SAMINT-MILI-22011
Examensarbete 15 hp
Juni 2022

UPPSALA
UNIVERSITET

Towards Understanding Knowledge Interchange In Cross-Functional Teams

A case study on organizational learning

Mohammad Al-Barghouthi

Masterprogram i industriell ledning och innovation
Master Programme in Industrial Management and Innovation

UPPSALA
UNIVERSITET

Teknisk- naturvetenskaplig fakultet
UTH-enheten

Besöksadress:
Ångströmlaboratoriet
Lägerhyddsvägen 1
Hus 4, Plan 0

Postadress:
Box 536
751 21 Uppsala

Telefon:
018 – 471 30 03

Telefax:
018 – 471 30 00

Hemsida:
http://www.teknat.uu.se/student

Abstract

Towards Understanding Knowledge Interchange In Cross-Functional Teams

Mohammad Al-Barghouthi

Today, many organizations are facing an increased necessity to employ cross-functional teams. Its growing popularity is rooted in its positive impacts on innovation. Additionally, these teams are an excellent way of managing complex organizational tasks without the need for a significant modification of the existing organizational structure. Despite the benefits of the cross-functional team, the diversity in the profession and the specialized knowledge possessed by the team members lead to different thought worlds and perceptions, causing communication barriers. This is problematic because communication is needed to share, transfer, and create knowledge, which are the prerequisites of both individual and organizational learning. There is various literature on knowledge management and learning; however, our understanding of how knowledge interchanges in cross-functional teams remain limited. Therefore, this thesis conducts semi-structured interviews at five successful companies to examine the policies and procedures established by management to facilitate the interchange of knowledge in the organization. Also, it investigates the activities used by coordinators to maximize learning and create a sense of belonging in the cross-functional team.

The findings of this study revealed several activities that could increase both the knowledge interchange and the team's learning. First, it is preferred to have decent knowledge accessibility, where the bar to contact anyone is low. Second, it seems that knowledge receptivity has to be increased, which can be done by giving knowledge a meaning, using pictures, analogies, metaphors, Etc. Third, a frame of reference could be needed, where people can get into each other's shoes through, for example, job rotations and learn each other's job□specific terminologies. Fourth, competition is preferred to be eliminated, which can be achieved by establishing a common team goal, removing internal bonuses, and eliminating ranking systems. Finally, it seemed essential to have cohesion in the group, which can be accomplished by having, for instance, afterworks, group travel activities, and collective organizational culture

Handledare: Ahmed Miran Ali
Ämnesgranskare: Anette Oxenswärdh
Examinator: Michal Zawadzki
SAMINT-MILI-22011

Popular Scientific Summary

Cross-functional teams are defined as a group of individuals who work interdependently with a shared goal across time, space, and organization boundaries. What characterizes the team members is the diversity in the profession. However, the dissimilarities in the group can cause communication barriers. This is problematic because communication is needed for knowledge interchange and learning — where "knowledge interchange" refers to the sharing, transfer, and creation of knowledge.

In this study, we examined the policies and procedures established by management to facilitate the interchange of knowledge in the organization. We also investigated the activities used by coordinators to maximize learning and create a sense of belonging in the cross-functional team. There are several research about how knowledge interchange in the organization. However, there is a limited understanding of how knowledge interchanges in cross-functional teams — especially when arguing from all three aspects of knowledge interchange in conjunction with learning theories.

The findings of this study revealed several activities that increase both the knowledge interchange and the team's learning. First, there should be decent knowledge accessibility, where the bar to contact anyone should be low. Second, the knowledge receptivity has to be increased, which can be done by giving knowledge a meaning, using pictures, analogies, and metaphors. Third, a frame of reference is needed, where people get into each other's shoes through job rotations and learn each other's job-specific terminologies. Fourth, competition needs to be eliminated; that can be done by establishing a common team goal, removing internal bonuses, and eliminating ranking systems. Finally, there must be cohesion in the group, which can be accomplished by having afterworks, group travel activities, and collective organizational culture.

Preface

Acknowledgements

I would like to recognize that this project would not have been possible without the close collaboration with Proactive Sales Management. Therefore, I would like to thank my supervisor Ahmed Miran Ali for giving me this opportunity. I want to extend my gratitude to my subject reader Anette Oxenswärdh, who has guided me and been a source of inspiration for how this study took form. Lastly, I would like to express infinite gratitude to my family for all the years of unconditional support. An explicit thanks to my father, Radwan Al-Barghouthi, my mother, Zarifa Al-Barghouthi, my sisters, Luma, Reem, Laian, and last but not least my wife Emilia Holm.

Contents

CHAPTER 1

INTRODUCTION

This chapter introduces the topic and emphasizes what needs to be achieved within the scope of the research. It also presents the study's central questions that will be answered based on the research findings.

1.1 Background

Many organizations nowadays are facing an increased requisite and popularity of employing *cross-functional teams* (Kotlarsky et al., 2015; Turner and Keegan, 1999). Its growing popularity is rooted in its positive impacts on innovation — enabling the firm to keep up in a world of increased digitization and complexity (Bai et al., 2017; Enz and Lambert, 2012; Lee and Ahn, 2018). The cross-functional composition sometimes gets misinterpreted with *project management teams*, but there is a big disjunction between these two forms. In cross-functional teams, people have functional duties in their specific departments alongside the work duties in the team. On the other hand, project management teams consist of people selected from various departments and work merely on a given project with a common goal (Cobb, 2011).

Despite the benefits of cross-functional teams, it is not easy to achieve a collaborative manner that alters the individual knowledge into an integrative cogenerated solution (Carlile, 2004). The diversity of specialized knowledge possessed by the team members leads to different thought worlds and perceptions, causing communication barriers. The more extensive the functional diversity among team members the greater the risk of task dissent (Majchrzak et al., 2012). These difficulties in managing knowledge within cross-functional projects arise because the process is way beyond transferring

knowledge from a source to a receiver. It requires participants to transform their existing knowledge into new knowledge, while being complements for other members in their knowledge transformation (Hargadon and Bechky, 2006; Tsoukas, 2009). Within the frame of knowledge transformation, individuals need to externalize the "deep" knowledge they possess. This could include assumptions about other team members' knowledge, the implicit causal conceptualization of the given problem, dependencies and interdependencies between the divergent specialty areas, and the different boundaries of the various potential solutions paths (Carlile, 2004).

Even though the cross-functional team structure is on demand, our understanding of how knowledge interchanges within this specific context remain limited (Huang et al., 2001). The whole field of knowledge management is undervalued and has not yet become anchored in organizations as an essential value creator (Kamara et al., 2002; McConalogue, 1999). Literature on knowledge interchange in cross-functional projects remains scarce, lacking insights into the activities conducted by organizational members in carrying out knowledge integration (Tell, 2011). This understanding is crucial, especially from the knowledge-based view, which builds on the assumption that knowledge is the primary resource of an organization's competitive advantage (Grant, 1996; Huang et al., 2001). This thesis adopts the knowledge-based view, concluding that the firm's primary function is the application of available knowledge — making the understanding of knowledge interchange a central role in the organizational efficiency and competitive advantage (Kamara et al., 2002; McConalogue, 1999).

1.2 Problematization

As mentioned before, there is a limited understanding of how knowledge interchanges in cross-functional teams. Much of the research on cross-functional knowledge integration focuses on concrete boundary objects (Majchrzak et al., 2012). Put differently, when trying to grasp knowledge interchange, an organizational learning stance is usually taken, redirecting the focus to concrete activities that are believed to be beneficial for the teams' efficiency and creativity (Bechky, 2003; Carlile, 2002; Ewenstein and Whyte, 2009). However, based on the literature review in 2, a knowledge management stance is not as highlighted when conducting such studies. According to King (2009), knowledge management focuses on the content while organizational learning focuses on the process. They both are highly correlated and achieve the same goal of making the organization smarter and more efficient. The distinction is purely academic and lies in the starting point. Organizational learning starts with focusing on teams and organizations, which

depends on individual learning. Knowledge management, on the other hand, starts with focusing on knowledge as a concept, but eventually, the individual is a necessary tool for accessing that information (Easterby-Smith and Lyles, 2011; King, 2009; Rogers, 2005). The last-mentioned epistemological approach is crucial to include, because it would also attempt to explain the underlying reasons of *why* the mentioned concrete activities are beneficial. Moreover, authors such as Ghobadi and D'Ambra (2012); Harms (2011); Hong and Vai (2008) take an epistemic stand, narrowed down to a single theory from the scope of knowledge interchange. This is too simplistic and does not reveal the bigger picture of the broad spectrum of knowledge.

Furthermore, some of the studies conducted by authors such Aime et al. (2014); Ghobadi and D'Ambra (2012); Littlepage et al. (2016); Love and Roper (2009); Sarin and McDermott (2003), have been quantitative. There is a need for qualitative case studies because they provide deeper information that demands extensive human interaction to be attained (Ercikan and Roth, 2006; Inkinen, 2016; Reichardt and Rallis, 1994).

1.3 Research Aim

By examining various streams of literature, one could notice a scarce and limited understanding of how knowledge interchanges in cross-functional teams. Therefore, this thesis aims to bridge some of the gaps by investigating how methods and activities used by successful[1] oordinators correlate with knowledge management and learning theories.

Three main questions were derived from the literature review in 2 and are presented in the section below to achieve the research aim.

1.3.1 Research Questions

- *What are management doing to facilitate the exchange of knowledge in the team?*
- *What methods and activities are coordinators using to maximize learning for the cross-functional teams?*
- *How do coordinators create a sense of belonging to the cross-functional team?*

[1] *Successful* is considered from the context of seniority.

1.4 Delimitations

Several variables could increase the efficiency of cross-functional teams. For example, one factor could be related to budget, and another variable could be related to technology. However, this thesis will mainly focus on the process of learning and knowledge itself, its characteristics, and its flow, making the focal point epistemological.

1.5 Outline

Chapter 1: Introduction

This chapter introduces the topic including the problem description, and emphasizes what needs to be achieved within the scope of the research. It also presents the study's central questions that will be answered based on the research findings.

Chapter 2: Literature Review

This chapter problematizes the existing literature and highlights a gap that this thesis aims to fill, driven by the research question and aim described in chapter one

Chapter 3: Theoretical Framework

This chapter presents the theoretical framework needed to understand knowledge interchange in cross-functional teams. More specifically, it covers the definition, sources, types, exchange, and creation of knowledge.

Chapter 4: Methodology

This chapter highlights the philosophical underpinnings of the thesis and outlines the specific research design choices. It also presents how the data were collected and analyzed. Put differently; it explains what was done and how it was done.

Chapter 5: Results & Analysis

This chapter presents the study's empirical findings in conjunction with the themes extracted by the thematic analysis. The results are then analyzed using the theoretical framework discussed in chapter 3.

Chapter 6: Discussion

This chapter delves into the overall meaning of the results and analysis. It evaluates the findings and shows how they relate to the research questions. Thus, making an argument to support the overall conclusion.

Chapter 7: Conclusion

This chapter serves as a concluding summary of the research findings and wraps up the thesis.

CHAPTER 2

Literature Review

This chapter problematizes the existing literature and highlights a gap that this thesis aims to fill, driven by the research question and aim described in chapter one.

In a world with growing complexity, firms are increasingly relying on an organizational form that is dependent on cross-functional projects (Turner and Keegan, 1999). Even though cross-functional teams enhance the company's competitive position, they often do not yield anticipated performance gains (Ancona and Caldwell, 1992). The literature review conducted by Williams and O'Reilly III (1998) concluded that individuals within these teams do not contribute with their best efforts. Instead, they explained the lack of individual collaborative performance as a relationship between functional background identity and dissimilarity. Hauptman and Hirji (1999) performed a study consisting of 50 cross-national teams from companies in the USA, Canada, Denmark, UK, Australia, and Finland. They concluded that team-based rewards, the management style of the project leader, and project structure; supported the teams' efficiency. Sarin and McDermott (2003) got similar results through their study of 229 members from 52 cross-functional projects. They emphasized a positive relationship between the teams' success and a democratic leadership style with the initiation of a goal structure.

Henke et al. (1993) also agreed that most firms are not using cross-functional teams as efficiently as they should, but contributed the rigidity to hierarchical structures within the team. Aime et al. (2014) partly agreed and developed the concept of *heterarchy*, which is a conceptualization of power structures in groups that is more dynamic than a traditional hierarchy. A study including 516 people across 45 teams demonstrated that heterarchical structures — in which the power relationships within a team shift

depending on their relevance to a given task — had a positive effect on the team's creativity.

Ainamo (2007) illustrated two main factors that correlate with the effectiveness of any cross-functional arrangement. First, when teams and their customers are relatively unfamiliar with each other, they will face a more significant challenge than a collaboration based on an extension of a present line. Second, when teams are familiar with a given product and the coordination mechanism used to manage product development, they will be more likely to deliver higher results. Sethi et al. (2001) had a different view and studied 141 cross-functional teams to conclude that innovativeness is positively related to the solidity of the teams' superordinate identity, costumers influence, and encouragement to take risks. Another interesting founding of theirs was how social cohesion negatively affected creativity when it exceeded a moderate level, contradicting the findings of Hauptman and Hirji (1999).

McDermott (1999) conducted a literature study where he argued that optimal learning is an exchange where team members build a relationship to make sense of each other's ideas. He highlighted the value of a double-knit organization in the knowledge exchange and pointed out its superiority over the orthodox matrix organization by Davis and Lawrence (1977). Nonetheless, when breaking down the process of knowledge exchange, many authors fail to distinguish between knowledge *sharing* and knowledge *transfer* and talk about them as synonyms Liyanage et al. (2009). Shifting from the thought of knowledge exchange, Khalil et al. (2013) viewed agile philosophy as one of the main contributors to knowledge creation within cross-functional teams.

All the mentioned literature justifies cross-functional teams' success from a focal point of either managerial styles or group identities. For example, some authors, such as Ghobadi and D'Ambra (2012); Harms (2011); Hong and Vai (2008), tackles the issue from an epistemological perspective narrowed down to a single theory from the scope of knowledge interchange — in this case, either knowledge *transfer* or knowledge *sharing*. Also, several works of literature exclude perspectives of learning theory. Further, when redirecting focus on the knowledge itself, scholars have approached the topic from various angles and used dichotomies in the attempt of defining and classifying knowledge, including but not limited to: internal vs external, and tacit vs. explicit (Heisig, 2009). However, there is a vague and limited understanding of how knowledge interchanges in cross-functional teams (Huang et al., 2001).

CHAPTER 3

THEORETICAL FRAMEWORK

This chapter presents the theoretical framework needed to understand knowledge interchange in cross-functional teams. More specifically, it covers the definition, sources, types, exchange, and creation of knowledge.

3.1 Definition of Knowledge

Since ancient times, the definition of knowledge has been a central part of epistemology. There are several definitions with many arguments of support, yet no one entirely satisfactory interpretation (Bolisani and Bratianu, 2018). However, knowledge is generally decomposed into three conditions, following Neta and Pritchard (2009).

- *The truth condition.*
- *The belief condition.*
- *The justification condition.*

Each of the conditions above is an essential element when trying to define knowledge, with limitations discussed in 3.1.1, 3.1.2 and 3.1.3.

3.1.1 The Truth Condition

This condition demands that if one knows a proposition, then it must be true. An essential building block of knowledge is captured here, which is being right. The issue arises when someone thinks something is true, but it turns out to be false. In this case,

there was no truth, and therefore the person did not know what was claimed to be known (Neta and Pritchard, 2009).

Since knowledge and truth go hand in hand, it is pertinent to address the nature of truth. There are two schools of thought that tackle the way truth is viewed, namely; *realism* and *relativism* (Pritchard, 2013). From the realist's point of view, truth is objective and does not depend on a personal opinion. The relativist, on the other hand, sees truth as something subjective, and therefore if one person believes in a flat earth and the other in a spherical earth, both would be right. The latter view is problematic when defining knowledge because it eliminates the distinction between right and wrong since anything could be a "truth" depending on the individual. Pritchard (2013) argues that relativism is self-undermining and therefore false. From a relativistic standpoint, the realist's view of truth is just as true as the relativist's perspective. However, the core philosophy of realism denies relativism — since realism does not embrace the concept of subjective truth. Therefore it follows that one of them must be wrong. If relativism is true, then realism must be true. But if realism is true, then relativism must be false.

3.1.2 The Belief Condition

This condition demands that if one knows a proposition, then the proposition must be believed in. An essential building block of knowledge is captured here, which is the empowerment of the individual experience (Neta and Pritchard, 2009).

Sometimes the concept of *belief* gets confused with the concept of *acceptance*. Philosophers usually underline the distinctions between these two. Van Fraassen et al. (1980) claimed that one could accept a proposition without believing in it. They argued that it is common among scientists to accept a particular theory as a sufficient basis for their research without believing it to be an explicit truth. Further, Bratman (1999) extends this thought by highlighting the idea of believing in a proposition without accepting it. He argued that one might truly believe that a ladder is stable before checking it, but there will be no acceptance until the ladder's stability is inspected.

