

## MASTER

### Improving knowledge transfer between product divisions adopting a social network perspective on individual behavior

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Improving knowledge transfer between product divisions:  
Adopting a social network perspective on individual behavior

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## Preface

Before you lies my graduation project for my master's degree in Innovation Management at the Eindhoven University of Technology. Over the last year, I have been analyzing the knowledge transfer behavior of employees at a Company in the Netherlands. I became interested in the subject of *knowledge transfer* after the identification of *knowledge* as a strategic competitive advantage. I have been curious about the growth of importance of knowledge in organizations. Especially within organizations that value their employees as important assets, because their knowledge contributes to the value creation of the organization.

In this report, I aim to transfer all my knowledge about the subject of *knowledge transfer*. In that sense, writing my thesis about this subject is may be the most ironic thing I've ever done. I faced many barriers during the research and writing process; Barriers that I recognized from my theoretical and empirical analysis. *First*, I discovered the role of ability. I didn't have much knowledge about this subject prior to starting. Therefore, it was difficult to identify what knowledge would and wouldn't hold value for my thesis. *Second*, I discovered the role of opportunity. For me, time pressure proved to be a constraint in the sense of opportunity. *Third*, I discovered the role of motivation. My extrinsic motivation (e.g. deadlines) of this final step towards graduation, was strong. Still- as most students will recognize- the intrinsic motivation of writing this thesis, which proved to be a time and energy-consuming process, wasn't always as on par. Still, I managed to finish this document. Hence, my thesis was a perfect example of the role of motivation, opportunity, and ability in knowledge transfer.

During this graduation process, I retrieved much support from different people, which I would like to thank. To begin, I want to thank my supervisors dr. ing. Wouters and dr. Cloodt. They helped me with valuable feedback, irrespective of the time pressure I have (unintentionally) put on them.

Furthermore, I want to thank multiple people of *the Company*. *First*, I want to thank my two supervisors (Charlotte and Kim), for reminding me of deadlines, motivating me in difficult times and helping me in the writing process. *Second*, I want to thank the COO for having faith in me and offering me the time needed to write this thesis. *Third*, I want to thank Pim for being understanding my thesis frustrations. Furthermore, countless employees of *the Company* have contributed to this thesis. Thank you for participating in the interviews, giving feedback, keeping me company at (writing) night shifts, and inviting me to many social events to distract me from my *thesis-fun*.

Also, I would like to thank dr. ir. Koppius of providing me with feedback and useful articles, outside his working hours. My friends and family for understanding why I canceled activities or didn't respond at all to their messages. Last, but not least, my parents, for financially supporting me during my education and not putting me under pressure to visit them, because they knew I was working hard on my thesis.

Thank you all. Let's catch up on lost time after I'm graduated.

*Eveline Wouters*  
*Breda, February 2020*

# Management summary

## *Introduction*

This report describes a study conducted by a Dutch Company on improving knowledge transfer between product divisions. The organization is structured by seven product divisions: departments that are responsible for the development, marketing and sales for specific product groups. The high extent of decentralization enables the divisions to make their own decisions and define their own strategy in aiming to improve product performance. Also, the Company stimulates entrepreneurial behavior through the establishment of high job autonomy, supporting risk-taking behavior and stimulating their employees to search for new business opportunities. Through the execution of new things, employees create much new knowledge by learning. This knowledge is valuable for the Company because it prevents employees from repeating mistakes. Because learning is a cognitive process, done by individuals, the obtained knowledge will be stored in the heads of employees. To maximize the benefits of the obtained knowledge, knowledge transfer is needed between product divisions.

Knowledge transfer refers to the process through which one unit is affected by the experience of another (Argote & Ingram, 2000, p. 151). Due to knowledge transfer, employees can learn from each other's mistakes. In this way, employees are sheltered from making the same mistake again, and which would negatively impact organizational performance (Argote, 2013). Also, knowledge obtained from another employee can lead to new insights for product or process improvement, because the employee reflects on that knowledge from another perspective (Tsai, 2001). However, the company recognizes that there is limited knowledge transfer between the product divisions. To increase the productivity of the employees, the Company aims to maximize their internal resources. Therefore, knowledge transfer between product divisions is needed. However, the Company is facing difficulties to improve this action, because knowledge transfer is a process that cannot be controlled by the management (Lin, 2007).

Therefore, this report aims to provide an answer to the central research question:

*How should the Company improve the limited individual knowledge transfer behavior between product divisions?*

In addition, this report aims the following research objective:

*This research aims to develop a solution design to improve the knowledge transfer behavior of individuals between product divisions of the Company.*

## *Method*

The thesis adopts the design science research paradigm, to structure the research in a valid and structured manner (Van Aken & Berends, 2018). This research paradigm aims to develop knowledge for the design of a solution to a *field-problem* (Van Aken, 2004). The design science research paradigm values the rigidity of theoretical and methodological techniques in combination with context-specific research (Van Aken & Berends, 2018). Therefore, a combination of both empirical and scientific knowledge is used as input, aiming to close the gap between scientific and practitioners research.

To obtain scientific knowledge, an extensive systematic literature review is executed. The objective of this literature was to identify barriers and underlying theories, explaining the concept of knowledge transfer behavior. To obtain empirical data, a combination of qualitative methods was used, the identify barriers and underlying theories, explaining the concept of knowledge. The synthesis of these scientific and empirical insights has led to the constitution of the current situation within the company (IST-situation). Within this IST-situation, the constrained constructs (barriers) were identified. The identification of barriers is important because it facilitates insights into which constructs have to be improved to achieve the desired situation (SOLL-situation).

The desired situation is substantiated through the development of design principles. These principles are structured by the CIMO-logics. They describe *why* (Mechanism) a certain intervention leads to a

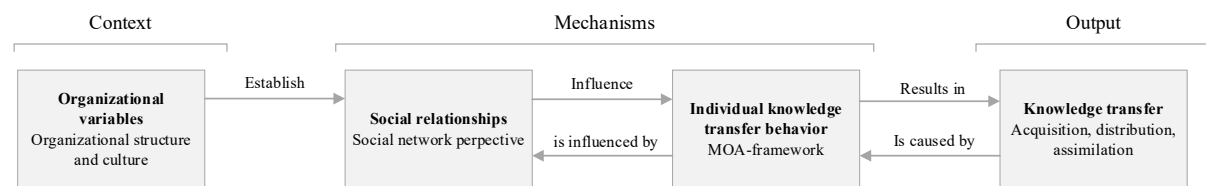
certain outcome in the given context (Tranfield, Denyer, & Smart, 2003). Based on a combination of design principles, a solution design is proposed. This solution design aims to solve the field-problem.

### *Theoretical framework*

This research combines multiple frameworks to identify *who* (the source or recipient unit), *when* (acquisition, distribution or assimilation phase) and *why* (motivation, opportunity, and ability framework) individuals engage in the knowledge transfer process. This combination is used to obtain a broad overview of bottlenecks, aiming to identify which interventions would lead to an improvement in knowledge transfer behavior. Through the introduction of the social capital theory, it could be determined *how* certain interventions improved knowledge transfer behavior.

The theoretical framework adopts the perspective that individual performance behavior is caused by the motivation, opportunity and the ability of individuals (Argote, McEvily, & Reagans, 2003). For individuals to participate in knowledge transfer behavior, they have to be motivated, gain the opportunity and have the ability to perform this desired behavior. The lack of one (or more) of the constructs indicated limited knowledge transfer behavior (Siemsen, Roth, & Balasubramanian, 2008). This research adopts the personalization strategy, referring to the knowledge transfer through interaction between individuals. Hence, the social capital theory is used to identify how the relationship between the two units (source and recipient) affect the motivation, opportunity, and ability of the other unit.

Furthermore, knowledge transfer is socially embedded within the organization (Argote & Ingram, 2000). This means that the activity is influenced by many context-related factors. Therefore, this theoretical framework takes context variables into consideration. Figure 1 shows the conceptual theoretical framework, indicating the causes of knowledge transfer behavior.



**FIGURE 1: CONCEPTUAL THEORETICAL FRAMEWORK**

### *Empirical current situation (Phase 1: What “is”)*

Through the conduction of 24 interviews and multiple observations, the current empirical situation within the Company was analyzed. This empirical analysis identified seven barriers the source and recipient face during the acquisition phase. These barriers explain why the source and/or the recipient do not (or to a lesser extent) participate in knowledge transfer behavior. The barriers are shown in Table 1.

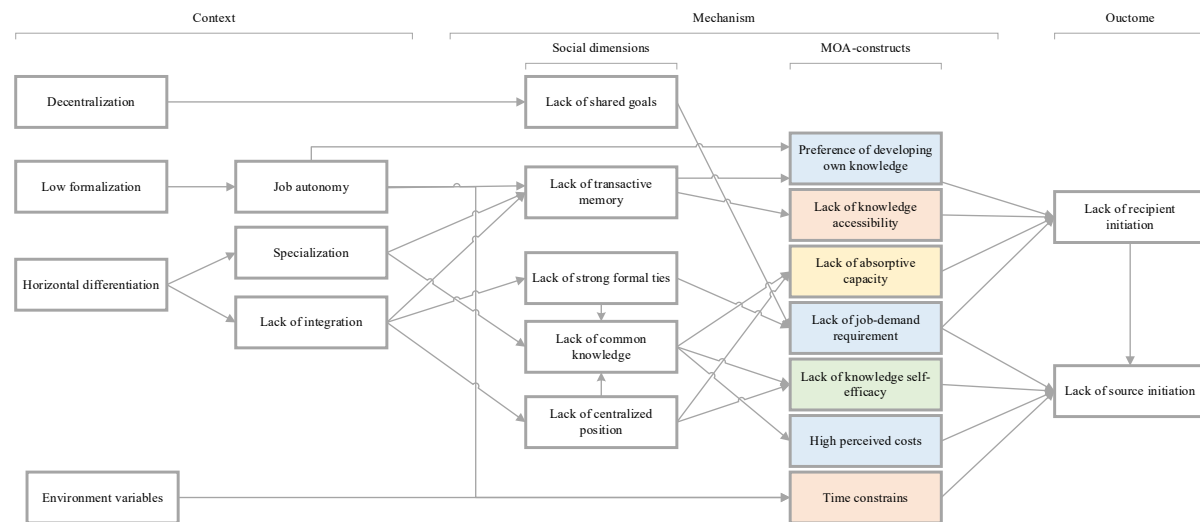
**TABLE 1: OVERVIEW OF BARRIERS TO PARTICIPATE IN KNOWLEDGE TRANSFER BEHAVIOR**

#	Barrier	Unit	Category
1	Lack of knowledge self-efficacy	Source	Lack of motivation and lack of ability
2	Lack of absorptive capacity	Recipient	Lack of ability
3	High perceived costs	Source	Lack of motivation
4	Preference of developing own knowledge	Recipient	Lack of motivation
5	Lack of job-demand requirement	Source and recipient	Lack of motivation
6	Lack of knowledge accessibility	Recipient	Lack of opportunity
7	Time constraints	Source	Lack of opportunity

*Theoretical current situation (Phase II: Model of what “is”)*

To identify the causes of the barriers in Table 1, the current situation is explained through the use of theoretical insights. These insights enable the identification of the underlying theories and causes of the barriers. As stated in Figure 1, the underlying theories and barriers are explained by the organizational variables (organizational structure and culture) and the social relationship established between the source and recipient units.

**FIGURE 2: PHASE II: MODEL OF WHAT "IS"**



Assuming the cause-effect relationships of Figure 2, the following assumption could be made on the current situation of the Company:

*The source and recipient units within the company are not engaged in knowledge transfer processes because: they prefer to develop their own knowledge, they lack of knowledge accessibility, the lack of absorptive capacity, they lack of job-demand requirements, they lack of knowledge self-efficacy, they perceive high transfer costs and they are facing time constraints. This is caused because the source and recipient lack of shared goals, lack of transactive memory, lack of formal ties, lack of common knowledge and/or lack of a centralized position in the organization. These dimensions of relationships are caused by the organizational structure (decentralization, low formalization, horizontal differentiation) and environmental variables.*

*Phase III: Model of what “Could be”*

The third phase focusses on the desired situation for the Company. Because this report focusses on the improvement of knowledge transfer behavior through the effect of social relationships, the desired situation focusses on the desired values of the social dimensions. Therefore, the following social dimensions have to be improved: the lack of shared goals, the lack of transactive memory, the lack of strong formal ties, the lack of common knowledge and the lack of centralized position.

