next, I dimensioned in the perspective of culture since the company values heavily influence the ways of working and the ways of treating each other inside the case organization. Thus, this question (2) concentrated around whether and how implied social behaviors and attitudes impacted the employees’ ways of working. Now that I had grasped the background of the social contexts and everyday working realities where the interviewees resided, I moved on to ask about knowledge management related topics. Thus, these questions (3, 4, and 5) were designed with the objective of extracting responses concerning knowledge conversion processes considering both implicit and explicit knowledge residing inside the company.

Table 2: Interview guide

<table>
<thead>
<tr>
<th>Theory</th>
<th>Concepts</th>
<th>Practical themes/wordings</th>
<th>Question(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-functional</td>
<td>1) Cross-functional</td>
<td>-Cross-functional teams</td>
<td>-What is your role/assignment?</td>
</tr>
<tr>
<td>integration</td>
<td>teams</td>
<td>-Cross-border ways of working</td>
<td>-Can you briefly describe how you work in a project you are part of?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Working process</td>
<td>-What does the new working process mean for you in your everyday work?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Do you follow the process flow? If yes, how? If no, why not?</td>
</tr>
<tr>
<td>1a) Project complexity</td>
<td>-Project complexity</td>
<td></td>
<td>- Can you describe your collaboration/working process together with a team member/specialist?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- What works well in your collaboration with team members/specialists?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- What could work better in your collaboration with team members/specialists?</td>
</tr>
<tr>
<td>1b) Team diversity</td>
<td>-Team diversity</td>
<td></td>
<td>-What are the benefits of working cross-functionally?</td>
</tr>
<tr>
<td>Knowledge management</td>
<td>1c) Temporary memberships</td>
<td>What are the challenges of working cross-functionally?</td>
<td>Specialist integration</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>1d) Fluid team boundaries/ Organic project-based environment</td>
<td>Flexibility in working across individuals/teams/department borders -Cross-functional ways of working -Silo-thinking</td>
<td>Would you say there is a systematic and standardized way of working for you?</td>
<td>Would you prefer a more or less systematic way of working? If yes, why? If no, why not?</td>
</tr>
<tr>
<td>Knowledge culture</td>
<td>2) Knowledge culture</td>
<td>What does the organizational culture mean to you?</td>
<td>Social interaction: Behavior and attitudes -Ways of working -Core working process</td>
</tr>
<tr>
<td>3) Implicit/explicit knowledge</td>
<td>Knowledge -Competence</td>
<td>How do you share your knowledge to colleagues?</td>
<td>-Can you share an experience when you shared knowledge to a colleague? A positive and/or negative experience.</td>
</tr>
<tr>
<td>SECI-model: Socialization, externalization, combination, internalization</td>
<td>Social interaction -Communication</td>
<td>If you need help to complete a project, how do you go about? How do you access that knowledge?</td>
<td></td>
</tr>
<tr>
<td>Knowledge conversion: Creation, storage, transfer, application</td>
<td>Sharing knowledge -Shared solutions -Common ways of working</td>
<td>Would you say that new knowledge is created in your projects?</td>
<td>-If yes, is this knowledge stored for re-use? If no, why not?</td>
</tr>
</tbody>
</table>
3.4.2.2 Observations

As I have been engaged weekly in a social setting relevant to my research issue over the course of three months, I participated in and observed daily work routines, meetings and interactions between co-workers with different roles. Both direct and participant observations were carefully noted in a research logbook and these notes functioned as a valuable complementary source of empirical data in the analysis chapter. Worth mentioning is that I entered this case study with a contextual pre-understanding of the case company as I have been employed there part-time for 2-3 years. Over this time, I worked (and currently work) as a sales co-worker and therefore have a pre-understanding of the company’s organizational structure, culture, processes, ways of working, tools and intranet. Beyond that I have been part of other academic projects in collaboration with the case company prior to the start of this master thesis. In these 2 projects, I was exposed to the product development process of interest in this thesis, hence I had some knowledge about the process entering this research project. I received access to the case company through my master program which is a collaboration with the case company. Further, I was provided access through my case company supervisor to enter various case company contexts and platforms. Moreover, he invited me and my co-researcher Victor Svensson to meetings and events that he found relevant for our projects, and also introduced us to employees of relevance to our theses. The meetings and events we attended were primarily concentrated to the development of the process and the ongoing work towards standardizing the process and achieving common ways of working. Thus, multiple interviews and observations were enabled to serve as major sources of empirical data. The table below summarizes the observations I was part of and the purpose for participating in each observation. Noteworthy to say is that these meetings were all attended together with my co-researcher, however the material we collected was used for different research purposes.

Table 3: Summary of observations

<table>
<thead>
<tr>
<th>Classification department or matrix</th>
<th>Purpose of meeting</th>
<th>Location</th>
<th>Date</th>
<th>Number of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matrices management meeting</td>
<td>Process mapping launch</td>
<td>Head office, Sweden</td>
<td>February, 2016</td>
<td>1 á 180 min</td>
</tr>
<tr>
<td>Engineering, quality and requirements matrix</td>
<td>Process mapping launch</td>
<td>Head office, Sweden</td>
<td>February-March, 2016</td>
<td>2 á 90 min</td>
</tr>
<tr>
<td>Event Type</td>
<td>Description</td>
<td>Location</td>
<td>Date Range</td>
<td>Duration</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>---------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Communication matrix meeting</td>
<td>Process mapping launch</td>
<td>Head office, Sweden</td>
<td>March, 2016</td>
<td>2 á 45 min</td>
</tr>
<tr>
<td>Sales matrix meeting</td>
<td>Process mapping launch</td>
<td>Head office, Sweden</td>
<td>March, 2016</td>
<td>1 á 45 min</td>
</tr>
<tr>
<td>General company presentation</td>
<td>General presentation of the current situation of the company, open to all co-workers</td>
<td>Head office, Sweden</td>
<td>March, 2016</td>
<td>2 á 90 min</td>
</tr>
<tr>
<td>Communication management, personal meeting</td>
<td>Input, description of the communication matrix assignment, and dialogue around our questions</td>
<td>Head office, Sweden</td>
<td>March-April, 2016</td>
<td>3 á 90 min</td>
</tr>
<tr>
<td>Process developer, personal meeting</td>
<td>Input, description of the process development and transition and dialogue around our questions</td>
<td>Head office, Sweden</td>
<td>February-May, 2016</td>
<td>3 á 45 min</td>
</tr>
</tbody>
</table>

3.4.2.3 Documentations

Internal case company documentations and standard forms have been a complementary source of information during my research process. The purpose of utilizing such like documentation was to create depth in the understanding of the case company’s current situation and internal ways of working. Multiple documents connected to new product development working processes were studied and are discussed in the empirical analysis. Also, I was provided access to the company intranet where tutorial internal trainings of the new process were studied.

3.4.2.4 Storing empirical data

All preceded collected empirical data was carefully transcribed and stored. A research logbook documented all my observations. Also, the in-depth interviews were closely documented by attentive recording and note-taking.

3.5 Analysis method

The method of analysis is extremely important in qualitative research due to the difficulty of handling a large and cumbersome data collection (Bryman and Bell, 2015). Further, the richness in the database is attractive, thus analytic paths within that richness can be very hard to find (Bryman and Bell, 2015). According to Merriam, ‘data analysis is the process of making sense out of the data which involves consolidating, reducing and
interpreting what people have said and what the researcher has seen and read— it is the process of making meaning’ (Merriam, 1998, p. 178). During data analysis, the case study researcher always reports on the case as it is the primary unit of analysis (Johnson and Christensen, 2012). Furthermore, when people and smaller groups of people are studied, the researcher typically attempts to reconstruct the different perspectives of the realities expressed by the participants (Johnson and Christensen, 2012). This was true also in my case study. The goal of my analysis chapter was to present a rich and holistic description of my case and its associated social contexts. Language is important in doing this since it is through language employees exchange information, knowledge and experiences by interacting with each other (Bryman and Bell, 2011). Thus, I was inspired by what is referred to as narrative analysis when it came to describing the empirical data I collected over the course of this thesis work. As defined, ‘narrative analysis is an approach to the elicitation and analysis of language that is sensitive to the sense of temporal sequence that people, as tellers of stories about their lives or events around them, detect in their lives and surrounding episodes and inject into their accounts’ (Bryman and Bell, 2011, p. 531). Moreover, I was inspired to reflect the answers and stories in narrative form that I heard during the various interviews and direct observations I was part of. Hence to some extent I applied narrative analysis techniques when describing the social context I had been studying. I committed to this approach since it supported me in conveying a ‘clear sense of an organization as an arena in which a variety of perspectives and viewpoints coexist’ (Bryman and Bell, 2011, p. 531). This was important for me as I was interviewing various roles and persons across the organization. I analyzed my large and complex body of data in three defined concurrent flows of activity: data condensation, data display and drawing
conclusions. I was inspired by Miles and Huberman’s (1994) approach to analyzing qualitative data. The model below illustrates the interactional and cyclical activity flow.

(Miles et al., 2014, cited Huberman and Miles, 1994)

**Figure 2: Components of data analysis**

### 3.5.1 Data condensation

Miles et al. defines this activity as the process of ‘selecting, focusing, simplifying, abstracting and/or transforming the data that appear in the corpus of written-up field notes, interview transcripts, documents and other empirical material’ (Miles et al., 2014, p. 12). I applied data condensation continuously through writing up summaries of my empirical data, that is, the notes I took during the interviews and observations. After doing this, I developed themes and categories for further analyses in order to label symbolic meaning to the compiled empirical data. This was a central part of my empirical data analysis as it deeply supported me in interpreting the initial meaning of my raw empirical data and enabled me to filter for regularities and common patterns. My data condensation process supported me in identifying good leads that came directly from the hearts of the participants. Several keywords were identified through the interview process; they are summarized in the table below according to relevant theory.

**Table 4: Interview keywords**

<table>
<thead>
<tr>
<th>Theory</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-functional integration</td>
<td>Specialist, core team, defined roles, clear responsibilities, guidelines, framework, roadmap, holistic view, time, time-planning, busy schedule, dependent of each other, multiple projects running simultaneously, communication, differences, expertise, skills, involvement, exclusion,</td>
</tr>
</tbody>
</table>
3.5.2 Data display

I did not want to get trapped in structuring my extensive pool of data in a poor and spontaneous way, nor to jump to unfounded conclusions. Hence, I designed my own way of displaying my condensed data in a thematic way. It is claimed that good displays of data are the key to a robust qualitative analysis (Miles et al., 2014). My displays are illustrated, discussed and analyzed in the form of thematic categories (see empirical analysis). The empirical analysis chapter is categorized in two parts. Part one is of more descriptive character since it also describes what the organization looks like, how employees perceive the organization as well as the internal changes currently taking place. Part two is of slightly more analytic character. Traditionally, data is displayed with a concept-driven approach. However, the concepts in my study connected with each other on too many levels, so in order to avoid repetition in chapter 4, I decided to design a framework consisting of result-driven themes instead. The wordings of the themes are picked up along the way in the empirical investigation. In the following chapter (5), as will be encountered, these themes are divided into couples of contradictory opposites which are further placed and discussed in relation to each other.

3.5.3 Drawing conclusions

The third activity stream of the analysis is the ‘interpretation of patterns, explanations, causal flows and propositions’ (Miles et al., 2014, p. 13). This is the part where I translated my interpretations of the studied social phenomenon into final conclusions, see chapter 6. This chapter also lists the theoretical contributions of the study as well as implications for further research.
3.6 Ethics

There are ethical principles common in all social research, however, management research takes place in a context that requires specific consideration (Bryman and Bell, 2007). An extensive amount of research and data gathering was conducted over the course of this thesis. It was classified as a top priority from the start of the research to collect, handle and analyze the gathered information in a careful and fair manner. During the interviews and observations, it was important to not violate any rules, privacy agreements, guidelines or personal limitations. I interacted to the best of my knowledge in a political correct manner with all stakeholders from the start to the finish of the research. The potential to harm anyone through the research process was paid high respect. The following criteria were collected from Bryman and Bell (2007).

- **Confidentiality:** All supporting material received with the objective of investigating the intended research issue were held strictly confidential. Regardless of whether confidential data concerned individuals, teams or the case organization at large, this requirement was strictly enforced.

- **Informed consent:** The interviewed employees and any employees present in the case company meetings where I observed were always ensured full informed consent of my attendance and purpose for being there.

- **Anonymity:** As many interviews were conducted throughout the course of the research, many different perspectives and opinions were heard. All identities of participating individuals were kept anonymous. The names of the interviewees’ roles were not revealed either, nor was the identity of the case company.

- **Honesty and transparency:** The need to openly and honestly communicate information about this research to any interested party was considered. The goal with this research was in all situations to meet and satisfy the wish of the case organization as a whole, and not individuals or specific groups within the organization. The benefit to the case company at large was valued higher than benefits on an individual employee or smaller group level.

- **Reciprocity:** The overall goal with this research was that the outcome should be of mutual benefit and future exchange to both the scientific community, the case company and for myself.

- **Misrepresentation:** The need to avoid misleading and misrepresenting reporting of findings was considered carefully. To the best of my ability, all involved
participants and the responses they contributed with in the research process were treated fairly.

3.7 Quality criteria

There has been recent discussion around the significance regarding the quality of qualitative investigations (Bryman and Bell, 2015). Validity concerns are challenging to handle in qualitative research, however still crucial to emphasize (Ghauri and Grønhaug, 2005). Bryman and Bell (2015) discuss the importance of ensuring quality in qualitative research studies by suggesting the use of different quality measures in two categories: Trustworthiness and authenticity. This thesis relates to several of those criteria.