An additional notion is whether to classify *delusions* as *beliefs*. Some authors as Campbell (2001) view delusions as beliefs and distinguish between rational and irrational beliefs. However, many authors reject that idea and separate delusions from beliefs. Bortolotti (2009) states that delusions are not receptive to evidence, which beliefs must be. Also, beliefs can be integrated with other beliefs, which delusions can not. Hence, there must be a dichotomy between delusions and beliefs.

3.1.3 The Justification Condition

This condition demands a way of justifying that the belief one has is true. An essential building block of knowledge is captured here, which is the proof of being right (Neta and Pritchard, 2009).

The reason behind the need for a justification is described by Bolisani and Bratianu (2018) as the elimination of the "lottery phenomenon". One can believe in winning the lottery, and it can become true; however, it would just be luck rather than knowledge — therefore, justification is needed.

The justified true belief is referred to as the *tripartite* account of knowledge. Gettier (2012) found these three conditions of knowledge incomplete and constructed counterexamples to demonstrate his thesis. He advanced by giving an example of how time can be known by looking at a reliable clock. Assuming the clock is previously known to reveal the correct time, it would then be a valid way of justification. However, if the clock breaks unknowingly, and someone looks at the clock the one moment in the day it is telling the "right" time, then a condition of *justified true belief* will be achieved without being knowledge.

The above interpretation of knowledge belongs to the classical epistemology, emphasizing *truthfulness* as the main characteristic. Nonaka and Takeuchi (1995) found this traditional interpretation static and lacking human nature. Hence, they shifted the focus away from *truthfulness* and underscored the concept of *justified belief* — which is a dynamic human procedure of justifying personal beliefs toward the truth. Put differently; they transformed the abstract philosophical discussion into a managerial issue. Further, they contemplated the justification process against the social and organizational context — where the knowledge creation occurs. This converged the nature of justification to an economic construct, where the justification was achieved by useful[1] metrics, including cost, profit, capabilities, etc. More details regarding the different metrics will be presented along with the thesis.

[1]The usage of the word *Useful* is considered from the context of an organizational economic advantage.

3.2 Sources of Knowledge

3.2.1 Rationalism

According to Longworth (2009), rationalists adapt at least one of the following views regarding the sources of knowledge.

- *The intuition thesis.*
- *The innate knowledge thesis.*
- *The innate concept thesis.*

In the first view, knowledge is seen as something derived by intuition and deductive[2] reasoning rather than from pure sensational experience. Ayalon and Even (2008) further explain deductive reasoning as the process of inferring conclusions from given premises — following logic rules — without the need of experimental validation. Leibniz and Parkinson (1995) clarify the intuition thesis by the following example:

$$\left.\begin{array}{l}\text{All men are mortal.}\\ \text{Alexander is a man.}\end{array}\right\} \text{Therefore we can deduce that Alexander is mortal.}$$

In the second view, knowledge is seen as something *innate* (determined by the nature of the human rather than a specific course of experience). This view indicates that our knowledge is neither experimentally learned nor intuitionally deduced. Instead, it is simply part of the rational self of the human being (Longworth, 2009). The innate knowledge thesis is often regarded to belong to radical rationalism. Philosophers with this prospect comprehend sensational experiences as triggering processes that bring knowledge to consciousness — but the knowledge itself is already there. Cooper et al. (1961) argues that the field of geometry in mathematics is neither deductively derived nor empirically obtained. Therefore, the knowledge must initially be there; otherwise, there will be no guidance on what to seek and no recognition when it is found.

In the third view, knowledge is separated from *concepts*, where the concepts is perceived as *innate* (Karakaş, 2019). This thought was already investigated by Descartes et al. (1988) who argued that we create concepts such as the idea of a unicorn from other concepts and ideas we possess. Therefore, concepts are innate, and knowledge is derived from concepts.

[2]This is the traditional approach of deductive reasoning, which I also adopted in this thesis.

3.2.2 Empiricism

According to Meyers (2014), empiricism is the view that justification of beliefs is experience-dependent — making the source of knowledge solely empirical. Put differently, empiricism denies both the intuition and the innate knowledge thesis, and it also rejects the innate concept thesis. According to empiricism, experience is our only source of concepts and ideas (Vanzo, 2013). Nevertheless, Chisholm (1948) does not share this view and criticizes empiricism in the following way. First, how do we know when to trust our sensory experience? Our experiences are exposed to delusions that drugs, brain injuries, etc. can cause. Second, even when allowing sensory-based statements, we will eventually reach a level where the sensory data need to be organized in a way that is not empirical — to deduce new knowledge.

Singh et al. (2007) wrote about how empiricism evolved with time and how it has today taken the role of quality assurance in the academic world. They clarified their declaration by stating that the most cited top management journals are empirical.

A final acknowledgment regarding the sources of knowledge is that someone can be a rationalist in mathematics and an empiricist in management or a specific part of management studies. However, it is not possible to adapt both rationalism and empiricism for the same subject matter since they contradict each other (Longworth, 2009).

3.3 Types of knowledge

3.3.1 Explicit

Explicit knowledge is the type of knowledge that has been articulated and codified (Davies, 2015). Nonaka and Takeuchi (1991) referred to explicit knowledge as *formal* and *systematic*. They extend the notion by mentioning a few examples of explicit knowledge, such as product specifications, documents, textbooks, and manuals. Smith (2001) refers to explicit knowledge as *know-what* and argues that it is often technical and gained through formal education or structured studies. She also states that one advantage of codification is the easy accessibility — making the knowledge highly reusable and available for solving additional problems.

3.3.2 Implicit

Implicit knowledge is the type of knowledge that can be articulated and codified but has not (Nickols, 2000). Some authors, such as Rolf (2004) classify the knowledge solely into two types, namely, the explicit and tacit form. According to him, implicit knowledge is not a type but a pre-stage of explicit knowledge. However, Griffith et al. (2003) disagrees and describes implicit knowledge as a type between the two extremes of explicit and tacit one. They mark out the possibility of making the implicit knowledge declarative by simple gestures, such as asking a team member how to perform a specific task.

3.3.3 Tacit

Tacit knowledge is the type of knowledge that can not be articulated or codified (Dienes and Perner, 1999). According to Sternberg (1997), tacit knowledge is usually informal and often highly personal and subjective. Polanyi and Sen (2009) emphasized that we know more than we can tell. They extended that idea by underlining how we recognize a family member's face without being able to covey that memory to somebody else fully. The recognition is a gestalt, and decomposing it for codification will fail to capture its composition. Liebowitz and Beckman (1998) considered tacit knowledge to be automatic and a source of influence on our collective behaviors — and by that, helping the decision-making process in organizations.

3.4 Knowledge Exchange

3.4.1 Knowledge Sharing

The knowledge-sharing process is described by Truch et al. (2002) as a mutual knowledge exchange, consisting of both the supply and demand of new knowledge. Ryu et al. (2003) agree to that definition and summarise knowledge sharing as a people-to-people process. According to Robertson (2002), the first step to a successful knowledge sharing system is to understand the involved humans — since knowledge sharing is a human activity. He continues by mentioning contextual factors that affect the efficiency of the knowledge-sharing process. He argues that attention to the team structure and constant sharing of documents benefit knowledge sharing. Davenport et al. (1997) clarified the dichotomy between sharing and reporting, and stated that sharing is a voluntary act — derived from trust and a united culture — whereas reporting is based on formal routines. They also

highlighted how knowledge sharing links the individual level with the organizational level, creating a competitive advantage for the organization. In accordance with Hendriks (1999), a major factor in organizational victory is the interaction between individuals with diverse knowledge — resulting in a much higher innovative success than when the same knowledge are managed individually.

Both explicit and tacit knowledge is possible to share, whereas explicit knowledge is possible to codify. However, the ability to codify knowledge should not be mistaken for the ability to share it. For that reason, Weiss (1999) introduced the concepts of *embedded* and *rationalized* knowledge, to separate explicit knowledge that is easy to share from the one that is not. Embedded knowledge is narrow, personalized, and context-dependent, thus, harder to share. On the other hand, rationalized knowledge is standardized, general, and context-independent, thus, easy to share. This could, for instance, be templates for drafting legal opinions or methodologies for regulating consulting projects (Weiss, 1999).

Several obstacles and factors reduce the ability of knowledge share. First, as Alvesson (2011) described it, the resistance to engage in knowledge sharing activities. The individual's knowledge could be its primary source of value to the firm, and sharing it could decrease that person's status in the organization. The second obstacle is lack of trust, which Andrews and Delahaye (2000) described as a killer of knowledge share. They argued that a competitive environment is highly correlated with trust issues, and therefore individuals are less likely to share their knowledge. The third barrier is the lack of opportunities to share. Bartol and Srivastava (2002) mention a few formal and informal settings in the organization that could allow professionals to share their experiences. Such activities are but are not limited to: Well structured teamwork, training programs, periodic meetings, and water-cooler chats. Also, too much stress can be a barrier to knowledge sharing because it leaves no room for the opportunity to share (Amin et al., 2011).

One vital detail to recognize is that many authors failed to distinguish between knowledge *sharing* and knowledge *transfer*. Typically, many researchers mix those two concepts and talk about them as synonyms (Liyanage et al., 2009). More details on knowledge transfer are found in the next section.

3.4.2 Knowledge Transfer

The knowledge transfer process is described by Argote and Ingram (2000) as an exchange beyond the individual level, which involves the group, department, division, and the organization as a whole. Therefore, the knowledge sharing activity (described in 3.4.1)

can be seen as a stage in the knowledge transfer process (Nonaka and Takeuchi, 1991). In another paper, Disterer (2001); Nonaka (1994) described some infrastructures that consolidate knowledge transfer and outlined hierarchies and bureaucracies as threats that should be broken down. Bartlett and Ghoshal (1998) agreed with that statement, and included the potential of *sticky knowledge*. The stickiness is a metaphorical expression of centralized knowledge in one part of the organization due to hierarchies — causing stiffness in knowledge transfer. The hierarchies are not solely among departments but are also embedded within the departments. According to Cranefield and Yoong (2005), as knowledge becomes more specialized, new terminologies are evolved. This creates a linguistic identity among specialists, restricting knowledge from being transferred to less experienced practitioners. Davenport et al. (1997) gave examples to flatten the organizational hierarchies and focused on the need to develop horizontal communication flows. Therefore, they strongly encouraged working in cross-functional teams. More about cross-functional teams is found under Section 3.7. Another support structure is a reward system that depends not only on financial success. Bartlett and Ghoshal (1998) argued that financial success promotes competition rather than encouraging knowledge transfer.

From the context of the knowledge-based view, there are uncertainties about the linkages between actions and their specific results. This leads to *causal ambiguity* and blurs the potential value of the knowledge possession (Uygur, 2013). Simonin (1999) explicated how causal ambiguity is positively correlated to the difficulty of transferring knowledge. Seaton (2002) argued that it takes knowledge about *how* to transfer knowledge in respect to achieving a successful knowledge transfer. He extends this thought by changing the phrase "*This is what I know*" to "*This is what my knowledge means for you*". The idea above underscores the conceptualization of knowledge utilization, which prevents the loss of information in knowledge transfer. Zahra and George (2002) expressed the importance of highlighting *why* the knowledge is helpful to increase the receiver's absorptive capacity and willingness to acquire that knowledge.

3.5 Knowledge Creation

The concept of knowledge creation touches the concept of *knowledge hierarchy* which initiates as *data* (Nonaka et al., 2000). Most data have numerical configuration and can therefore be quantified. When data is given purpose and put into context, it becomes *information* and is often assigned a unit of measure. However, a number with a unit of measure has almost no value without meaning. It is the human intervention that gives

information a meaning and turns it into *knowledge* (Smith, 2001). Some researchers such as Hansen et al. (1999) argue that transforming *knowledge* to *wisdom* increases the competitive advantage of a given company. Tobin (1998) built on the case by emphasizing the misconception of *wisdom* being a transformation of *knowledge*. He argued that *wisdom* closely resembles *tacit knowledge*, and is therefore just a type of knowledge.

Nonaka et al. (2000) provided a three-element model that can be used to understand how organizations create knowledge. This dynamic model consists of: (i) the *SECI* process, describing how knowledge is created via interactions between the tacit and explicit domain; (ii) the *Ba* process, mapping the mutual context for knowledge creation; and (iii) *knowledge assets*, describing the inputs, outputs, and the moderating factors of knowledge creation.

3.5.1 SECI

According to Nonaka and Takeuchi (1991), knowledge creation can be modeled with two dimensions. The *epistemological* dimension contrast between tacit and explicit knowledge. Besides, the *ontological* dimension outlines knowledge that is shared; individually, groupwise, and organizationally. This dynamic interaction between the two dimensions depicts the four patterns of knowledge creation, namely: *socialization*, *externalization*, *internalization* and *combination*.

3.5.1.1 Socialization

During the socialization process, tacit knowledge is converted to new tacit knowledge. This is achieved through observation, imitation, and shared experience. The socialization process indeed gives the person new tacit knowledge; however, it lacks the ability to provide a systematic insight into the knowledge. Since the knowledge never becomes explicit, it becomes hard for the organization to leverage the knowledge holistically (Nonaka and Toyama, 2015).

3.5.1.2 Externalization

In the externalization process, tacit knowledge is converted to explicit knowledge. This occurs when the organization formally articulates internal roles of operation. Nonaka et al. (2000) explain that tacit knowledge can also become explicit through innovation — for instance, when a new approach to financial control is developed based on someone's

tacit knowledge acquired over many years in the job. Bontis (1998) describes externalization as the process of expressing the inexpressible. He points out the difficulty of the process and states that all knowledge will never be conveyed. Nevertheless, loss of knowledge can be minimized by using models, metaphors, and analogies.

3.5.1.3 Internalization

Throughout the internalization process, explicit knowledge becomes tacit knowledge. This happens during the employees' involvement in seminars, workshops, training, and dialogues. Put differently, explicit knowledge is interpreted by a person's frame of reference and subsequently internalized. This tacit knowledge is then creatively applied to develop specific ideas, but is rigid to distribution across the organization (Smith, 2001).

3.5.1.4 Combination

During the combination process, explicit knowledge is transformed into new, more complex explicit knowledge. The knowledge could originate from internal or external sources, i.e., from inside or outside the organization. Successively, it gets processed, edited, and combined, to form new explicit knowledge. This could, for instance, attain when a manager collects different information throughout the organization and synthesizes it into a report. The combination does not directly expand the knowledge-base of the company, but it is beneficial for the organization since it is easily allocated (Gourlay, 2003).

3.5.2 Ba

Knowledge needs a context to be created, and is therefore context-specific in terms of with *whom* and *how* participation took place (Vygotsky, 2012). Philosophers such as Shimizu (1995) and Nishida and Dilworth (1970) developed the concept of *ba*; originating from the Japanese language and means "space and time". *Ba* is the platform where information matures into knowledge — which counters Simon (1983) idea of knowledge creation being intrinsic. Sometimes, *ba* is confused with the concept of *communities of practice*. Wenger (1999) clarifies the hesitancy by arguing that a *community of practice* is a place where embedded knowledge is learned, while *ba* is a place where new knowledge is created. Diving deeper into the concept of *ba*, Nonaka and Takeuchi (1991) divide it into two interactive dimensions. The x-axis includes the type of interaction, being *individual* or *collective*. The y-axis incorporate the media of communication, whether it being *face*

to face or *virtual*. The dynamic interchange between the dimensions results into four contexts for knowledge creation, namely: *originating ba*, *interacting ba*, *systemising ba* and *exercising ba*.

3.5.2.1 Originating Ba

The *originating ba* is defined by individual and face-to-face interplay. This interchange removes the barrier between the self and the other. Further, the one-on-one interaction captures phenomenons beyond conversation, such as body language, feelings, and emotions. What is apprehended is often indescribable, making the *originating ba* a context for *socialization* — where tacit knowledge is converted to new tacit knowledge (Nonaka and Konno, 1998).

3.5.2.2 Interacting Ba

The *interacting ba* is defined by collective and face-to-face interplay. This interchange captures each individual's experience and innate skills, leading to a translation of articulated concepts and common terms among the group. What is apprehended is both communicable and codifiable, making the *interacting ba* a context for *externalization* — where tacit knowledge is converted to explicit knowledge (Corno et al., 1999).

3.5.2.3 Exercising Ba

The *exercising ba* is defined by individual and virtual interplay. During this interchange, the individual utilizes explicit knowledge communicated virtually in the forms of documentation, manuals, simulations, etc. This leads to apprehending by the individual's cognitive system as new work practices and concepts. Hence, the *exercising ba* is a context for *internalization* — where explicit knowledge becomes tacit knowledge (Balestrin et al., 2008).

3.5.2.4 Systemising Ba

The *systemizing ba* is defined by collective and virtual interplay. During this interchange, explicit knowledge is shared virtually in documentation, online forums, video lectures, etc. This offers a collaborative environment for the people, where comments, discussions, and debates occur. The individuals can then combine their explicit knowledge with the already existing one. Hence, the *systemising ba* is a context for *combination* — where explicit knowledge is transformed to new, more complex explicit knowledge (Chou and Wang, 2003).