In order to do so, interventions are proposed. These interventions are derived from practical CIMO-logics. These design principles are based on interventions, derived from the empirical situation. Therefore, they are grounded and field-tested, which enhances the relevance of the Company. The following categories of interventions were found:

- 1) A change in the work design; referring to the organizational structure of the Company
- 2) Interventions based on training and development
- 3) Interventions based on hiring the right employees
- 4) The introduction of supporting technologies

### *Conclusions (Phase IV: What “could be”)*

This report suggests the introduction of cross-division teams to improve the individual knowledge transfer behavior between divisions. In particular, these teams are set-up by request of (potential) customers and are temporary. The introduction of cross-division customer project teams is likely to enhance knowledge transfer behavior because:

- The introduction of project teams leads to the introduction of formal ties between the product divisions. Therefore, divisions are likely to improve their interaction. As a result, the source and recipient will become aware of each other’s expertise and tasks. This enhances the transactive memory and creates a common knowledge base.
- Because of the common knowledge base, the perceived costs are likely to decrease. Hence, less context-related variables are needed to be transferred in order for the source and recipient to understand each other.
- The introduction of formal ties increases the job-demand requirement for knowledge. Therefore, knowledge transfer is not recognized as a pro-social behavior. This is because the knowledge transfer is needed to satisfy the (potential) customer.
- Because the customer project teams aim to satisfy the customer, the source and recipient aim to maximize the same goal. Therefore, knowledge transfer is not seen as lost time.
- The temporary character of the customer project teams will increase the number of ties within the organization. Therefore, individuals obtain a centralized position within the organization. This centralized position enables employees to obtain generalized knowledge.

### *Discussion*

This conduction of this research contributes to several theoretical implications. *First*, it combined multiple frameworks to obtain a broad understanding of constructs affecting knowledge transfer behavior. *Second*, the research confirmed the importance of the knowledge acquisition phase and the role of the recipient. *Third*, this report contributes to the consulted articles by implicating the importance of the job-demand requirement of knowledge.

Also, this research gained some managerial implications. *First*, it was suggested that the identification of barriers would result in effective interventions for managers to improve the limited knowledge transfer behavior between divisions. *Second*, it was suggested that the identification of these barriers needs a broad analysis, including various behavior constructs (motivation, opportunity, and ability). *Third*, it was suggested that in order to motivate knowledge transfer behavior, employees need to feel responsible to transfer their knowledge, by identifying the need for knowledge transfer.

Due to time constraints, the research is demarcated by focusing on the acquisition phase of the knowledge transfer process. However, the study indicates an important role of knowledge rejecting of the recipient in the knowledge assimilation phase. Therefore, further research is needed on the underlying constructs of this behavior. Furthermore, this study did not identify multiple constructs of the recipient for engaging in the knowledge transfer process. Therefore, further research could be done on the role of the recipient and his motivation, opportunity and ability constructs underlying to this behavior.

Also, this study has identified seven barriers for the source and recipient to not engage in the knowledge transfer process. However, the reciprocal importance of the barriers was not discovered. In order to determine the most appropriate intervention, further research is needed to identify the most important barrier.



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# 1. Introduction

“I started at The Company ten years ago. Back then, we coordinated activities with face-to-face contact. We worked with twenty employees. They easily fit into one department. We were just more connected. Besides, we offered just six different products back then. Now, we offer 36 different products ... Back in the days, there was just less knowledge to share.” – A marketing employee at the Company

This chapter starts with a quote from an employee. This quote indicates the change in how knowledge is managed when the organization grows. According to Greiner (1998), practices (such as knowledge management) do not last throughout the life of an organization. To continue organizational growth, revolutions must be made which express themselves in changes in practices. For example, employees' tasks of small companies are often broad, because of the small number of employees (e.g. an employee is responsible for the procurement, developing and selling new products). However, financial growth enables organizations to acquire more employees to fulfill tasks. Subsequently, managers might structure the organization in divisions, to enhance specialization and therefore productivity and competitive advantage (Jones, 2013). However, the coordination practices between employees are likely to change, because employees only contribute to a narrow aspect of the value creation, instead of the whole process.

This thesis focusses on the change in the knowledge management practices of a growing company. Because organizations are forced to survive in a changing and competitive environment, it becomes important to efficiently manage internal resources with organizational capabilities (Gibson & Birkinshaw, 2004) (see Appendix A for a more detailed explanation). Knowledge has emerged as an important strategic internal resource for several reasons (Kogut & Zander, 1992). The first reason encompasses the difficulty for competitors to imitate knowledge (Zander & Kogut, 1995). This is because knowledge is embedded within organizational processes and intangible (Argote & Ingram, 2000). For example, the institution of a well-organized customer contact service is based on knowledge. However, the customer contact process is part of a larger network of organizational processes. This complexity of the processes within an organization makes it harder to imitate for competitors because there are many factors involved why this certain customer contact process is working for a certain company.

Knowledge is created through a process of learning (Argote & Miron-Spektor, 2011). Because learning is a cognitive individual process, knowledge is often stored within the mind of individuals (Grant, 1996b; Fiol & Lyles, 1985). Therefore, knowledge repositories are dispersed over the organization (Szulanski, 2000). To maximize the value of internal resources, these resources need to be transferable within the organization (Barney, 1991). The ability to transfer this knowledge between individuals, and therefore fully exploit the available sources is consequently seen as one of the most important processes in knowledge management (Argote & Ingram, 2000). Thus, knowledge transfer is recognized as an important organization capability to create a competitive advantage.

This thesis focusses on the knowledge transfer processes within a specific company (hereafter, the Company). Due to confidentiality reasons, the Companies' name will be indicated as 'the Company'. The legitimate name of the company is known by the supervisors of the Eindhoven University of Technology (TU/e).

Knowledge transfer refers to the process through which one unit is affected by the experience of another (Argote & Ingram, 2000, p. 151). Due to knowledge transfer, employees can learn from each other mistakes. In this way, employees are sheltered to make the same mistake again, and therefore negatively impact organizational performance (Argote, 2013). Also, knowledge obtained from another employee can lead to new insights for product or process improvement, because the employee reflects from another perspective (Tsai, 2001).

This chapter constitutes the foundation of this report. The chapter starts with an introduction to the empirical context by introducing the Company in Subchapter 1.1. Afterward, the problem analysis is discussed, based on exploratory interviews with five employees of the Company (Subchapter 1.2). Subsequently, a problem statement and research objective are discussed in Subchapter 1.3. Then, a

research approach is discussed, including a chosen research paradigm, methodology, research questions and research design (Subchapter 1.4). Finally, the report outline of the upcoming chapters is given in Subchapter 1.5.

## 1.1. The Company

The Company operates in the high-technology industry, developing and selling software products for the business-to-business market globally. The Company was founded in 1999. Back then, they were developing and selling one (software) product. For the last 20 years, the Company's strategy is mainly focused on exploration activities. These activities express oneself in mergers and acquisitions. Through these activities, the Company expanded its product range from one to six product divisions. Additionally, through interactions with (potential) customers and imitating competitors, a continuous flow of innovation has been taken place. This strategy aims the product range expansion, adding new features in the existing product categories and to gain market share and international growth. Now, over 300 are people working globally.

### *The Company's strategy*

The Company is growing, as constituted by annual growth figures and revenue numbers. However, according to the Chief operating officer (COO), the Company performance lags in comparison with their global competition. Therefore, the COO recognizes the need for maintaining and increasing their market share. Hence, a diminished market share will decrease the Company's bargaining power towards customers, suppliers, competitors, resulting in lower revenue and higher costs (Probst & Raisch, 2005). Therefore, the COO expresses the need for exploitation activities (such as activities such as refinement and efficiency). These proposed exploitation activities are expected to lead to the organization's efficiency; which should entail improved profitability (Auh & Menguc, 2005). The COO states that this efficiency is needed to maintain the profit margins on products sold, and correspondingly, it is necessary to stay profitable. Therefore, this thesis focusses on the exploitation of knowledge resources to enhance productivity (Grant, 1996b).

### *The organizational structure*

The Company is shaped according to a multidivisional structure of six different product divisions. All product divisions consist of one or more development, sales, and marketing functions. Also, every product division has a product manager. These product managers are responsible to overview the product performance and are thus able to make strategic choices. The Company endeavors a flat organizational structure, including low hierarchy and a high level of freedom. Therefore, the product divisions are self-managing. Appendix B visualizes a systematic organogram of the Company.

### *The Company's culture*

Furthermore, the Company invests in the company culture by organizing many social activities, and places to meet. The management team (MT) stimulates employees to work open and transparent, and disfavor employees working from home. As a result, the Company stimulates its employees to help each other through face-to-face contact. Additionally, employees use internal communication tools such as documentary repository and chat programs to communicate and coordinate with each other.

## 1.2. Problem analysis

This thesis addresses a *field problem*. A field problem refers to an empiric situation that could and should be improved, determined by the Company (Van Aken & Berends, 2018). This problem analysis refers to the current situation aiming to identify the field problem. The field problem is explained by conducting a cause-effect analysis.

### 1.2.1. Methodology

This cause-effect analysis is composed through an analysis of five interviews with employees and the COO of the Company. The participants were selected through judgmental sampling, which refers to sampling through a criterion (Blumberg, Cooper, & Schindler, 2011). For this analysis, the participants were chosen on the familiarity of organization processes in general. This criterion was chosen because knowledge transfer is affecting all product divisions in general. Besides judgmental sampling, snowball sampling was conducted. In several interviews, the participant advised talking with someone else in the

organization about a certain subject. In the end, a face-to-face meeting with the COO was set up, to validate and enrich the cause-effect analysis.

### 1.2.2. Cause-effect analysis

Within the cause-effect analysis, the causes and effects of knowledge transfer within the Company are discussed. Based on the exploratory interviews, three causes were found and discussed in the text below. The *first* cause reflects on the behavior of subunit orientation, caused by the organizational structure within the Company. The *second* cause focusses on the lack of mutual understanding, caused by the different product life cycles of the product divisions. The *third* cause focuses on the prioritizing behavior of the employees, caused by time constraints. After the discussion of the three causes, the effects of knowledge transfer for the Company are discussed. This subchapter ends with a visual cause-effect diagram.

#### *Cause 1: Subunit orientation*

The Company stimulates its employees' commitment to the Company. The founders endeavor an open, flat and transparent organization, combined with high job autonomy, which gives employees the freedom to fulfill tasks within their skillset and interests. This perceived high job autonomy is not only present on the individual level, but the Company also provides group autonomy by establishing self-managing divisions and teams within this division. Therefore, they have the freedom to set their own product performance goals, and the freedom to make their own (strategic) decisions on how to achieve those goals.

Product divisions within the Company are constantly improving and expanding their product features and possibilities to meet the changing needs of their customers and the market. As mentioned before, individuals and divisions experience high group autonomy, enabling them to make their own choices to improve product performance. According to the interviewees, individuals in product divisions generally base their decisions on their own experiences and paradigms to achieve their product performance. In this way, they can make decisions faster. The COO argues that individuals not always are fully exploring the opportunities to learn from other individuals because they do not acquire knowledge from other product divisions. Because employees are focused on their paradigm, they often lose sight of what is going on in other divisions. Thus, individuals who are orienting in their own (product division) unit, often miss knowledge transfer opportunities which could be relevant for them.

#### *Cause 2: Lack of mutual understanding*

Because the Company has expanded its product range gradually over the last twenty years, the different product categories (and their teams) differ in the product life cycle (PLC) stages. According to Day (1981), the product life cycle consists of four stages: the introduction, growth, maturity and decline stages. Multiple sources in the Company confirm that product division A is operating in a maturity phase. Hence, the product manager responsible for the performance of product A utilize different strategies than, for example, the product manager responsible for product D, which has just entered the growth phase.

The COO states the differences in PLC-stages often leads to the adoption of different strategies per product division. However, because employees in other divisions are not aware of the operations in other product divisions, they often do not understand the strategic choices made in other divisions. According to multiple employees, they feel that many decisions are made based on intuition, instead of evidence (e.g. performance numbers). Conversely, the COO disagrees with this employees' perception and indicates a *lack of mutual understanding* between the product divisions. According to him, this lack of mutual understanding is the result of not being apprised of the strategy and the differences caused by operating in varying PLC-stages.

The lack of mutual understanding barriers the ability of individuals to recognize relevant knowledge outside their product division. When there is no relevant knowledge identified, individuals are not acquiring other divisions to transfer the knowledge. Therefore, the lack of mutual understanding results in a lack of knowledge transfer.

### *Cause 3: Prioritizing of activities*

Employees and the COO state that the Company is forced to continue their exploration activities, because of the changing needs of their customers. Therefore, employees are constantly improving the product, adding new features and search for new markets and collaborations. Because the industry where the Company operates in, is growing and changing, this leads to an endless of possibilities, and thus tasks to discover. However, the Company is facing a lack of employees. Therefore, employees have the feeling that they have to prioritize their tasks because there are more opportunities to perform than time available.

The prioritizing of tasks is based on the contribution to product performance. For example, if a big customer requests a new feature, it will be a higher priority to develop and launch his request. Hence, when someone from another product division is asking for advice on a specific subject, it often has a lower priority, because it will not lead to a higher product performance for the knowledge provider. Therefore, individuals tend to help (and thus transfer knowledge) individuals within their product division first then someone outside their product divisions.