3.7.1 Trustworthiness

3.7.1.1 Credibility

Bryman and Bell (2015) highlight that the criteria of credibility are particularly evident in terms of trustworthiness when researching social contexts and realities. It is important that the researchers’ perceptions and findings accurately corresponds to the actual realities which were studied. I partly fulfilled this criterion through having multiple critical eyes continuously discussing the credibility of the perceptions and findings of the study. Moreover, I received input and valuable guidance from external eyes; my co-researcher, tutor, case company supervisor and examiner. However, there were some constraints that significantly limited the credibility of my study.

First of all, the theory of organizational culture turned out to be more central to the totality of my study than I had anticipated from the beginning. Moreover, my realization of studying organizational culture in synergy with the knowledge management theory grew the further I came in my empirical investigation. What I had anticipated to research from the beginning, knowledge management between cross-functional product development teams and specialists in a complex project-based business environment, directed me successively towards the organizational culture literature. As part of my choice of employing the abductive reasoning approach, it was possible for me to bring in organizational culture at a later stage of my research process. However, if there would have been more time, I would have balanced my literature review in a better way and thus merged knowledge management with organizational culture at an earlier stage in the
research process. Also, I would have preferred to conduct second interviews, where I could have placed heavier and direct focus on the tensions I had found between the organizational culture and the knowledge management strategies (process standardization). Further and due to the time constraint, if I could repeat my research process I would have preferred to expand my current interview sample group to interview more than 3 team members and more than 3 specialists. Overall, if I had been able to invest more time in both my literature review and in my empirical investigation, the credibility of my key findings would be stronger since my portrait of findings from the social realities I studied would be more accurate.

Further and given that my research was a single-company case study, my results would have increased in credibility if they were also investigated in other companies facing similar challenges. To this end, my theoretical results are limited in their academic contributions since they were drawn based on the situation of one single company and its internal company culture and ways of working. On this note, I have promoted suggestions for further research based on my study’s findings in the final chapter of this thesis.

3.7.1.2 Transferability

This criterion concerns whether the findings and conclusions of the study are transferable beyond my own study’s context. As qualitative research generally entails an intensive research of a smaller group or of individuals, the findings tend to be unique to the specific case where the research was carried through (Bryman and Bell, 2015). Despite the fact that this study was carried out at a single Swedish organization, I regard the findings as relevant to any company challenged with knowledge transfer in project-based organizations set up of cross-functional teams. By saying that the findings may be relevant to other studies I do not claim that they are per se generalizable. Moreover, my case study may not be considered generalizable since I sought to increase my understanding and to explain socio-cultural patterns inside a specific case company. In other words, the small group of individuals and employees that I chose to study were not necessarily representative for a larger population. The ultimate goal of my case study was to focus on the uniqueness of my case and to develop an understanding of its complexity with the help of recognized theories. However, my wish was to yield findings that could partly be applied to other relevant studies beyond my own, however the totality of my
study does not claim generalizability. Nevertheless, there may be favorable pieces of this study that can be applied elsewhere in industry and academia.

3.7.1.3 Dependability

According to Bryman and Bell (2015), it is recommended to ‘audit’ the research process with respect to complete fulfillment of the trustworthiness criteria. In line with this suggestion, I carefully documented how this research was conducted by different types of archives. First, I documented daily activities in a personal logbook in order to keep track of my own progress, but also to audit dates of events such as interviews and matrix meetings. Secondly, all collected empirical data was archived. For instance, the face-to-face interviews were both recorded and written down in notes in order to eliminate errors during citations etc.

3.7.1.4 Reflexivity

This criterion concerns what the researchers’ personal impact on the research process was. Moreover, researchers ‘talk about ourselves and our presuppositions, choices, experiences, and actions during the research process in a sufficiently precise way so that it allows others to follow what we mean and did’ (Mruck and Breuer, 2003, p. 191). When trying to answer in which way the interactions between myself and my chosen research participants and how the outcome of my research was influenced by my own behaviors, perceptions and how I personally make meaning of things, there was no easy answer. As my study aimed at creating an enhanced understanding of socio-cultural dynamics in cross-functional and project-based organizations, I needed to reflect upon to what degree I allowed my background and past experiences to influence my research and the outcome of this process.

Self-reflection was the key for me to acknowledge the value of my findings as well as realizing the limitations of my own research. As my research process matured I realized that my choices related to my research were nuanced by my personal experiences and interpretations of the company. As I had previously worked there and was therefore familiar with the organizational culture, I realized I was to some extent limited by my own fascination and loyalty to the company. It was a challenge for me to undertake the role of an independent researcher. However, with time, I learned to see my own subjectivity and reflexivity as a possible resource for increasing knowledge, both for my
reader and for myself. I understood that my interpretation of the empirical data was not objective and thus did not mirror a single reality. Rather, I viewed all knowledge as constructed jointly by me and my research participants through our social interaction.

3.7.2 Authenticity

3.7.2.1 Fairness

This criterion emphasizes whether the empirical data justifies the opinions put forward by the sample group in a fair way. I attempted to fulfil this criterion by including both core team members and temporary team members in my sample group. The interview participants were made sure to have different professional roles, experiences, gender, and length of employment in the company. To the best of my ability and within the given timeframe, I fairly justified the collected empirical data. However, my study has significant limitations in justifying this criterion due to some conditions.

First, the fact that I had previous experience from working within the company can be viewed upon as both a strength and a limitation. As I had developed a positive perception of the company culture over the course of some few years of employment, I may have been somewhat biased in my choice of the questions asked and in the interpretation of the interviewees’ responses. For example, I entered this master thesis with a positive perception of the organizational culture and its impact on the working atmosphere. Thus, I also had a pre-understanding of what the challenges of working in an environment so largely influenced by the organizational culture could be like. Given that I possessed this knowledge prior to this research project, I could spend more time on analyzing the organizational culture as opposed to learning about the culture from square one. However, I was simultaneously partly nuanced from having positive experiences from working within this culture.

Secondly, my sample group was in all honesty too small to claim authentic fairness. Due to the time constraint of three months, I had to put an end to my data collection process despite the fact that I had more potential interviews to hold. If I had more time, I would have made sure to include more interviewees that could have represented most or all business areas of the organization. As is the case now, a small sample group represents the viewpoints and voices of the larger organization, which is not quite fair.
3.7.2.2 *Educative authenticity*

In close relation to ontological authenticity, this criterion seeks to improve the way others with interest in the research see opportunities to improve their own social realities with similar challenges (Bryman and Bell, 2015). In fulfilling this criteria, I hope that this thesis work will be shared and reflected upon within the case company, but also to persons with academic interest in the research topic.

***

We have now reached the end of this chapter. The empirical analysis to follow provides, discusses and analyzes the empirical data collected in this case study with close circumstantiality to previously posed theory.
This chapter describes, discusses and analyzes the gathered empirical data from this case study in relation to previous presented theory. The chapter primary consists of interviews and direct and participant observations, however, case company documentations were used to a smaller extent.

The content of this chapter is described in narrative form and is categorized into two parts, which in turn are divided in thematic categories. Part one describes, contextualizes and analyzes the empirical data in relation to knowledge integration and transfer in cross-functional projects. Part two repeats this process but with organizational culture and knowledge integration and transfer as the main focus.

Part one is of more descriptive character since it simultaneously describes the structure of the organization and how the employees perceive it, as well as describes internal changes currently taking place. Part two is of slightly more analytic character.

The case company of which this thesis is conducted for is a Swedish multinational corporation. The company is a global leading retailer within its industry and operates in dozens of countries worldwide. The company has production units and suppliers in various countries outside Sweden. Approximately 1 300 co-workers divided in different departments and with different assignments work with identifying customer needs and developing products to fulfil these needs. The head office consists of open office landscapes where the co-workers are organized according to product groups. There are 8 business areas and all in all 55 development teams that are spread over these business areas depending on product group and range complexity. As the purpose of this research was to increase the understanding of the socio-cultural dynamics of knowledge integration and transfer in cross-functional projects, the empirical analysis to follow includes the condensed and relevant data collected in interviews, observations from formal and informal meetings as well as internal case company documentations.

4.1 Knowledge integration and transfer in cross-functional projects

Recall that knowledge management strategies strive to identify where and what sources of knowledge the organization already possesses, what needs to be known in the future as well as creating an organizational culture that promotes learning, creation and transfer of knowledge across the organization. In integrating knowledge management strategies, organizations can learn to convert knowledge through the processes of creation, storage,
transfer and application. With this in mind, let us move forward and analyze the situation within the case company in relation to knowledge integration and transfer in cross-functional projects through three identified key thematic categories: 1) Towards a standardized process, 2) High diversity and flat organizational structure and 3) Follow-up. These themes emerged during the empirical investigation.

4.1.1 Towards a standardized process
The studied process in this thesis is concerned with organizing, developing and launching new products. This process is a knowledge management strategy which aims to manage knowledge integration and transfer by planning and sequencing the product development projects. There is a formal kick-off of the project, whereafter as many activities as possible are done in parallel and cross-functional team involvement is scheduled early in the projects. More time is spent early in the process to develop the concept, idea and design with the purpose of saving costs and time towards the end of the development projects. Moreover, this way of working secures that the product development projects connect with the internal business ambitions throughout the entire product development cycle. Although there is a core working process in place to sequentially support the projects from the kick-off stage to market launch to follow-up, this was not the case a few years back. The case company is in a transition phase where the goal of the organization is to achieve standardized ways of working across the business as well as securing systematic working-routines in the complex network of stakeholders consisting of core development teams that are surrounded by supporting specialists that contribute to the team on ad-hoc bases. The process workflow is currently being mapped, however, prior to this it underwent major transformations.

The previous development process was largely functional and characterized by project leaders that pushed their ideas through the different departments and absorbed contributions from these departments along the way. The project leader used to work with a number of contributors and integrating their knowledge and contributions into the process. The project leader used to work with 50 people or more who contributed to the project, and these contributors were in turn involved in 50 or more projects simultaneously. Thereof, the contributors were not able to see the totality of all the projects they were part of, and as a consequence of this efficient knowledge storage and transfer was challenging to systematize. At that time, the company was smaller and better
equipped to be managed and organized this way since individuals with different competences were easier to get in touch with when the project required their knowledge. This process was largely influenced by the organizational culture and entrepreneurship, as illustrated below:

‘The context was different before we launched our new process. There is no good and bad process, it depends on the context. This was a really good model before, it was working really well. It was simple and a lot of entrepreneurship was allowed. There were less markets, less legal requirements and a number of more influencers that made the context less complex. For example, the amount of legislation and legal demands has grown exponentially. Also, we opened in many new markets. It became more and more complex over time’

(Process development)

Moreover, the old process is viewed as being largely influenced by the culture and values. It was inspired by creativity, spontaneity and entrepreneurship. As described by the co-workers, one project leader may have come up with a good idea for a new product which was then pushed through the process in its own path. The new process, on the other hand, is more inspired by delegating ownership and responsibility and to formalize things. The employees emphasize that there is no good and bad process, as in the quote above, but the surrounding contexts now and then calls for a different type of process. What happened was that when the company started to grow at a fast pace, the old way of working resulted in longer time-to-market and caused inefficiencies in the process. Thereof, the major differences to the product development process which is in place today has to do with the standardization of phases. All phases were still executed before; however, they were not formalized;

‘… how we prepare, how we create the connection to the project to the action plan, how we create the concept of the product, this was all not part of the old process. It was still done, but it was done by the product developer in isolation. Not in the context and connection to the business. The projects were finished when we had the product council and approved the product’

(Process development)

The old process allowed personal entrepreneurship and was characterized by project leaders that worked according to their personalities and individual ways of working. In broad terms, the old process was described by the co-workers as something like this:
There were few formalized competence profiles nor pre-defined responsibilities. For instance;

‘The idea still came from the action plan, but preparing that idea used to be done only by the product developer [project leader]. They would start approaching designers, [...] what the concept should be and then their individual profile would look at one type of problems and less at other types of problems. Maybe they would focus more on the beauty and function of the product and less on the supply set-up or what the concept for how to meet the customer should be like’

(Process development)

According to my interviews, it appears that the biggest difference to today’s process concerns ownership, governance and decision-making. Moreover, the decision-making process used to be rigid and time-consuming since all projects had to walk through the same decision-points regardless of project complexity. Since all projects historically had to walk through the same decision-making processes there were numerous inefficiencies in the process. As many projects are large-scale and complexly technical with pressed time-frames in new product development (Söderquist, 2006), it was advocated in the company that time could be gained and invested in the more complex projects by allowing the less complex projects to pass decision-gates more smoothly. A process developer describes how it used to be;

‘The big difference was in the governance. Before there were distinct decision-points, councils. 15-40 persons used to see the prototypes, drawings and make decisions around the product offer, and not around the project. They would go and give critical input on the product design for example. One consequence it this was that these councils were happening at pre-defined times. As it was hard to get the whole management team available for a meeting when the project needed it, pragmatically what was happening was once every two months’ time was dedicated for councils. Those projects that were ready were taken through the councils. There was lots of inefficiency since the simpler projects waited to be
pushed through and the more complex projects were compressed to be able to go through the council. All projects regardless of the complexity were going through the same meetings’
(Process development)

There were internal opinions in the organization, as exemplified in the quote above, that there was a need to eliminate inefficient and non-value adding activities in the process. The major change for improving the product development process was to implement cross-functional teams, which according to literature enables organizations desire to integrate more information and knowledge in the process, enhance creative thinking and innovation (Gemser and Leenders, 2011). Thus, the case company is now a matrix organization which is further composed of cross-functional product development teams that work in a project-based environment. Each team consists of five roles represented from different departments that hold different competences; project management, project controlling, technique, supply chain and sales. Each team member has a pre-defined network of stakeholders and ad-hoc specialists that contribute with knowledge into the core product development team through each member. See illustration below for the case company cross-functional team set-up:

![Cross-functional team approach](Illustrated by Hamlin and Svensson, 2016)

**Figure 4: Cross-functional team approach**

By working this way, the organization hope to provide the core teams with a better overview and holistic view of the range. Another benefit of designing the organization this way is that the product success may be positively affected since this ‘improvisational capability might enable the firm to effectively respond to changes in customer needs and
market demands’ (Gross, 2014, p. 726). This is consistent with my experiences where the co-workers in the process declare to experience various improvements in the everyday work environment. For example, early involvement of the project contributors and less rigid decision-making processes since the team no longer has to wait for the management team to be set together to make decisions. By allowing the core teams more self-directedness and freedom in decision-making, the idea is that the organization can become more flexible and not be as tightly dutiful the year cycle. Moreover, the process is adjustable according the complexity of the projects:

‘The process is based on checkpoints, you can move through them in fairly short amount of time and you can also stretch it over 2-3 years which is also how the process is designed. It is based on the need of the project. Even in the faster projects we adhere to the process’

(Team member)

Notoriously, the project teams are supported by temporary team members. Thereof, the team boundaries are quite fluid and common and systematic ways of working are observed as an opportunity for improvement in the overall development process. This realization is consistent with research which argues that this organizational structure promotes few incentives for knowledge transfer (Söderquist, 2006). Both the project teams and specialists work on various projects simultaneously, which further contributes to the fluid project environment and difficulty in capturing knowledge for storage and future re-use in other projects as this knowledge is typically implicit (Ajmal and Koskinen, 2008). For these reasons, the tool process mapping is lately used in the organization for the purpose of structuring and analyzing the current situation of the process and to further create a basis for a standardized and common way of working across all business areas. According to the different matrix managers, the process mapping is a good working tool which is the starting point for implementing consistent and standardized ways of working across the entire business, as expressed at a general company presentation:

‘Moving away from working in silos and start to work together for real’

(General company presentation, observation)

There is agreement over the matrices that the mapping of the process is more than just a tool, rather it is believed that it will enable the employees to better grasp the totality of
the process and hence increase the understanding of one’s own and of colleagues’ roles, assignments and responsibilities. This is encouraged in knowledge management literature where Nonaka and Takeuchi (2005) for example suggest conscious management of the organizational knowledge flows. According to interviews, these responsibilities were not always clear before the process was mapped, but the hope is that this will improve since they are now visualized in an interactive task management tool online. As exemplified here, the company has recently implemented a strategic knowledge management tool which provides the platform needed to mobilize the human knowledge asset (Gold et al., 2001). These tools largely enable common ways of working within an organization by influencing internal habits of communication, collaboration, information sharing, learning and decision-making (Oliver and Kandadi, 2006). This is a practical example where the company draws from the SECI-model and employs combination processes. Moreover, explicit knowledge is collected, combined, edited and processed through information technologies with the intention of generating new knowledge to further be transferred across the organization (Nonaka et al., 2000). The hope of the organization through such combination processes is to enable knowledge transfer within and between project teams. On this note it is however also raised in a matrix meeting that this tool is not to replace personalized communication between the co-workers. Although much information can be codified with the help of information technology related tools, it must not be forgotten that:

‘This is only a collaboration tool; it should not replace human communication’
(Matrix meeting, observation)

The mapping of the workflow process includes both the development teams as well as the specialists working with the team on temporary basis. From a process development point of view, it was repeatedly pointed out that:

‘It is important that it is understood that this process was not designed to exist on top of people, rather, it needs to be explained that this process mapping was done to support the co-workers in their everyday work’
(Matrix meeting, observation)

For this reason, the mapping was done by evaluating together with the co-workers how people see their assignments in their matrices. By receiving hands-on input from the co-
workers that actually work in the process was a good start to realizing strategic knowledge management implementation by moving towards a standardized process. Upon the launch of the process mapping, the organization strives towards identifying what needs to be delivered and by whom and when in any given project. To this end, it was raised in a matrix meeting that the organization is not always aware of the pre-conditions that are necessary particularly for some specialists:

‘We have to be aware of what it takes for specialists to actually be a contributor’

(Matrix management meeting, observation)

On this note, it is discussed in matrix management meetings that there has to be an even sharper definition of what the deliverables actually require from the co-workers in terms of time, input and output. Moreover, there has to be a common view over the information flow considering ‘what’, ‘when’ and ‘who’ does what in the projects. This is something that was also observed in matrix-meetings where it was revealed that it is not perfectly clear who is responsible for what. By clarifying this, the hope is to support the collaboration between the core development team and specialists even more, particularly since some groups of specialists at times perceive that they are not fully involved and aligned in the projects:

‘We do not always understand the responsibilities in the same way’

(Matrix meeting, observation)

By continuously improving the recently launched process with its related workflow mapping, the organization hope to embrace structure and common ways of working in order to secure knowledge integration and transfer across individuals and project teams. According to the descriptions provided by co-workers and internal company documentation, the new process roughly looks something like this:

(Illustrated by Hamlin and Svensson, 2016)
However, it is clearly communicated that the process itself will not solve any problems. Moreover, the process is there to establish similar ways of working, and the more similar working routines there are, the easier it gets for everyone to collaborate. If the organization leads the process and masters to handle all the competences within it, it is communicated that it will become a powerful tool for everyone working within it. Thus the hope of the organization is that the process mapping should provide its co-workers to:

‘Have the big picture in a project where the co-workers can capture knowledge in the process’
(General company presentation, observation)

According to observations made in the matrix management meetings, the process method tools do not work without input and feedback from the competences and roles actually working in the process. Thus in order to successfully develop standardized ways of working, then all involved co-workers (both team members and specialists) need to contribute with input. The mapping is a starting point for improvements, and it is now up to the co-workers to provide input to make it even better. According to a team member, the new process is a benefit:

‘We see the benefit of following the process and having guidelines. You are not a slave of the process; you are not bound to it. For example, in projects with low complexity you do not need to follow it strictly. The new process provides a lot more transparency in the flow of information and the connections between roles are a lot more defined. Especially, the time planning is better. Before it was very much when we did not have a time plan set up with a critical path, it was one thing after another. Now, we can parallelize tasks’
(Team member)

As exemplified above, it is continuously repeated that the co-workers do not see themselves as ‘slaves’ of the process. Interestingly, they simultaneously appear to be longing for structure and clear defined roles and responsibilities based on the above discussion around process mapping of the workflow. Here, the same hint of a contradiction is revealed but in other wording;
'I like frameworks, and I like the flexibility that comes with frameworks. The framework helps us achieve goals.'

(Team member)

The common understanding of the workflow process within the organization becomes important as there appears to be some contradictions. On one hand, there is a desire for structure and clarity in roles and responsibilities. However, on the other hand, there appears to exist some extent of resistance towards actually following the structure practically. On this note, the facilitation of the organizational culture of knowledge creation and transfer are highly influenced by the formulated company values where shared organizational values and a unified vision are vital (Ajmal and Koskinen, 2008). Nevertheless, the process mapping hopes to improve the working environment organization-wise, since:

‘With our new process, organization-wise, there are more defined and clear roles and responsibilities. There is a roadmap that people can follow and if you have a map and know where you are going, we all know what is coming next’

(Specialist)

In summary, the case company is in a transition phase where the hope of the company is to achieve standardized ways of working across the business as well as securing systematic routines for knowledge integration and transfer in the complex network composed of team members, specialists and other stakeholders. The old process, as described by co-workers, was largely inspired by the organizational culture, creativity and personal entrepreneurship. The new process is to a much greater extent characterized by structure and delegation of ownership and responsibility to different roles; in other words, the hope with the standardized process is to secure knowledge integration and transfer across the entire organization. This will be done through externalization processes as illustrated in the SECI-model where knowledge can be transformed from implicit to explicit and be made available and accessible to others also working in the process. To this end, the major change when re-designing the product development process was to implement a matrix-based organization composed of cross-functional project teams. The employees do not differentiate or refer to a good and bad process, rather, it was the surrounding contexts that created the need for a new and different type of process. Moreover, the company started to grow at a fast pace and the old way of
working resulted in longer time-to-market and caused workflow inefficiencies. To conclude, the new process (which is currently being mapped) hopes to establish similar and standardized ways of working across the entire business. The socio-cultural dimension that constituted the formation of the old process largely influences the adaptation and reception of the new process, and this is something that can become a strong organizational asset if these two are productively aligned in the future.

4.1.2 High diversity and flat organizational structure

Notoriously, the organization is now composed of self-directed teams that are assigned to a specific task within a given business area. Those teams are composed of individuals with different functional expertise typically from multiple countries, cultures, ages and gender. Apart from various indications that the stress-level is high, the overall perception of working in such a diverse, fluid and international organizational environment is perceived as positive;

‘We are very open-minded here. You have to be ready to work with all kinds of personalities that you might not be used to because we have people coming from everywhere that have different organizational cultures or cultures all in all. So, working here you have to be quite open to differences’

(Specialist)

Further, the level of creativity and innovative thinking is believed to be enhanced by designing project teams with high diversity since each individual offers his or her input and expertise of problems and potential solutions (Bharadwaj et al., 2015). According to the interviewed project contributors, each contributor is active in more than one running project simultaneously. According to the co-workers, working this way is not always easy but the benefits outweigh the challenges;

‘We cannot create products if we do not work cross-functionally. It is sometimes a hassle, because it is a lot of people involved, but in such a large and complex business it is something we just have to deal with. The challenges equal the benefits, since we sit on so much different knowledge in different areas. It is sometimes hard to utilize all the knowledge we possess because the timelines are pressed and we might not always be aware of what people have skills in. We do not always have time to dig deeper and investigate for the better solution, and of course that compromises somewhere in the end, and maybe the end result is affected’

(Specialist)
The challenge is obvious, to succeed in integrating and managing to transfer all the knowledge that sits within the organization. Here, externalization processes through the SECI-model becomes essential where implicit knowledge is transformed into explicit knowledge. To this end, previous research advocates the benefits of flat organizations based on self-directed, fluid cross-functional teams in knowledge management models (Van Beveren, 2003) where knowledge can be externalized and accessed and applied by more people through interdepartmental knowledge exchange. This organization is composed of many flat and dynamic teams and networks where managers and co-workers work closely together. The hierarchy is generally perceived as small, which is appreciated amongst the co-workers;

‘Our organization is very flat and I like that. I am very close to my manager’

(Team member)

Recall that with this organizational structure the team members are more directly involved in the decision making processes which benefits both productivity and saves time since the teams are empowered with more self-directed decision-making freedom. A team member recognizes the improvement in efficiency in relation to the new process as opposed to the old one;

‘We have a lot of good insights and experience on the table when we take decisions. We are more efficient. I am a firm believer in working this way’

(Team member)

In summary, the case company is multinational, large and complexly interrelated. It is further composed of many flat and dynamic project teams and networks characterized by highly diverse individuals with different functional expertise, countries and cultures of origin and different work experiences. Due to the fact that the business is so complexly interrelated and characterized by high diversity, it can be challenging to get all project contributors that work across the traditional department borders to share common project requirements, ways of working and to make the most efficient use of the expertise that is spread across the organization. Previous research advocates the benefits of flat organizations based on cross-functional teams in knowledge management models since this organizational structure enables interdepartmental knowledge creation and transfer (Van Beveren, 2003). To this end, the SECI-model highlights that externalization
processes supports this challenge by integrating and transferring the knowledge that sits inside the organization through transforming implicit knowledge into explicit. To conclude this section, the challenge lies in externalizing and making the most efficient use of all the diverse skills and knowledge that sits in the minds and hands of all project contributors in order to enable successful organization-wide knowledge integration and transfer.

4.1.3 Follow-up
In responding to the question if knowledge is created in the interviewees’ ongoing projects, the responses are integrative across team member and specialists;

‘New knowledge is created at a weekly or at least monthly basis. A lot of it is stored in my brain or in my computer. I do not have a natural place to put it. I will unfortunately not feed it into some kind of knowledge database’
(Specialist)

‘The new knowledge that is created in projects is not stored as much as it should be probably. In every single project, some kind of new knowledge is created’
(Team member)

As raised in these two quotes, there are barriers and limitations when it comes to storing knowledge for organizational learning and transfer for re-use in other project teams. This opens for the risk of not learning from past projects, which in turn increases the likelihood that the same mistakes will be repeated in other teams and in other projects which is often the case in project-based organizations (Ajmal and Koskinen, 2008). Further, the knowledge asset could potentially be lost if there are few standards for storing knowledge since there is no consistency in communicating the learnings across the organization (Bharadwaj et al., 2015). Of course much newly created knowledge currently is and can be codified in databases, as for instance new product safety requirements and legislations on different country levels etc. However, to the question whether knowledge is integrated for potential transfer and re-use in other similar projects, particularly the implicit new learnings and experiences appears to partly evaporate according to the co-workers. Much of this knowledge rather appears to sit in the minds and hands of the employees, since it does not easily store in codifiable enabling tools, nor is there historically a tradition of storing this knowledge. Rather, this knowledge conversion occurs to be done primarily
through socialization processes. One specialist tracks this dilemma to a type of mentality within the company;

‘This company is not good at evaluating. We are very good at saying we need to document this, but nothing happens. It is always future and forward. This has to with that the majority of the people that work here are a certain kind of people. There is a huge majority of people that are creative and just want to move forward’

(Specialist)

Strengthened by the above quote, there are observed tendencies within the organizational culture that underestimate the importance of reflection and evaluation of the past in favor of moving on to the next project. This observed behavior, in turn, inhibits knowledge integration and storage for organizational learning and memory. Notoriously, without standards there cannot be consistency in communicating knowledge across the organization (Bharadwaj et al., 2015). However, it is not true to reflect the process as the cause for lacking organization-wide standards for knowledge storage of newly created knowledge. There is, as illustrated in figure 6, a formalized follow-up phase in the process. However, the learnings made in other projects appears to be difficult to take part of if you are sitting in another team or business area anyways:

‘Knowledge from another team and from other functions, there are very few ways for me to take part of that knowledge’

(Team member)

Recalling to previous research, there are various reasons that contribute to failing knowledge transfer which include technical, organizational and cultural issues (Ajmal and Koskinen, 2008). Technically, there are opportunities for improvements when it comes to knowledge storage according to the employees. Moreover, there is an observed current lack in efficient codification implementations that support knowledge transfer (note that a new project management online tool is planned to take effect soon);

‘We do not have a good bank stored with knowledge that has been created in other project teams. I rather talk to the different departments and ask around how they deal with certain things. It is not efficient when everybody does it this way. We need to make a better way of transferring knowledge and sharing best practices’

(Team member)
From an organizational and cultural perspective, much of the project follow-up learnings tend to be converted through socialization processes. Moreover, they are exchanged between and within projects through person-to-person interaction. Here there is an observed opportunity for improvement where the conscious implementation of knowledge externalization processes could be useful. By externalizing project learnings, other individuals and project teams could make use of this knowledge if it were only made available to them.