3.5.3 Knowledge Assets

According to Nonaka et al. (2000), *knowledge assets* are firm-specific resources that constitutes the base of knowledge creation. The knowledge assets can not be bought; thus, organizations need to build and develop those assets internally. Generally, it is hard to measure and manage knowledge assets — since they consist of knowledge-creating activities, which are constantly evolving (Stewart, 2007). In order to understand how knowledge assets are acquired, created, and exploited, they are divided into four categories, namely: *experiential*, *conceptual*, *routine* and *systemic*.

3.5.3.1 Experiential

The *experiential* knowledge assets are of tacit nature and build through common shared experience. This shared experience constructs the organization's members, its suppliers, and its customers. The purpose of *experiential* knowledge assets are to share both the skills and know-how of individuals (Nonaka et al., 2000). The know-how is a procedural category; hence *experiential* knowledge assets make process-oriented tasks easier to accomplish. Since *internalization* require individuals to achieve process-oriented tasks, it becomes reasonable to suggest that *experiential* knowledge assets facilitate *internalization* (Chou and He, 2004).

3.5.3.2 Conceptual

The *conceptual* knowledge assets are of explicit nature and builds through symbols, images, and language. These assets are founded on the concepts held by organization members along with the customers, and can be anything from designs to brand equity. Because these assets are relatively tangible with a know-what class, *conceptual* assets are easier to acknowledge than *experiential* assets (Nonaka et al., 2000). The know-what is a declarative category; hence *conceptual* knowledge assets make content-oriented tasks easier to accomplish. Since *externalization* require members to carry through content-oriented tasks, it becomes sensible to propose that *conceptual* knowledge assets facilitate *externalization* (Becerra-Fernandez and Sabherwal, 2001).

3.5.3.3 Routine

The *routine* knowledge assets are of routinized tacit nature and build through organizational culture, know-how, and routines. Sharing the organizational background story helps the employees to form routine knowledge, which has functional characteristics

(Nonaka et al., 2000). The know-how is a declarative category that benefits process-oriented tasks — however, routine knowledge assets require organizational members to share, integrate, and continuously utilize routines, forming certain patterns of thinking. The members' extensive and interactive coordination makes the task domain vastly broad. Since *socialization* has a broad task domain, it becomes decent to point out that *routine* knowledge assets facilitate *socialization* (Chou and He, 2004).

3.5.3.4 Systemic

The *systemic* knowledge assets are of systematized explicit nature and build through manuals, product specifications, and documents. Also, legally protected intellectual properties such as patents and licenses belong to this classification (Nonaka et al., 2000). The *systemic* knowledge assets are the easiest to share due to their tangible know-what configuration. In addition, they require dynamic interchange in which personal knowledge is combined through communication and collaboration with other individuals and business units to form new explicit knowledge. Since *combination* forms new explicit knowledge, it becomes pertinent to propose that *systemic* knowledge assets facilitate *combination* (Becerra-Fernandez and Sabherwal, 2001).

3.6 Organizational Learning

3.6.1 Individual & Collective Learning

Organizational learning has two perspectives: (i) *cognetive perspective*, based on psychology and individual learning; (ii) *social perspective*, based on sociology and social learning. The psycho-social view of learning can be demonstrated by the interplay of the individual and collective domain. (Chiva and Alegre, 2005; Easterby-Smith et al., 1999; Yanow, 2000). Three main themes reveal the relations between individual and collective learning (Fenwick, 2008). The first theme is the *individual knowledge acquisition*, which characterizes learning as an individual human process of translating new skills, behaviors, and concepts to resources that expand the organizational capabilities (Nafukho et al., 2004). This view also assumes that individuals acquire knowledge cognitively by listening and acting, which presupposes a conversion from tacit knowledge to explicit (Morris and Beckett, 2004). At this level, a process of intuition is needed, which Crossan et al. (1999) describe as the preconscious recognition of the pattern. Clegg et al. (2005) argued that recognition is supplementary to organizing which in turn implicates thinking.

The second theme is *sensemaking and reflective dialogue*. This theme underlines learning as deliberative and a meaning-making procedure through language. This views learning as both individual and collective denotation of identifying problems and creating solutions. The collective is seen as a forum for sharing meaning and gives rise to individual reflections necessary for creating new knowledge (Svensson et al., 2004). Reflection will increase the depth of knowledge; it will personalize and contextualize the knowledge further and help identify missing areas, making the learner more receptive to knowledge (Chang, 2019; Moon, 2013). Generating new knowledge depends on the interplay of diverse knowledge (Sproull, 2010). Common knowledge is a precondition for organizational members to be able to communicate and provides a basis for coordination (Lawson and Lorenz, 1999). At this level, a process of integration is needed, which Crossan et al. (1999) describe as the process where individuals develop shared understanding and take coordinated actions through mutual adjustment.

The third theme is *Network utility*. This view conceptualizes learning as a sequential series of utility networks. Put differently, the individuals and teams convey knowledge through their network within and across organizations (Fenwick, 2008). However, this can sometimes gestate learning as a linear operation of transmission, where the information remains undisturbed, which is not true — since the interpretation is subjective and the message could also be misinterpreted (Brown and Duguid, 2002). At this level, a process of institutionalization is needed which Crossan et al. (1999) describe as the process of establishing routinized actions — embedding individual learning into the organizational structures, systems, procedures and strategies. Further, authors such as Cabrera and Cabrera (2002) reported a correlation between learning and sociocultural issues. They stated that individuals and teams would most likely share in circumstances where sharing is valued and supported by, for instance, a shared sense of group identity.

3.6.2 Cooperative Learning

Cooperative learning can be defined as people working together in a group. The size of the group must not exceed a limit that allows everyone to participate in the collective assigned task. Also, the team is expected to conduct the task with direct and relatively controlled supervision of the manager (Cohen, 1994). As the term "cooperative learning" implies, employees help each other learn and share knowledge in the team and across the organization. The manager allows the employees to set goals and learn uniquely without dictating specific instructions. This allows the employees to continuously be active participants in the learning process and acquisition of knowledge (Sharan and Sharan, 1987). For further understanding, Davidson and Major (2014) demonstrates

cooperative learning by referring to the jigsaw method. This method expects all team members to learn all parts of a material and not only the part of their field of expertise.

There is no single universal method of cooperative learning, but some scholars such as Davidson and Worsham (1992) suggest four critical attributes for achieving cooperative learning: (i) a task suitable for group work; (ii) one-to-one interaction in smaller groups; (iii) interdependent structure; (iiii) individual responsibility. Kagan (1989) also identified four critical attributes for achieving cooperative learning with the acronym *PIES*: Positive interdependence, Individual accountability, Equal participation, and Simultaneous interaction.

3.6.3 Collaborative Learning

Collaborative learning is defined in a way that emphasizes the importance for the people not only to work together in a group but also to let the group work together with the manager, thus shifting the nature of the authority to less restricted. Further, collaborative learning views knowledge as something constructed by people talking together and reaching an agreement. Thus, collaborative learning focuses on working together toward the same goal without the necessity of being interdependent (Bruffee, 1999). For further understanding, Davidson and Major (2014) demonstrates collaborative learning by giving an example of creating a musical theater. The musical involves several tasks such as: creating vocal music, creating instrumental music, choreography, costume design, lighting, etc. Each person is primarily responsible for one aspect of the tasks, yet all components must fit together interdependently to create the musical theater under the leadership of the director.

Brubacher et al. (1990) suggest five critical stages for achieving collaborative learning. The first stage is *engagement*, people meet and engage by providing input and information relevant to the given task. Second, comes the *exploration* stage, where people explore the information by judging based on their a priori knowledge and past experience. Here it is free to think loudly, make mistakes and ask questions. Thirdly, a *transformation* stage occurs, where people dive deeper and heavily work with the information to achieve a better understanding. During this stage, the manager's role is to monitor the learning process to address misconceptions. The fourth stage is the *presentation*, people present their findings and get feedback and critique from other members. In the last stage, a *reflection* step takes place, where the individuals look back at what they have learned for further processing and reflections on both the content and the learning process itself.

3.7 Cross-Functional Teams

Cross-functional teams are defined as a group of individuals who work interdependently with a shared goal across time, space, and organization boundaries (Dubé and Paré, 2004). Firms are increasingly relying on an organizational form dependent on cross-functional projects. These projects are an excellent way of managing complex organizational tasks without the need for a major modification of the existing organizational structure (Turner and Keegan, 1999). The work performed by cross-functional teams is heavily dependent on the type of organization; however, Huang and Newell (2003) identified three interrelated yet distinctive tasks. First, cross-functional teams are often formed to generate new ideas and foster innovation — teams formed for new product development is a classic example (Clark, 1991). Second, such teams are used to achieve a collective consensus through negotiations that embrace a broader spectrum of organizational departments. For instance, cross-functional teams are exploited in strategic planning since they account for the diversity of interests between organizational units — and by that, resolving internal politics (Bishop, 1999). Third, such teams are used for managing strategic change initiatives, including but not limited to; ERP systems, process innovations, and GDSS technological solutions (Gopal and Prasad, 2000). Strategic change initiatives involve multiple stakeholder groups, external consultants, and users, which scale the degree of complexity and require cross-functional collaborations (Lawrence and Lorsch, 1967).

Once the cross-functional team has been assembled with people from different backgrounds, the individual knowledge must be shared to establish a solid understanding of each member's different functions, preferences, and potential contributions. This step is vital for integration and enables the team members to carry on and create new knowledge (Calantone and Rubera, 2012). In addition, many researchers have discussed the relationship between cross-functional teams and knowledge creation. Mir and Rahaman (2003) used a case study to illustrate this relationship by following the framework of Nonaka (1994), and concluded that knowledge is created and enhanced through cross-functional collaborations. The results of the research conducted by Lin et al. (2015) were in accord with Mir and Rahaman (2003), suggesting that cross-functional collaboration is positively related to knowledge creation. Rafique and Mahmood (2018) extended the proposition and highlighted a relationship between knowledge sharing and job satisfaction. They revealed an interchangeable interconnection between the two variables. Put differently, they argued that job satisfaction positively impacted knowledge sharing, whereas knowledge sharing had a strong effect on job satisfaction. Organizational culture is claimed to have a significant role in the general job satisfaction, unity

among employees, and overall wellbeing Conţiu et al. (2012). Howard (1998); Madu (2012) mention activities supporting a cohesive organizational culture, such as internal celebration and the remainder of the inner values.

Since Cross-functional teams involve people of different professions, it becomes challenging to establish a social infrastructure that allows both the sharing and transfer of knowledge (Corso et al., 2006). Additionally, Carlile (2002) added to the knowledge barriers and stated that *syntactic boundaries* would emerge as a consequence of differences in vocabulary, lexicon, routines, and protocols. Further, *semantic boundaries*; such as the lack of mutual knowledge causes differences in the elucidation of meanings attached to certain phenomena, which reduces the participation in the social interaction (Dougherty, 1992). Also, having an unequal distribution of prior knowledge (essential for the given task) undermines the members' capacity to cooperate interdependently and contribute to the knowledge processes Cramton (2001).

To solve some of the mentioned problems Kellogg et al. (2006) argued that the *syntactic boundaries* could be reduced by making standards and specifications available for all the involved parties. Hinds and Weisband (2003) emphasized the need of building a shared understanding among the members to diminish the *semantic boundaries*. Shared understanding in a cross-functional team is the degree of cognitive overlap, perception, and expectation of a given task. Gherardi et al. (1998) underlined the value of having a *job rotation* across business divisions, which reduces the problem of knowledge isolation. This helps the members to develop mutual understanding and shared practices — as shifting the team members across different business activities increases the exposure to variation of tasks and diversification of personalities.

Due to the cross-functional team's diversity, members benefit from establishing common ground personally. Put differently, team-building activities foster cohesion, which is a precondition for collaboration (Dubé and Paré, 2004; Jahanbakhsh et al., 2017; Klein et al., 2009). Team-building refers to activities that improve the team's bond and outcome (Klein et al., 2009). Also, these activities can cultivate interpersonal relations like psychological safety — supporting learning behaviors, and team performance. (Edmondson, 1999; Stanton et al., 2004). There are many types of team-building activities, but Glover and Midura (1992) found activities outside the workspace to be more beneficial. Oerlemans et al. (2014) agreed and added the perspective of social activities as providing support for stress recovery.

3.8 Summary

Knowledge can come in different forms, where the main types of knowledge are *explicit* and *tacit* knowledge. Explicit knowledge is the type of knowledge that can be articulated and codified (Davies, 2015). Tacit knowledge is the type of knowledge that can not be articulated or codified (Dienes and Perner, 1999).

The phenomenon of knowledge exchange can be divided into the processes of *sharing* and *transfer*. The first step to a successful knowledge-sharing system is to understand the involved humans — since knowledge sharing is a human activity. Attention to the team structure and constant sharing of documents benefit knowledge sharing (Robertson, 2002). Several obstacles and factors could reduce the ability of knowledge sharing. First, the individual's knowledge could be its primary source of value to the firm, and sharing it could decrease that person's status in the organization. Another barrier is the lack of opportunities to share. Bartol and Srivastava (2002) mention a few formal and informal settings in the organization that could allow professionals to share their experiences. Such activities are but are not limited to: Well structured teamwork, training programs, periodic meetings, and water-cooler chats. Also, too much stress can be a barrier to knowledge sharing because it leaves no room for the opportunity to share (Amin et al., 2011).

The knowledge transfer process is described by Argote and Ingram (2000) as an exchange beyond the individual level, which involves the group, department, division, and the organization as a whole. Disterer (2001); Nonaka (1994) described some infrastructures that consolidate knowledge transfer and outlined hierarchies and bureaucracies as threats that should be broken down. As knowledge becomes more specialized, new terminologies are evolved. This creates a linguistic identity among specialists, restricting knowledge from being transferred to less experienced practitioners (Cranefield and Yoong, 2005). Additionally, Bartlett and Ghoshal (1998) argued that a reward system based on financial success promotes competition rather than encouraging knowledge transfer. Further, Zahra and George (2002) expressed the importance of highlighting *why* the knowledge is helpful to increase the receiver's absorptive capacity and willingness to acquire that knowledge.

When I comes to knowledge creation, Nonaka and Takeuchi (1991) introduced the *SECI* model. The first part is *socialization*, where tacit knowledge is converted to new tacit knowledge by, for instance, observation (Nonaka and Toyama, 2015). The second process is *externalization*, where tacit knowledge is converted to explicit knowledge. This occurs when the organization formally articulates internal roles of operation (Nonaka et al., 2000). The third part is *internalization* , where explicit knowledge becomes

tacit knowledge. This happens during the employees' involvement in seminars, workshops, training, and dialogues (Smith, 2001). The last process is *combination* , where explicit knowledge is transformed into new, more complex explicit knowledge. This could, for instance, attain when a manager collects different information throughout the organization and synthesizes it into a report (Gourlay, 2003).

There are three main themes that reveal the relations between individual and collective learning. The first theme is the *individual knowledge acquisition*, which assumes that individuals acquire knowledge cognitively by listening and acting, which presupposes a conversion from tacit knowledge to explicit (Morris and Beckett, 2004). At this level, a process of intuition is needed, which Crossan et al. (1999) describes as the preconscious recognition of the pattern. Clegg et al. (2005) argued that recognition is supplementary to organizing which in turn implicates thinking. The second theme is *sensemaking and reflective dialogue*. This theme underlines learning as deliberative and a meaning-making procedure through language. The third theme is *Network utility*. This view conceptualizes learning as a sequential series of utility networks. Put differently, individuals and teams would most likely share knowledge in circumstances where sharing is valued and supported by, for instance, a shared sense of group identity Cabrera and Cabrera (2002).

Collective learning can be divided into *cooperative* and *collaborative* learning. Cooperative learning can be defined as people working together in a group. The size of the group must not exceed a limit that allows everyone to participate in the collective assigned task. Also, the team is expected to conduct the task with direct and relatively controlled supervision of the manager (Cohen, 1994). Collaborative learning is defined in a way that emphasizes the importance for the people not only to work together in a group but also to let the group work together with the manager, thus shifting the nature of the authority to less restricted. Further, collaborative learning views knowledge as something constructed by people talking together and reaching an agreement. Thus, collaborative learning focuses on working together toward the same goal without the necessity of being interdependent (Bruffee, 1999).

CHAPTER 4

METHODOLOGY

This chapter highlights the philosophical underpinnings of the thesis and outlines the specific research design choices. It also presents how the data were collected and analyzed. Put differently; it explains what was done and how it was done.