### *Problem: Limited knowledge transfer*

To summarize, the limited knowledge transfer in the Company is likely caused by individuals which are, 1) operating within a subunit orientation, and 2), do not have a mutual understanding towards other product divisions and 3) are prioritizing their own product performance activities before other tasks. According to the COO, this unilateral behavior often results in ‘re-inventing the wheel’, re-make mistakes which are made in the past and many tasks are performed double, without knowing if these tasks are done already. The process of knowledge transfer enables employees to learn from their peers (Argote & Miron-Spektor, 2011). Thus, because of the limited knowledge transfer among divisions, the units within an organization are not able to learn. Therefore, there is limited *organizational learning* in the Company.

The limited organizational learning results in *low productivity* of employees (Roloff, Woolley, & Edmondson, 2011). Currently, many resources (such as time and personnel) are needed to establish regular product performance. The COO emphasizes if employees learn from experiences of individuals in other product divisions; divisions and individuals will make better decisions, leading to higher productivity. Currently, the COO argues that the used effort (e.g. time, money investments, personnel) does not lead to the product performance which is forecasted.

Besides productivity, the COO of the Company recognized the number of mistakes being made twice towards customers. He argues that, because the employees do not learn from their mistakes, mistakes are often repeated. In the past, this has led to losing customers, because those customers were not satisfied. Furthermore, the recovery of these mistakes demands effort, which would result in even lower productivity.

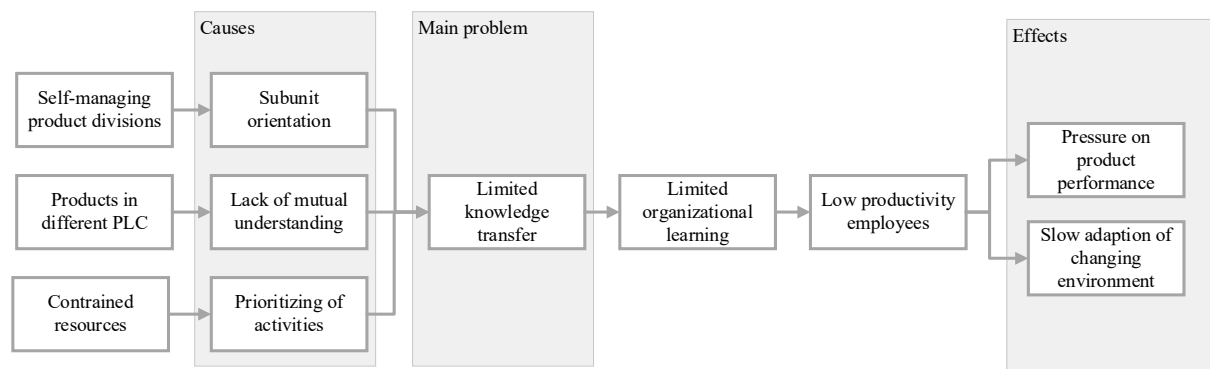
### *Effects*

The low productivity in divisions puts the profitability of the product performance under pressure. According to the COO, the low productivity of the employees requires too many resources (e.g. time, investment and personnel) compared to the product’s revenue. This results in a low margin for the Company, resulting in a shortage of resources left to perform more exploration activities in the future. According to the COO, these exploratory activities are vital to keeping track of the changing environment in which the Company is operating, as well as the ambition to expand its market further internationally.

Furthermore, low productivity also affects the ability to react to changing environmental conditions, because much time is needed to react. The COO emphasizes the importance of being adaptable to the changing environment. He states that their customers rapidly require new products and solutions. When the Company does not offer the required products in a short time, the customers often switch to competitors of the Company. The loss of customers will lead to a decrease in the market share of the Company.



Based on these empirical data, a cause-effect diagram has been made and is visualized in Figure 3.



**FIGURE 3: CAUSE-EFFECT DIAGRAM OF THE PROBLEM ANALYSIS, BASED ON EMPIRICAL DATA**

### 1.3. Problem statement

As stated in the cause-effect analysis, there is limited knowledge transfer between individuals who are operating in different product divisions. Reflecting on the cause-effect analysis, the following problem statement is defined in Box 1:

*The limited individual knowledge transfer between divisions, caused by subunit orientation, lack of mutual understanding and the prioritizing of activities, negatively effects the Company's performance and slows the adaption of the changing environment.*

#### BOX 1: PROBLEM STATEMENT

As stated before, a field problem refers to a situation that can be improved to enhance business performance (Van Aken & Berends, 2018). Moreover, the objective of this research aims to design a solution to change and improve this problem, leading to the desired situation. Therefore, this research has the following objective displayed in Box 2:

*This research aims to develop a solution design to improve the knowledge transfer behavior of individuals between product divisions of the Company.*

#### BOX 2: RESEARCH OBJECTIVE

### 1.4. Research approach

The following paragraphs discuss the research approach used in this thesis. *First*, an introduction is made by adopting a research paradigm. *Second*, the research process is discussed. *Third*, the analysis-synthesis bridge model is introduced. *Fourth*, the research questions are determined, based on the methodology and the research model. *Fifth*, a research approach overview is given by visualizing the research design.

#### 1.4.1. Research paradigm

To structure this thesis in a valid and structured manner, the research is guided through a certain research paradigm (Van Aken, 2005). According to Van Aken (2004), a paradigm reflects on the combination of research questions asked, research methodologies allowed to answer these questions and the nature of the pursued research products (p. 224). The upcoming paragraphs focus on the determination of which research paradigm is adopted in this research.

The scientific research distinguishes three paradigms in research; the formal, explanatory and design sciences (Van Aken, 2004). *Formal science* is used in philosophy and mathematics and aims to build a system of propositions to test on internally logical reasoning, without the use of empirical context. *Explanatory science* describes and aims to explain a certain event within a field and is generally used in natural sciences and social sciences. Propositions within the explanatory science paradigm develop a proposition that is based on evidence. Last, *design science* is often used within engineering sciences

and aims to develop knowledge for the design and realization of a solution to, for example, improve performance (Van Aken, 2004).

As stated in the research objective, this research aims to develop a solution to solve the problem statement in Box 1. Therefore, this research adopts the *design science research paradigm (DSR-paradigm)*. The DSR-paradigm aims to develop generic solutions for business problems through design and testing in the field (Van Aken & Berends, 2018, p. 228). The design science research paradigm values the rigidity of theoretical and methodological techniques in combination with context-specific research (Van Aken & Berends, 2018). This context-specific research is needed as input for the design, so the design will be relevant for the Company. Therefore, empirical research is included in this research. However, empirical research is often difficult to control, because they lack rigor methodology and quality (Van Aken & Berends, 2018). Thus, scientific knowledge is derived from academic literature. Therefore, the guidance of the DSR-paradigm would result in the development of the desired solutions which would fit in the empirical context of the Company and is valid and reliable (Van Aken & Berends, 2018). The combination of both empirical and scientific knowledge as input is suggested to build a bridge between scientific and practitioners research (Van Aken & Berends, 2018).

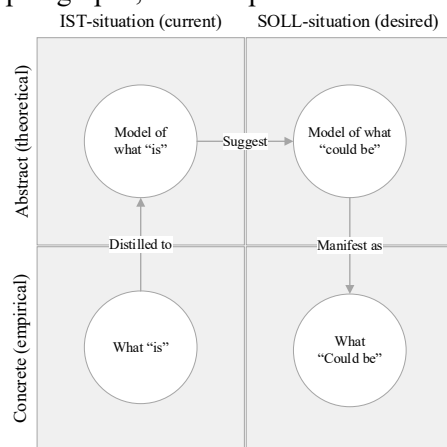
### 1.4.2. Problem-solving cycle

The most applicable research approach in de DSR-paradigm is the problem-solving cycle (Van Aken & Berends, 2018). Hence, the cycle aims to produce knowledge that can be used to design a solution to solve a problem. This cycle follows the process steps: (1) the problem definition, (2) the analysis and diagnosis, (3) the solution design, (4) the intervention and (5) evaluation and learning. The first three steps are recognized as the design part, the intervention is recognized as the change part and the last steps concern the learning part. Due to the time restrictions of the master thesis, the research is focused on the design part.

In the first step, the formulation of the problem definition is already discussed in Subchapter 1.2. Thus, the upcoming chapters are focusing on the second step (the analysis and diagnosis) and the third step (the solution design). To do so, the analysis-synthesis bridge model (Subchapter 1.4.3) elaborates on the analysis and diagnosis. Subsequently, a solution design is made.

### 1.4.3. Analysis-synthesis bridge model

As discussed before, this thesis aims to develop a solution to improve the current situation towards the desired situation. To structure this process, the analysis-synthesis bridge model is used. This model is used because it not only focusses on bridging the gap between the current (IST) and desired (SOLL) situation. It also bridges a gap between the empirical context and the scientific exploration of the context and solution (Dubberly, Evenson, & Robinson, 2008). The model is shown in Figure 4. In the following paragraphs, the four phases are further explained.



**FIGURE 4: ANALYSIS-SYNTHESIS BRIDGE MODEL (DUBBERLY, EVENSON, & ROBINSON, 2008)**

*Phase I: What “is”*

In Phase I, the current empirical situation is discussed. In this phase, the problem is detected and the gap in current knowledge is detected (Mendel & Yeager, 2010). To detect the current empirical situation, a provisional situation is made in the problem analysis. However, this problem analysis is conducted on only five interviews. Therefore, Phase I is explained in Chapter 3.2.

*Phase II: Model of what “is”*

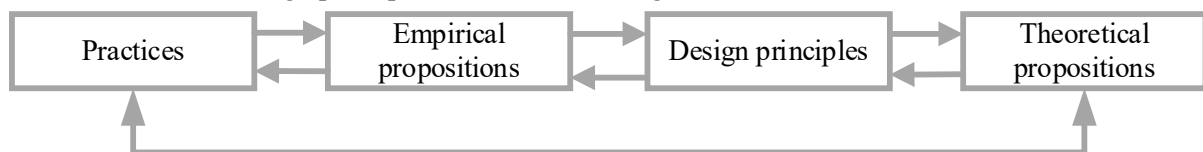
In Phase II, the empirical situation is distilled into an abstract model (Mendel & Yeager, 2010). In particular, the situation is explained aided by scientific input. In this way, the barriers of knowledge transfer behavior are detected: the scientific literature explains *why* the current situation occurs. To identify the mechanisms, a systematic literature review is conducted. A detailed methodology of the systematic literature review is discussed in Chapter 2.1. The model of Phase II is conducted in Chapter 4.1. This chapter reflects on the synthesis of theoretical and empirical analysis.

*Phase III: Model of what “could be”*

In Phase III, design principles are formulated. According to Van Aken (2004), these design principles need to be field-tested and grounded. In particular, field-tested refers to the evidence if the solution truly works (validity). Also, grounded means that the design principles also explain why a certain intervention leads to the desired outcome (Van Aken & Berends, 2018). Therefore, the design principles are established on findings in scientific literature and empirical context and are structured by the CIMO-logic structure. The use of both practices and research findings as input aims to bridge the gap between the empirical context and theory (Van Aken & Berends, 2018). The design principles and the CIMO-logic structure are discussed below.

In this thesis, a systematic literature review is conducted to create *theoretical propositions*. The scientific input helps to conduct well-informed decisions about the effect of the interventions in social science (Tranfield, Denyer, & Smart, 2003). Thus, it enables the discovery of *why* a certain intervention leads to a certain effect. Therefore, research is becoming well-founded. The use of a systematic literature review minimizes the bias and error and is therefore recognized as ‘high-quality’ evidence (Tranfield, Denyer, & Smart, 2003). Furthermore, the systematic literature review results in propositions that are scientifically valid and reliable (Van Aken, 2004).

Furthermore, this research uses qualitative research methods to create *empirical propositions*. The use of qualitative research methods is further discussed in Chapter 3.2. In general, the empirical context encompasses solutions to solve the business problem (Van Burg, 2011). These solutions are often generated by reflection-in-action (Schön, 1987). This refers to the process of individuals (or teams) who discover improvements for their actions and assimilate them to test if the improvement works in the field. Therefore, the combination of empirical propositions could lead to new solutions, which are tested in other empirical context and might solve the current business problem for the Company. The process of establishment of design principles is visualized in Figure 5.



**FIGURE 5: FORMULATION OF DESIGN PRINCIPLES (VAN BURG, GILSING, REYEMEN, & ROMME, 2008)**

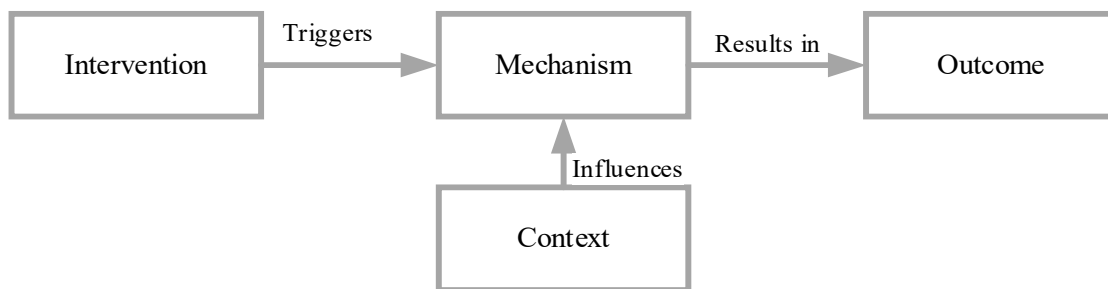
The design principles are composed following the CIMO-logic structure. This structure consists of a combination of a problematic *Context*, for which the design proposition suggests a certain *Intervention* type, to produce, through specified generative *Mechanisms*, the intended *Outcome(s)* (Denyer, Tranfield, & Van Aken, 2008, p. 393). The use of the CIMO-logic structure enables the identification of why a certain intervention results in a specific outcome, within a certain context (Weber, 2011). For example, in an organization where different programmer language is used (*context*), a workshop on the

same programmer language (*interventions*), enhances the ability to recognize relevant knowledge for other product divisions (*outcome*), through the creation of a common knowledge base (*mechanism*).