In summary, there is a continuous creation flow of project knowledge inside the organization. Much of this codifiable knowledge is stored in databases. Much of the implicit knowledge appears to sit in the minds and hands of the employees, partly since it does not easily store in codifiable enabling tools, and partly because there is not historically a cultural tradition of storing this knowledge somewhere. However, with the new process, there is a formalized phase where the purpose is to systematize this routine and externalize project learnings across the organization. To conclude, there are observed cultural tendencies that historically have been characterized by a mentality that somewhat underestimate the importance of project follow-ups and evaluation of the past in favor of moving forward towards the next project. Thus, now, the hope of the organization is to come to terms with this challenge by employing knowledge management strategies that standardizes following up on projects as part of the process.

4.2 Organizational culture and knowledge integration and transfer in cross-functional projects

The knowledge culture within an organization influences the knowledge conversion processes (e.g. Leidner and Kayworth, 2006, Davenport and Prusak 1998a) by motivating employees to create, share and apply knowledge for the benefit of the organizations best (Oliver and Kandadi, 2006). This occurs through influencing the behavioral norms amongst the employees (Ling-Hsing and Tung-Ching Lin, 2015), and can be done by for instance formulating organizational values that are followed practically by the co-workers. With this in mind, let us move forward and analyze the situation within the case company in relation to organizational culture and knowledge integration and transfer through three identified key thematic categories: 1) Project-specific and experience-based
knowledge culture, 2) Sense of belonging and 3) Future and forward. These themes emerged during the empirical investigation.

4.2.1 Project-specific and experience-based knowledge culture

There is both implicit and explicit knowledge within the organization, and all roles supposedly possesses a bit of both. The explicit knowledge is codifiable and usually stored in the form of outputs of the project. However, the implicit knowledge, typically referred to as ‘experience’ by the interviewees, is harder to capture for storage, here according to a specialist;

"The output of what I do is out there, this knowledge can be easily stored. [...] But for now we have not had a common place like a database where we place our analyses for example, because for every project we do an analysis with all the information and input that we have [...] Someone can use what I created, but they do not really know what I based that on. But some of this knowledge I do not even have formalized for myself, I do not have it in notes somewhere, it is my own experience. We could come further, of course, by having a database for the product analyses’

(Specialist)

As implied in this quote, the implicit knowledge is harder to codify for externalization purposes as this knowledge is highly individual, project-specific and experience-based. Implicit knowledge rather stores itself in an organization through face-to-face sharing of experiences, observations and imitations (Koskinen, 2004) whereas the explicit knowledge is shared through codification strategies using IT tools and systems (Koskinen, 2004). Research advocates that personalization strategies of interactive nature are tailored to meet the needs of a specific person rather than reaching out to the entire organization (Lopez-Nicolas and Meroño-Cerdan, 2011), which demonstrated to be true according to the team member below;

'I share a lot of knowledge and experience in things we send out, for example in emails, strategies, sales start packages and recommendations. They are quite formalized and documented. It is more factual, rational and less emotional. Every time I interact with somebody I try to motivate why I am saying something with my experience. Most of the time I share my knowledge and experience, it will be in the context and related to an experience that has led me to that point, opinion or decision. You tell people what you think and you also tell them why. You share a little bit of your experience in a way, it could be small things and very big things’

(Team member)
In alignment with what is disclosed in the quote above, implicit knowledge in organizations is hard to share to others unless sharing experiences through socialization processes is possible (Koskinen, 2004). In response to the interview question posed regarding how to go about when either sharing with or accessing knowledge from a colleague, the typical way to do this is to employ socialization as illustrated in the SECI-model. Moreover, you ask around in your network and look for the person that sits with the first-hand information. Typically, this appears to occur through spontaneous social meetings, discussions and informal meetings:

‘I try to ask around, how do you do this? How do I not do this?’
(Specialist)

‘[...] We talk to the people that know the first-hand information that I need for my specific question to solve my job.’
(Specialist)

This realization aligns with previous research that suggests that the primary means of social interaction is preferred over using pre-coded databases with information when obtaining knowledge for use in projects (Cross and Sproull, 2004). These socialization processes, by means of interacting personally with someone with the purpose of exchanging knowledge, enables mental models and mutual trust to be created and transferred over the organization (Nonaka et al., 2000). This way of converting knowledge appears to be commonly applied across the case company, however, it is not always a smooth process according to the co-workers. Many interview respondents proclaim of having to invest much time, effort and energy when searching for and accessing necessary knowledge to be able to complete a project task. To recall, personalization strategies can be very costly due to inefficient use of time (Chai and Nebus, 2012). The below scenarios strengthen the presumption that collecting knowledge from colleagues with the first-hand information through socialization can be a timely hassle. This challenge applies to team members as well as specialists;

‘Most of the commercial questions we work with has to do with concepts, lay-outs, commerciality, communicating on the web and in the stores and these are things we have worked with for many years, so it is easy to find somebody that knows more than I do. We even have subject matter experts. As soon as it gets a little more advanced, how we work with social media as part of a sales start as an example, how do
we work with Instagram for a new product, then it is very hard to find somebody who can help you to do that. As soon as it is a little bit outside the concept or the normal ways of working, then it can be quite a challenge to find somebody that can help you’

(Team member)

‘We need to have both implicit and explicit knowledge in our business. There are some things that are written down in templates and stuff like that, and there are a lot of requirements that could be better documented actually. As it is today, you need to spend a lot of time to drag out knowledge you need for yourself from the right people. Who can I ask to get information about something I need is a lot of my daily work. [...] I connect with people in any way I need to’

(Specialist)

There are also practical challenges in relation to socialization strategies that impede effective knowledge integration and transfer. For instance, since the organization is multinational, many co-workers travel continuously and are often located in different locations and time zones. A co-worker exemplifies this scenario below;

‘My starting point is to find somebody that knows more than me, and that you can always find. I go to them first and run my issue and scenario by them and ask for their advice. I pick up the phone, write them an email or go and speak to them. Sometimes they could be right here, sometimes far away. It is a big company’

(Team member)

Additionally, since the internal employee turnover is high there are situations where employees with specialized and implicit personal knowledge banks have moved on to a different position. This causes challenges in the systematic integration and transfer of knowledge since these employees are no longer naturally accessible sources of knowledge in the role they were previously employed in. Nevertheless, it is here hinted that a mixture of both codification and personalization strategies is the preferred method when collecting knowledge for re-use in new projects. In other words, relying solely on socialization processes can be dangerous. A specialist describes below:

‘Hopefully a former colleague is still within the organization so I can look them up even if they changed their position. That is the benefit of working in a large organization, I am not the only one working with my assignment around here. Even if it is not the exact same problem I can always ask someone: How did you go about solving this problem? I prefer going and asking someone rather than tapping into a system and looking for the input because you always get that extra nuance from talking to someone. I would
probably read the background first, but I would still go and talk to the person to get those extra details or extra thinking behind that you will not ever put into writing. I want to have both’

(Specialist)

The above quote aligns well will existing research where the long-term success in strategic knowledge management implementation lies in a balanced mix of knowledge exploitation which is desirably supported by the dual and concurrent processes of codification and personalization (Mukherji, 2005). A major managerial attempt of addressing the challenge of capturing implicit knowledge for integration and transfer occurs through monthly matrix meetings. The social and interactional elements in those meetings are observed to be generally perceived as vital, and are therefore highly valued across the different matrices. Both team members and specialists refer to the monthly matrix meetings as an important platform for sharing knowledge and experiences to colleagues within their “home”-matrix;

‘In our commercial team we meet every month to share knowledge. The daily communication is also a way of sharing knowledge for us, phone, email, Facebook...’

(Specialist)

‘We meet in matrix meetings with all colleagues every fifth week and we share very much the same challenges, opportunities and frustrations’

(Team member)

In continuation, it is also raised that there are business area meetings on a regular basis where additional knowledge sharing takes place:

‘We share a lot of knowledge within our role with each other in my business area. The way we are sitting allows us to do this. If one of us does something, then that is shared between us. Between the business areas, it happens that we share knowledge with each other, but really not as often. It is not standardized in any way. I would prefer to have it standardized because I am super interested in what other people do. We do not really have a good forum for it. We do when it is something really big in the matrix, but when it is something small like sharing experiences it happens informally when you know somebody. It also has to do with how comfortable you are with asking people as well. There is not a really good way of sharing it’

(Specialist)

‘We meet every week and share our best practices in our business area. Then we meet in the team, and I share things in those meetings. Mostly through face-to-face interaction’
As implied in the above quotes, integrating and transferring knowledge across different business areas, between team members and specialists and between groups of roles appears to be somewhat inconsistent and typically done through spontaneous discussions and informal meetings. Moreover, knowledge integration and transfer is more focused to take place within matrices and within teams. Furthermore, it is hinted through the formalized matrix and business area meetings that some old ways of working and thinking still exist in the organization. Moreover, it is sometimes revealed that the matrices tend to revert to the corresponding former departmentalized functions as they were set up before the cross-functional team approach was implemented. Working in silos was more common in the old way of working. Recall that this was the reason to implement the cross-functional team approach, to move away from working and acting in departmental knowledge silos (Lindner and Wald, 2011). As knowledge management models prefers flat networks based on fluid, cross-functional coupled teams rather than hierarchical departmentalized organizational structures (Van Beveren, 2003), there is a potential observed tension here. As flat and fluid organizational structures with cross-functional teams ‘ease the flow of ideas across departments, or provide venues for employees to communicate informally’ (Bharadwaj, 2015, pp. 424-425), there appears to exist opportunities for improvement where important knowledge and information flow across different matrices, teams and between teams and specialists can be improved with the help of formalized forums and social meetings across these borders. To this end, it was emphasized by a team member that the integration and transfer of knowledge between team members and specialists is not supported in the same way with strategic knowledge management inspired pre-set weekly and monthly meetings as it is matrix- and business area-wise. In response to the question how knowledge is exchanged between these groups, the answer is typically that this exchange occurs through informal dialogue and spontaneous discussions, that is, through socialization strategies;

‘Once a month we talk formally about the processes, small and big things. Informally I connect with a group of people once in a while. There is a big effort to capture implicit knowledge, but in the meeting with the specialists, this is the part where we miss meeting. You can see when there is one person in the team not meeting with the specialists face-to-face. You can have all these tools and systems, but there is still something missing. We are human beings and we are working with people here really. We are doing product development, but all day long we are meeting face-to-face with people’

(Team member)
As hinted in the quote above, combination processes as described in the SECI-model, potentially facilitates such knowledge conversion by enabling knowledge transfer within and between projects contributors through the use of information technologies. However, codification strategies alone are not the resolution to this challenge since an over focus to the use of tools and systems in knowledge management implementation is typically unsuccessful and inefficient (Lopez-Nicolas and Meroño-Cerdan, 2011). This is due to the fact that IT tools are only capable of coding a small amount of the knowledge an employee actually possesses and that this expertise is often outdated within months. Also, it is obvious that the method of managing un-codifiable knowledge through a personalized and interactive person-to-person focus is irreplaceable. Thus, dual processes of codification and personalization strategies are viewed as necessary for successful knowledge management implementation. As there appears to be few clear and formalized organization-wide structures or frameworks for how knowledge should be transferred across business areas, between teams and specialists, it is up to the employees to catch important knowledge embodied within other project teams and project learnings;

‘Knowledge created in other projects does not naturally come to me. It is not given to me, I have to go and ask for it. When I see a lack in my communication, I go and find that so I can get part of new information and new solutions, but it is not fed to me’
(Specialist)

On the question of how one manages to take part of knowledge created in other projects, it rather becomes a question of self-directed initiatives and informal transfer processes. The interactional elements of such knowledge transfer are vital. Moreover;

‘In connection to the working process, spontaneous discussions are the way to share knowledge, especially with the technicians. The informal everyday interaction is important’
(Specialist)