4.1 Philosophical Assumptions

The knowledge interpretation in 3.1.3 embraces the classical epistemology and underlines *truthfulness* as one of the main characteristics of knowledge. Nonaka and Takeuchi (1995) found this traditional interpretation static and lacking human nature. Hence, they shifted the focus away from *truthfulness* and underscored the concept of *justified belief* — which is a dynamic human procedure of justifying personal beliefs toward the truth. This resonates well with *interpretivism* which acknowledges that reality and knowledge are not entirely objective and will always be influenced by people within that environment (Ryan, 2018). According to Thanh and Thanh (2015), *interpretivism* within epistemology prefers using qualitative methods for data collection. Further Bryman (2006) criticized the objectivism found in a positivist stance, and Bell et al. (2018) argued that *interpretivism* follows a *constructionist* ontology — which contemplate reality as a dynamic interplay between human actions and constant change. Based on the qualitative methodology and the highly human interactive interviews that will be conducted by this thesis, *interpretivism* and *constructionism* were taken as philosophical assumptions.

4.2 Research Design

The research design is a framework that explains how data collection analysis is conducted (Creswell and Creswell, 1994). Since this thesis is built around a case, the research design follows the principles of a *multiple case study* — because this study is conducted in different organizations within various fields, allowing a contrast that increases the findings' diversity (Bell et al., 2018). Case studies are most of the time linked with *qualitative* methodologies and enable investigation of a phenomenon together with its context (Yin, 1994). Further, case studies provide an in-depth understanding of a complex topic through recognition of different stands (Feagin et al., 1991). Moreover, such designs are recommended for addressing research questions that are presented as *why*, *what* and *how*, and when the researcher has negligible influence over interpersonal events (Yin, 2009). Bell et al. (2018) presented three main types of design: *exploratory*, *descriptive*, and *explanatory*. This study fits in the *exploratory* domain, as there is an existing limitation in understanding how knowledge interchanges in cross-functional teams.

4.3 Data Collection

This thesis utilizes a *purposive sampling technique* following (Etikan et al., 2016). The given option is suitable since the study does not seek a randomized selection. The samples were strategically chosen based on the study's relevance, which in this case were successful coordinators — due to their expertise in managing cross-functional teams.

Moving on to the interviews, this research conducts a *semi-structured* approach with *open-ended* questions to stimulate a deeper conversation on the topic. According to (Galletta, 2013; Kallio et al., 2016; Rubin and Rubin, 2005), the semi-structured approach enables the interviewer to improvise follow-up questions based on the participants' responses. Further, it allows for a subjective and free verbalization of the contenders' thoughts. Also, it authorizes reciprocity between the interviewer and the participant.

The total number of interviewees is five, constituting the *sample size*. When it comes to the sample size, there is variability among scholars regarding what is suggested as a minimum. Morse (2000); Ochieng (2009) recommend five participants as a guideline for *qualitative* research but emphasize some factors of influence, such as the quality of data and nature of the topic. Fugard and Potts (2015) agreed with the mentioned guideline and approved its validity from the perspective of thematic analysis — this will

be addressed in more detail in 4.4. The *primary data* were collected in five different organizations, described in the table down below. These organizations were recommended by the thesis partner, Proactive Sales Management. However, due to time constraints, no more companies were contacted — this can cause issues which are discussed in 4.5.

Table 4.1: Overview of Participating Coordinators.

Respondent	Company	Location	Interview-duration	Medium
R1	Fellowmind	Stockholm, Sweden	40 min	Teams
R2	Information Security Council	Gävle, Sweden	48 min	Face to Face
R3	Sandvik	Sandviken, Sweden	41 min	Telephone
R4	Scania	Södertälje, Sweden	37 min	Teams
R5	Svenska Kraftnät	Solna, Sweden	51 min	Face to Face

4.4 Data Analysis

To provide meaning to the collected data, a *thematic analysis* approach was adopted in this study. This strategy systematically identifies, organizes, and provides insight into patterns of meaning (themes) across the collected set of data (Braun and Clarke, 2012). Thematic analysis is widely used because of its flexibility in terms of theoretical framework, research questions, sample size, and data collection methods (Clarke et al., 2015). Further, it is designed to identify shared meanings and is therefore not suited for unique personal experiences (Vaismoradi et al., 2013). This is perfectly aligned with the research aim of this thesis — since it is fixed on knowledge interchange, which is centered around collective interpretations.

The flexibility that thematic analysis offers can also be a drawback if not carefully utilized (Clarke and Braun, 2013). It can be difficult for the researcher to determine what data to put under the focal point and with what epistemological framework (Braun and Clarke, 2006). According to Kiger and Varpio (2020), the underlying aspects of the study should be explicitly stated because different goals are harnessed for a positivist stance compared to a constructionist ontology. They also stated that a travail description of findings does not exclusively establish thematic analysis, as it does not

fulfill the requirement of more interpretive work. Moreover, Maguire and Delahunt (2017) mentioned how lack of internal consistency and overlapping themes contribute to a weak and unfounded analysis.

This research conducts thematic analysis using the six-step system provided by Braun and Clarke (2012), namely: (i) *familiarizing with the data*; (ii) *generating initial codes*; (iii) *searching for themes*; (iv) *reviewing potential themes*; (v) *defining and naming themes*; and (vi) *producing the report*. The first step is to review the transcription of the interviews repeatedly to make it more familiar. Second, the parts of the interviews that seemed theoretically significant were labeled. The emerging codes were then investigated, contrasted, and categorized if systematically repeated, leading to concepts. In the third step, coded data was processed to identify areas of similarities and recognize patterns that would present themes. Themes should capture something about the vital data relative to the research question. Fourth, quality is checked by recursively reviewing the themes concerning both the coded data and the data set as a whole. The fifth step is to provide more relevant and informative names to the themes and ensure they do not overlap. In the last step, themes are presented in a way that answers the research questions. Themes should have logical connections and be arranged in a meaningful manner to tell a coherent story about the collected data (Braun and Clarke, 2012; Maguire and Delahunt, 2017).

4.5 Method discussion

Although this thesis has been attentively conducted to preserve a decent research quality, some obstructions are to be discussed. First, the external validity is relatively low, which Yin (1994) assigns to the strains in replicating qualitative studies. Second, there exists some bias, which grounds in the subjectivity caused by the nature and characteristics of the open-ended question approach (Bell et al., 2018). Third, the purposive sampling technique described by Etikan et al. (2016) determined the whole sample, which precludes other potential respondents that fit within the category of interest. However, this is feasible because a randomized selection is not sought since the effects are negligible when the sample size is small (Sanson-Fisher et al., 2007). Fourth, the sample size of this study is the accepted minimum when following the recommendations of (Morse, 2000; Ochieng, 2009). A larger sample size would uncover a wider variety of opinions which could possibly lead to more valuable findings for the research aim (Bell et al., 2018). Lastly, the nature of a cross-sectional study is the instant monitoring of variables — allowing an observation within a short time frame without

the need for follow-ups (Zangirolami-Raimundo et al., 2018). There is an expected time limit to consider in the research design — which is suitable for this study since it occurs within the scope of a degree project course.

4.6 Ethical Considerations

This thesis avoids ethical conflicts by initially eliminating harm to the participants. This is done by privatizing sensitive personal data and ensuring anonymity for the respondents, following the recommendations of (Bell et al., 2018). Also, questions that reveal sensitive information have been avoided to circumvent the company's potential loss in competitive advantage. There was transparency towards the interviewees in terms of informing them about the research purpose. This step was taken before the data collection phase to give the participants a choice of whether they wanted to participate. Further, deception could arise if the research declares distorted results (Israel and Hay, 2006; Oliver, 2010). This risk is minimized by taking notes of the interview, reducing the dependency on raw memory, and leaving a trace that enables tracking of the research process for future checking. Lastly, it is crucial to acknowledge that the obtained data from the interviews are not intended to represent the organizations as a whole — despite that participants constitute the respective company in which they are currently active (at the time of the interview).

CHAPTER 5

RESULTS & ANALYSIS

This chapter presents the study's empirical findings in conjunction with the themes extracted by the thematic analysis. The results are then analyzed using the theoretical framework discussed in chapter 3.

This study collected the data through semi-structured interviews at five different companies, using eight open-ended questions. The collected data were then categorized according to 4.4, based on the emerging concepts in the coding process. The emerging concepts were then sub-categorized into five different themes, which answer the research questions in 1.3.1. The complete interviews and questions can be found in 7.

5.1 Knowledge Accessibility

Knowledge accessibility was a recurring theme among the participants. It is pertinent to cross-fucntional team learning because the precondition of learning is knowledge availability (King, 2009). All five organizations agreed on the difficulties of locating knowledge virtually. The first cause of rigidity is assigned to the lack of structure.

> *"...we have information scattered a bit everywhere, which makes the process of finding things more difficult."* (R1)

This resonates very well with the theory of individual and collective learning, mentioned by Clegg et al. (2005); Crossan et al. (1999); Fenwick (2008). In order to maximize learning, information needs to be well structured.

The second cause of rigidity is allocated to the content uploaded.

> *"...it is fair to say that the knowledge on the intranet is just general. There, we have PowerPoint presentations and lectures on different topics. They are good study material, to begin with; however, once the knowledge becomes more specialized, the harder it becomes to find that knowledge. I believe that specialized knowledge becomes less digitalized in the form of documentation and more hidden in personal experiences."* (R4)

In case of the intranet, the content there has been either articulated in video lectures, or codified in forms of PowerPoint presentations and documentations — making the knowledge explicit (Davies, 2015). On the other hand, when knowledge became highly specialized, it was not uploaded on the intranet. This can be analyzed from two perspectives, namely, *knowledge classification* and *knowledge share*. The first perspective can be explained by the concept of *knowledge hierarchy* and the idea of knowledge transforming to wisdom when specialized (Hansen et al., 1999). The key is recognizing wisdom as tacit knowledge, which is the type of knowledge that can neither be verbalized nor expressed in written form (Dienes and Perner, 1999; Tobin, 1998). From the second perspective, the concepts of *embedded* and *rationalized* knowledge should be separated — creating a dichotomy between explicit knowledge that is easy to share from the one that is not. Embedded knowledge is narrow, personalized, and context-dependent, thus, harder to share. On the other hand, rationalized knowledge is standardized, general, and context-independent; thus, easy to upload to the intranet Weiss (1999).

All the interviewees agreed that asking a colleague is the best approach to access the more personalized knowledge. They also believed that it was the management's responsibility to lower the bar for people to have contact with each other. This is the major aspect of knowledge sharing, which Ryu et al. (2003) describes as a people-to-people process. However, the interviewees (R2, R5) struggled to contact the right person.

> *"It is like a jungle. Finding the right person is an art. It has become like this because we have a viscous organization. Every decision must be controlled by many different people. It is extremely bureaucratic."* (R5)

What characterizes (R2, R5) is that they work in the public sector with many regulations and bureaucracy. From a knowledge transfer stand, regulations and bureaucracies are outlined as threats that should be broken down, which can be done by eliminating paperwork whenever possible (Disterer, 2001).

When it comes to knowledge accessibility, all respondents mentioned workshops and coffee breaks as the primary activities for knowledge sharing. When it comes to workshops, the most considerable emphasis was centered on the opportunity of collectively turning theoretical knowledge into a practical one.

> *"One more thing is workshops [...] Everything that puts theory into practice is incredibly important. If you have only read theory, you will be very disappointed when you apply it in practice because there is a lot of knowledge and aspects that can not be included in books. On the other hand, if you are put into practice without any theory, you will be very lost and do not know where to start. The theory is what makes us move forward with qualified guesses."* (R3)

> *"...workshops help employees cooperate with each other and solve the cases together. This is more fun than reading a circuit diagram, for instance. If the workshops were only about reading theory, no one would attend."* (R4)

From the knowledge creation point of view, workshops are part of the *internalization* process. Explicit knowledge is interpreted by a person's frame of reference and subsequently internalized into tacit knowledge (Smith, 2001). This can be connected to the knowledge hierarchy by Hansen et al. (1999) where such knowledge transformation creates wisdom. Further, workshop settings could fit into the category of *exercising ba*, leading to apprehending by the individual's cognitive system as new work practices and concepts (Balestrin et al., 2008). Moreover, workshops are also classified as *experiential knowledge assets*, which allows the share the know-how of individuals, making process-oriented tasks easier to accomplish (Nonaka et al., 2000). Also, depending on how the workshop tasks are structured and the manager's relation to the group, it could fit both the cooperative learning methodology by Davidson and Worsham (1992) or the collaborative learning method by (Brubacher et al., 1990).

With regard to the coffee breaks, significance was outlined toward the relaxed environment — which eliminates the fear of making mistakes — and the importance of physical interaction.

> *"Coffee breaks are also a way to get to know each other and get much knowledge in return. Unfortunately, there have been fewer coffee breaks because fewer people have been in the office. We have tried to have coffee breaks online, but it does not work. One must meet physically."* (R3)

> *"One of the most important things is creating relaxed environments by emphasizing to the employees that it is okay to make mistakes. This encourages them to take action and be driven, eliminating some of the stress. It is not a coincidence that the best ideas come in the shower when we are in a relaxed state. [...] The best place to share knowledge is somewhere with a cup of coffee."* (R4)

The statement of (R4) correlates well with the study of Amin et al. (2011) where they found stress to be a barrier to knowledge sharing since it decreases the individual's opportunity to share. Also, according to Brubacher et al. (1990), having tolerance for making mistakes is a key factor in learning. Furthermore, face-to-face interchange removes the barrier between the self and the other. It captures indescribable conversation, including body language, feelings, and emotions. This according to Nonaka and Konno (1998) fits into the categorical conditions of *originating ba*, which is a context for *socialization*. Put differently, it turns the individual's tacit knowledge into new, more developed tacit knowledge (Nonaka and Toyama, 2015).

5.2 Knowledge Receptivity

Knowledge receptivity was a recurring theme among the participants. It is relevant to knowledge transfer where a high receptivity is desired in conjunction with a low *causal ambiguity* (Uygur, 2013). A common ground among the interviewees is the importance of giving knowledge a meaning.

> *"...be clear about why, for example, things should be ready by a certain date. When you announce why you do as you do, you become more credible because you do not want to seem to do things just for the sake of it."* (R1)

> *"It is about giving the knowledge a meaning; for example, if I train people in healthcare, [...] Instead of information security, I talk about patient security and describe why information security is important for patient security."* (R2)

Seaton (2002) pointed out the significance of meaning in knowledge transfer. He extends this thought by changing the phrase "This is what I know" to "This is what my knowledge means for you". Moreover, Zahra and George (2002) expressed the importance of highlighting why the knowledge helps increase the receiver's absorptive capacity and willingness to acquire that knowledge. This idea can also be extended to the second theme of individual and collective learning, namely *sense-making*. According

to Svensson et al. (2004), this theme underlines learning as deliberative and a meaning-making procedure. Therefore, the collective is seen as a forum for sharing meaning and gives rise to individual reflections necessary for creating new knowledge.

Another thing participants pointed out was the value of using concepts, metaphors, and pictures when conveying a message.

> *"One must speak in a way as if the recipient of the information has no background at all. You use concepts and metaphors; maybe use pictures. You put on a steady tone of the conversation."* (R5)

From the focal point of *externalization*, this makes sense because the knowledge creation cycle necessitates a process of tacit to explicit knowledge metamorphosis (Nonaka et al., 2000). Bontis (1998) declared that all knowledge would never be conveyed; nevertheless, loss of knowledge can be minimized by using models, metaphors, and analogies. This interchange captures some of the individual's innate knowledge, thus fitting the context of the *interacting ba* (Corno et al., 1999). When observing firm-specific resources that constitute the base of knowledge creation, the citation of (R5) fits the *conceptual knowledge assets*. According to Nonaka et al. (2000), these assets are explicit and built through symbols, images, and concepts. Hence, Becerra-Fernandez and Sabherwal (2001) argued for its benefits toward the accomplishment of content-oriented tasks.

One more notion interviewees agreed upon was the vitality and urgent need for unbooked time in the schedule. This time was not necessarily devoted to relaxation and stress elimination but also dedicated to the individual and collective reflection on what was performed.

> *"The organization should allow its employees to devote time for knowledge sharing and not push employees to focus only on chargeable time."* (R1)

> *"You should have more [...] time to actually be able to document. You should also give the employees some air in the schedule so they have time to reflect and blend in with what they have learned."* (R3)

This harmonizes well with both individual and collective learning, where Svensson et al. (2004) pointed out the necessity of reflection in knowledge creation. Chang (2019); Moon (2013) agreed and argued that reflection would increase the depth of knowledge. Additionally, they stated that it would personalize and contextualize the knowledge further and help identify missing areas, making the learner more receptive to knowledge. Reflection is also the last stage in collaborative learning, where the

individuals look back at what they have learned for further processing and reflections on both the content and the learning process itself (Brubacher et al., 1990). During the process of reflection, no new empirical data arises; however, from a rationalist stand, new knowledge can be derived by intuition and deductive reasoning (Ayalon and Even, 2008).

Regarding the type of management, participants underlined that micromanagement is not preferred. Micromanagement refers to a style where managers observe and closely control their subordinates and employees.