This CIMO-logic structure is guided by the following logics (Denyer, Tranfield, & Van Aken, 2008; Holloway, Eijnatten, Romme, & Demerouti, 2016):

- **Context (C):** Environmental setting and characteristics which could influence the change (for example, organizational structure, individual characteristics).
- **Interventions (I):** The interventions are actions by the company to achieve a certain outcome.
- **Mechanisms (M):** The mechanism is triggered by the intervention and explains why the intervention in a certain context result in a desired outcome.
- **Outcome (O):** The outcome of the intervention.

In conclusion, the structure of the CIMO-logic is visualized in Figure 6.



**FIGURE 6: CIMO-LOGIC STRUCTURE (DENYER, TRANFIELD, & VAN AKEN, 2008)**

Within this report, three different structures are used in statements. The names of those statements and their explanations are given in Table 2.

**TABLE 2: TYPES OF STATEMENTS USED IN REPORT**

Names	Structure	Theoretical approach	Empirical approach
Findings	Mechanism results in outcome (MO)	Constructs (Chapter 2.4)	Empirical findings (Chapter 3.2)
Propositions	Context influences mechanisms, which results in outcome (CMO)	Theoretical propositions (Chapter 2.7)	Empirical propositions (Chapter 3.3.)
Design principles	Context influences mechanisms, which is triggered by an intervention, resulting in an outcome (CIMO)	Design principles (Chapter 4.2)	

*Phase IV: What “could be”*

In Phase IV, the abstract design principles are used to define a solution, which is applicable in the context of the Company. Also, actions that need to be taken for the company to undertake are discussed, by identifying the gap between the current and the desired situation. Furthermore, the solution is evaluated. The outcome of Phase IV is discussed in Chapter 5.

**1.4.4. Research questions**

Assuming the problem statement and research objective (Subchapter 1.3), this research aims to answer the following central research question, presented in Box 3:

*How should the Company improve the limited individual knowledge transfer behavior between product divisions?*

**BOX 3: CENTRAL RESEARCH QUESTION**

Based on the central research question, the following research questions are elaborated:

By conducting a theoretical analysis, the following questions will be answered:

**RQ<sub>1</sub>:** What are the constructs affecting individual knowledge transfer behavior?

**RQ<sub>2</sub>:** Which context-related factors cause barriers to individual knowledge transfer behavior?

By conducting empirical analysis in the Company, the following questions will be answered:

**RQ<sub>3</sub>:** What are the barriers to individual knowledge transfer behavior in the Company?

**RQ<sub>4</sub>:** Which context-related factors cause barriers to individual knowledge transfer behavior in the Company?

By combining the theoretical and empirical insights, the following questions will be answered:

**RQ<sub>5</sub>:** Which barriers and underlying constructs explain the lack of knowledge transfer behavior of the Company?

**RQ<sub>6</sub>:** Which design principles could be made, which are both grounded and field-tested?

By proposing a design for improvement:

**RQ<sub>7</sub>:** What are the design requirements for the proposed solution design?

**RQ<sub>8</sub>:** What is the most preferable solution design for the Company to improve the limited individual knowledge transfer behavior between product divisions?

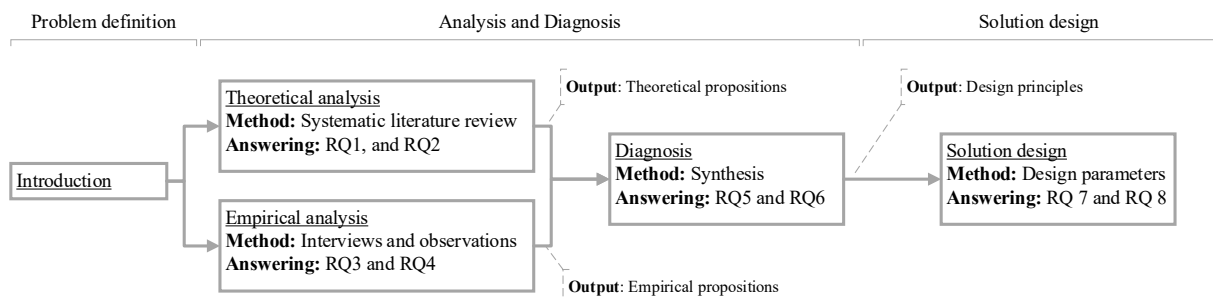
Figure 7 visualizes which research questions contribute to which analysis-synthesis bridge model phase.

	IST-situation (current)	SOLL-situation (desired)
Abstract (theoretical)	Model of what “is” <i>Answering: RQ1 and RQ5</i>	Model of what “could be” <i>Answering: RQ 6 (Composed of RQ2 and RQ4)</i>
Concrete (empirical)	What “is” <i>Answering: RQ3</i>	What “could be” <i>Answering: RQ7 and RQ8</i>

**FIGURE 7: RESEARCH QUESTIONS ANSWERED PER PHASE**

### 1.4.5. Research design

The research design summarizes the discussed research methodology, the undertaken steps in de problem-solving cycle and the research questions. The research design is shown in Figure 8. The informed choices behind this methodology and the execution of these methods are discussed in detail within every chapter. In subchapter 1.5., these chapters are outlined.



**FIGURE 8: RESEARCH DESIGN**

## 1.5. Report outline

This paragraph reflects on the structure of the upcoming chapters. In Chapter 2, the theoretical analysis is discussed, including the theoretical background and framework. Chapter 3 consists of an empirical analysis (Phase I). Insights obtained from Chapters 2 and 3 are synthesized in Chapter 4. This chapter reflects on the abstract current situation (Phase II) of the Company and a generic overview of possible solutions to improve the current situation (Phase III). Then, Chapter 5 elaborated on a solution model to solve the *field-problem* as discussed in this chapter (Phase IV). Afterward, Chapter 6 constructs the conclusion, answering the central research question, formulated in Subchapter 1.4.4. Finally, Chapter 7 evaluates this research by discussing the practical and theoretical implications and the quality of the research.

## 2. Theoretical analysis

This chapter discusses the theoretical analysis. The theoretical analysis has three objectives. The *first* objective is to provide a broad understanding of basic concepts and definitions of the subject. The *second* objective is the formulation of mechanisms *why* individuals do not participate in knowledge transfer behavior. The *third* objective is to discuss the context-related variables to explain the limited knowledge transfer behavior.

This chapter is divided into four sections. *First*, the methodology is discussed (Subchapter 2.1.). *Second*, the theoretical background is explained (Subchapter 2.2.). *Third*, the theoretical framework is discussed (Subchapter 2.3.)

### 2.1. Methodology

The theoretical analysis in this research was executed within two phases. *First*, exploratory research was done. According to Hart (2018), such exploratory research aims to provide a better understanding of general interest and to determine the point of departures for further research. The output of this exploratory research provides a narrow scope for further research and identifies keywords (Easterby-Smith, Thorpe, & Jackson, 2015). *Second*, a systematic literature review was performed. Both methodologies are elaborated separately below.

#### 2.1.1. Methodology exploratory research

The exploratory research started with a search at the TU/e library for books, covering the topic of knowledge management. These books generally do not cover the latest research available (Easterby-Smith et al., 2015). However, they provide a comprehensive overview of the multi-faceted concept of knowledge.

Besides the books, the search engine of the Web of Science was used. 22,821 articles that cover the topics of ‘*knowledge transfer*’, ‘*knowledge sharing*’, ‘*knowledge management*’ or ‘*organizational learning*’ were identified. These articles were ranked by the number of citations. After reading the first 50 titles and abstracts, a total of eleven articles were chosen to read. During the reading-process, special attention was given to the use of definitions and underlying theories. The chosen books and articles found are presented in Appendix C.

#### 2.1.2. Methodology systematic literature review

The exploratory phase was done by the conduction of a *systematic literature review*. According to Tranfield et al. (2003), the usage of a systematic literature review encompasses minimal bias and error. Therefore, the systematic literature review is recognized as ‘high-quality’ evidence in this thesis. Hence, guided by a systematic approach enhances the transparency, reliability, and validation of the review (Cronin, Ryan, & Coughlan, 2008).

The disadvantages of using a systematic literature review are time-consuming, limiting creativity, and intuitive (Easterby-Smith et al., 2015). However, considering the pre-knowledge, the wide range of existing literature and the aim of the literature review, creativity and intuition have lower priority. The systematic literature review is conducted through the following steps: problem formulation, data collection, data evaluation, analysis and interpretation, and public presentation (Cooper, 1984). Within the following paragraphs, the steps of the systematic literature review are discussed.

##### *Step 1: Problem definition*

Within the problem definition, research questions for the literature review were determined, as well as the criteria for inclusion and exclusion of articles (Randolph, 2009). The objective of the systematic literature review is to provide answers to the first research question, as discussed in the Introduction (Chapter 1):

**RQ<sub>1</sub>**: What are the constructs affecting individual knowledge transfer behavior?

**RQ<sub>2</sub>**: Which context-related factors cause barriers to individual knowledge transfer behavior?

Additionally, the following inclusion and exclusion criteria are used:

- The literature should cover the relevant topic of knowledge transfer.
- The literature should cover knowledge transfer within organizational boundaries.
- The literature should be available in full text in English.
- The literature should meet the following quality criteria:
  - o Only peer-reviewed articles are considered.
  - o The Journal Impact Factor (JIF) of the published articles must exceed the number of 1.000 (Tranfield et al., 2003).

*Step 2: Data collection*

The data collection step started by undertaking the following actions: deciding on a search method, determine databases, and identifying keywords and combinations of keywords (Randolph, 2009). Van Aken and Berends (2018) discuss two different methods to collect academic literature: the use of search engines and the use of the ‘snowball method’. Both methodologies are applicable in this systematic literature review and will be performed subsequently. *First*, the Web of Science search engine was used to provide access to different types of publications. Web of Science is recognized as the most important search engine, covering multiple fields, such as management and psychological fields (Van Aken & Berends, 2018). *Second*, the snowball method was used. References used in publications were traced to find other relevant publications. This method is validated by Randolph (2009), who claims only ten percent of the publications are covered by academic searching engines. The other 90 percent can be derived from tracing references. Due to time restrictions, an exhaustive review with a selective citation is used (Cooper, 1988). This implicates the usage of only journal articles (both academic and practitioners).

Keywords were extracted from the exploratory research. Also, the keywords were extended by synonyms, to cover the inconsistent use of definitions in knowledge literature (Easterby-Smith & Lyles, 2011; Argote et al., 2003). The keywords, synonyms, and sources are shown in Table 3.

**TABLE 3: KEYWORDS AND THEIR SYNONYMS**

Keywords	Synonyms	Sources
Knowledge transfer	Knowledge sharing, knowledge distribution	(Van Wijk, Jansen, & Lyles, 2008) (Szulanski, 1996) (Huber, 1991) (Tsai, 2001) (Argote & Ingram, 2000)
Barriers (negative)	Bottleneck, impediment, hurdle, boundary	Thesaurus.com, (Husted, Michailova, Minbaeva, & Pedersen, 2012)
Factors (positive)	Context, antecedents, influence	(Jones, 2013) (Van Wijk, Jansen, & Lyles, 2008)
MOA	Motivation, opportunity, ability	(Argote, McEvily, & Reagans, 2003)
Social capital	Social network	(Chow & Chan, 2008)

*Step 3: Data evaluation*

During the data evaluation step, the inclusion and exclusion criteria were executed. This evaluation of the articles is shown in Table 4. *First*, all the search results were refined showing only English, peer-reviews, and full access articles (Colum A). *Second*, the titles and abstracts were scanned to determine if these cover the topic of knowledge transfer within organizations (Colum B). *Third*, the quality of the article was determined by considering the Journal Impact Factor (Colum C). *Fourth*, the articles were scanned and guided by the question ‘does this article contribute to an answer for the research question’. When the answer was *yes*, the article was used (Colum D).

The articles were found using search strings. These strings and the chosen articles are found in Appendix D. Also, the articles found through the snowball methods are also provided in Appendix D. Furthermore, the determination of the Journal Impact Factors is shown in Appendix E.