By relying so heavily on socialization in knowledge integration and transfer processes, the individual’s personality and social ability of absorbing necessary knowledge becomes decisive. Moreover, the responsibility lies on the shoulders of the co-workers to collect the right knowledge at the right point in time. On this note, research advocates that socialization effectively ‘brings together novices and experts so that the former can benefit from the latter’s experiences’ (Allal-Chérif and Makhlouf, 2016, p. 1540), which is what is happening in the case company. However, on the other hand, it can be risky to
rely incontrovertibly on a knowledge integration and transfer based on social interaction when there for example are new and un-experienced employees at a new position;

‘The daily things that are not always related to projects, it could be a new way of working overall, there we are not so good at documenting. For example, if someone starts new, we do not have a good guide for them’

(Team member)

These persons may not yet have developed a holistic view of the assignment and its belonging responsibilities. A team member continues to reflect on this issue, and concludes that there might be a danger when your personal network is your starting point for accessing and transferring knowledge;

‘I will go to somebody that shares their experiences with me. Not so much going into a database or opening a folder and find documentations where another team member has stored knowledge from another project. I rather go and speak to people that have worked in similar projects that are happening or have already happened to understand their barriers, learnings and what they would have done differently. It is much more on an interactional level to access information. It is very dependent on my network. It means that you starting point to accessing knowledge is your network, and that probably should not be your starting point’

(Team member)

As previously stressed, organizational culture plays a vital role when developing an efficient knowledge sharing culture (e.g. Davenport and Prusak, 1998a, Oliver and Kandadi, 2006, Alvesson, 2013). In this case, there appears to be an underlying cultural dynamic that allows and expects knowledge to be shared through personal networks i.e. socialization processes. The contradiction here lies on the one hand that the starting point of sharing and accessing knowledge is allowed to rely on the employees’ personal network. But on the other hand, there is an outspoken request to implement strategic knowledge management activities through formalizing process steps to secure knowledge integration and transfer. For example, there are now project follow-up routines formalized in the process to evaluate project learnings. There appears to have been a culturally manifested mentality in the past that to some extent underestimated documenting project learnings for organizational memory. There is however awareness within the projects that they need to undergo evaluation of what went well and what could have gone better, here emphasized by a specialist:
'There is always internalized and implicit knowledge that is not written down because it would not make sense to write it down. If the communication is a hustle in one project, that is not written down and stored somewhere. Rather, if we have that problem, it needs to go back to the team that worked with the project. It needs to be kept within the team somehow, and that is a whole other story, but it is really important to feedback into the team’

(Specialist)

There is no use for knowledge management strategic implementations if the organization fails to integrate and transfer the internal knowledge to its everyday working routines (Bharadwaj et al., 2015). This can be tricky if there are few standards for doing this dynamically between the different groups and business areas in the organization. The general observation is that groups of roles, functions and business areas are somewhat silo-oriented, as exemplified below;

‘In our organization we support each other function-wise. There is a lot of information sharing and a lot of information alignment because we have realized, as a function, if we have a common way of working, and the teams see consistency and professionalism, it creates good-will’

(Team member)

In other words, if single departments apply knowledge in one way and another department in a second way and a third department in a third way, the organization might continue to develop silo-oriented sub-organizations that may develop local sub-cultures. Then there is a running risk that other roles, functions or business areas are working in better and more efficient ways;

‘[…] Maybe we are good in sharing knowledge within our departments, but then there might be somebody else working in a totally different, simpler and better way that is not transferred. That we are not so good at’

(Team member)

In summary, the implicit knowledge within the organization is hard to codify for externalization purposes as this knowledge is highly individual, project-specific and experience-based. Consistent with my experiences through interviews and observations, the primary means of socialization is preferred over using pre-coded databases with information when obtaining knowledge for use in projects (Cross and Sproull, 2004). Moreover, the co-workers typically ask around in their network and look for the person that sits with the first-hand information. Thus, much of the exchange of knowledge
appears to occur through informal and spontaneous interactional meetings. Consistent with research, exchanging knowledge through such socialization processes enables mental models and mutual trust to be created and transferred across the organization (Nonaka et al., 2000). The knowledge conversion process is not always smooth, as it is reported by the co-workers that much time, effort and energy is disposed in the search for necessary project knowledge. Consistent with previous research, a mixture of both codification and personalization strategies is therefore the preferred method when collecting knowledge for re-use in new projects (Mukherji, 2005). On this note, it was raised that the integration and transfer of knowledge between team members and specialists is not supported in the same way with strategic knowledge management preset weekly and monthly meetings as it is matrix- and business area-wise. The exchange of project knowledge between these groups appears to occur through informal interactive dialogue and spontaneous discussions. To conclude, there is a huge organizational asset if the organization productively aligns the existing knowledge culture characterized by networking and socialization with the simultaneous employment of standards and routines for knowledge integration and transfer processes between roles and groups other than within the matrices and business areas.

4.2.2 Sense of belonging

The case company commits to a strong set of cultural values. Team spirit, togetherness and humbleness are major cornerstones of the organizational culture. The organizational culture mirrors the business practices in both small and big and positive and negative ways. The values are formalized and continuously spoken and referred to in meetings, presentations and in spontaneous discussions. The values seem to have a positive correlation to employee loyalty, hard work, ambition and transparency. Examples below confirms how the company values impact the co-workers’ behaviors and attitudes in a positive way;

‘Before I worked here I minded my own business, now I do not get upset if I miss my deadline because of someone else because I know they try their best according to their time schedule to deliver to me on time’

(Specialist)

‘I believe in our values. This is the reason I continue to work here. They are also values that I carry myself, how you should behave and how you should look at things. The values sit within us, how we speak
to each other, how we agree, how we disagree, how we see opportunities instead of challenges. [...] That for sure sets the tone for how you speak to people’

(Team member)

A team member continues to reflect upon the organizational values, and highlights that they are a set of principles that not only advocate good business practices, but also serves as guidelines to conflict management. There is an outspoken tolerance in the organization for mistakes, disagreement and un-predictable events in projects. Situations as such with un-predicted changes and uncertainty calls for flexibility and team spirit. Here, the values are outspoken to function as a base for how to resolve challenges and together come up with the best solution to move forward:

‘A lot of the values are common sense and very good business practices. By having a system of values as something with principles that guides us for how to behave helps us, because if there is a conflict there is a way for how to resolve it. They are guiding principles. The danger and risk is that people have implied or expected ways of thinking. With new processes for example, I have seen it in our function, there was a change process where people had to learn that this is how we will behave and act now. It is important that you find your own voice, because sometimes you have to be the uncomfortable partner as a controller that holds everyone to the agreed time plan. We all have values and we are all adults, but in the end we forget things, we do not do things on time, people break communication channels and then things do not go according to plan’

(Team member)

Interestingly, this above quote hints that there can be a contradiction in how the organizational culture is adhered to in theory and in practice. In theory, the culture is commonly and proudly spoken of as a standardized framework that employees more or less seem to know by heart. But in practice, there appears to be implied ways of thinking and working that not always conform with the cultural framework the employees describe. Research says that cultural interpretations develop over time and are successively passed on to new employees and project contributors and takes form when groups embrace similar interpretive schemes (Alavi et al., 2005). It appears that groups have interpreted the culture in somewhat different practical ways which to some extent has developed into local sub-cultures. In turn, these interpretations influence the accepted behaviors and attitudes in the overall organization (Alavi et al., 2005). However, the conspicuous point here is that the observations and interviews indicate that the majority of the employees appear to hold on to and claim that the culture is standardized across the entire organization, when this may not always be the case. For example, in such a diverse
and international organization, it is intensely pushed that every employee is treated with respect, and that everyone is included and acknowledged in their roles. This is revealed to be true in some groups, but not in all. Here a team member is satisfied with the organizational culture since it advocates equality;

‘Everyone is allowed to speak. The culture here is fantastic because everybody is valued and speak their opinion, and everybody is treated in the same way independent of roles, that is important for me’

(Team member)

However, as has been previously discussed, inconsistencies in the question of inclusion and sense of belonging in parts of the organization have been revealed. According to my observations, the culture is simultaneously and truly the foundation of the way of working and the way of treating each other. However, as the organization is so large and complex and composed of various groups, matrices, business areas and departments, it appears to not be uncommon that a business area can be thought of as an employees’ immediate organization. In such sub-organizations, it is not rare that sub-cultures co-exist. Here, a positive sub-culture within a business area appears to exist:

‘The culture sets the tone and foundation for how we work in the organization, and when I say organization I mean my own business area which is my immediate organization. If there is a healthy culture of maybe having some fun as an example, we take work quite seriously, but we can also smile and laugh at ourselves when we make mistakes. The openness and that we try to do things together are things that are really important for me’

(Team member)

Further, the employees do not only seem identify themselves within their business area as their main and immediate organization. There are, according to some interviewees also presumed sub-cultures within groups of roles. Following is an example where such a sub-culture is presumed to have developed within a matrix;

‘The culture is there, it is. The core values are there. It depends on the role, though. Some roles are more competitive. Since we are not part of the core teams, that excludes us a bit. Call it sub-cultures. There is a huge difference between some specialists and some groups of team members for instance. Within some role they might be a little bit more competitive, that is the culture within that group, it has developed into that. Some groups of specialists are not that sales or results-oriented, and sometimes you can feel that difference. They think they know better sometimes. Some roles more or less pull a rank because they feel that they have the solution for something based on their own perspective and experience. It does not mean
that they have the last word, and they should not tell the specialist what to do because that could go so wrong. That can happen sometimes’

(Specialist)

This quote further testifies that there are present power structures within the organization, although the organizational structure is pronounced to be flat. Moreover, ‘organizational culture is not something that an organization has, a culture is something that an organization is’ (Oliver and Kandadi, 2006, p. 7). The cultural framework, with the values as the basis for the internal social interaction that influences behaviors (Alavi et al., 2005), appear to not always be consistent with praxis. These power-structures particularly reveal themselves when the question regarding implied social behaviors and attitudes between co-workers is posed. It appears that the perception of the flat organization, in some cases, creates a basis for conflicts that do not have a clear structural solution. It is not formalized that one role is above another, yet there still appears to be power battles of who is above who, as exemplified below:

‘Sometimes the teams have a tremendous and valuable experience which is something we really rely on; they are our ear out to the market. But sometimes it makes them feel they know best without having the knowledge or specialized knowledge that specialists have. Sometimes, when it gets to a disagreement, it happens that they pull rank and that can really create conflict since it is not formalized that they drive things’

(Specialist)

In replication, a team member reflects on the terminology commonly used inside the organization. The term ‘specialist’ can be miss-interpreted as it may appear as if only the specialists are specialized in what they do, and not the team members. The team members are also highly specialized in their roles;

‘The word specialist has been used a lot in a way. Of course our specialists are very specialized at what they do, but so am I in a way. You have the core team, and you have the specialists, it is the common language. But the people sitting in the team are also very specialized in their specific field and then they come together and contribute with their specialized knowledge into the totality to have a common view in all angels of the project’

(Team member)
As revealed in this discussion, the roles are differently perceived depending on what group you are part of, and there are hints of a tradition of silo thinking and working. These perceptions may also differ over different business areas. For instance;

‘There is always inconsistencies. There is a huge difference in responsibilities. The roles can be differently perceived in different business areas. In some, the specialist can be seen as just a [...] whereas in some they are more respected and seen as something really important’
(Specialist)

In this context it is also raised that the specialists are highly involved and highly dependent of the project team members. Noteworthy here is that the organizational structure determines the degree of teamwork in a corporation (Bharadwaj, 2015). Moreover, the value of the team approach is that every contributor brings his or her expertise to the teams’ joint tasks. Thus, it is important that the collaboration between the project contributors is functional, and that all feels equally involved. Here, a specialist emphasizes that this relationship is highly dynamic and interdependent:

‘We are highly involved and highly dependent of each other. Everything they do affects me and everything I do affects them’
(Specialist)

In response to the posed question regarding the collaboration between the core team and the specialists and its related challenges and benefits, some different points are brought up. Firstly, the busy schedule of some team members are seen as challenging in this collaboration since the specialists struggle with collecting the information they need from them to be able to complete their own project tasks. Here, a specialist describes the situation;

‘Working with the core team depends a lot on the person of course, as in any collaboration. But it is also quite tricky to work with them because they are a very busy role. They travel a lot and have a heavy meeting schedule, so their time with the specialists is quite limited. All I have worked with have tried to solve this to their best effort, but they have a very limited schedule and sometimes that is a problem because I need to scream and chase them for the information that I need. Some of the information I need only sits with them, and that causes problems’
(Specialist)
In replication to this, a team member confirms that their assignment is demanding with hectic travel and meeting schedules. Time is always in short supply for both team members and specialists. It is described that time is particularly a struggle for team members since many stakeholders are dependent on communication flows through them. The capability of handling multiple communication flows and keeping the right people informed with relevant information when they need it largely depends on the person and personality type as exemplified below;

‘The pure fact that it is two different groups, two different physical meetings and interactions, that is a challenge in itself. Since I am the spider in the web in a way, it is very much dependent on me, my personality, ability to have relationships with people, keep people informed, have a good communication flow, having time available to do that. [...] This is only a small part of it, it is half of the assignment. You only have the time that you have’

(Team member)

Further, it is raised on behalf of the specialists that there needs to be a clear understanding that their contribution is a part of the final product. It is raised that some specialists perceive that their contributions are sometimes valued as not equally important. They mean that there are some business areas where the contribution by some specialists is something that can be done quickly towards the end of a project. The specialists mean that without their contribution, there would be no sales start of the product at all. In response to my question concerning challenges of working in the set-up of permanent and temporary team memberships, a specialist mentions;

‘In some teams’ our contribution is perceived as not so important. Even though we are not in the core team, we are equally as important’

(Specialist)

On this note, there are voices that perceive that some of the specialists’ contributions are compromised and perceived as something that can be viewed upon as a cover-up for errors made in the actual development of the product. As all players in a cross-functional team have different priorities, backgrounds and cognitive frameworks (Söderquist, 2006), reaching compromises of what is expected of whom and at what point in time is clearly a challenge in the dynamics between team members and specialists. The scenario of using some of the specialists’ tasks as a cover-up for product development mistakes appears to reoccur across the different business areas according to some specialists;
'In the best of worlds, we are part of the project from the very beginning. But I do not think we are there yet. Mistakes in the product development should not be fixed by us, and that still happens. It becomes our issues to solve.’