> *"...you do not need micromanagement. It is clear that employees require good leadership and someone who books monthly interviews, priorities at the strategic level, etc., but this is done jointly with the employees. So the employees and management work together"* (R1)

> *"There is no need to regulate the way they work. Instead, we hire them to do their job in their way, and our responsibility is to provide them with the resources needed to help them reach their goals."* (R4)

> *"You do not want a manager who breathes in your neck because it is unmotivating, and you learn worse. You should include a manager in the conversation, you should be collaborative, and the hierarchy should be as flat as possible."* (R5)

The above management style is typically associated with collaborative learning. It emphasizes the importance for the people not only to work together in a group but also to work together with the manager/coordinator, thus shifting the nature of the authority to a less restricted one (Brubacher et al., 1990). Additionally, scholars outlined hierarchies as threats to knowledge sharing, transferring, and creation. Thus, Davenport et al. (1997) encouraged to develop horizontal communication flows.

5.3 Frame of Reference

Frame of reference was a recurring theme among the participants. It is the precondition for the manifestation of knowledge sharing in cross-functional teams — since the teams involve people of different professions (Corso et al., 2006). All the interviewees agreed on the importance of having a common language.

> *"We try to have a common language in the organization. As a newcomer, you eventually learn the language. We try to make an effort to always explain what we mean by certain terminologies. The world of business systems has standardized concepts, so our employees in other countries understand what is meant, even if they have different mother tongue."* (R1)

As knowledge becomes more specialized, new terminologies are evolved. This creates a linguistic identity among specialists, restricting knowledge from being transferred to less experienced practitioners (Cranefield and Yoong, 2005). Since Cross-functional teams involve people of different backgrounds, a social infrastructure needs to be established to allow both the sharing and transfer of knowledge (Corso et al., 2006). One has to overcome the *syntactic boundaries* that would emerge as a consequence of differences in vocabulary, lexicon, routines, and protocols (Carlile, 2002). Hence, Kellogg et al. (2006) argued that the syntactic boundaries could be reduced by making standards and specifications available for all the involved parties.

While diving deeper into the cross-functional team structure, it becomes clear that the diversity in the background creates dependence among the individuals.

> *"...we have many individuals with different skills and backgrounds; lawyers, economists, environmental backgrounds, and engineers. The diversity in the background makes them very dependent on each other."* (R5)

However, when interpreting the dissimilarity from the lens of knowledge, the diversity in the profession naturally implies a lack of mutual knowledge. This is what Dougherty (1992) refers to as *semantic boundaries*, where the lack of mutual knowledge causes differences in the elucidation of meanings attached to certain phenomena — reducing the participation in the social interaction. According to Cramton (2001) having an unequal distribution of prior knowledge (essential for the given task) undermines the members' capacity to cooperate interdependently — where being interdependent is a prerequisite in collaborative learning (Bruffee, 1999). To overcome the *semantic boundaries*, some interviewees recommended workshops to reach a consensus.

> *"One more thing is workshops because then you get to test things in addition to the typical chores, and you can somehow get into your colleague's shoes."* (R3)

> *"You have workshops to get into each other's shoes and reach a consensus in the language"* (R5)

Hinds and Weisband (2003) emphasized the need to build a shared understanding among the member to diminish the *semantic boundaries*. Shared understanding in a cross-functional team is the degree of cognitive overlap, perception, and expectation of a given task. Gherardi et al. (1998) underlined the value of having a job rotation across business divisions, which reduces the problem of knowledge isolation. This helps the members develop mutual understanding and shared practices — as shifting the team members across different business activities increases the exposure to variation of tasks. The main point here is the "exposure to variation of tasks", which have some correlation with (R3) statement of "test things in addition to the typical chores".

Another commonality between the participants is acknowledging the benefits of giving feedback to each other.

> *"...when we review each other's texts, we do it in edit mode and use comments so that we can teach each other. We want to make each other better, which does not happen if we do not criticize each other's work."* (R2)

> *"You should give them time and opportunities to give each other constructive criticism."* (R3)

The above is in tune with the theory of organizational learning. (Brubacher et al., 1990) called the fourth stage for *presentation*, where people present their findings and get feedback and critique from other members. They also argued that this step is a precondition for reflection.

5.4 Competition Elimination

Competition elimination was a recurring theme among the participants. Eliminating competition is, by definition, a maximization of cooperation and collaboration. The candidates agreed that a common goal is one of the best expulsion of rivalry.

> *"Creating customer value is really a common goal. Common goals are the driving force we have. We understand what our products and efforts do for both our customers and society as a whole. Then everyone knows that what we do is not something one can do alone, but you need your group members. To help your colleague is to help yourself."* (R3)

> *"...every team member must know exactly what the team goal is."* (R4)

> *"What mainly drives cooperation is that in addition to individual goals, we have common goals."* (R5)

This is not unexpected; hence the cross-functional team is defined as a group of individuals who work interdependently with a shared goal across time, space, and organization boundaries (Dubé and Paré, 2004). Further, Ainamo (2007) emphasized how having a common goal will foster collaboration and the delivery of higher results.

Another common ground between the interviewees is the elimination of internal bonuses and ranking systems.

> *"From the organization's point of view, knowledge sharing should be encouraged. We previously had individual bonuses. However, there was less incentive to share the knowledge because it would affect the individual salary. Therefore, we removed the bonus system to mark that we are in this together and work for the same thing."* (R1)

> *"After all, we do not have internal rankings, so there is no clear need for keeping knowledge from others."* (R4)

> *"...the way we behave inside and outside of work is monitored because when we work in the public sector. This is linked to competition because, as an employee, you are an ambassador for the Swedish people, which is celebrated internally. The better employee is exemplified by the titles "the employee of the month" or "the employee of the week", which it is posted on the intranet so everyone can see it"* (R5)

Nonaka (1994) describes hierarchies as infrastructures that threaten knowledge sharing, transfer, and creation. One way to flatten hierarchies is to get rid of the ranking systems. Even though rankings can motivate employees, it is also a source of competition. Another way to flatten hierarchies is removing the bonus system, which promotes competition rather than encouraging knowledge interchange (Bartlett and Ghoshal, 1998; Cranefield and Yoong, 2005; Davenport et al., 1997).

The candidates consented to the idea that giving people the opportunity for career advancement decreases the chance of competition among them.

> *"We have almost no internal competition with us because there is no reason for it. There is always something to do, and if you want to do something else, you usually get the chance to do it. So you can jump around in the organization according to your own needs."* (R1)

> *"Here, we do have some degree of competition, but it is a little different than private companies. Here you do not work for profit maximization, but you work for quality assurance. The one who delivers top-quality results excels in relation to others."* (R5)

The internal competition is higher in the company of (R1) compared to (R5). The difference is that one company gives the employees the chance to try different jobs based on their needs, whereas the other is performance-based. Rafique and Mahmood (2018) highlighted a relationship between knowledge sharing and job satisfaction. They revealed an interchangeable interconnection between the two variables. Put differently, they argued that job satisfaction positively impacted knowledge sharing, whereas knowledge sharing had a strong effect on job satisfaction.

Some participants acknowledged the fear of being unwanted if they did not possess unique knowledge.

> *"There is a fear that you can become interchangeable if too much knowledge is leaked. In some cases, individuals can also see the bargaining position knowledge provides, and that they can take advantage of the situation to their upper hand, for example, higher salary, more vacation, or other benefits"* (R2)

> *"We are, in a way, herd animals. If you share your knowledge, there is a risk that you may not be needed in the herd anymore. These are thus purely selfish motives, where one separates the concepts "one's own best" from "the group's best"* (R3)

This is what Alvesson (2011) describes as the resistance to engaging in knowledge sharing activities. He argued that the individual's knowledge could be its primary source of value to the firm, and sharing it could decrease that person's status in the organization. Andrews and Delahaye (2000) stated that this could eventually lead to trust issues over time — making the individuals even less likely to share their knowledge. However, there were no indications of trust issues mentioned by the interviewees, more than their fear of being interchangeable.

5.5 Cohesion

Cohesion was a recurring theme among the participants. Ainamo (2007) declared the significance of cohesion and stated that when team members are relatively unfamiliar

with each other, they will face more challenges in collaboration. The candidates agreed that afterwork and group travel activities are beneficial for group cohesion.

> *"Afterworks are very important because you manage to get to know each other in-depth and become more friends than just colleagues. However, it is also important to do something bigger. For example, we have rented a cottage and have a weekend with lots of activities."* (R3)

> *"activities such as afterworks and away days for employees help the team members to get to know each other and have a personal twist on the professional environment. The away days focus on team building and how teamwork can be facilitated. Doing such various activities helps colleagues get the sense of being heard and being a part of a family. The activities usually consist of a complex but fun task, which employees tackle in teams."* (R4)

> *"Afterworks are also important because you build the relationship outside of work and get closer to each other."* (R5)

This is well synchronized with the literature, where Dubé and Paré (2004); Jahanbakhsh et al. (2017); Klein et al. (2009) argued that team-building activities foster cohesion, which is a precondition for collaboration. Also, these activities can cultivate interpersonal relations like psychological safety — supporting learning behaviors, and team performance. Glover and Midura (1992) found activities outside the workspace to be more beneficial. Oerlemans et al. (2014) agreed and added the perspective of social activities as providing support for stress recovery.

Other factors that consolidate a common identity are progress celebration and collective organizational culture.

> *"You have to make sure that there is a culture in the organization that conveys a "we" and a pride that you work exactly where you work [...] It is as well important to have more consistent coffees where you celebrate your successes and give each other feedback."* (R3)

> *"...we had the motto "we make each other better", which was printed out and put on the walls of all business units. It was referred to all the time, which created a sense of community and encouraged each other to do better, which is done, for example, by sharing knowledge [...] We celebrate with Kick-offs, cake, or similar when we have completed a project."* (R2)

Organizational culture is claimed to have a significant role in the general job satisfaction, unity among employees, and overall wellbeing Conţiu et al. (2012). Howard (1998); Madu (2012) mention activities supporting a cohesive organizational culture, such as internal celebration and the remainder of the inner values. Cabrera and Cabrera (2002) reported a correlation between learning and sociocultural issues. They stated that individuals and teams would most likely share in circumstances where sharing is valued and supported by, for instance, a shared sense of group identity. Davenport et al. (1997) clarified the dichotomy between sharing and reporting and stated that sharing is a voluntary act — derived from trust and a united culture — whereas reporting is based on formal routines. This highlights a relationship between knowledge sharing and a culture that supports cohesion.

CHAPTER 6

DISCUSSION

This chapter delves into the overall meaning of the results and analysis. It evaluates the findings and shows how they relate to the research questions. Thus, making an argument to support the overall conclusion.

6.1 Holistic Reflection of Findings

The themes presented in 5 are:

- *Knowledge accessibility*
- *Knowledge receptivity*
- *Frame of reference*
- *Competition elimination*
- *Cohesion*

The main thing to acknowledge is the interdependencies of these themes. For instance, *knowledge accessibility* is a precondition for *knowledge receptivity*. This is evident as you can not receive what you can not access. Even if you are able to receive, you need a *frame of reference* to make sense of what was acquired. Also, you can not access what is hidden, making *competition elimination* a prerequisite for *knowledge accessibility*. Following the same logic, *cohesion* can not be fully achieved without

competition elimination, and a *frame of reference* requires some level of *cohesion* in the team.

Regarding the first research question, management can do several things to facilitate the exchange of knowledge in the team. First, a platform that collects explicit knowledge needs to be in place. The interviewed coordinators directed some concerns about the lack of structure in these platforms, casing a rigidity in virtual knowledge accessibility. This resonated well with Clegg et al. (2005); Crossan et al. (1999); Fenwick (2008) who emphasized the need to structure information to maximize learning. However, the practical consequence caused by lack of structure is the enforcement of team members to reach out to each other — fostering more collaboration. This could arguably be more beneficial to knowledge interchange for three primary reasons. Initially, this approach enables the construction of personal relationships. Subsequently, it can lead up to the sidelines, which leaves the individual with more knowledge than what they were initially looking for.

Second, management needs to maximize collaboration and minimize competition in the organization. One way to do that is to convey a common goal. Put differently, management needs to be transparent with the employees and continually update them about where the organization is headed. The present leads to collaboration which is imperative to knowledge exchange (Ainamo, 2007). This is in alignment with the literature review where Sarin and McDermott (2003) observed a positive correlation between the team's success and a common goal. Another factor that minimizes competition is the elimination of internal bonuses and ranking systems. The respondents viewed the bonus and ranking systems as an obstacle to engaging in knowledge sharing activities because they would affect their respective salaries. Depending on the knowledge distribution in the organization, this could lead to knowledge hierarchies. This synchronizes well with the literature review, where Henke et al. (1993) found that most firms are not using cross-functional teams as efficiently as they should and contributed the rigidity to hierarchical structures within the team.

Regarding the second research question, coordinators can utilize several activities to maximize learning for the cross-functional team. First, there should be a level of knowledge receptivity among the group. One way to achieve receptivity is to assign meaning to the knowledge (Seaton, 2002). According to the coordinators, this can be established by conveying the benefits of that particular knowledge to the receiver. However, this presumes a comprehension of what the receiver looks for, which is not always the case. Therefore, a frame of reference needs to be manifested. For example, one has to overcome the syntactic boundaries that would emerge as a consequence of

differences in vocabulary, lexicon, routines, and protocols (Carlile, 2002). The syntactic boundaries could be reduced by making standards and specifications available for all the involved parties (Kellogg et al., 2006). Besides the syntactic boundaries, semantic boundaries arise as a consequence of the diversity in the profession, which implies a lack of mutual knowledge. Finally, the respondents agreed that workshops helped the cross-functional team members to overcome the semantic boundaries, following (Gherardi et al., 1998). From the perspective of the literature review, both syntactic and semantic boundaries centralize knowledge, which can be conceptualized as knowledge hierarchies (Henke et al., 1993).

Second, having unbooked time in the schedule facilitates knowledge receptivity. One perspective is the stress reduction caused by not having an overloaded schedule. Another perspective is the enablement of reflection time, which harmonizes well with both individual and collective learning (Svensson et al., 2004). This can also expand the individual's frame of reference by offering the opportunity of giving feedback to others, which is in tune with the theory of organizational learning (Brubacher et al., 1990). The coordinators referred to feedback as "constructive criticism". This underlines that not all kind of feedback is necessarily beneficial for the learning of the cross-functional team. Instead, the focus was on the significance of conveying the critique in a meaningful way — creating a dichotomy between constructive and destructive critique.

Regarding the third research question, coordinators can create a sense of belonging to the cross-functional team in various ways. First, the cross-functional team needs both afterwork and group travel activities. This is in alignment with Dubé and Paré (2004); Jahanbakhsh et al. (2017); Klein et al. (2009) who argued that team-building activities foster cohesion, which is a precondition for collaboration. Put differently, cohesion correlates with competition elimination, making sense of belonging a requisite for knowledge exchange (Ainamo, 2007). Despite the benefits of a shared identity mentioned by Sethi et al. (2001) in the literature review, Hauptman and Hirji (1999) argued that social cohesion negatively affected creativity when it exceeded a moderate level. However, no measurement standard or clear definition of "moderate level", were put forward. Nevertheless, the coordinators in this thesis viewed cohesion as a necessity for both knowledge exchange and creation — where Clark (1991); Hendriks (1999) viewed the knowledge interchange as beneficial to creativity and innovation. Given the premise that cohesion leads to knowledge exchange and knowledge interchange fosters creativity, one can deductively conclude that cohesion promotes creativity, thus contradicting the position of (Hauptman and Hirji, 1999).

6.2 Suggestion for Future Research

This thesis has some limitations that can be considered in future research. First, the sample size was relatively small. More precisely, the sample size of this study is the accepted minimum when following the recommendations of (Morse, 2000; Ochieng, 2009). A larger sample size would uncover a wider variety of opinions which could lead to more valuable findings for the research aim (Bell et al., 2018). Second, it could be interesting to inspect how knowledge interchanges in startups and what aspect it differs from larger organizations. Third, not much emphasis was put on managing virtual cross-functional teams, which could be of interest for future studies — especially after the COVID-19 pandemic, where remote work has increased. Fourth, it could be fascinating to examine how to facilitate knowledge interchange when managing overseas teams and how the socio-cultural aspects affect learning and knowledge exchange.

CHAPTER 7

Conclusion

This chapter serves as a concluding summary of the research findings and wraps up the thesis.

My research shows several ways to maximize learning and knowledge interchange in cross-functional teams. First, it seems valuable to have decent knowledge accessibility, which can be achieved with a well-structured intranet, workshops, coffee breaks, and making it easy for people to contact each other. Second, it seems that the knowledge receptivity has to be increased, which can be done by giving knowledge a meaning, using pictures, using metaphors, and getting rid of micromanagement. Third, a frame of reference could be needed, which can be attained by having a common language, job rotation, and constructive criticism. Fourth, it appeared that competition is preferred to be eliminated; that can be done by establishing a common team goal, removing internal bonuses, eliminating ranking systems, and giving people the opportunity for career advancement. Finally, it seemed essential to have cohesion in the group, which can be accomplished by having afterworks, group travel activities, progress celebrations, and collective organizational culture.

Bibliography

Aime, F., Humphrey, S., DeRue, D. S., and Paul, J. B. (2014). The riddle of heterarchy: Power transitions in cross-functional teams. *Academy of Management Journal*, 57(2):327–352.