**TABLE 4: DATA EVALUATION OF SYSTEMATIC LITERATURE REVIEW**

Query	Keywords	Colum A	Colum B (topic)	Colum C (quality)	Colum D (used)
1	Knowledge transfer OR knowledge management OR organizational learning	22,821	13*	13	9
2	Knowledge transfer AND MOA-framework	43	4	3	2
3	Knowledge transfer AND barriers	1785	7*	7	2
4	Knowledge transfer AND Social capital	725	13*	7	2
5	Knowledge transfer AND factors	4,992	14*	5	4
6	Snowball method				30

\*Refined by amount cited and read the first 50 titles and abstracts

#### *Step 4 and 5: Data analysis and interpretation*

To summarize and compare the literature, the chosen articles were listed in Excel. For every article, the following questions are asked; 1) What problem is addressed, 2) Which theories are used, 3) Which methods are used and 4) what are the findings of this article (Blumberg, Cooper, & Schindler, 2011). Additionally, the definitions used in the articles were highlighted, including survey questions (if applicable). These questions were used as input for the formulation of interview questions and the coding process in Chapter 3 (Empirical analysis).

## 2.2. Theoretical background

In this subchapter, a general overview of the key concepts, definitions, and underlying theories are discussed. A broad understanding of the available literature is needed for two reasons. *First*, the literature on knowledge and learning in organizations has become specialized, focusing on a narrow perspective (Easterby-Smith & Lyles, 2011). However, to successfully implement a solution design for knowledge management in the empirical context, a broader understanding of the multi-faceted knowledge management problem is needed (Alavi & Leidner, 2001; Nonaka, 1994). *Second*, several streams of literature have developed parallel from each other, without any cross-references. Therefore, many inconsistencies in perspectives, definitions, and underlying theories have emerged (Easterby-Smith & Lyles, 2011). This subchapter starts the explanation of the concept of knowledge. Afterward, the concept of knowledge transfer is discussed.

### 2.2.1. Knowledge

In this subchapter, multiple perspectives on knowledge are discussed. *First*, two perspectives on knowledge created are discussed. *Second*, a taxonomy of knowledge is explained.

#### 2.2.1.1. Two perspectives on knowledge creation

In this subchapter, two perspectives on knowledge creation are discussed; the creation through data and information and the creation through organizational learning. Both perspectives will be used in this thesis. The *first perspective* introduces the concepts of data, information, and knowledge. The *second perspective* is based on the creation of knowledge through experience and learning.

##### *Perspective 1: Data, information, and knowledge*

For organizations to manage their knowledge resources efficiently, knowledge of this distinction is needed (Davenport & Prusak, 1998). This is because organizations often fail in identifying their knowledge management problems: they lack data, information or knowledge. Because the management of those three concepts demands different interventions, organizations often apply the wrong intervention.

This perspective divides the concepts of data, information, and knowledge (Alavi & Leidner, 2001). Information and knowledge are often used interchangeably, however, the academic literature suggests a distinct difference (Davenport & Prusak, 1998). To explain the difference between information and knowledge, the definition of data is needed. Data are ‘a set of discrete, objective facts about events’ (Davenport & Prusak, 1998, p. 2). Data only describe what happens, without judgment or interpretations

(Davenport & Prusak, 1998). Examples of data are profit numbers and retention rates on the companies' website.

Data can be transformed into information when data is processed (by a computer) or interpreted (by a person). This transformation could be made by adding meaning to the data (Davenport & Prusak, 1998). Information may impact a person's way of thinking or judgment concerning an event. When information is interpreted by a person, information is referred to as knowing *what* something means (Kogut & Zander, 1992). Also, information is indicated as know-who. This know-who refers to dispose of information on which employees possess which knowledge (Kogut & Zander, 1992).

Subsequently, knowledge can be derived from information by personalizing the information (for example by learning lessons). Knowledge is referred to as 'valuable information from the human mind' (Davenport & Prusak, 1998, p. 9). Knowledge is often indicated as know-how (Kogut & Zander, 1992). An example, the knowledge of how to launch a new product in the market is considered as know-how.

### *Perspective 2: Knowledge creation based on learning*

The upcoming paragraphs are zooming in on the process of learning and therefore, the creation of knowledge. This explanation is done by the theoretical framework of organizational learning from Argote and Miron-Spektor (2011). A central argument in this framework is the knowledge as an outcome of learning. This is in line with the general assumption made by Easterby-Smith and Lyles (2011), knowledge is the content organization possesses and organizations can learn, whereby it acquires and contributes to this content.

Because individuals can learn, they are assumed to be the primary agents of knowledge creation (Grant, 1997). Knowledge could be obtained by learning from own experiences (knowledge creation) and learning from experiences of other individuals (knowledge transfer) (Argote & Miron-Spektor, 2011). This obtained knowledge could be stored for further use in the future. In this way, the knowledge repositories change; it has derived knowledge (Argote & Ingram, 2000). According to Argote and Ingram (2000), knowledge can be stored in individuals (members of the organization), technology (products, hardware, and software made by individuals) or tasks (routines and goals set up by individuals).

When the obtained knowledge is assimilated, the knowledge repositories change. According to Argote and Miron-Spektor (2011), this change manifests itself in cognitions or behavior (p. 1124). The more an individual learns the more value the knowledge repository (Argote & Ingram, 2000). However, because individuals learning capability is bounded, knowledge repositories are getting specialized (Grant, 1997). This specialized knowledge becomes rare and valuable. Reflecting on the knowledge-based resource view (Appendix A), organizations consider specialized knowledge as a source for strategic advantage (Barney, 1991).

#### 2.2.1.2. Taxonomy of knowledge

In this subchapter, a classification of knowledge is made. This classification follows the assumption that individuals do know more than they can explain (Polanyi, 1966). The knowledge which is stored in human minds refers to tacit knowledge (Alavi & Leidner, 2001). In contrast, explicit knowledge could be articulated and codified (Alavi & Leidner, 2001). In the following paragraphs, both knowledge dimensions are discussed.

Tacit knowledge is created through experiences and rooted in actions (such as decision-making, performing tasks) (Argote & Miron-Spektor, 2011; Alavi & Leidner, 2001). As stated in the previous paragraph, tacit knowledge is stored in individual minds. The creation of tacit knowledge is often derived from actions and events which are performed without the awareness of learning (Reed & Defillippi, 1990). Therefore, it is difficult for an individual to articulate this knowledge, because there is no clear cause-effect relationship (Alavi & Leidner, 2001). This effect is further discussed in Subchapter 2.2.2.3. (*Elements in knowledge transfer*).

In contrast to tacit knowledge, explicit knowledge is articulated, codified, and generalized (Alavi & Leidner, 2001, p. 11). Therefore, explicit knowledge does have a clear cause-effect relation (Szulanski,

1996). Moreover, explicit knowledge is easily transferred by email or stored in the organization's knowledge management systems. An example of explicit knowledge is the knowledge of a certain customer in a region (Alavi & Leidner, 2001).

### 2.2.2. Knowledge transfer

In this subchapter, the concept of knowledge transfer is discussed. As stated in the introduction, knowledge transfer is defined as the process where one unit (e.g. individual, group, department or division) is affected by the experience of another (Argote & Ingram, 2000, p. 151). This subchapter discussed the following concepts: the importance of knowledge transfer, knowledge transfer strategy, knowledge transfer elements, knowledge transfer processes and the role of the elements in the processes.

#### 2.2.2.1. Importance of knowledge transfer

As stated in Appendix A, knowledge is recognized as an important firm resource to build a competitive strategy. However, the ability to organize the organization's capabilities, such as knowledge creation and knowledge transfer will affect this competitive advantage (Kogut & Zander, 1992). In this subchapter, the effects of knowledge transfer as discussed, to explain why knowledge transfer is important.

Knowledge transfer between individuals enables organizations to maximize their value through the exploitation of the existing knowledge resource (Grant, 1996b). This exploitation is important for two reasons; the first reason contains the need for knowledge to the right person at the right time (Alavi & Leidner, 2001). Activities and especially decision-making activities often require different kinds of specialized knowledge (Grant, 1996b). Because the individual's learning capability is bounded, individuals are generally only specialized in a few areas. Because the activities require a broad spectrum of specialized knowledge, knowledge has to be transferred from one specialist to another (Grant, 1996a). When the knowledge is obtained to make the right decision, the change of making the right decision enhances. Thus, knowledge transfer enhances the effectiveness of organizational performance.

The second reason to improve the exploitation of existing resources is based on productivity. Productivity is obtained when there are fewer resources needed as input, to create the same amount of output (Grant, 1991). To fully exploit the organization's knowledge assets, knowledge transfer is needed (Szulanski, 1996). Hence, the knowledge transfer between units stimulates the reuse of knowledge by multiple employees (Grant, 1996b). In this way, fewer resources are needed to emulate the same performance. This enhances efficiency (Grant, 1996b).

Thus, the knowledge transfer and thus learning from the experiences from others affects productivity and effectiveness in organizational operations. In this way, knowledge transfer effects organizations to do the right things (by making good decisions) and doing these things right (by improving the productivity). Therefore, knowledge transfer is recognized as a positive factor in organizational performance (Van Wijk, Jansen, & Lyles, 2008).

#### 2.2.2.2. Knowledge transfer strategy

In this subchapter, two knowledge management strategies are discussed. Subsequently, the chosen strategy of personalization is highlighted.

Organizations execute different strategies to manage (and thus transfer) their knowledge resources. Hansen, Nohria, and Tierney (1999) discovered two strategies based on the storage of knowledge; codification strategy and personalization strategy. Within the *codification strategy*, organizations store their knowledge within information systems, such as computers and databases. As discussed before, the knowledge that is codified and written down in documents and manuals refers to explicit knowledge (Alavi & Leidner, 2001). The use of a codification strategy enables the accessibility of the knowledge because it is centrally stored, and employees could easily access it. Additionally, because the codified knowledge does not request much interpretation, it could be used easily by people, irrespective of their skills and capabilities (Alavi & Leidner, 2001).

In contrast, the *personalization strategy* focusses on the knowledge transfer which is stored in individuals' minds (Hansen, Nohria, & Tierney, 1999). Therefore, knowledge is dispersed among the organization and knowledge transfer has become an important activity in knowledge management (Grant, 1996b). As discussed, knowledge within people is referred to as tacit knowledge (Alavi & Leidner, 2001). To transfer this tacit knowledge, social interaction between the source and the recipient is needed (Nonaka, 1994).

The determination of the right strategy depends on the competitive strategy of an organization (Hansen, Nohria, & Tierney, 1999). As discussed in the introduction, the Company is operating in an innovative and growing environment. This results in the change of customer needs and requirements and therefore creates continuously knowledge. In this environment, the codified knowledge would lose value soon, because it is not up to date anymore (Hansen, Nohria, & Tierney, 1999). Therefore, this thesis focusses on the transfer of tacit knowledge through socialization, adopting the personalization strategy.

Although this thesis adopts the personalization strategy, it does not mean codification will be fully neglected. According to Alavi and Denford (2011), effective knowledge involved a combination of technological and social elements. Therefore, the strategy of codification, and thus the use of IT-tools is recognized as supporting the social processes of knowledge transfer.

#### 2.2.2.3. Knowledge transfer elements

This subchapter focusses on the elements which are involved during the knowledge transfer process. According to Szulanski (2000), the following elements are involved: a source, a recipient, a channel, the knowledge, and the context. In short, *knowledge* is transferred from a *source unit* toward a *recipient unit* through a *channel* in a certain *context* where the transfer is taken place. These elements are short discussed in the following paragraphs.

The definition of knowledge transfer refers to one unit which is affected by the experience of another (Argote & Ingram, 2000). This definition implicates a source unit (which possesses the knowledge to be transferred) and a recipient unit (which is affected after knowledge is transferred). As stated in the introduction, this thesis focusses on the knowledge transfer between product divisions. However, a successful knowledge transfer implicates a change in behavior (Argote & Miron-Spektor, 2011). Since only individuals have cognitive learning abilities, the transfer is needed to be done between individuals. Thus, this thesis adopts the assumption that both the source unit and recipient are individuals. Yet, they are working in different product divisions.

The previous subchapter discussed the knowledge strategy of personalization. Therefore, the channel through which knowledge is transferred is face-to-face interaction. Face-to-face interaction facilitates the transfer of tacit knowledge (Alavi & Leidner, 2001). Tacit knowledge is characterized by ambiguity (Reed & Defillippi, 1990). Knowledge ambiguity refers to the inherent and irreducible uncertainty as to precisely what underlying knowledge components and knowledge sources are and how they interact (Van Wijk, Jansen, & Lyles, 2008, p. 833). The transfer of ambiguous knowledge requires the explanation of many context-related factors, to clarify the cause-effect relations (Szulanski, 1996). If these cause-effect relations are neglected, the receiver of the knowledge might misunderstand the knowledge.

According to Argote and Miron-Spektor (2011), it is not possible to improve knowledge transfer processes, without involving the context. In this thesis, the context variables such as organizational structure and culture are discussed. As can be read in Subchapter 2.3, choices concerning organizational structure and culture are affecting both individual behavior and social relationships (Jones, 2013).