(Specialist)

‘Sometimes the specialist is expected to fix product development problems, to use our contribution as a Band-Aid. The team member should have been able to catch these problems, but it happens that they think that these errors can be solved with our expertise. Then we just have to make the best out of the situation, but then it is never the best solution for the customer. It is a product development problem that turns into our problem. There is always new people, and things get lost along the way, when people are new they do not always catch everything and that hurts. The learnings made one time are lost along the way, and you continue doing the same mistakes over and over again’

(Specialist)

As put forward here, the internal employee turnover is high which may end up hurting the outcome of the projects, and in the end the company’s customers. In such a large and fast-growing international organization, there are pools of appealing job offers and advancement opportunities which may be the reason for the frequent internal transfer of employees. Internal turnover in the organization is generally perceived as something positive that considers opportunities for employees to grow in their personal careers. However, the down-side of suchlike high internal employee turnover may be that the difficulty of replacing the knowledge an employee has developed in the position.

Based on the above discussion, consensus prevails across the interviewee responses that a major challenge of designing the organization in teams of five with a surrounding network of ad-hoc specialists and other stakeholders are to make all contributors feel involved and equally valued. The team members are aware of the challenge and that some of the responsibility lies on them;

‘Challenges of working this way are that the specialists on occasions do not always feel so involved. They might feel that they do not have the same ownership of the project as the teams do, however I feel that we are all a team even if we are doing different things. Our challenge is to get everybody involved, to see it as “ours” even if we are all involved in different stages more and less. This is better where I am now, but before the specialists felt a bit outside and did not feel ownership because they were not a part of the team. That we need to change, because everybody is important and should be raised that everyone contributes equally to the projects’

(Team member)
‘Some specialists feel like second-class citizens. A little bit excluded. This can lead to human side problems. We do not want to miss people along the way, that they do not feel involved’

(Team member)

‘The challenges of having so many external specialists are synchronicity, transparency, information flow and resource management. Sharing a portfolio and totality of a project is also challenging since my team is running 10 projects at a time. Our specialists need to cope with all the different changes and time plans in our 10 projects, plus 5 projects with another team, and 8 projects with another. It is quite many variables. For example, last year, one of our technicians was doing some kind of ad-hoc spreadsheet-solution for resource management. We need to tackle and do more automated resource management in the future’

(Team member)

As expressed in the quotes above, the specialists sense of not belonging to the core team, the sense of feeling excluded, are challenges that the organization is highly aware of. The sense of belonging and relatedness to the team is connected with positive and interpersonal social relationships which is desirable for the greater outcome of the projects and organization at large. There are clear challenges of obtaining this, but it is according to a team member a matter of investing time and effort in the dialogue and communication with the specialists;

‘Each of us work with our stakeholders and specialists. It is a challenge to balance being in the team, meeting that forum, taking those decisions, make sure you are including the knowledge when you are taking those decisions and what is important for that specialist for example. How do you represent them? [...] That puts high demands on each person in the team to have a good understanding and appreciation of the persons you are representing. You really need to understand that. Secondly, you need to have a constant dialogue with the specialists. I do not see an easy solution to this rather than investing and taking the time with your specialists and stakeholders. To really engage them in the process and make sure that they are aligned with it so that they can do a good job and know everything that is decided’

(Team member)

The specialists agree to some extent, and fill in that in the past there has been a gap of sufficient information transfer in the externalization processes, transforming implicit knowledge to explicit, necessary for the project of which the specialists are part of. Although the team members appear to be aware of the fact that time and a continuous dialogue needs to be invested to address this challenge, there is still a lack in the information sharing in the dynamics between team members and specialists.
'We are not part of any core team meetings, at least not in our business area, for good and for worse. But there are probably differences in how other business areas do it. In some, the specialists are more involved in the core team meetings. However, I especially interact with one of the roles from the core team, both on a daily basis and in weekly meetings. The dialogue is continuous. The challenges of not being in the team is that you might not catch the changes made inside the team, which gets to the specialists too late. We do not really have a good way of getting informed of those changes. Sometimes we catch it, and sometimes we do not. That can be a frustration.

(Specialist)

It is here implied that there is a need for standardizing the transfer of important information in the interplay between teams and specialists, since it is now informally transferred through socialization and thus risks not getting caught along the way. The challenge remains, but the hope of the organization is that this will partly be addressed upon the launch of a new project management tool where project-related information can be externalized and internalized to all authorized stakeholders. The idea of implementing such a knowledge management strategic tool is to make knowledge independent of whomever decided or created it and make it accessible for other authorized employees (Lopez-Nicolas and Merono-Cerdan, 2011). Particularly some specialists are looking forward to integrating an online tool that will support the codification of necessary knowledge;

'I do not get first-hand information of everything that happens in a project. I always need to go through someone, and I have to ask for information that could have been given to me first-hand instead. We have not had any tools supporting the process in the past, so as a specialist I have been more told that there is a checkpoint coming up, rather than being able to work pro-actively and provide information for that.

With the new tool supporting the projects, it will be easier for the specialists to work pro-actively.’

(Specialist)

To the question what the benefits are of working as an external team resource, there are also many positive responses. There are a few obvious benefits of working as a specialist and not being part of the core team. Firstly, time again appears to be a critical focal point (particularly when we adhere to the fact that most employees have 10 or more projects running simultaneously);

'By not being in the team, you save a lot of time since I do not join all their meetings. There is a lot of information in those meetings that I do not need as a specialist. The only thing I miss is that I sometimes
miss important updates that I should have been informed about, like changes in sales start dates for example’
(Specialist)

Further, the specialists list the benefit that they can grasp a more holistic view of the organization and its range and that they can see the projects coming out in relation to other projects, which is a desirable outcome. The co-workers get a larger overview of what is happening in their business area overall. It is brought up that when you sit in a team, there is a risk of getting narrow-minded and traditional in your way of thinking;

‘When you work as a specialist you get more of a holistic view than if you were connected only to one team. If you only work in one team, the risk is to become like small little islands that do not always connect with the other ones. There is a risk of making more mistakes if us specialists are connected only to one single team’
(Specialist)

‘It is good to be outside the core team, because we have an outside view of things, we can take the customers perspective’
(Specialist)

As demonstrated here, this specialist sheds light on that their key priority is to represent the end-customer. Interestingly, it became evident through the research process that other roles had different key priorities (although satisfying the end-customer is always a priority). For instance, some roles appear to undertake a more results- and sales-oriented approach, whereas others might have their focus on technical solutions and functionality. These contrasts manifest themselves when these groups work closely together and are forced to compromise across functional borders on a regular basis. This challenge becomes extra apparent when the interviewees slip into discussing the process of practically managing samples which is a task required in almost all development projects. This issue appears to be of good repute as the question of responsibility and ownership of the task is unclear for both team members and specialists. Below, a specialist exemplifies;

‘One of the greatest issues we have has to do with samples. The samples are today such an unclear responsibility. Nobody really knows who has the responsibility for this. This is one of the biggest frustrations. We need to hunt to get the samples now, this process is not working at all. There are periods where I spend half of my time hunting for samples. It is an issue of responsibility. You need to keep
yourself updated and go to different people. There is no standard for how to do this, it is a big mess. This is the same around the building, it is not just in my business area’

(Specialist)

Another specialist highlights that it is not only the responsibility and ownership of this task that are not sufficiently and clearly defined, but there is also a lack of sharing a common understanding across the different roles of what the samples and 3D-models actually should be composed of. Moreover, the common understanding of what the task really requires differs across functions as put in context below;

‘We have a great teamwork, but as always it is a challenge to understand each other’s work. Take 3D-models for example. Even though we have the same goal to get all the documentations done in time, it can be challenging to have a common understanding of what 3D documentation is, what do we need from our suppliers and when do we need it. Basically, to really talk the same language around those topics. 3D-models mean something to the technician, but something else for me’

(Specialist)

By absorbing these opinions and frustrations put forward by the co-workers, it becomes a strategic knowledge management question of standardizing the task within the process and delegating the responsibility and ownership to reduce these recurring frustrations and confusion of who owns the task. In this context, team members highlight the need for additional clarity in the process;

‘In the sample process we have communication challenges because the responsibilities are not clearly defined. When you have so many actors and so many involved people, structure is totally needed. If we were a start-up company, we could work without structure, but we are too big now’

(Team member)

‘Our organization is designed to work cross-functional and cross-border. [...] There are for sure some things that are important when working this way. You need to be clear who does what, who is accountable for what and what everybody will bring, who has which information, who do you need to work with on what... It is easy for five people to agree on something, but then everybody leaves the table, but then who is going to do it? Some things will be crystal clear who is going to do it because that is the way it is; some agreements are linked specifically to one role or responsibility. For some things though it might not be clear, if we are working on it together. So you need to be really clear on this’

(Team member)
In summary, this section found that there is a potential contradiction in how the organizational culture is adhered to in theory and in practice. In theory, the culture is commonly referred to as a standardized framework of organizational values that, to name a few, advocate openness, equality and togetherness. However, in practice, some implied ways of thinking and working that not always conform with the cultural framework have been revealed. It is not uncommon in such large organizations composed of various groups, matrices and business areas, that different cultural interpretations develop over time and are successively passed on to new employees and project contributors and takes form when groups embrace similar interpretive schemes (Alavi et al., 2005). Moreover, sub-cultures evolve, which appears to have happened to some extent in the case company. In alignment with this finding, some inconsistencies in the question of inclusion and sense of belonging in parts of the organization were revealed. To conclude, the challenge of designing the organization in teams of five with a surrounding network of ad-hoc specialists and other stakeholders are to make all project contributors feel involved and equally valued. It appears that in correlation with strategic knowledge management implementation, that is, to enforce clear responsibility and ownership of tasks, the organization could potentially experience an enhanced sense of group cohesiveness, involvement and belonging for all employees that are contributors to the final project outcome. Particularly, the standardization of knowledge integration and transfer through drawing on externalization and internalization processes from the SECI-model in the interplay between teams and specialists is observed as an opportunity to approach this challenge.

4.2.3 Future and forward

Upon the kick-off of a project, the core project team together look at the milestones of the process and try to plan according to the complexity of the project. Recall that the team is composed of five people, and they are the ones that see the project from the ideation phase all the way to the follow-up. Each team member in turn have a business team with specialists and external stakeholders around them of which they are responsible for integrating their expertise. Structuring organizations this way with temporary team members in project-based work is becoming more and more common (Lindner and Wald, 2011). As is the case in the case company, these specialists join projects for shorter times when their expertise is required and stay until their task is completed and they move on to the next project (Söderquist, 2006). When the team is preparing for the kick-off, each
team member is supposed to go out to the business team meet with the specialists and stakeholders and align if we they got the project scope right. Together with input from specialists and other stakeholders, the team together looks at experience from other projects and what is known about the project and then try to make a rough time plan of the milestones of what aims to be achieved and when. It is evident that none of the time-planning is done by one person, as it is important that the contributions by all stakeholders are carefully considered and integrated;

'We do this together, because it is key that everybody brings their expertise’

(Team member)

Despite the attempt to involve all stakeholders early in the time planning of a project, there are still frustrations concerning the allocation of time, here expressed on several occasions by different specialists:

'The timelines do not always match with the timelines of those working with forecasting and sales etc. To get all those in harmony is challenging’

(Specialist)

'Everyone wants more time, all the time’

(Specialist)

'I have several projects running at the same time and I also have three teams that I work with for the time being due to some sick-leaves. This is tricky of course because you have so many connection points and projects in different phases, all the time. But it also makes the job very dynamic, and you get to think high and low every day. It is challenging, but fun’

(Specialist)

Beyond the fact that time appears to be in short supply, there are other managerial challenges revealed during the research process that relate to an organizational culture mentality of always wanting to be ‘on the run’, to move forward. The culture in the organization advocates employee loyalty, hard work and performance. The goals, ambitions and working speed is very high. This results in high stress levels since the employees are loyal to the organization and want to perform and deliver under pressed time-schedules, see examples below;
'Everyone is helpful and says yes to help others a lot. This is great, but it of course has a backside. Everyone says yes all the time and people also need to learn how to say no. The ambitions are super high, and so is the stress-level. The company does not straight out say that we expect you to work this much, but the culture indirectly expects you to do so. The culture is very good and very dangerous’

(Specialist)

‘You are expected to be highly energetic, outgoing, to love your job everyday which is tiresome of course. The organization is very vibrant, and everyone working here is expected to be as vibrant every day, which of course is not the case. This is, under the table, expected from you. The stress-level is very high. The culture that says you should love your job and you should work a lot, comes with putting a lot of stress on people. No one is super-energized every day and has time to do everything’

(Specialist)

With such pressed time-plans, it appears that this influences teams to quickly move on to the next project and thus underestimates the importance of project evaluation and the documentation of learnings made in a project. This is particularly a struggle in project-based organizations where implicit knowledge is tricky to capture and store for re-use (Ajmal and Koskinen, 2008). Drawing on the SECI-model, the knowledge conversion processes of combination and internalization may be negatively affected as a consequence of these cultural tendencies. This may be so since there is little consistency in collecting project knowledge for systematic integration and organization-wide knowledge transfer.