Ainamo, A. (2007). Coordination mechanisms in cross-functional teams: a product design perspective. *Journal of Marketing Management*, 23(9-10):841–860.

Alvesson, M. (2011). *Management of knowledge-intensive companies*. de Gruyter.

Amin, A., Basri, S., Hassan, M. F., and Rehman, M. (2011). Software engineering occupational stress and knowledge sharing in the context of global software development. In *2011 National Postgraduate Conference*, pages 1–4. IEEE.

Ancona, D. G. and Caldwell, D. F. (1992). Demography and design: Predictors of new product team performance. *Organization science*, 3(3):321–341.

Andrews, K. M. and Delahaye, B. L. (2000). Influences on knowledge processes in organizational learning: The psychosocial filter. *Journal of Management studies*, 37(6):797–810.

Argote, L. and Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational behavior and human decision processes*, 82(1):150–169.

Ayalon, M. and Even, R. (2008). Deductive reasoning: In the eye of the beholder. *Educational Studies in Mathematics*, 69(3):235–247.

Bai, W., Feng, Y., Yue, Y., and Feng, L. (2017). Organizational structure, cross-functional integration and performance of new product development team. *Procedia Engineering*, 174:621–629.

Balestrin, A., Vargas, L. M., and Fayard, P. (2008). Knowledge creation in small-firm network. *Journal of knowledge management*.

Bartlett, C. A. and Ghoshal, S. (1998). Beyond strategic planning to organization learning: Lifeblood of the individualized corporation. *Strategy & Leadership*.

Bartol, K. M. and Srivastava, A. (2002). Encouraging knowledge sharing: The role of organizational reward systems. *Journal of leadership & organizational studies*, 9(1):64–76.

Becerra-Fernandez, I. and Sabherwal, R. (2001). Organizational knowledge management: A contingency perspective. *Journal of management information systems*, 18(1):23–55.

Bechky, B. A. (2003). Object lessons: Workplace artifacts as representations of occupational jurisdiction. *American Journal of Sociology*, 109(3):720–752.

Bell, E., Bryman, A., and Harley, B. (2018). *Business research methods*. Oxford university press.

Bishop, S. K. (1999). Cross-functional project teams in functionally aligned organizations. *Project Management Journal*, 30(3):6–12.

Bolisani, E. and Bratianu, C. (2018). The elusive definition of knowledge. In *Emergent knowledge strategies*, pages 1–22. Springer.

Bontis, N. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management decision*.

Bortolotti, L. (2009). Delusions and other irrational beliefs.

Bratman, M. E. (1999). *Faces of intention: Selected essays on intention and agency*. Cambridge University Press.

Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2):77–101.

Braun, V. and Clarke, V. (2012). Thematic analysis.

Brown, J. S. and Duguid, P. (2002). Local knowledge: Innovation in the networked age. *Management Learning*, 33(4):427–437.

Brubacher, M., Payne, R., and Rickett, K. (1990). *Perspectives on small group learning: Theory and practice*. Oakville, Ont.: Rubicon Pub.

Bruffee, K. A. (1999). *Collaborative learning: Higher education, interdependence, and the authority of knowledge*. ERIC.

Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done? *Qualitative research*, 6(1):97–113.

Cabrera, A. and Cabrera, E. F. (2002). Knowledge-sharing dilemmas. *Organization studies*, 23(5):687–710.

Calantone, R. and Rubera, G. (2012). When should rd & e and marketing collaborate? the moderating role of exploration–exploitation and environmental uncertainty. *Journal of Product Innovation Management*, 29(1):144–157.

Campbell, J. (2001). Rationality, meaning, and the analysis of delusion. *Philosophy, Psychiatry, & Psychology*, 8(2):89–100.

Carlile, P. R. (2002). A pragmatic view of knowledge and boundaries: Boundary objects in new product development. *Organization science*, 13(4):442–455.

Carlile, P. R. (2004). Transferring, translating, and transforming: An integrative framework for managing knowledge across boundaries. *Organization science*, 15(5):555–568.

Chang, B. (2019). Reflection in learning. *Online Learning*, 23(1):95–110.

Chisholm, R. M. (1948). The problem of empiricism. *The Journal of Philosophy*, 45(19):512–517.

Chiva, R. and Alegre, J. (2005). Organizational learning and organizational knowledge: towards the integration of two approaches. *Management learning*, 36(1):49–68.

Chou, S.-W. and He, M.-Y. (2004). Knowledge management: the distinctive roles of knowledge assets in facilitating knowledge creation. *Journal of information science*, 30(2):146–164.

Chou, S.-W. and Wang, S.-J. (2003). Quantifyingba': an investigation of the variables that are pertinent to knowledge creation. *Journal of Information Science*, 29(3):167–180.

Clark, K. B. (1991). Product development performance: Strategy. *Organization, and Management in the World Auto Industry*.

Clarke, V. and Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The psychologist*, 26(2).

Clarke, V., Braun, V., and Hayfield, N. (2015). Thematic analysis. *Qualitative psychology: A practical guide to research methods*, 222:248.

Clegg, S. R., Kornberger, M., and Rhodes, C. (2005). Learning/becoming/organizing. *Organization*, 12(2):147–167.

Cobb, A. T. (2011). *Leading project teams: The basics of project management and team leadership*. Sage.

Cohen, E. G. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of educational research*, 64(1):1–35.

Conţiu, L. C., Gabor, M. R., and Oltean, F. D. (2012). Employee's motivation from a cultural perspective–a key element of the hospitality industry competitiveness. *Procedia economics and finance*, 3:981–986.

Cooper, L., Hamilton, E., Cairns, H., et al. (1961). *The collected dialogues of Plato*, volume 18. Princeton University Press.

Corno, F., Reinmoeller, P., and Nonaka, I. (1999). Knowledge creation within industrial systems. *Journal of management and governance*, 3(4):379–394.

Corso, M., Giacobbe, A., Martini, A., and Pellegrini, L. (2006). What knowledge management for mobile workers? *Knowledge and Process Management*, 13(3):206–217.

Cramton, C. D. (2001). The mutual knowledge problem and its consequences for dispersed collaboration. *Organization science*, 12(3):346–371.

Cranefield, J. and Yoong, P. (2005). Organisational factors affecting inter-organisational knowledge transfer in the new zealand state sector: a case study.

Creswell, J. W. and Creswell, J. D. (1994). Research design.

Crossan, M. M., Lane, H. W., and White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of management review*, 24(3):522–537.

Davenport, T. H., Prusak, L., et al. (1997). *Information ecology: Mastering the information and knowledge environment*. Oxford University Press on Demand.

Davidson, N. and Major, C. H. (2014). Boundary crossings: Cooperative learning, collaborative learning, and problem-based learning. *Journal on excellence in college teaching*, 25.

Davidson, N. and Worsham, T. (1992). *Enhancing thinking through cooperative learning*. ERIC.

Davies, M. (2015). Knowledge–explicit, implicit and tacit: Philosophical aspects. *International encyclopedia of the social & behavioral sciences*, 13:74–90.

Davis, S. M. and Lawrence, P. R. (1977). The matrix organization-who needs it. *Classics of Organization Theory*, pages 209–218.

Descartes, R. et al. (1988). *Descartes: Selected philosophical writings*. Cambridge University Press.

Dienes, Z. and Perner, J. (1999). A theory of implicit and explicit knowledge. *Behavioral and brain sciences*, 22(5):735–808.

Disterer, G. (2001). Individual and social barriers to knowledge transfer. In *Proceedings of the 34th annual Hawaii international conference on system sciences*, pages 7–pp. IEEE.

Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization science*, 3(2):179–202.

Dubé, L. and Paré, G. (2004). The multi-faceted nature of virtual teams. In *Virtual teams: Projects, protocols and processes*, pages 1–39. IGI Global.

Easterby-Smith, M., Araujo, L., et al. (1999). Organizational learning: current debates and opportunities. *Organizational learning and the learning organization: Developments in theory and practice*, 1(1):1–21.

Easterby-Smith, M. and Lyles, M. A. (2011). *Handbook of organizational learning and knowledge management*. John Wiley & Sons.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative science quarterly*, 44(2):350–383.

Enz, M. G. and Lambert, D. M. (2012). Using cross-functional, cross-firm teams to co-create value: The role of financial measures. *Industrial Marketing Management*, 41(3):495–507.

Ercikan, K. and Roth, W.-M. (2006). What good is polarizing research into qualitative and quantitative? *Educational researcher*, 35(5):14–23.

Etikan, I., Musa, S. A., Alkassim, R. S., et al. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1):1–4.

Ewenstein, B. and Whyte, J. (2009). Knowledge practices in design: the role of visual representations asepistemic objects'. *Organization studies*, 30(1):07–30.

Feagin, J. R., Orum, A. M., and Sjoberg, G. (1991). *A case for the case study*. UNC Press Books.

Fenwick, T. (2008). Understanding relations of individual—collective learning in work: A review of research. *Management learning*, 39(3):227–243.

Fugard, A. J. and Potts, H. W. (2015). Supporting thinking on sample sizes for thematic analyses: a quantitative tool. *International Journal of Social Research Methodology*, 18(6):669–684.

Galletta, A. (2013). *Mastering the semi-structured interview and beyond*. New York University Press.

Gettier, E. L. (2012). *6. IS JUSTIFIED TRUE BELIEF KNOWLEDGE?* De Gruyter.

Gherardi, S., Nicolini, D., and Odella, F. (1998). Toward a social understanding of how people learn in organizations: The notion of situated curriculum. *Management learning*, 29(3):273–297.

Ghobadi, S. and D'Ambra, J. (2012). Knowledge sharing in cross-functional teams: a coopetitive model. *Journal of Knowledge Management*.

Glover, D. R. and Midura, D. W. (1992). *Team building through physical challenges*. Human Kinetics.

Gopal, A. and Prasad, P. (2000). Understanding gdss in symbolic context: Shifting the focus from technology to interaction. *MIS quarterly*, pages 509–546.

Gourlay, S. (2003). The seci model of knowledge creation: some empirical shortcomings.

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal*, 17(S2):109–122.

Griffith, T. L., Sawyer, J. E., and Neale, M. A. (2003). Virtualness and knowledge in teams: Managing the love triangle of organizations, individuals, and information technology. *MIS quarterly*, pages 265–287.

Hansen, M. T., Nohria, N., and Tierney, T. (1999). What's your strategy for managing knowledge. *The knowledge management yearbook 2000–2001*, 77(2):106–116.

Hargadon, A. B. and Bechky, B. A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. *Organization science*, 17(4):484–500.

Harms, D. (2011). Environmental sustainability and supply chain management—a framework of cross-functional integration and knowledge transfer. *Journal of Environmental Sustainability*, 1(1):9.

Hauptman, O. and Hirji, K. K. (1999). Managing integration and coordination in cross-functional teams: an international study of concurrent engineering product development. *R&D Management*, 29(2):179–192.

Heisig, P. (2009). Harmonisation of knowledge management–comparing 160 km frameworks around the globe. *Journal of knowledge management*.

Hendriks, P. (1999). Why share knowledge? the influence of ict on the motivation for knowledge sharing. *Knowledge and process management*, 6(2):91–100.

Henke, J. W., Krachenberg, A. R., and Lyons, T. F. (1993). Perspective: cross-functional teams: good concept, poor implementation! *Journal of product innovation management*, 10(3):216–229.

Hinds, P. J. and Weisband, S. P. (2003). Knowledge sharing and shared understanding in virtual teams. *Virtual teams that work: Creating conditions for virtual team effectiveness*, pages 21–36.

Hong, J. F. L. and Vai, S. (2008). Knowledge-sharing in cross-functional virtual teams. *Journal of general management*, 34(2):21–37.

Howard, L. W. (1998). Validating the competing values model as a representation of organizational cultures. *The international journal of organizational analysis*.

Huang, J. C. and Newell, S. (2003). Knowledge integration processes and dynamics within the context of cross-functional projects. *International journal of project management*, 21(3):167–176.

Huang, J. C., Newell, S., and Pan, S. L. (2001). The process of global knowledge integration: a case study of a multinational investment bank's y2k program. *European Journal of Information Systems*, 10(3):161–174.

Inkinen, H. (2016). Review of empirical research on knowledge management practices and firm performance. *Journal of knowledge management*.

Israel, M. and Hay, I. (2006). *Research ethics for social scientists*. Sage.

Jahanbakhsh, F., Fu, W.-T., Karahalios, K., Marinov, D., and Bailey, B. (2017). You want me to work with who? stakeholder perceptions of automated team formation in project-based courses. In *Proceedings of the 2017 CHI conference on human factors in computing systems*, pages 3201–3212.

Kagan, S. (1989). The structural approach to cooperative learning. *Educational leadership*, 47(4):12–15.

Kallio, H., Pietilä, A.-M., Johnson, M., and Kangasniemi, M. (2016). Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. *Journal of advanced nursing*, 72(12):2954–2965.

Kamara, J. M., Augenbroe, G., Anumba, C. J., and Carrillo, P. M. (2002). Knowledge management in the architecture, engineering and construction industry. *Construction innovation*.

Karakaş, A. (2019). An analysis of rationalism in english language teaching. *International Journal of Educational Spectrum*, 2(1):49–62.

Kellogg, K. C., Orlikowski, W. J., and Yates, J. (2006). Life in the trading zone: Structuring coordination across boundaries in postbureaucratic organizations. *Organization science*, 17(1):22–44.

Khalil, C., Fernandez, V., and Houy, T. (2013). Can agile collaboration practices enhance knowledge creation between cross-functional teams? In *Digital Enterprise Design and Management 2013*, pages 123–133. Springer.

Kiger, M. E. and Varpio, L. (2020). Thematic analysis of qualitative data: Amee guide no. 131. *Medical teacher*, 42(8):846–854.

King, W. R. (2009). Knowledge management and organizational learning. In *Knowledge management and organizational learning*, pages 3–13. Springer.

Klein, C., DiazGranados, D., Salas, E., Le, H., Burke, C. S., Lyons, R., and Goodwin, G. F. (2009). Does team building work? *Small group research*, 40(2):181–222.

Kotlarsky, J., van den Hooff, B., and Houtman, L. (2015). Are we on the same page? knowledge boundaries and transactive memory system development in cross-functional teams. *Communication research*, 42(3):319–344.

Lawrence, P. R. and Lorsch, J. W. (1967). *Organization and environment managing differentiation and integration*.

Lawson, C. and Lorenz, E. (1999). Collective learning, tacit knowledge and regional innovative capacity. *Regional studies*, 33(4):305–317.

Lee, K. and Ahn, J. M. (2018). The impacts of cross functional team on innovation performance and openness. In *DRUID Academy Conference*, pages 17–19.

Leibniz, G. W. and Parkinson, G. H. R. (1995). Philosophical writings.

Liebowitz, J. and Beckman, T. (1998). *Knowledge organizations: What every manager should know*. CRC press.

Lin, Y., Wang, Y., and Kung, L. (2015). Influences of cross-functional collaboration and knowledge creation on technology commercialization: Evidence from high-tech industries. *Industrial marketing management*, 49:128–138.

Littlepage, G. E., Hein, M. B., Moffett III, R. G., Craig, P. A., and Georgiou, A. M. (2016). Team training for dynamic cross-functional teams in aviation: Behavioral, cognitive, and performance outcomes. *Human Factors*, 58(8):1275–1288.

Liyanage, C., Elhag, T., Ballal, T., and Li, Q. (2009). Knowledge communication and translation–a knowledge transfer model. *Journal of Knowledge management*.

Longworth, G. (2009). Rationalism and empiricism. *Key Ideas in Linguistics and the Philosophy of Language*, pages 67–74.

Love, J. H. and Roper, S. (2009). Organizing innovation: Complementarities between cross-functional teams. *Technovation*, 29(3):192–203.

Madu, B. C. (2012). Organization culture as driver of competitive advantage. *Journal of academic and business ethics*, 5:1.

Maguire, M. and Delahunt, B. (2017). Doing a thematic analysis: A practical, step-by-step guide for learning and teaching scholars. *All Ireland Journal of Higher Education*, 9(3).

Majchrzak, A., More, P. H., and Faraj, S. (2012). Transcending knowledge differences in cross-functional teams. *Organization science*, 23(4):951–970.

McConalogue, N. (1999). Knowledge management in the construction industry: a study of major uk contractors. *Unpublished MSc dissertation, Loughborough University, UK*.

McDermott, R. (1999). Learning across teams. *Knowledge Management Review*, 8(3):32–36.

Meyers, R. G. (2014). *Understanding empiricism*. Routledge.

Mir, M. and Rahaman, A. (2003). Organisational knowledge creation and the commercialisation of state mail service. *International Journal of Public Sector Management*.

Moon, J. A. (2013). *Reflection in learning and professional development: Theory and practice*. Routledge.

Morris, G. and Beckett, D. (2004). Learning for/at work: Somali women "doing it for themselves". *Journal of Workplace Learning*.

Morse, J. M. (2000). Determining sample size.

Nafukho, F. M., Hairston, N., and Brooks, K. (2004). Human capital theory: Implications for human resource development. *Human Resource Development International*, 7(4):545–551.