#### 2.2.2.4. Knowledge transfer processes

This subchapter reflects on the activities in the knowledge transfer process. In general, knowledge transfer research has been fragmented to an overall perception of the movement of knowledge between recipient and source (Van Wijk, Jansen, & Lyles, 2008). However, Szulanski (2000) argued knowledge transfer is not an act but a process with activities before and after the movement. This argument is important because Szulanski (1996) found that specific barriers did not influence the whole knowledge

transfer process equally. Therefore, different phases face different barriers, and therefore other interventions are needed to overcome this barrier (Szulanski, 2000).

The following subchapters describe three processes in knowledge transfer; knowledge acquisition (the phase before the actual movement), knowledge distribution (knowledge movement phase) and knowledge assimilation (the phase after the actual movement of knowledge). These processes are related to each other (Argote & Miron-Spektor, 2011). This implies a beginning or completion at a phase depends on successful completion at the phase before. For example, if the recipient is not motivated to initiate the knowledge transfer process in the acquisition phase, there will be no distribution or assimilation phase.

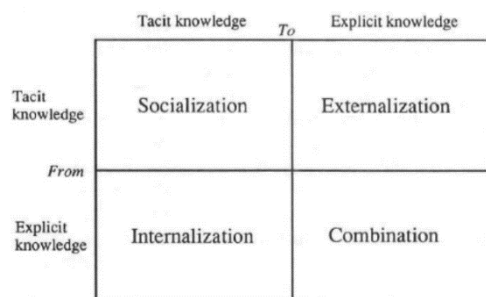
#### 2.2.2.4.1. Knowledge acquisition

The knowledge acquisition phase refers to the phase where the initiation is done to distribute knowledge (Huber, 1991; Szulanski, 1996). The initiation could be done by the source unit or by the recipient unit (Huber, 1991). In case the source initiates the process, the source will actively contact the recipient to provide knowledge (Lin, 2007). This situation could occur when the source created or obtained knowledge and thinks this created knowledge could be relevant for other employees in an organization (Huber, 1991).

Also, the knowledge transfer process could be initiated by the recipient (Huber, 1991). In this way, the recipient actively searches for a source unit for specific knowledge or information. This active search is in general initiated through the recognition of (expected) problems. When the problem cannot be solved based on the knowledge repositories of the recipient, he or she is likely to search actively for this knowledge to improve this knowledge repository (Szulanski, 1996). This often leads to a narrow and focused search for available resources within and outside the organization (Huber, 1991).

#### 2.2.2.4.2. Knowledge distribution

The knowledge distribution phase constitutes the phases when knowledge flows between the source and recipient (Van Wijk et al., 2008; Szulanski, 1996). This phase starts when the decision is made to proceed with knowledge transfer (Szulanski, 1996). According to Huber (1991), the knowledge which is shared between different units leads to the creation of new knowledge. As stated before, this knowledge can be explicit or tacit knowledge. This knowledge creation is shown in Figure 9. According to this framework, tacit knowledge to tacit knowledge is created by socialization, meaning the interactions between units (Nonaka, 1994). Externalization is done when tacit knowledge is codified and stored for further retention. Within internalization, individuals learn from explicit knowledge (such as market reports) and create tacit knowledge. As of last, the combination of existing explicit knowledge by for example ordering is called combination (Nonaka, 1994).



**FIGURE 9: KNOWLEDGE CREATION (NONAKA, 1994)**

As discussed before, this thesis adopts the personalization strategy. This strategy complements knowledge distribution through the activity of socialization. This kind of distribution enables knowledge dyadic distribution of knowledge (Van Wijk, Jansen, & Lyles, 2008). This two-way communication enables the recipient to provide feedback on the knowledge transferred (Van Wijk, Jansen, & Lyles, 2008). This enhances the possibility the knowledge is fully understood by the recipient.

Yet, if the knowledge is not sufficient to solve the knowledge gap of the recipient, he can ask more questions (Huber, 1991).

#### 2.2.2.4.3. Knowledge assimilation

A successful knowledge transfer results in an individual who is affected by the knowledge of another individual (Argote & Ingram, 2000). Therefore, the knowledge distribution is not enough, the recipient has to *use* this received knowledge within his context and therefore assimilate the knowledge (Huber, 1991). If the obtained knowledge is not assimilated and used in the new context, the recipient will not learn in a satisfactory way (Huber, 1991; Argote & Ingram, 2000). Thus, knowledge assimilation refers to the process by which distributed knowledge is given one or more commonly understood interpretations (Huber, 1991, p. 90).

#### 2.2.2.5. Involvement of the source and recipient

Knowledge transfer, which is facilitated through socialization, requires both involvements of the source and recipient. However, the involvement of the source and recipient is not equally distributed (Szulanski, 2000). Therefore, the following paragraphs focus on the involvement of the source and recipient per phase.

According to Szulanski (2000), the involvement of the source declines when the knowledge transfer process progresses. In particular, when the acquisition phase is initiated by the source, the source needs the ability to detect the knowledge and recipient to transfer (Cohen & Levinthal, 1990). Also, the knowledge distribution phase requires the involvement of the source. If the source is not willing to devote much effort to distribute knowledge, it may lead to an incomplete distribution. In this case, the recipient may face difficulties in the knowledge assimilation phase (Szulanski, 1996).

If the recipient initiates the knowledge transfer process by actively searching for knowledge, the source is also involved (Szulanski, 2000). As stated before, the knowledge distribution phase starts when the decisions are made by both the recipient and source to proceed to knowledge distribution (Szulanski, 1996). In this way, the source would decide in the acquisition phase to provide the knowledge to the source.

During all three phases of knowledge transfer, the involvement of the recipient is needed (Szulanski, 2000). Hence, if the recipient is not willing or able to start this initiation, there will be no knowledge transfer process. Furthermore, little involvement of the recipient is needed during the distribution phase. As discussed before, the recipient has the possibility to provide feedback and therefore enhance the chance of successful knowledge transfer (Huber, 1991). The last phase of assimilation is mainly the responsibility of the recipient. Hence, if the recipient is not motivated or able to assimilate knowledge, this phase is likely to fail (Szulanski, 2000).

The involvement per phase per unit is overviewed in Table 5. The next subchapter discusses the factors explaining why a source or recipient may or may not participate in the knowledge transfer phases.

**TABLE 5: OVERVIEW INVOLVEMENT UNITS PER PHASE (SZULANSKI, 1996; 2000; HANSEN, MORS, & LOVAS, 2005)**

	<b>Knowledge acquisition</b>	<b>Knowledge distribution</b>	<b>Knowledge assimilation</b>
<b>Source</b>	Much involvement needed	Much involvement needed	Little to no involvement needed
<b>Recipient</b>	Much involvement needed when recipient initiates, otherwise little involvement	Little involvement needed	Much involvement needed

## 2.3. Theoretical framework

The chapter discusses the theoretical framework. The theoretical framework aims to identify underlying explanations of *why* individuals decide not to participate in the knowledge transfer process, which leads to limited knowledge transfer behavior. Also, the effect of social relationships on knowledge transfer behavior is explained. Because this thesis focusses on the knowledge transfer through socialization, it is important to identify the influences of social relationships on individual behavior (Adler & Kwon, 2002). Furthermore, the origins of social relationships are discussed (organizational variables), because this encompasses the context where knowledge transfer is taken place.

The *first* subchapter focusses on the explanation of individual knowledge transfer behavior by introducing three factors to explain behavior: motivation, opportunity, and ability (MOA-framework) (Argote, McEvily, & Reagans, 2003). The *second* subchapter introduces the social relationships between the source and recipient, by analyzing the social network perspective. In this subchapter, the effects of social relationships on knowledge transfer behavior are indirectly described by the mediator of the MOA-framework. The *third* subchapter discusses the organizational (*context*) variables that are involved through the establishment of social relationships. The relation between context variables, social relationships, knowledge transfer behavior, and knowledge transfer is overviewed in Figure 10.

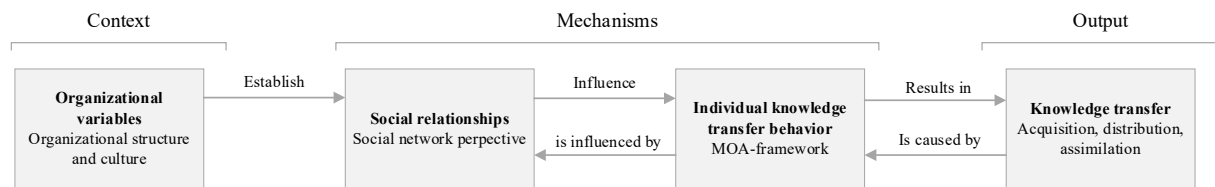


FIGURE 10: CONCEPTUAL THEORETICAL FRAMEWORK

The produced framework is used to develop theoretical propositions. These propositions aim to explain the cause-effect relation between the context constructs, mechanisms, and output (Subchapter 2.4). These theoretical propositions are used to explain the theoretical underpinning (Phase II- Chapter 4.1)

### 2.3.1. Individual knowledge transfer behavior

To identify the reason(s) why individuals participate in the knowledge transfer process, the behavior of the individuals is determined by the motivation, opportunity, and ability (MOA)-framework. This framework is frequently used to determine to explain the underlying concepts to knowledge transfer behavior (Adler & Kwon, 2002; Argote, McEvily, & Reagans, 2003; Siemsen, Roth, & Balasubramanian, 2008).

The MOA-framework assumes that individual performance is based on motivation, opportunity, and ability to perform (Blumberg & Pringle, 1982). This framework has been frequently used in the context of knowledge transfer behavior, aiming to explain *why* individuals participate in knowledge transfer (Argote, McEvily, & Reagans, 2003). In short, *motivation* refers to the willingness to participate in the knowledge transfer process (Szulanski, 1996). *Opportunity* reflects on the context of antecedents, such as accessibility and time availability (Borgatti & Cross, 2003). *Ability* reflects on the capacities and skills of the individual to perform knowledge transfer activities (Argote, McEvily, & Reagans, 2003).

The MOA-framework argues the need for all three factors (motivation, opportunity, and ability) for an individual to perform successful knowledge transfer behavior (Argote, McEvily, & Reagans, 2003). For example, a recipient could have the ability to detect the needed knowledge and has the motivation to acquire it from the source. However, if the source would not make the needed knowledge available, the recipient lacks opportunity. This situation could result in a lack of knowledge transfer between the source and recipient. According to Reinholt, Pedersen, and Foss (2011), the most knowledge is acquired (by the recipient) and provided (by the source), when they derive high motivation, opportunities, and ability to transfer knowledge. However, because the literature of knowledge transfer is extended, it may be time-wise impossible to cover interventions to improve the motivation, opportunity, and ability of an individual.

Therefore, the MOA-framework in this thesis is used to identify the constrained factors in knowledge transfer behavior. Siemsen, Roth, and Balasubramanian (2008), introduced a constraining-factor model of the MOA-framework, to identify the bottlenecks in knowledge transfer behavior. This model is based on the identification of constraining resources in a process, which enables managers to choose an appropriate intervention to increase this bottleneck(s). For example, when an individual lacks motivation but possesses the opportunity and ability, motivation is the bottleneck in the knowledge transfer process. Hence, Siemsen et al., (2008) found a strong effect on knowledge transfer of motivation, when motivation was the constraining factor. However, when motivation was not the constraining factor, changes in motivation have little or no effect on knowledge transfer.

This theoretical framework starts with an explanation of motivation, opportunity, and ability antecedents which are expected to increase or decrease the MOA-constructs. Thereafter, the framework explains how MOA-constructs are influenced by social relationships. The identification of the constrained constructs is done during the empirical analysis (Chapter 3.2) because it will discuss which construct is constrained. When the constrained constructs are identified, interventions focused on that barrier could be developed. This is done in Chapter 4.2.

### 2.3.1.1. Motivation

As stated before, *motivation* refers to the willingness to participate in the knowledge transfer process (Szulanski, 2000). Participation in knowledge transfer activities is generally based on voluntary actions, which cannot be controlled or enforced (Lin, 2007). Therefore, motivation has been recognized as the key determinant in the process of knowledge transfer (Osterloh & Frey, 2000; Lin, 2007). The motivation of both the source (by initiating or providing knowledge in the distribution) and the recipient (by acquiring knowledge and assimilating knowledge) is needed (Szulanski, 2000). When a source lacks the motivation to provide knowledge, the available knowledge remains unexposed to the recipient (Bock, Zmud, Kim, & Lee, 2005). On the other side, the motivation of the recipient enables the acquisition of knowledge from others and affects the willingness to assimilate to obtained knowledge in their context (Szulanski, 2000).