To summarize this section, there is an observed cultural dynamic within the organization that advocates an organizational mentality and fondness for aiming forward and being ‘on the way’ towards the future. Through interviews and observations, underlying culturally rooted behaviors and attitudes are reflected as a reason behind this mentality, for good and for worse in relation to strategic knowledge management implementations for knowledge integration and transfer routines. Moreover, these cultural dynamics may contribute to the, in combination with pressed time-schedules, underestimation of the importance of making time for evaluation and documentation of project learnings.

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We have now reached the end of the empirical analysis. The next chapter discusses the challenges and findings of this chapter by placing them in relation to each other.
5 Discussion

This chapter discusses the challenges that were described and analyzed in the previous chapter by placing them in relation to each other. The chapter is broken down into three categories consisting of couples of key themes. At first sight, the composition of the couples seem to be contradictory, however in reality, they are viewed as highly complementary to each other. The composition of the couples were not constructed with the intentions of arriving at any right or wrong answers, that is, they are not mutually exclusive. Rather, the couples are meant to be discussed with the purpose of indicating that they have a productive effect on each other.

Understanding the organizational culture of an organization is critical in running cross-functional projects. It might be particularly significant in cross-functional integrated projects where the employees have different functional backgrounds, age, gender and individual cultures, and hence may have different ways of thinking and working. This is highly significant in my case company as this organization is flat, large, operates in a quick and multinational arena and is currently undergoing a strategic knowledge management implementation, namely standardizing the working process.

In this context, previous research suggests that ‘there could be either multiple local cultures at work influencing knowledge management practices within a firm or, instead, a single dominant corporate culture driving knowledge management choices, decisions, and outcomes’ (Alavi et al., 2005, p. 195). Further, there may be an underlying organizational culture in the company, however, the existence of various local cultures in the firm is rather likely (Alavi et al., 2005) especially in large, complex multinational companies. With respect to these findings, my study suggests that there can be both multiple local sub-cultures and a single dominant organizational culture within an organization that strongly influences the integration and transfer of project knowledge. As demonstrated in my study, individuals, project teams or matrices are seldom categorized into one particular type of organizational culture since they rather represent mixtures of several cultures. In such multinational corporations, this may be due to the reasons that employees are continuously recruited from various countries, new technology is regularly introduced or departmental and project team perspectives exists all over the firm (Alavi et al., 2005). For these reasons, shared values and a ‘collective mind’ are vital for cross-functional project collaborations composed of permanent and
temporary team members as this provides the focus and energy for knowledge creation and transfer (Ajmal and Koskinen, 2008). In this context it is inevitable to not reflect upon how an organization that belongs to multiple local sub-cultures and one dominant organizational culture supports as well as hinders knowledge integration and transfer between cross-functional product development teams and specialists in a project-based organization. It is further significant to reflect upon how strategic knowledge management initiatives such as a process standardization implementation supports as well as hinders knowledge integration and transfer between cross-functional product development teams and specialists.

To those ends, it is essential to further increase the understanding of the socio-cultural dynamics of knowledge integration and transfer processes between temporary and permanent cross-functional project members. Therefore, the sections to follow discusses, with circumstantiality to my study and previous promoted research, some dynamics that were identified as significant for organizations to be aware of when working under this organizational structure. The dynamic dimensions to be discussed emerged during the empirical investigation when the simultaneous need for creating room for the existing organizational culture and the need for a process change were unfolded. Firstly, the dynamics between ‘towards a standardized process’ and ‘project-specific and experience-based knowledge culture’ are coupled together and discussed. Next, the ‘flat and fluid organizational structure’ and ‘sense of belonging’ are placed in relation to each other and further discussed. Lastly, ‘follow-up’ and ‘future and forward’ are coupled together and discussed. Through discussing these socio-cultural dynamics, my study arrives at that the interaction between the organizational culture and the process is significant in effective knowledge integration and transfer. Through this discussion, I found that the case company is moving towards a network-based knowledge culture.

5.1 Towards a standardized process vs. Project-specific and experience-based knowledge culture

My study suggests that when a knowledge culture with a tradition of socialization and network-based knowledge integration and transfer meets systematic employment of strategic knowledge management standards and routines for knowledge conversion
processes, an organization can still support and make efficient use of its new and existing knowledge although these two themes at glance may seem contradictory.

As suggested in my study, knowledge is typically stored and transferred within an organization through both formal and informal interactional meetings (apart from explicit and codifiable knowledge that is naturally stored in databases). Formally, implicit knowledge is transferred in monthly matrix meetings, business area meetings and weekly core team meetings. However, the transfer of knowledge appears to only be formalized within certain constellations of people, but large multinational organizations consists of more interrelated groups than those. This was further confirmed by a co-worker that expressed: ‘We do not have a good bank stored with knowledge that has been created in other project teams. I rather talk to the different departments and ask around how they deal with certain things. It is not efficient when everybody does it this way […]’. This challenge closely relates to the previous discussion under ‘Follow-up’, where it was argued that there are barriers and limitations when it comes to storing knowledge for organizational learning and re-use across project teams or other traditional functional borders. This is, consistent with previous research, often the case in project-based organizations since project-related learnings are difficult to memorize (Ajmal and Koskinen, 2008). This finding from research is consistent with my experience in the case company when it for example was expressed by a co-worker that: ‘Knowledge from another team and from other functions, there are very few ways for me to take part of that’. Further, two-way communication between departments occurs significantly more often when professionals are team members as opposed to when they work in different functions (Hauptman and Hirji, 1996). In further reflection of this finding, the distance between team members and temporary team members appears to be more silo-oriented than necessary. To this end a reflection arises, would some formalized interactive meetings where they can exchange experiences and project learnings support these two groups in integrating and transferring all diverse functional expertise for best possible project outcome?

Drawing on the SECI-model, my study suggests that there is appraisal for spontaneous and informal socialization processes as a means of knowledge conversion. By employing such a network-based knowledge culture, more and different sources of knowledge can beneficially be accessed which enhances information processing capabilities (Gemser and
Leenders, 2011) which in turn encourages high-quality learning experiences interdepartmentally (Edmondson and Nembhard, 2009). As the case company culture advocates personal networks as a starting point for such interdepartmental knowledge integration and transfer, this ultimately means that knowledge can be accessed from diverse external personal networks as well (Edmondson and Nembhard, 2009). From the other side of the same coin, project-based organizations struggle with effective knowledge transfer (Ajmal and Koskinen, 2008) since much of the knowledge integration and transfer occurs through socialization processes, that is, spontaneous and informal networking. This in turn may inhibit organizational memory and the storage of learnings for transfer across traditional borders of roles, teams and groups. This became particularly clear in my study when I discussed the organizational culture and the implied social behaviors and attitudes that impact the employees’ ways of working and routines of interacting with each other. One notable implied social behavior that seems to be culturally manifested entails that ‘Most of us spend a lot of time aligning, discussing and running things by each other. It does not say formally anywhere that this is how it should be done. [...] We do this a lot’. Following this realization, the knowledge transfer culture ultimately appears to heavily rely on the employees’ personal network and networking skills. This coheres well with previous research that argues that networks are incredibly important in knowledge transfer processes (Edmondson and Nembhard, 2009).

Recall that organizational culture plays a vital role when developing an efficient knowledge culture (Davenport and Prusak, 1998a). As suggested in my study, socialization was preferred over collecting necessary project knowledge from a database. For example, ‘I will go to somebody that shares their experiences with me. Not so much going into a database or opening a folder. [...] It is much more on an interactional level to access information. It is very dependent on my network. It means that you starting point to accessing knowledge is your network, and that probably should not be your starting point’. In continuation, this implied way of working is further strengthened by an interviewee that appreciates working with codification strategies, but highlights that accessing required knowledge for a project task should be complemented through personalized interaction: ‘I prefer going and asking someone rather than tapping into a system and looking for the input because you always get that extra nuance from talking to someone. [...] I want to have both’. This insight confirms previous research which advocates the importance of dual processes of codification and personalization strategies
for successful knowledge management implementation (Mukherji, 2005). But the question remains, how can personalization and codification strategies be balanced when it is widely accepted across the organization to build your own knowledge bank which to a big extent relies on your personal network and networking skills?

On this note and with reference to my study, there are internal voices that drive the need for more strategic knowledge management initiatives through implementing standardized and common ways of working where roles, responsibilities and ownerships are more clearly defined than they have been historically. In other words, there is a request for more strategic knowledge management implementation where there is a common view over the information flow considering ‘what’, ‘when’ and ‘who’ in the projects. To this end, structure and clear definitions of responsibilities and ownerships are longed for across the organization, as expressed: ‘[...] if you have a map and know where you are going, we all know what is coming next’. Interestingly, there is an organizational tension here that on the one hand calls for a standardized process with a mapped workflow as a means of coming to terms with clarifying task ownerships and responsibilities, and on the other hand advocates a network-based knowledge sharing culture built on socialization and spontaneous social interaction. For example: ‘When you have so many actors and so many involved people, structure is totally needed. If we were a start-up company, we could work without structure, but we are too big now’. According to my observations, the ongoing change process with the process standardization might not only be a result of a historical lack of structure, but also a result of the tradition of having an organizational culture largely influenced by entrepreneurship, that is, the organizational culture is characterized by a flat structure, the co-workers are future and forward-seeking and personal contacts and networks are important. This assumed contradiction is confirmed as there appears to be implied ways of thinking and working that not always conform with the idea of the standardized process: ‘[...] You are not a slave of the process; you are not bound to it [...]’. In other words, there tends to be some deviations in employee behavior in relation to the attempt of standardizing the process, and in this context it is notable that organizational culture has major impact on employee behavior (Ling-Hsing and Tung-Ching Lin, 2015).

As the company started to grow at a fast pace, the organizational structure, the process and the surrounding environment became more and more complex. Thus, there was a
detected need for a knowledge culture that could manage all these complexities which resulted in the standardization of the process. Moreover, the organization was largely idea-driven in the past, but with the standardization of the process the company is now moving towards a knowledge-driven culture. There might be tensions in the dynamics between the organizational culture when placed in relation to the processual change, however these two aspects can and should be exploited together as the organization is moving towards a network-based knowledge culture. A network-based knowledge culture could mean that it is not a question of changing or updating the organizational culture, but rather creating room for the existing network-based knowledge culture in alignment with the perceived need for the processual change. Hence, the new process and the knowledge culture ought to interact and be given room to shape each other.

On the one hand, cultural interpretations develop over time and are successively passed on to employees and project contributors and takes form when groups embrace similar interpretive schemes (Alavi et al., 2005). To this end, when cultural interpretations have been rooted for a long time, they cannot easily or quickly adjust to a major processual change. On the other hand, the standardization of the process may prescribe an approaching change process in some well rooted mentalities in the organizational culture in order for all project contributors, team members and specialists, to employ the new process not just in theory but in practice as well. Hence, the interaction between the new process and the organizational culture most probably requires patience, time and hard work to complement each other to its fullest.

5.2 High diversity and flat organizational structure vs. Sense of belonging

Next, my study suggests that a single dominant organizational culture can co-exist underneath multiple local cultures within an organization simultaneously. Further, my study demonstrates that all these cultural patterns contributes to influencing knowledge management choices, decisions and outcomes. As a result of this finding, inconsistencies in the intercultural knowledge integration and transfer may evolve between these different cultural interpretations which can both support and hinder the social dynamics of group cohesiveness, involvement of all project contributors as well as the sense of belonging. The challenge lies in achieving a ‘collective mind’ within an organization
where cross-functional project compositions characterized by high diversity meets subcultures within groups of roles, matrices or within other functional borders.

Previous research mainly imprints the advantages of flat organizations in successful knowledge management implementations (Van Beveren, 2003), but on the other hand struggles to offer models for how an organization can work with the informal power structures that exist even in flat organizations. With reference to my study, such power structures have been revealed especially in relation to my posed interview questions around organizational culture and implied social behaviors and attitudes that are related to the culture. It appears that conflict and frustration tends to arise when certain groups or roles fall into social behaviors that presume they are above others in the pronounced flat organizational hierarchy. A specialist exemplifies, ‘[...] Sometimes, when it gets to a disagreement, it happens that they pull rank and that can really create conflict since it is not formalized that they drive things’. This viewpoint implies that it happens that groups of roles refer to their experience as a means of ‘pulling rank’. In this context and as a replication this allegation by another team member: ‘[...] Every time I interact with somebody I try to motivate why I am saying something with my experience. Most of the time I share my knowledge and experience, it will be in the context and related to an experience that has led me to that point, opinion or decision. You tell people what you think and you also tell them why [...].

Previous research claim that teamwork is encouraged if the organization is matrix-based, as is the case in my case company, as opposed to companies structured with a bureaucratic hierarchical base (Bharadwaj, 2015). Thus, the difficulty in cross-functional project compositions lies in synchronizing all project actors as they come from different disciplines and has their own cultures, cognitive frameworks and different ways of working. It is not seldom that especially large organizations are composed of mixtures of several cultural patterns or a single underlying dominant culture (Alavi et al., 2005). My study suggested that there is an underlying organizational culture underneath these subcultures. Through matrix meeting observations and interviews, various “local” cultures appeared to co-exist. According to literature, such individual or smaller group cultures are not necessarily in harmony with each other, nor in harmony with the prevailing culture of the project (Ajmal and Koskinen, 2008). Drawing on the SECI-model in the context of knowledge integration and transfer from all sources of knowledge and skills residing
within the organization, externalization processes notoriously supports in transforming implicit knowledge into explicit. It is important to not allow the emergence of sub-cultures that are not in harmony with each other to hinder knowledge integration and transfer across these borders of groups and roles. Rather, all knowledge shall preferably be externalized and made efficient use of regardless of which part of the organization it resides in. This is significant as my interviews and observations demonstrated that sub-cultures that were not necessarily in harmony with each other and informal power structures to some extent appeared to exist.