Neta, R. and Pritchard, D. (2009). *Arguing about knowledge*. Routledge London.

Nickols, F. (2000). The knowledge in knowledge management. *The Knowledge Management Yearbook, 2000–2001*, 12:21.

Nishida, K. and Dilworth, D. A. (1970). Fundamental problems of philosophy the world of action and the dialectical world. translated with an introd. by david a. dilworth.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1):14–37.

Nonaka, I. and Konno, N. (1998). The concept of "ba": Building a foundation for knowledge creation. *California management review*, 40(3):40–54.

Nonaka, I. and Takeuchi, H. (1991). The knowledge-creating company. *Harvard business review*, 85(7/8):162.

Nonaka, I. and Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford university press.

Nonaka, I. and Toyama, R. (2015). The knowledge-creating theory revisited: knowledge creation as a synthesizing process. In *The essentials of knowledge management*, pages 95–110. Springer.

Nonaka, I., Toyama, R., and Konno, N. (2000). Seci, ba and leadership: a unified model of dynamic knowledge creation. *Long range planning*, 33(1):5–34.

Ochieng, P. A. (2009). An analysis of the strengths and limitation of qualitative and quantitative research paradigms. *Problems of Education in the 21st Century*, 13:13.

Oerlemans, W. G., Bakker, A. B., and Demerouti, E. (2014). How feeling happy during off-job activities helps successful recovery from work: A day reconstruction study. *Work & Stress*, 28(2):198–216.

Oliver, P. (2010). *The student's guide to research ethics*. McGraw-Hill Education (UK).

Polanyi, M. and Sen, A. (2009). *The tacit dimension*. University of Chicago press.

Pritchard, D. (2013). *What is this thing called knowledge?* Routledge.

Rafique, G. M. and Mahmood, K. (2018). Relationship between knowledge sharing and job satisfaction: a systematic review. *Information and Learning Science*.

Reichardt, C. S. and Rallis, S. F. (1994). The qualitative-quantitative debate: New perspectives. *New directions for program evaluation*, 61:1–98.

Robertson, S. (2002). A tale of two knowledge-sharing systems. *Journal of Knowledge Management*.

Rogers, E. W. (2005). Building a healthy learning organization at the nasa goddard space flight center. In *First International Forum on Integrated System Health Engineering and Management in Aerospace*. Citeseer.

Rolf, B. (2004). Two theories of tacit and implicit knowledge. *Blekinge Institute of Technology. Ronneby, Sweden*.

Rubin, H. J. and Rubin, I. (2005). Interviewing: The art of hearing data. *Thousand Oaks, CA*.

Ryan, G. (2018). Introduction to positivism, interpretivism and critical theory. *Nurse researcher*, 25(4):41–49.

Ryu, S., Ho, S. H., and Han, I. (2003). Knowledge sharing behavior of physicians in hospitals. *Expert Systems with applications*, 25(1):113–122.

Sanson-Fisher, R. W., Bonevski, B., Green, L. W., and D'Este, C. (2007). Limitations of the randomized controlled trial in evaluating population-based health interventions. *American journal of preventive medicine*, 33(2):155–161.

Sarin, S. and McDermott, C. (2003). The effect of team leader characteristics on learning, knowledge application, and performance of cross-functional new product development teams. *Decision sciences*, 34(4):707–739.

Seaton, R. (2002). Knowledge transfer, Strategic tools to support adaptive, integrated water resource management under changing conditions at catchment scale-a co-evolutionary approachr. *The Aquadapt project*.

Sethi, R., Smith, D. C., and Park, C. W. (2001). Cross-functional product development teams, creativity, and the innovativeness of new consumer products. *Journal of marketing research*, 38(1):73–85.

Sharan, Y. and Sharan, S. (1987). Training teachers for cooperative learning. *Educational Leadership*, 45(3):20–25.

Shimizu, H. (1995). Ba-principle: new logic for the real-time emergence of information. *Holonics*, 5(1):67–79.

Simon, H. A. (1983). Reason in human affairs stanford university press.

Simonin, B. L. (1999). Ambiguity and the process of knowledge transfer in strategic alliances. *Strategic management journal*, 20(7):595–623.

Singh, G., Haddad, K. M., and Chow, C. W. (2007). Are articles in "top" management journals necessarily of higher quality? *Journal of Management Inquiry*, 16(4):319–331.

Smith, E. A. (2001). The role of tacit and explicit knowledge in the workplace. *Journal of knowledge Management*.

Sproull, L. (2010). Organizational learning. In *Stanford's Organization Theory Renaissance, 1970–2000*. Emerald Group Publishing Limited.

Stanton, N. A., Hedge, A., Brookhuis, K., Salas, E., and Hendrick, H. W. (2004). *Handbook of human factors and ergonomics methods*. CRC press.

Sternberg, R. J. (1997). Successful intelligence: a broader view of who's smart in school and in life. *The International Schools Journal*, 17(1):19.

Stewart, T. A. (2007). *The wealth of knowledge: Intellectual capital and the twenty-first century organization*. Currency.

Svensson, L., Ellström, P.-E., and Åberg, C. (2004). Integrating formal and informal learning at work. *Journal of Workplace Learning*.

Tell, F. (2011). Knowledge integration and innovation: a survey of the field. *Knowledge Integration and Innovation: Critical challenges facing international technology-based firms*, 25:69.

Thanh, N. C. and Thanh, T. (2015). The interconnection between interpretivist paradigm and qualitative methods in education. *American journal of educational science*, 1(2):24–27.

Tobin, D. R. (1998). *The knowledge-enabled organization: moving from" training" to" learning" to meet business goals*. Amacom New York.

Truch, A., Higgs, M., Bartram, D., and Brown, A. (2002). Knowledge sharing and personality. In *Henley Knowledge Management Forum*, volume 23.

Tsoukas, H. (2009). A dialogical approach to the creation of new knowledge in organizations. *Organization science*, 20(6):941–957.

Turner, J. R. and Keegan, A. (1999). The versatile project-based organization: governance and operational control. *European management journal*, 17(3):296–309.

Uygur, U. (2013). Determinants of causal ambiguity and difficulty of knowledge transfer within the firm. *Journal of Management & Organization*, 19(6):742–755.

Vaismoradi, M., Turunen, H., and Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & health sciences*, 15(3):398–405.

Van Fraassen, B. C. et al. (1980). *The scientific image*. Oxford University Press.

Vanzo, A. (2013). Kant on empiricism and rationalism. *History of Philosophy Quarterly*, 30(1):53–74.

Vygotsky, L. S. (2012). *Thought and language*. MIT press.

Weiss, L. M. (1999). Collection and connection: The anatomy of knowledge sharing in professional service firms. In *Academy of Management Proceedings*, volume 1999, pages A1–A6. Academy of Management Briarcliff Manor, NY 10510.

Wenger, E. (1999). *Communities of practice: Learning, meaning, and identity*. Cambridge university press.

Williams, K. Y. and O'Reilly III, C. A. (1998). Demography and. *Research in organizational behavior*, 20:77–140.

Yanow, D. (2000). Seeing organizational learning: Acultural'view. *Organization*, 7(2):247–268.

Yin, R. K. (1994). Discovering the future of the case study. method in evaluation research. *Evaluation practice*, 15(3):283–290.

Yin, R. K. (2009). *Case study research: Design and methods*, volume 5. sage.

Zahra, S. A. and George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of management review*, 27(2):185–203.

Zangirolami-Raimundo, J., Echeimberg, J. d. O., and Leone, C. (2018). Research methodology topics: Cross-sectional studies. *Journal of Human Growth and Development*, 28(3):356–360.

Appendices

Fellowmind (R1)

1. Can you give a short presentation of yourself?

I am a coordinator at a company called Fellowmind. We work with various customers nationally and internationally, delivering ERP systems based on the Microsoft platform. I am now working on projects that are focused on the automotive industry and the recycling industry.

2. How do you communicate with cross-functional team members?

I communicate mainly via Teams chat and group conversation function. It is easy to get the message across in a group chat. However, if I want things done faster, I usually contact the person privately. If you delegate a task in a meeting, it is important to be clear with whom you will give the task and when it should be completed. We rarely have physical meetings. The disadvantage of digital meetings is that people usually sit with other things simultaneously, and then it is easy to miss information. Nevertheless, it is always difficult to have physical meetings.

3. What can you tell me about cooperation and competition between employees regarding knowledge sharing?

a) What are the drivers for cooperation?

The driving force for cooperation is trust, knowing whom to turn to and with what. Having a good cooperative climate with the mentality of building things together. It takes a long time to build such a climate in a team and organization. It is not built during a project, but several projects are required. Moreover, most of the time, you usually interact with the same people over the different projects, and over time you build trust. You have to stand up for each other and be clear about why, for example, things should be ready by a certain date. When you announce why you do as you do, you become more credible because you do not want to seem to do things just for the sake of it.

b) What are the drivers for competition?

We have almost no internal competition with us because there is no reason for it. There is always something to do, and if you want to do something else, you usually get the chance to do it. So you can jump around in the organization according to your own needs. If you choose not to help a colleague in another team, it is usually only temporary as you may be busy with some other work at the moment.

4. How would you evaluate the obtainability of knowledge?

a) How easy is it to find knowledge in the forms of documentation and video lectures?

We're not that good at that. This is because we have information scattered a bit everywhere, which makes the process of finding things efficiently more difficult. When we work with customers, and they want to reduce the cost, documentation is usually what smokes. This would mean that we do not handle documentation and that it is the customer who does it. Nevertheless, in practice, no one takes care of the documentation. The advantage of documenting the processes is that it is much easier to follow up on what is to be done. Furthermore, employees can more easily participate and utilize that knowledge in later projects. Then you do not end up in the stage where you have to guess. In addition, we have a good intranet that contains much useful information. But not everything is available on the intranet, and the information is a bit scattered as I mentioned earlier.

b) How easy is it to reach out and contact people with the appropriate knowledge for the given task?

It's pretty easy in our organization. The bar to contact anyone is quite low. You can write to the finance department or the warehouse department and ask specific questions, and people answer pretty quickly. If you contact the wrong person, they usually try to refer you to the right person. It is easy to find out whom to contact. The manager and those who have worked longer usually keep track of such things.

5. From your perspective, how can managers, coordinators, and employees facilitate the sharing of knowledge?

Among the best things you can do is always to lower the bar for people to have contact with each other and enable people to talk to each other. People should be able to sit with each other physically. They should have enough to do to be busy with the job but not too busy to have a little chat with each other where they reflect on what they do and have done. You can also add the classic coffee machine chitchat. The worst way to share knowledge is to book a three-hour team meeting on a Friday afternoon and tell the team that "now we will share knowledge; let us begin!" The most effective knowledge sharing takes place over a long period by itself, i.e., organically. We try to have a common language in the organization. As a newcomer, you eventually learn the language. We try to make an effort to always explain what we mean by certain terminologies. The world of business systems has standardized concepts, so our employees in other countries understand what is meant, even if they have different mother tongues. Another perspective is that we try to promote learning by throwing employees directly into the projects and allowing them to learn by working practically rather than reading a book. You can not write everything down, so you have to experience certain things. We work

in a sector where employees have studied at the university, and most of the time, they do not have the ambition to enter working life by continuing to learn on a theoretical level.

6. What activities do you use to unite the team and create a "we" feeling?

The best way to create a common identity is to make people suffer a little bit together. They have to go through something difficult together, which usually welds a group together. There must also be times when they can talk to each other. You do not build a "we" feeling if five people sit separately in a room and work on the same project. They should face tough challenges. For example, the restaurant industry is tiring and back-breaking; however, the employees usually have good cohesion and connection. It would be best if you did not strive for people to work so hard that they feel bad, but it should be a bit tough, to also be able to create a feeling of victory when the task is completed. The feeling of victory is usually inclusive and a good basis for community. In addition, one must also have team activities, workshops, and afterwork, which strengthens the team spirit very much.

7. Which policies, procedures, and resources on an organizational level increase the creation, sharing, and use of knowledge?

From the organization's point of view, knowledge sharing should be encouraged. We previously had individual bonuses. However, there was less incentive to share the knowledge because it would affect the individual salary. Therefore, we removed the bonus system to mark that we are in this together and work for the same thing. The organization should allow its employees to devote time for knowledge sharing and not push employees to focus only on chargeable time. For example, we had a meeting in another city where project managers gathered and shared knowledge. The organization gave us the opportunity to do so, as well as conditions in the form of train tickets, etc., to enable this exchange of knowledge. There is also an office where people can sit together, and the office should be located in a place that allows everyone to go in and work. Another thing that I appreciate with Fellowind is that the employees have good personal responsibility and ambition. This means that you do not need micro-management. It is clear that employees require good leadership and someone who books monthly interviews, priorities at the strategic level, etc., but this is done jointly with the employees. So the employees and management work together towards a common goal.

8. Anything else you want to add to this conversation?

Nothing beyond what was said.

Information Security Council (R2)

1. Can you give a short presentation of yourself?

I am currently working as a coordinator for a cross-functional team in the Gävle municipality, at the information security council. The team's primary goals are anticipating, assessing, and actively managing new and emerging threats from a information security stance.

2. How do you communicate with cross-functional team members?

We utilize fast and short channels, either call via teams or chat. It depends on whom we work with. We work a lot with the municipality's IT department, and they are used to working agile with advanced technologies. We usually take one reconciliation meeting per week (maximum 60 min) to discuss points according to a set agenda. There is always someone who has the lead for each point and reports on the status. Between reconciliation meetings, we chat in teams for the most part. In other cases where the teams are not as tech-savvy, there will be more physical or video meetings, usually longer emails.

3. What can you tell me about cooperation and competition between employees regarding knowledge sharing?

a) What are the drivers for cooperation?

In the public sector, a driving force is to promote the welfare and as much activity as possible per each tax SEK. Sharing knowledge is of the utmost importance for the quality of the business to be good, and in many cases, employees are also consumers of the business that is conducted. For example, in health and medical care, employees want to do a good job and spread the knowledge because it will, in turn, benefit their care when they are in need. Furthermore, many in the public sector have a driving force that is not the salary but rather contributes to good welfare, legal security, etc.

b) What are the drivers for competition?

There is a fear that you can become interchangeable if too much knowledge is leaked. In some cases, individuals can also see the bargaining position knowledge provides, and that they can take advantage of the situation to their upper hand, for example, higher salary, more vacation, or other benefits.

4. How would you evaluate the obtainability of knowledge?

a) How easy is it to find knowledge in the forms of documentation and video lectures?

This is one of our great challenges. We have poor management and no vision for how

this should work, where each area is different. It is said that the intranet should be the core of knowledge, but in practice, we have x number of thousands of employees who have never been on the intranet. There is a gap between what centrally placed managers believe and what actually happens in practice. There is a complete lack of communication between different departments, support activities, and core activities. Often there is someone central in a support business who thinks that something should be a certain way; however, that does not correspond to the reality and the needs of the core business. At the same time, some managers do not dare to govern despite the demand. An example is when we identified that an instruction is needed on how employees should handle their phones. The IT director said that we do not need it because we work with trust-based management, which according to him, means that we can trust that employees know how to handle their phones and what they are allowed and not allowed to do. This is although it is the employees themselves who request the instructions. At the same time, according to the GDPR law in Sweden, several supervisory cases state that an organization needs to have such things in place.

b) How easy is it to reach out and contact people with the appropriate knowledge for the given task?

For those who are more centrally located, it is not difficult, where personal awareness is high, and you always find the right one. Several parts of the organization work with function mailboxes, making it easy. On the other hand, for people far out in the business (first line) becomes more challenging; based on the description above, much contact information is available on the intranet that they do not use.

5. From your perspective, how can managers, coordinators, and employees facilitate the sharing of knowledge?

It is about targeting information/communication based on the receiver's culture and speaking their language. It is about conveying knowledge in many different ways, for example, knowledge about a certain subject theoretically and, in other cases, practically. It is about giving the knowledge a meaning; for example, if I train people in healthcare, I need to speak their language. Instead of information security, I talk about patient security and describe why information security is important for patient security. The same applies if I talk to IT operations, then I use concepts such as operational security, etc. We also work with exercises and workshops, which are good because we leave the theory and become practical. This means that employees get to experience, which is important because most of us humans are experience-driven and understand things only when we have experienced them. We sometimes write meeting notes at meetings to have

a consensus and traceability about what we have said and agreed on. For example, when we review each other's texts, we do it in edit mode and use comments so that we can teach each other. We want to make each other better, which does not happen if we do not criticize each other's work. Other things we do are interactive e-educations. We have different governing documents, but to make these more accessible and attractive, we create interactive e-educations where we learn how to think.

6. What activities do you use to unite the team and create a "we" feeling?

We can create a "we" feeling by having afterworks, conferences, coffee breaks, joint training or similar. We celebrate with Kick-offs, cake, or similar when we have completed a project. It can also be about us taking x number of minutes during meetings and chitchatting. It is simply about giving each other feedback and getting a good feeling. Give each other opportunities and put each other in situations where one can do a good job and feel that he/she is contributing to the goal we have. We should not value different tasks differently, but one should highlight that all things are important; even the chef is important in a war. It is about giving each other different roles and pushing each other to develop, dare, inspire, and motivate each other. We have to put people in situations where they can succeed, do a good job, and then grow in and do an even better/harder job.