#### 2.3.1.1.1. Motivation constructs of the source

As discussed in the theoretical background, the involvement of the source is needed in the first two phases; knowledge acquisition and the knowledge distribution phase (Szulanski, 2000). The underlying theory of the source's motivation can be explained through the *social exchange theory* (Lin, 2007; Osterloh & Frey, 2000). Within the social exchange theory, the source decides to provide knowledge if the perceived benefits (such as satisfaction or rewards) exceed the perceived costs (e.g. risk, time and effort) (Wang & Noe, 2010; Cabrera & Cabrera, 2005). When the perceived costs are higher than the perceived benefits, the source is likely to preserve his knowledge (Reagans & McEvily, 2003; Husted & Michailova, 2002). Thus, the motivation of the source could be enhanced by decreasing the costs or by enhancing the benefits (Cabrera & Cabrera, 2002). Both the perceived benefits and costs are discussed in the following paragraphs.

#### *Perceived benefits*

The perceived benefits are generally divided by intrinsic and extrinsic motivation (Osterloh & Frey, 2000; Lin, 2007; Nguyen, Nham, Froese, & Malik, 2019). People are intrinsically motivated when they perform a certain behavior because of enjoyment, interest, satisfaction, self-expression or personal challenge in work (Amabile, 1996, p. 3). In contrast to intrinsic motivation, people are extrinsically motivated when they engage in the work to obtain some goals apart from the work itself (Amabile, 1996, p. 3). Promotion bonuses and social recognition are examples of extrinsic motivators (Cabrera, Collins, & Salgado, 2006).

Both intrinsic and extrinsic motivation are positively connected to knowledge transfer processes (Lin, 2007). However, the connection of intrinsic motivation on knowledge transfer processes is stronger (Nguyen, Nham, Froese, & Malik, 2019). Nonetheless, intrinsic motivation reflects an individual's beliefs and characteristics, which makes it hard to analyze and control by managers. Therefore, interventions taken by managers are generally based on stimulating the extrinsic motivation of employees (e.g. rewards) (Osterloh & Frey, 2000). Consequently, the combination of both intrinsic and



extrinsic motivation is driving employees to participate in knowledge transfer activities (Osterloh & Frey, 2000).

#### *Perceived costs*

According to Husted and Michailova (2002), individuals determine their perceived costs based on the social order of this relationship. When the relationship is based on suspicion, assuming a conflict of interest, power and politics are present. This implicates a high hostility between the source and recipient (Schultze & Stabell, 2004). In contrast, relationships based on low hostility are built on trust and a common interest (Schultze & Stabell, 2004). In the following paragraphs, the derived costs are discussed.

In the case of a high hostility context, sources tend to preserve their knowledge to survive in power games of the organization (Husted & Michailova, 2002). In this situation, the knowledge possession of the source may lead to an individual competitive advantage, because his knowledge repository is rare and valuable for the organization (Casimir, Lee, & Loon, 2012). The provision of knowledge from a source towards a colleague could cause a loss in bargaining power, loss of value and may feel to a loss of ownership (Husted & Michailova, 2002; Szulanski, 1996).

In the case of a mild hostile context, social relationships are based on trust and not seen as problematic (Hislop, 2009). In this context, the costs are based on individual economic concerns (Husted & Michailova, 2002). Knowledge transfer is a costly process, which demands resources such as time and effort to provide knowledge to a recipient (Husted & Michailova, 2002). The time spent on knowledge transfer is often not described in the job subscription and therefore a voluntary act above the normal responsibilities (Nonaka, 1994). Thus, the time spent on knowledge transfer influences individual performance, because less time is spent on these activities.

#### 2.3.1.1.2. Motivation constructs of the recipient

As stated before, the recipient's motivation influences the success of both acquisition and assimilation phase. In similarity with the motivation constructs of the source, the hostility between two units also influences motivation sources for the recipient. For example, through the development of in-group affection, group thinking could derive (Husted & Michailova, 2002). In this way, the group is not motivated to change the status quo and therefore will not be motivated to search for knowledge (acquisition phase) or assimilate the knowledge (Husted & Michailova, 2002).

Furthermore, the recipient could be intrinsically motivated to develop their own knowledge and ideas instead of reusing the source's ideas and knowledge (Husted & Michailova, 2002). The creation of his own knowledge and ideas might give derives satisfaction, enjoyment, interest and personnel challenge (Amabile, 1996). In this way, there will be no knowledge transfer, because the recipient is not motivated to initiate the knowledge acquisition.

As stated before, the knowledge transfer process could be time costly (Husted & Michailova, 2002). According to Argote (2013), recipients tend to make decisions or perform activities based on their own experiences, because this overleaps the knowledge transfer process. Also, the assimilation of the knowledge might demand some time as well (Szulanski, 1996). For example, some unexpected problems may derive after the knowledge distribution phase. To overcome these problems, new knowledge transfer may be needed (Szulanski, 1996). Therefore, the perceived costs increase, resulting in less motivation to assimilate knowledge.

#### 2.3.1.1.3. Overview motivation-related antecedents

An extensive literature review has been done to identify motivation- related constructs within the literature that influence knowledge transfer behavior. A summation of these constructs, including their definitions, is shown in Table 6.

**TABLE 6: MOTIVATION-RELATED CONSTRUCTS**

Unit	Phase(s)	Constructs	Explanation	Effect	Source
Source	Acquisition	Knowledge self-efficacy	The belief of the source, that his knowledge can help the recipient in solving his problem.	Positive	(Lin, 2007) (Cabrera, et al., 2006) (Nguyen, et al., 2019) (Bock, Zmud, Kim, & Lee, 2005)
		Enjoyment	The (perceived) pleasure the source obtains through provide knowledge.	Positive	(Lin, 2007) (Nguyen, et al., 2019)
		Organizational commitment	The level and type of psychological attachment an employee has to an organization.	Positive	(Cabrera et al., 2006)
		Reciprocal benefits	The degree to which the sources believe one can improve mutual relationships with others through one's knowledge transfer.	Positive	(Lin, 2007) (Nguyen, et al., 2019) (Bock, et al., 2005)
		Expected organizational rewards	The degree the source perceives that they will receive external rewards (more salary, promotion, job security).	Positive	(Burgess, 2005) (Cabrera, et al., 2006) (Nguyen, et al., 2019)
		Loss of value or bargaining power	The perceived loss of value or bargaining power through the loss of ownership.	Negative	(Husted & Michailova, 2002)
Recipient	Acquisition Distribution	Perceived costs	The (perceived) time the knowledge transfer process is going to take and therefore is not spend on the formal job description.	Negative	(Husted & Michailova, 2002) (Hansen, Mors, & Lovas, 2005)
	Acquisition Assimilation	Preference of developing own knowledge	Preference of developing own knowledge instead of the renewal of other ideas.	Negative	(Husted & Michailova, 2002)
	Acquisition	Perceived costs	The (perceived) time the knowledge transfer process is going to take	Negative	(Hansen, Mors, & Lovas, 2005)

### 2.3.1.2. Opportunity

The *opportunity* reflects to as the environmental constructs which enable individuals (both source and recipient) to participate in knowledge transfer (Siemsen, Roth, & Balasubramanian, 2008). In the upcoming subchapters, the opportunity-related constructs are discussed for the source and the recipient.

#### 2.3.1.2.1. Opportunities constructs of the source

After the conduction of the literature review, three opportunity-related constructs were identified; organizational support, time availability and the reaction of the recipient (Siemsen, Roth, & Balasubramanian, 2008; Husted & Michailova, 2002). These constructs are discussed in the following paragraphs.

The first construct reflects organizational support. Because of the growth of Information Technology (IT)- systems, much research has been focused on the use and effects of these tools (Argote & Miron-Spektor, 2011). Also, the psychical environment of the organization affects knowledge transfer behavior through opportunities. This could be done by investing in the facilitation of formal and informal meeting spaces for example (Riege, 2005).

The second construct refers to the perception of time available to spend on knowledge transfer. According to Siemsen et al., (2008), time availability is one of the most situational constraints in organizations. Their perspective is based on knowledge transfer as an informal, voluntary process from a source's perspective. Therefore, knowledge transfer could be experienced as a distraction for their formal work (Willem & Buelens, 2009). Furthermore, Siemsen et al., (2008) found that if time was the constraining construct in knowledge transfer, it also reduces the motivation and ability to zero. This implicates, that if a source does not have time, he will not provide knowledge irrespective of his motivation and ability.

The third construct reflects on the behavior of the recipient. As stated before, in the knowledge transfer process, both the involvement of the source and recipient are needed to complete the transfer successfully (Szulanski, 2000). When the recipient reluctant the knowledge which is provided by the

source, the source lack of opportunity to transfer to knowledge to the right place (Husted & Michailova, 2002)

### 2.3.1.2.2. Opportunities constructs of the recipient

In similarity to the opportunity-related constructs of the source, organizational support, time availability and behavior of the other units involved in knowledge transfer, influences the opportunity for the recipient. Also, several more opportunity-related constructs for only the recipient were found. These consist of knowledge accessibility and knowledge availability in the organization.

As stated in the theoretical background, the knowledge acquisition of the recipient is often an action based on a gap in the recipient knowledge repository (Szulanski, 1996). As a result of this gap, the recipient might search for the knowledge in his organization. However, the recipient is not able to find this knowledge because no one in the organization possesses the knowledge, the recipient will lack knowledge availability. Therefore, the availability of knowledge sources is conceptualized as an opportunity (Inkpen & Tsang, 2005).

The previous paragraph focusses on the knowledge available in the organization. However, even if the recipient has detected the knowledge within the organization, it may not mean the sources want to provide this knowledge. As discussed in the theoretical background, knowledge is often stored in the mind and practices of individuals (Grant, 1996b). The recipient's accessibility to this knowledge is often depending on the behavior of the source (Szulanski, 1996). Hence, if the source is willing to provide the knowledge asked, the recipient lacks accessibility of the needed knowledge (Borgatti & Cross, 2003; Riege, 2005). Relationships between the source and recipient facilitating knowledge transfer behavior, and therefore the network of an organization is important.

### 2.3.1.2.3. Overview opportunity-related constructs

An extensive literature review has been done to identify opportunity constructs within the literature that influence knowledge transfer behavior. A summation of these constructs, including their definitions, is shown in Table 7.

**TABLE 7: OPPORTUNITY-RELATED CONSTRUCTS**

Unit	Phase	constructs	Explanation	Effect	Source
Source	Acquisition Distribution	Behavior of the recipient	The extent of the recipient reluctant the provided knowledge	Negative	(Husted & Michailova, 2002)
		Organizational support	The degree to which organizational context supports the development of transfer	Positive	(Szulanski, 2000) (Cabrera, et al., 2006)
		Time contains	Time constraints or high workload	Negative	(Siemsen, et al., 2008) (Huber, 1991) (Reagans & McEvily, 2003)
Recipient	Acquisition Distribution Assimilation	Organizational support	The degree to which organizational context supports the development of transfer	Positive	(Szulanski, 2000) (Cabrera, et al., 2006)
		Time contains	Time constraints or high workload	Negative	(Siemsen, et al., 2008) (Huber, 1991) (Reagans & McEvily, 2003)
	Acquisition	Knowledge availability	The recipient perception of the availability of quality knowledge	Positive	(Borgatti & Cross, 2003) (Husted & Michailova, 2002) (Szulanski, 2000)
		Knowledge accessibility	The accessibility of the knowledge for the recipient	Positive	(Borgatti & Cross, 2003)

### 2.3.1.3. Ability

The *ability* refers to the individual's competencies and skills needed for knowledge transfer (Adler & Kwon, 2002). Within the systematic literature review; two constructs were found knowledge self-efficacy and (of the source) and absorptive capacity (of the recipient). These constructs are discussed in the following paragraphs.

As stated in Table 6, knowledge self-efficacy refers to the belief people have that their knowledge can help to solve job-related problems and improve work efficacy (Lin, 2007, p. 139). In this table, knowledge self-efficacy was classified as a motivation-related construct. Hence, the extent of

knowledge self-efficacy has a positive impact on knowledge transfer behavior (Lin, 2007; Nguyen, Nham, Froese, & Malik, 2019). However, knowledge self-efficacy involves a certain knowledge base and an identification of relevant knowledge (Bock, Zmud, Kim, & Lee, 2005). Therefore, the construct is recognized as both a motivation and ability construct.

The majority of the research indicates the knowledge base and expertise as an important individual characteristic affecting the ability to transfer (Argote, McEvily, & Reagans, 2003; Kang & Kim, 2017; Siemsen, Roth, & Balasubramanian, 2008). This is because individuals learn by adding knowledge to their current knowledge base (Argote & Miron-Spektor, 2011). Therefore, it is for individuals easier to identify, value and apply new knowledge, because they have the cognitive ability to process the context-related constructs of tacit knowledge by themselves (Van Wijk, Jansen, & Lyles, 2008; Reagans & McEvily, 2003). Thus, the ability to identify, value and apply new knowledge is influencing the knowledge transfer behavior of the recipient (Cohen & Levinthal, 1990). Table 8 overviews the ability-related constructs used in this thesis.