To this end, another co-worker reflects around the challenge of harmoniously synchronizing different groups with each other, and reveal that these sub-cultures tends to cause ‘we-and-them’-thinking: ‘Since we are not part of the core teams, that excludes us a bit. […] Within that role they might be a little bit more competitive, that is the culture within that group, it has developed into that. […] sometimes you can feel that difference’. Further, as the organization is complexly interrelated and composed of various groups, matrices, business areas and departments, it appears that there are differences in how employees perceive their ‘home’-organization. For instance, a business area can be thought of as a co-worker’s immediate organization: ‘[…] when I say organization I mean my own business area which is my immediate organization […]’, whereas for others the matrix can be thought of as the immediate organization. In such scenarios, it is not surprising that sub-cultures emerge. The risk with these observed tendencies are that the organization might allow the development of silo-oriented sub-organizations with their own sub-cultures within groups of roles, functions or business areas that in turn impact the knowledge integration and transfer processes within the organization. Recall that the background to re-designing organizations with a cross-functional project team approach was to move away from just this; departments working and acting in knowledge silos (Lindner and Wald, 2011).

In further reference to my study and in the same context, it was raised that there is awareness in the organization that temporary team members at times feel a bit excluded to the core project team and sensed that they do not belong. For instance; ‘Some specialists feel like second-class citizens. A little bit excluded. This can lead to human-side problems. We do not want to miss people along the way, that they do not feel involved’. In this context, research advocates that bounded project teams are likely to
share a sense of belonging and identity which in turn motivates cooperative behavior (Edmondson and Nembhard, 2009). On the other hand, the less team stability and boundedness experienced within a project, the less is also the group cohesiveness, team performance and positive internal dynamics (Edmondson and Nembhard, 2009). On this note, it is further put forward in literature that a strong directional organizational culture is capable of synthesizing the various individual cultures within a project (Ajmal and Koskinen, 2008), which is required in order to reach a ‘collective mind’ between all actors involved in the project. Thus, although research encourages flat organizations with fluid and flexible team boundaries, one must not forget that this organizational structure is still subject to ‘[…] various interpretations based upon organizational norms and social interactions among individuals’ (Alavi et al., 2005, p. 193).

In consistency with previous research, it is important to be aware of the fact that internal collaboration and cooperative behavior may suffer in flat and organic project-based organizational structures (Slotegraaf and Atuahene-Gima, 2011). When discussing this topic with a team member, this challenge is seen as a task without any easy solutions: ‘I do not see an easy solution to this rather than investing and taking the time with your specialists and stakeholders. To really engage them in the process and make sure that they are aligned with it so that they can do a good job and know everything that is decided’. With this quote in mind, research states that the overall effectiveness of cross-functional teams largely depends on how successfully all diverse functional expertise is integrated within the team (Qiu et al., 2009). The challenge is obvious but difficult to approach, to achieve a sense of belonging and to make every project contributor feel equally important and involved. It comes down to the importance of the socialization mode in the SECI-model to synchronize the various teams, groups and local cultures. Recall to Nonaka et al. (2000) that highlight that it is through social meetings that mental models and mutual trust is both created and transferred across an organization. Also, the externalization mode which transfers knowledge to other team members (making implicit knowledge explicit) further allows knowledge to be shared to other teams facing similar challenges. Thus, the social elements of knowledge conversion, to uphold a continuous dialogue between the team and its surrounding specialists and stakeholders, is crucial for effective knowledge conversion processes. Moreover, it is the social dynamics within any given project that influence the ways in which knowledge integration and transfer is carried through over time in organizations.
With this in mind and in relation to knowledge management theory, the integration of cross-functional project collaborations and temporary team memberships can complicate knowledge transfer processes since it can be challenging to achieve a ‘collective mind’ of the project outcome when there are sub-cultures that impact the social dynamics between cross-functional and highly diverse groups that cooperates on daily and weekly bases. However, on the other side of the same coin, let us not forget that it is this flat and fluid organizational structure characterized by high diversity that enables interdepartmental knowledge integration and transfer across traditional functional borders through socialization and personal networking. Networks are incredibly important in knowledge transfer processes (Edmondson and Nembhard, 2009), hence my study directs firms working in this organizational structure towards obtaining a network-based knowledge culture.

To conclude, social behaviors and attitudes in an organization are heavily influenced by social norms (Alavi et al., 2005), and these social norms has the power to create an effective knowledge integration and transfer culture over time. Therefore, it is vital to understand the underlying dominant organizational culture of the organization that influences the knowledge integration and transfer practices, but it is just as important to understand the local cultures. As demonstrated in my study, there is not necessarily either a single dominant culture or many small local cultures within an organization. Rather, these two can co-exist. To this end, the challenge remains in both academia and industry; to offer suggestions for how to practically address the intercultural knowledge integration and transfer process and to reach a ‘collective mind’ between these sub-cultures and the underlying dominant culture. Particularly, the social dimension of this challenge needs to be addressed as my study sheds light on the effect of sub-cultures on group cohesiveness, sense of belonging and ultimately on project performance. In order to obtain a productive network-based knowledge sharing culture, it is essential that these social dynamics positively influence the interpersonal relationships across individuals, team members, specialists, groups of roles and/or matrices.

5.3 Follow-up vs. Future and forward

Finally, my study suggests that there can be cultural tendencies that on the one hand favors moving onwards to future projects and thus to some degree underestimates the
importance of documenting project learnings for future inter-organizational knowledge integration and transfer for re-use. On the other hand, there can be a desire for more standardized and common ways of working (standardizing the process refers to processual changes, whereas achieving common ways of working refer to socio-cultural dynamics of working routines). My study suggests that by allowing these opposites to meet, effective knowledge integration and transfer for organizational learning and memory can be supported although there is a strong forward-seeking organizational culture.

As suggested in my study, in the attempt of standardizing the process in order to secure improved knowledge integration and transfer processes, the follow-up and evaluation of projects is observed as a case in point where deeply rooted cultural dynamics can contradict and create tensions with the attempt of standardizing the process. Moreover, there is now a formalized ‘follow-up’ phase in the new process, however, the importance of reflection and following up on project learnings occurs to be somewhat underestimated both historically and today. According to research, cultural interpretations develop over time and are successively passed on to new employees and takes form when groups embrace similar interpretive schemes (Alavi et al., 2005). According to a co-worker, this might partly have to do with the personality types working in the company: ‘[…] There is a huge majority of people that are creative and just want to move forward’. Another reason that may impact the knowledge culture when it comes to storing project learnings at common platforms for future re-use may be the pressed time-plans and high stress-levels within the organization. Is there simply no time to pause and reflect over what went well and what could have been done differently in a project? The following quote intensifies this assumption: ‘This company is not good at evaluating. We are very good at saying we need to document this, but nothing happens. It is always future and forward’. In scenarios as described above, it is particularly the knowledge contributed by temporary team members and other stakeholders that is difficult to capture and store for re-use since this knowledge is typically built on the socialization processes in the SECI-model. As the case company to a large extent relies on suchlike network-based knowledge transfer, there might be an observed tension here, which a specialist further confirms: ‘If the communication is a hustle in one project, that is not written down and stored somewhere. Rather, if we have that problem, it needs to go back to the team that worked with the project. […]’.
As implied in my study, the tendencies within a knowledge culture that are observed to underestimate the importance of documenting knowledge, in this case knowledge around project learnings and experiences, may have a major impact as important knowledge assets can be lost which in turn inhibits organizational memory (Lindner and Wald, 2011). Drawing on the SECI-model, the knowledge conversion processes of combination and internalization may be negatively affected as a consequence of these observed cultural tendencies. Without following standards and routines for storing knowledge from the follow-up phase by all project contributors, team members as specialists, there is little consistency in communicating this knowledge across the organization (Bharadwaj et al., 2015). This is further confirmed by an employee: ‘Knowledge from another team and from other functions, there are very few ways for me to take part of that knowledge’. Suchlike rooted cultural interpretations that manifests the acceptance towards moving future and forward instead of looking backwards and reflecting over what went well and what could have been done differently, over time, influences the accepted behaviors and attitudes in the overall organization (Alavi et al., 2005). It is a matter of social norms associated to the organizational culture that pre-defines which behaviors and attitudes are accepted in the organization (Alavi et al., 2005). With reference to my study, it appears that this is exactly what has happened. The knowledge culture has over time been allowed to influence the common perception of the importance of evaluation and project follow-up across the organization, and hence the combination and internalization processes have over time not been made most efficient use of.

In the context of the proclaimed inconsistent execution the follow-up phase in the process, there is naturally less use for strategic knowledge management implementation if the organization struggles with applying the knowledge the organization possesses to its everyday working routines (Bharadwaj et al., 2015). In this context, technology not only codifies and promotes knowledge storage but also promotes an organization’s knowledge culture by influencing employee habits around communication, collaboration, information sharing and learning etc. (Oliver and Kandadi, 2006). Sticking to standards and storing knowledge for future transfer is valuable since other project teams most likely tackle very much the same challenges and frustrations. Thus, it is vital that time, although there may be little disposable time in the organization, is invested in documenting project follow-ups to eliminate the risk of teams repeating the same mistakes over and over again.
To conclude, the process is undergoing a strategic knowledge management structural transition which aims at enabling consistent knowledge conversion processes to take place across the entire organization where knowledge combination and internalization processes may be embraced. For example, one of the process phases formalizes the follow-up phase for promoting organization-wide learning and memory. This is a practical example of how common ways of working in praxis is an ongoing process of socio-cultural processes. Furthermore, with such a major structural process change follows a need for socio-cultural adaptation to that change. The standardization of the process can only provide the framework for the way of working, whereas it is the socio-culturally rooted dynamics that has to adapt to the change in environment and make the difference in the knowledge integration and transfer processes, and this most definitely takes time.

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The key findings of this master thesis have now been discussed. The remaining and final chapter concludes these findings and suggests practical implications and theoretical suggestions for further research.
6 Conclusion

In this final chapter the conclusions that have been drawn with regards to this research are presented. The chapter provides both practical and theoretical implications for further research.

This thesis has examined how organizational culture and knowledge management strategies support as well as hinder knowledge integration and transfer between cross-functional product development teams and specialists in project-based organizations. For many multinational corporations that work in a highly complex, international and cross-functional project-based environment, it is close to a must to undertake a network-based knowledge culture. To this end, it was demonstrated that the integration and transfer of knowledge preferably takes place through personal networking. Employees did not reject storing and accessing knowledge in databases, however to see the full effect of knowledge integration and transfer they preferred to engage in complementary knowledge conversion built on socialization. As a result of working this way, however, organizations should be aware of socio-cultural dynamics that may arise. These network-based knowledge sharing organizations of course consist of various dynamics, however my case study identified some to be further reflected upon when working in this environment.

6.1 Key findings and research implications

Firstly, my study contributes with the finding that an organization with a network-based knowledge integration and transfer culture and a standardized process with standards and routines for effective knowledge conversion processes are two sides of the same coin that can both support and hinder knowledge integration and transfer between cross-functional product development teams and specialists working in a project-based environment. Committing to moving towards a network-based knowledge culture is not synonymous to re-designing the existing knowledge culture within the organization, rather, it is a way of making room for this culture in an environment with a strategic knowledge management implemented process. They are not mutually exclusive. Here, the contribution in praxis lies in the organizational awareness of allowing the knowledge culture and process to interact and shape each other. A suggestion for further research is to investigate how specific cultural values impact a standardized process and an
organizations’ knowledge culture. Also, how do organizations with network-based knowledge cultures support as well as hinder knowledge creation processes?

Further, my study contributes with the finding that both a single dominant organizational culture and multiple local cultures within an organization can contribute to support and hinder knowledge integration and transfer in cross-functional project collaborations. In extension to this finding and as was demonstrated in praxis through my study, inconsistencies in the knowledge integration and transfer processes may evolve across these different cultural interpretations which may further affect the social dynamics of group cohesiveness, the sense of involvement of all project contributors as well as the sense of belonging. An implication for further research calls for extended investigation in praxis of how to achieve a ‘collective mind’ within an organization composed of high diversity, cross-functional project collaborations and various sub-cultures within groups of roles, matrices and/or within other functional borders. Another suggestion is to further research how the dominant organizational culture impacts knowledge management initiatives versus the impact of the local sub-cultures within large organizations.

Finally, this study sheds light on the importance of studying knowledge management in synergy with organizational culture. A major implication of the key role played by the organizational culture, as investigated and demonstrated in praxis in this study, is that it has the power to both support and hinder the reception of knowledge integration and transfer initiatives remarkably. This study shows that there can be cultural tendencies that advocates a ‘future and forward’ mentality that are still capable of adhering to a standardized working process. Noteworthy here is that there is a slight difference in achieving common ways of working and standardizing a process. Common ways of working are a socio-cultural matter, whereas standardization and structure are processual matters. Nevertheless, my study suggests that by allowing process standardization and a forward-seeking network-based knowledge culture to meet, effective knowledge integration and transfer for organizational learning and memory can still emerge. In other words, these opposites do not preclude the other. Rather, they are complementary to each other in the integration of knowledge creation, storage, transfer and application processes. A suggestion for further research calls for extended investigation in praxis how other organizations with a network-based knowledge culture documents project learnings for knowledge transfer and inter-organizational re-use. Another research implication would
be to investigate how an organizations’ knowledge culture is influenced after the implementation of a standardized working process.
References