7. Which policies, procedures, and resources on an organizational level increase the creation, sharing, and use of knowledge?

In my previous organization, we had the motto that we make each other better, which was printed out and put on the walls of all business units. It was referred to all the time, which created a sense of community and encouraged each other to do better, which is done, for example, by sharing knowledge. In the organization I work for now, we also have such work. However, it is merely on the departmental level and nothing at all at the organizational level, which means that more downpipes are created, and some do not think they work for the same organization. For example, some teachers within the school department think that they work at a certain school and not for the municipality. They believe that the municipality is something else, but the school is part of the municipality which is problematic. Further, there are employee days in the organization where different themes are raised to spread knowledge and where departments tell about what is going on and what is current. Some newsletters are sent out, and interactive training can be completed at any time. There are thus opportunities for competence development, for example, via an internal system where we can attend training, which is also encouraged. In addition, there are opportunities to apply for development programs to

become a manager. There is also an encouragement to develop and change the type of work within the organization. There is an opportunity to set aside x number of percent of the employer's salary to facilitate the opportunity for skills development. Various governing documents are intended to facilitate knowledge creation and sharing. However, the organization has failed in the implementation of these. Additionally, regulations and paperwork should always have a function and add some kind of value, otherwise it will merely be waste of time.

8. Anything else you want to add to this conversation?

No, nothing right now!

Sandvik (R3)

1. Can you give a short presentation of yourself?

I work as a coordinator at Sandvik in the business area of machine and manufacturing solutions. More specifically, we are working on design and planning automation.

2. How do you communicate with cross-functional team members?

We communicate mainly via Microsoft Team's call and chat function. We also use email. Sometimes we also meet physically. We have no policy for when to use which communication channel. Nevertheless, after the covid-19 pandemic, Teams have become the most central communication channel.

3. What can you tell me about cooperation and competition between employees regarding knowledge sharing?

a) What are the drivers for cooperation?

What drives the collaboration is business. To create customer value and products that we can sell. Creating customer value is really a common goal. Common goals are the driving force we have. We understand what our products and efforts do for both our customers and society as a whole. Then everyone knows that what we do is not something one can do alone, but you need your group members. To help your colleague is to help yourself. Further, it is not fun to know everything yourself because it means that you will be forced to have an unnecessary amount of responsibility.

b) What are the drivers for competition?

We do not have much competition. However, having more knowledge than others is an advantage in salary negotiations and opens up new career opportunities. We are, in a way, herd animals. If you share your knowledge, there is a risk that you may not be

needed in the herd anymore. These are thus purely selfish motives, where one separates the concepts "one's own best" from "the group's best".

4. How would you evaluate the obtainability of knowledge?

a) How easy is it to find knowledge in the forms of documentation and video lectures?

It is not very easy. We upload much material, but there is no clear structure for finding things. We have an intranet and other places where information is available. Nevertheless, there is no real logic or order in why things are exactly where they are. In addition, all the "know-how" that the company lives on is not available on the intranet, but that information is hidden in the senior employees. I have had projects where people have been good at documenting and making reports. Then when they were on another project in another department, they could not participate in the previous documentation because they became classified for a certain department.

b) How easy is it to reach out and contact people with the appropriate knowledge for the given task?

It is pretty easy. You can see the organizational structure on teams and the intranet when searching for a specific person. You see the person's boss and colleagues and subordinates. But of course, you have to have some experience to understand what all roles mean and thus choose the right person to contact. However, the easiest thing you can do is turn to your boss or someone more senior in the company. It usually always works out to get it right, maybe not on the first try, but you always get there.

5. From your perspective, how can managers, coordinators, and employees facilitate the sharing of knowledge?

We have meetings where you share what you have done and what you have learned from it. But it is also required that you are regularly asked to give presentations because then you demonstrate your subject area. This gives people more control over whom to turn to when they encounter problems that require that type of knowledge. One more thing is Workshops because then you get to test things in addition to the typical chores, and you can somehow get into your colleague's shoes. Everything that puts theory into practice is incredibly important. If you have only read theory, you will be very disappointed when you apply it in practice because there is a lot of knowledge and aspects that can not be included in books. On the other hand, if you are put into practice without any theory, you will be very lost and do not know where to start. The theory is what makes us move forward with qualified guesses. In addition, the theory is difficult in the beginning, but it becomes a habit because the more you read, the better reading comprehension you get. Coffee breaks are also a way to get to know each other and get much knowledge in

return. Unfortunately, there have been fewer coffee breaks because fewer people have been in the office. We have tried to have coffee breaks online, but it does not work. One must meet physically.

6. What activities do you use to unite the team and create a "we" feeling?

You have to make sure that everyone's voice is heard. You should not claim to know better and just have your old habits, but you should also be open to change. You must have a common goal and always remind each other of the common goal. Having a vision and goals is the foundation of everything. If you do not know where you are going, your commitment will get worse, and what you do might not agree with the direction you should have. If you have different goals, the team will be segregated. Afterworks are very important because you manage to get to know each other in-depth and become more friends than just colleagues. However, it is also important to do something bigger. For example, we have rented a cottage and have a weekend with lots of activities. This makes the team stronger and is also a good way to recover. It is as well important to have more consistent coffees where you celebrate your successes and give each other feedback.

7. Which policies, procedures, and resources on an organizational level increase the creation, sharing, and use of knowledge?

It should be easy to reach people. You should not have too much secrecy between the departments. You should have more documentation and the time to actually be able to document. You should also give the employees some air in the schedule so they have time to reflect and blend in with what they have learned. You should give them time and opportunities to give each other constructive criticism. You have to make sure that there is a culture in the organization that conveys a "we" and a pride that you work exactly where you work. From the management's point of view, it is important to be transparent, always update on the vision, and be very clear with their goals. I have noticed that the thresholds for what your assignment includes have been raised. Many years ago, when I started working at Sandvik, you could go to a specific person at work and say, "these are the dates I will travel", or "these components are what I need", and the person would fix it. Nevertheless, today you have to do all that yourself. This is good because you learn the administrative side; unfortunately, it is time-consuming.

8. Anything else you want to add to this conversation?

No.

Scania (R4)

1. Can you give a short presentation of yourself?

I am a project coordinator at Scania. Our mission is to manufacture buses and trucks for Sweden and the global market. The focus is on both commercial and private use.

2. How do you communicate with cross-functional team members?

The primary platform that team members use for communicating is Microsoft Teams, both the chat and call functions. The team has a group chat, but I also contact them privately when the tasks are person-specific. The emails are also used, but primary to include other teams in the communication. Only In case of urgency or critical matters is the phone used to contact members.

3. What can you tell me about cooperation and competition between employees regarding knowledge sharing?

a) What are the drivers for cooperation?

At Scania, cooperation is the company's primary focus, and we encourage employees to share knowledge with each other. We believe that sharing knowledge with the employees and having a platform such as face-to-face meetings and development activities help employees trust each other — which helps the company reach its goals. The complexity of the task is one of the main drivers of cooperation. It forces individuals to collaborate, and we encourage that by emphasizing that there is no shame in asking. After all, we do not have internal rankings, so there is no clear need for keeping knowledge from others.

b) What are the drivers for competition?

In the company, competition between employees is looked down upon, but if I must point out the main driver for competition, it would be the incentives for idea protection. More specifically, we have a system that allows employees to get patents for their findings, which increases the person's status (even though the company is the primary patent owner). Engineers apply for all the cases of the patent I know. This can create tension in the group, consisting of people with different backgrounds. Another thing is lack of time. It is not a driver for competition, but it is a barrier to cooperation.

4. How would you evaluate the obtainability of knowledge?

a) How easy is it to find knowledge in the forms of documentation and video lectures?

In order to access knowledge, we have the portals that we can use in case we need to find a particular topic that we are not familiar with, which helps us gain knowledge immediately. However, it is fair to say that the knowledge on the intranet is just general. There,

we have PowerPoint presentations and lectures on different topics. They are good study material, to begin with; however, once the knowledge becomes more specialized, the harder it becomes to find that knowledge. I believe that specialized knowledge becomes less digitalized in the form of documentation and more hidden in personal experiences.

b) How easy is it to reach out and contact people with the appropriate knowledge for the given task?

By using Teams, employees can contact a particular person who has the knowledge one is seeking. We can also ask colleagues and get an idea of whom to ask, and they help point us in the right direction. The biggest problem is that the intranet does not show what everyone is experts on or what projects they have been active in. Thus, this knowledge becomes colleague-dependent, which is problematic since employees change jobs and takes that knowledge away with them outside the company.

5. From your perspective, how can managers, coordinators, and employees facilitate the sharing of knowledge?

Regular meetings focus on various topics and cases that various employees are facing issues with. Interactive workshops help employees cooperate with each other and solve the cases together. This is more fun than reading a circuit diagram, for instance. If the workshops were only about reading theory, no one would attend. Workshops also encourage teamwork in a less severe manner, which is very beneficial. One of the most important things is creating relaxed environments by emphasizing to the employees that it is okay to make mistakes. This encourages them to take action and be driven, eliminating some of the stress. It is not a coincidence that the best ideas come in the shower when we are in a relaxed state. Another critical factor for knowledge creation and sharing is trusting the employees. There is no need to regulate the way they work. Instead, we hire them to do their job in their way, and our responsibility is to provide them with the resources needed to help them reach their goals. Further, every team member must know exactly what the team goal is and what every member can provide when it comes to goals. The best place to share knowledge is somewhere with a cup of coffee.

6. What activities do you use to unite the team and create a "we" feeling?

The main drivers for a ''we" feeling are highly correlated with the drives of cooperation. For example, activities such as afterworks and away days for employees help the team members to get to know each other and have a personal twist on the professional environment. The away days focus on team building and how teamwork can be facilitated. Doing such various activities helps colleagues get the sense of being heard and

being a part of a family. The activities usually consist of a complex but fun task, which employees tackle in teams. The winning team gets a symbolic price just to motivate them and create a competitive environment. The competition here is between teams and not between the employees within the team. In summary, a common goal is the best way to create unity.

7. Which policies, procedures, and resources on an organizational level increase the creation, sharing, and use of knowledge?

The resources such as the portals that we use and Microsoft Teams help share information with each other. It should be normalized to get messages from people in different projects and departments because you are all in the same boat. The cultural aspect is critical. People should not only know what they should do, but also know why they do it and what benefits it will provide. Even though we are a revenue-driven company, there is a higher purpose behind what we do. Our products help our customers, for example, to transport food and goods, which is a contributing factor to why you can go to your local store and be able to buy food. Also, the organization should not bury the individual with work and occupy every single second of the employees. Employees should be able to breathe because it allows them to communicate with each other, which eventually leads to either a "we" feeling or them sharing knowledge.

8. Anything else you want to add to this conversation?

I have covered everything I wanted to say; thank you for the interview.

Svenska Kraftnät (R5)

1. Can you give a short presentation of yourself?

I work on Svenska Kraftnät, as a coordinator. I am part of the development and analysis unit, where we analyze data from the electricity supplier. I coordinate the exchange of information between the state and electricity suppliers.

2. How do you communicate with cross-functional team members?

We have several ways. We have continuous team meetings weekly. Then we also have individual reconciliations between colleagues and me in different contexts. The meetings occur randomly at intervals between 2-3 weeks. We also have unit meetings that take place every two weeks. These are scheduled communication opportunities. Then there is the spontaneous communication via corporate Skype, either chat or conversation. We use Outlook as an email, and some days we have a face-to-face meeting in the office.

3. What can you tell me about cooperation and competition between employees regarding knowledge sharing?

a) What are the drivers for cooperation?

What mainly drives cooperation is that in addition to individual goals, we have common goals. For example, if we have 7 people who work to make it easier for electricity suppliers to sell their electricity via the market, we have many individuals with different skills and backgrounds; lawyers, economists, environmental backgrounds, and engineers. The diversity in the background makes them very dependent on each other. So there must be a synergy when working in such a project form. The goal is for people to contribute within their area of expertise. In summary, there is a dependency that drives the collaboration. We had an engineer who did everything in the supply chain a long time ago, but it became too complex, so we started to divide it. Transparency is the key to a functioning and motivating collaboration, where everyone knows what to contribute.

b) What are the drivers for competition?

Here, we do have some degree of competition, but it is a little different than private companies. Here you do not work for profit maximization, but you work for quality assurance. The one who delivers top-quality results excels in relation to others. The consequences are connected to the salary interview that occurs 1-2 times a year, where you argue why you deserve more than your colleagues. Another thing is career development. If you show top-quality results, the probability of achieving higher positions, such as managerial positions, increases. Quality jobs are what is required to advance internally. A third aspect is that the way we behave inside and outside of work is monitored because when we work in the public sector. This is linked to competition because, as an employee, you are an ambassador for the Swedish people, which is celebrated internally. The better employee is exemplified by the titles "the employee of the month" or "the employee of the week", which it is posted on the intranet so everyone can see it.

4. How would you evaluate the obtainability of knowledge?

a) How easy is it to find knowledge in the forms of documentation and video lectures?

As a coordinator, my primary tasks have been to look at what we have for data needed for the work and what we lack. With others, I identify what kind of knowledge we have, do not have, and what knowledge we need. Some things are unclear, and people do it in their own way. It is not easy to find routines for everything, so the individuals create the routines themselves. So there is nothing you can search for on the intranet or Google. The information is not available, and if it is, it is usually not updated. We work with legal

requirements, and the legal requirements are a fresh product that changes a little from time to time. 90% of all the knowledge needed already exists within the company, but the problem is that you do not know where to look because it is spread everywhere. Every employee has many areas of responsibility, so it is difficult to gather all the information in one place.

b) How easy is it to reach out and contact people with the appropriate knowledge for the given task?

It is like a jungle. Finding the right person is an art. It has become like this because we have a viscous organization. Every decision must be controlled by many different people. It is extremely bureaucratic. Things move extremely slowly. In almost all efficient companies, you contact in one step vertically, i.e., you ask a manager, or you contact one step horizontally, i.e., a colleague with the same or similar position. With us, it is 3-4 steps. You go to the manager of the manager's manager, or the colleague of the colleague's colleague.

5. From your perspective, how can managers, coordinators, and employees facilitate the sharing of knowledge?

One should identify what kind of knowledge is missing. One should do a gap analysis to identify what and who is missing. Then you invite those who have the knowledge to a presentation for an entire team. It is suggested that the speaker present his/her topic, then you should have a time where the employees ask their questions and things they have thought about. One must speak in a way as if the recipient of the information has no background at all. You use concepts and metaphors; maybe use pictures. You put on a steady tone of the conversation. You must have a background and purpose for the problem and goals to map the journey and create motivation. You have workshops to get into each other's shoes and reach a consensus in the language. Also, you should learn by doing, because it is difficult to have all the knowledge in writing, and it is easier to learn things on a practical level. The theory is usually boring, and there is nothing that gets stuck in the head as easily as a practical experience.

6. What activities do you use to unite the team and create a "we" feeling?

We have done something called "team-building activity", and we have something called "team day", where we talk about how to do to create better cohesion. It is about identifying each other's needs because everyone has different needs. We use games where you compete with yourself and each other in a fun manner. The purpose is to get your colleagues to get to know you better. For example, you put the team in a line, and a

person who keeps the game says, "from north to south, which country do you prefer to live in geographically". Then you have to stand in that order. For example, suppose someone says "Italy", and another says "Egypt". In that case, the person who says "Egypt" should stand behind the person who says "Italy" as Italy is located north of Egypt geographically. You help each other stand in the right position given the chosen country. So you get along with each other less seriously and cooperate on solving a fun but challenging problem. You can also appoint someone in the team who bakes, and then everyone sits at the coffee table and have a good time. Afterworks are also important because you build the relationship outside of work and get closer to each other.

7. Which policies, procedures, and resources on an organizational level increase the creation, sharing, and use of knowledge?

You should have an open house, for instance, "25 May, you can meet the system developers". This creates opportunities for employees to talk to each other. This should be part of the corporate strategy, and we have something called the "strategy engine concept". Mandates and incentives have been given to colleagues. Anyone within the organization can suggest activities, changes, and improvements. You set aside 1 hour a week where you can give any suggestions. The person who comes up with the proposal will be responsible for implementing the proposal. In other places, people can complain and suggest things, as in the classic line organization. However, here, you get a real chance to develop your idea and suggest real implementation procedures. Further, it should be easy in the organization to contact people, which we lack (in addition to the strategy engine). We also have something called "responsibility under freedom"; the more responsibility and quality, the more freedom. The less responsibility and quality, the less freedom you get, since you will get more follow-up calls. You do not want a manager who breathes in your neck because it is unmotivating, and you learn worse. You should include a manager in the conversation, you should be collaborative, and the hierarchy should be as flat as possible.

8. Anything else you want to add to this conversation?

No, I am fine with what was mentioned during the interview.