**TABLE 8: ABILITY-RELATED CONSTRUCT**

Unit	Phase	Construct	Explanation	Effect	Source
Source	Acquisition	Knowledge self-efficacy	The belief people have that their knowledge can help to solve job-related problems and improve work efficacy	Positive	(Lin, 2007)
Recipient	Acquisition Assimilation	Absorptive capacity	The ability of the recipient to identify, value and apply new knowledge	Positive	(Szulanski, 2000)

#### 2.3.1.4. Overview MOA-constructs per phase

To create an overview, Table 9 includes all the MOA-constructs as discussed per phase per unit. The table shows that the majority of the constructs are placed in the acquisition phase. As stated before, the acquisition phase ends when the actual decision (by the source and recipient) is made to proceed to distribute knowledge (Szulanski, 1996). Therefore, this thesis will mainly focus on the knowledge acquisition phase.

Table 9 answers the first research question:

**RQ<sub>1</sub>:** What are the constructs affecting individual knowledge transfer behavior?

**TABLE 9: MOA-CONSTRUCTS PER PHASE**

Factor	Construct	Effect	Unit		Phase		
			Source	Recipient	Acquisition	Distribution	Assimilation
Motivation/ ability	Knowledge self-efficacy	Positive	X		X		
Motivation	Enjoyment of helping	Positive	X		X		
	Organizational commitment	Positive	X		X		
	Reciprocal benefits	Positive	X		X		
	Organizational rewards	Positive	X		X		
	Loss of value and bargaining power	Negative	X		X		
	Perceived costs	Negative	X		X	X	
	Perceived costs	Negative		X	X	X	X
Opportunity	Preference of developing own knowledge	Negative	X		X		X
	Behavior of the recipient	Negative	X		X	X	
	Organizational support	Positive	X		X	X	
	Organizational support	Positive		X	X	X	
	Time constrains	Negative	X		X	X	
	Time constrains	Negative		X	X	X	X
Opportunity/ ability	Knowledge accessibility	Positive		X	X		
	Knowledge availability	Positive		X	X		
Ability	Absorptive capacity	Positive		X	X		X

The identified constructs of Table 9 are the input for the empirical analysis in Chapter 3. Hence, if the empirical findings indicate a high value of a construct that has a negative effect on knowledge transfer behavior, it will be implicated as a barrier. In addition, constructs which a positive effect on knowledge transfer process with a low value in the empirical data, could also be detected as a barrier. Constructs that have a positive effect on knowledge transfer behavior and have a positive value, are recognized as a driver.

### 2.3.2. The effect of social relationships

As discussed in the theoretical background, the knowledge transfer process takes place between a source and a recipient (Szulanski, 1996). Extensive research shows that the properties of the relationship between the source and recipient influence knowledge transfer behavior of both the source and the recipient (Argote, McEvily, & Reagans, 2003). For example, when the source and recipient are linked with a close emotional relationship, they are more likely to actively participate in knowledge transfer behavior (Kang & Kim, 2017). The upcoming paragraphs explain the social network perspective, its dimensions and the antecedents which are expected to affect the knowledge transfer process.

#### *Social network perspective*

A considerable amount of literature adopts the *social network perspective* as an external construct (Kang & Kim, 2017; Adler & Kwon, 2002). The social network perspective refers to a pattern of relationships between the units within an organization (Inkpen & Tsang, 2005). These relations facilitate knowledge transfer because the recipient has access to the needed knowledge (in the source) (Adler & Kwon, 2002). However, it is not only the appearance of the relationships (hereafter called ties), which affect the knowledge transfer process. Therefore, the social network perspective is analyzed by three dimensions; the structural, relational and cognitive dimensions (Nahapiet & Ghoshal, 1998). In the following three subchapters, the relationship between the social dimensions and MOA-framework is explained. Afterward, Figure 14 provides a summation of the effects of social dimensions on the individual knowledge transfer behavior.

#### 2.3.2.1. Structural dimension

The *structural* dimension involves the pattern of networks, configuration and the linkages between units (Nahapiet & Ghoshal, 1998; Inkpen & Tsang, 2005). The structural dimension is mainly determined by the organizational structure. The organizational structure refers to the formal system of tasks and authority relationships that controls how people are to cooperate and use resources to achieve the organization's goals (Jones, 2013, p. 30). In particular, it reflects on who is connected with who. These ties allow actors to access the knowledge which is needed (Nahapiet & Ghosal, 1998). In general, the structural dimensions involve network ties and network configuration.

*Network ties* are the links between two actors. These ties provide the opportunity to access knowledge from other divisions. Therefore, it enhances knowledge transfer (Inkpen & Tsang, 2005). Network ties could differ in content, this is discussed in the *relational dimension*.

The *centralized position* of a unit is recognized as an opportunity to access knowledge (Van Wijk, Jansen, & Lyles, 2008). So, if a unit is centralized in the organization, it is expected that the unit has many ties. Because of a centralized position obtained many ties, it is expected to obtain knowledge from different other units, resulting in higher knowledge acquisition (Tsai, 2001). Besides the centralized position, the unit is expected to have a broad range of ties, including access to different specialized sources (Reagans & McEvily, 2003). This means that the unit is exposed to different perspectives and the creation of an overview. According to Reagans and McEvily (2003), this broad overview increases the ability to identify valuable knowledge. Therefore, the centralized position of a unit may increase the opportunity to access knowledge and the ability to absorb new, valuable knowledge.

In conclusion, the effects of the structural dimension of social relationships increase the opportunity and ability. This relationship is summarized in Figure 11.

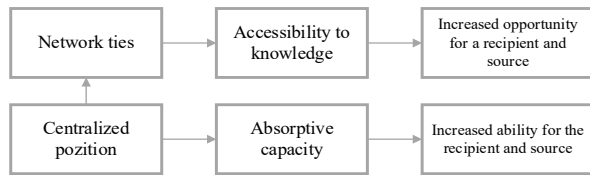


FIGURE 11: EFFECTS OF THE STRUCTURAL DIMENSION ON MOA-CONSTRUCTS

### 2.3.2.2. Relational dimension

The *relational* dimension refers to the relational characteristics of the ties (Nahapiet & Ghoshal, 1998). The relational dimension focusses on the role of direct ties between units (Inkpen & Tsang, 2005). In this thesis, the following relationships are discussed; the existence of ties (formal or informal) and the tie strength (Van Wijk, Jansen, & Lyles, 2008; Aalbers, Dolfsma, & Koppius, 2014; Hansen, 1999).

#### *Tie strength*

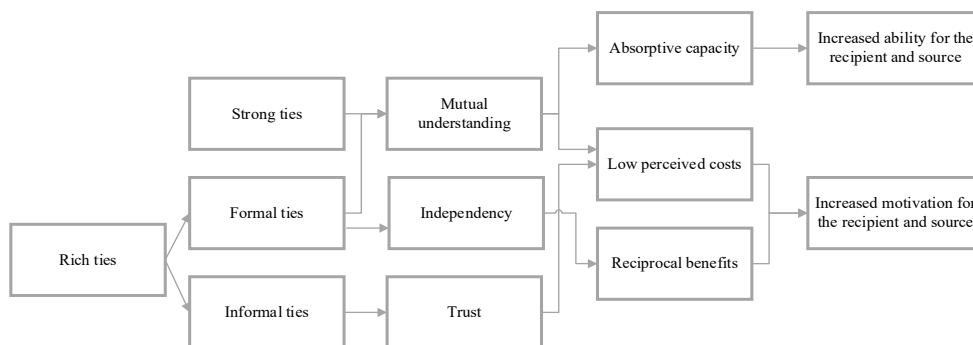
The tie strength refers to the extent of the frequency of interaction and the closeness of the relation (Hansen, 1999). Strong ties are often expensive to maintain (e.g. regularly visits) (Hansen, 1999). However, through the intensive collaboration between the ties, they increase their mutual understanding, because they are aware of each other's knowledge repository and tasks (Hansen, 1999). Thus, in case the knowledge is tacit and the ties are strong, less time and effort have to be made because they are aware of each other knowledge (Reagans & McEvily, 2003). This would increase the motivation to participate in knowledge transfer behavior. Also, because the units are aware of each other tasks and knowledge requests. It may be easier for a source to identify knowledge that could be valuable for the recipient (Reagans & McEvily, 2003). Therefore, it may increase the chance the source unit will initiate the knowledge acquisition.

#### *Formal versus informal ties*

Ties within an organization can be established by formal systems (organizational structure) or informal systems (determined by social preference). Formal ties are ties that are needed for an individual to fulfill their job (Aalbers, Dolfsma, & Koppius, 2014). In this way, interdependency exists, the source and recipient need each other to achieve their performance goals (Jones, 2013). Therefore, individuals are more likely to participate in knowledge transfer, because they feel that this investment will pay back itself back (Jones, 2013).

Aalbers et al., (2014) provided insights that only informal ties would not lead to the acquisition of innovative knowledge. To create innovative knowledge, *rich (both formal as informal) ties* were necessary. Formal ties are recognized with common knowledge because they build mutual understanding through frequent coordination (Aalbers et al., 2014). This overlap in knowledge facilitates the identification of complex, new, valuable knowledge. However, the combination with informal ties also facilitates the trust and willingness to provide this knowledge. Therefore, to obtain innovative in-depth knowledge, rich ties are required (Aalbers et al., 2014). Also, the trust within informal ties overcome the perceived costs to participate (Casimir, Lee, & Loon, 2012). Therefore, informal ties increase the motivation to participate in knowledge transfer behavior.

In conclusion, the effects of the relational dimension of social relationships increase the ability and motivation of the source and recipient. These relationships are summarized in Figure 12.



## FIGURE 12: EFFECTS OF THE RELATIONAL DIMENSION ON MOA-CONSTRUCTS

### 2.3.2.3. Cognitive dimension

The cognitive dimensions represent the resources providing shared meaning and understanding between network members (Nahapiet & Ghoshal, 1998). After the conduction of the literature review; three cognitive constructs were found: common knowledge (Aalbers, Dolfma, & Koppius, 2014), shared goals (Inkpen & Tsang, 2005) and transactive memory (Argote & Ren, 2012)

#### *Common knowledge*

The first cognitive construct reflects to the overlap in knowledge repositories between the source and the recipient (Van Wijk, Jansen, & Lyles, 2008). An important assumption in common knowledge (the overlap of knowledge repositories) is that transfer knowledge should fill the gap in knowledge repositories of the recipient (Szulanski, 2000). When the recipient and source share common knowledge, less context is needed for this distributed knowledge (Alavi & Leidner, 2001). In this case, less effort and time has is needed from both the source and the recipient (Zander & Kogut, 1995). Therefore, the cost for knowledge transfer is lower and thus, the motivation higher.

Furthermore, common knowledge between the source and recipient enables the ability to identify value and relevant knowledge (Van Wijk, Jansen, & Lyles, 2008). This assumption was made because shared knowledge helps the source and recipient to understand the context-related variables. Therefore, they are able to identify what knowledge is new for them and identify this knowledge as valuable (Reagans & McEvily, 2003).

#### *Shared goals*

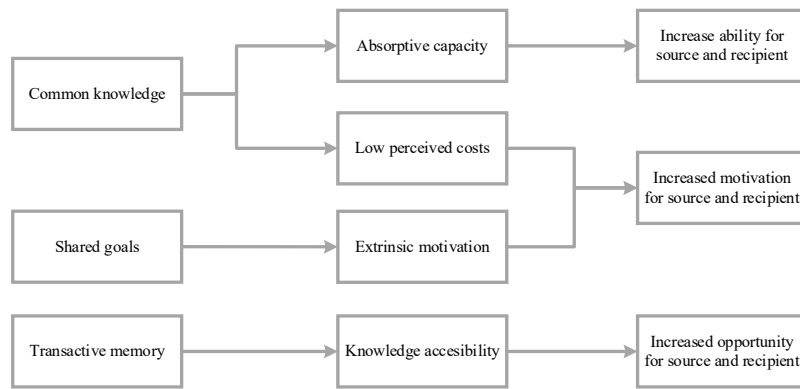
Also, shared goals represent the degree to which network members share a common understanding and approach to the achievement of network tasks and outcomes (Inkpen & Tsang, 2005). As stated before, extrinsic motivation refers to motivation which is achieved through the introduction of goal-driven reasons (Lin, 2007). So, when the source and individual share the same goal, they may be more willing to provide knowledge towards each other, because it may indirectly contribute to the shared goals. Also, the common understanding which may arise from the shared goals may manifest itself in trust (Inkpen & Tsang, 2005). As stated before, trust in somebody is likely to overcome the perceived costs (Casimir, Lee, & Loon, 2012). Therefore, if the source and recipient share the same goals, there are likely to be motivated to provide each other knowledge when someone asks for it.

#### *Transactive memory*

The transactive memory systems refers to a shared system that individuals in groups and organizations develop to collectively encode, store and retrieve information or knowledge in different domains (Argote & Ren, 2012, p. 1376). Therefore, transactive memory manifests itself in organization as ‘who knows what’ (Borgatti & Cross, 2003). According to Huber (1991), organizations often do not know what they know. Hence, knowledge is stored in the heads of individuals, and therefore not visible and dispersed over the organization (Argote & Ingram, 2000).

Transactive memory systems enhances the opportunity to access the knowledge (Argote & Ren, 2012). Hence, the cognitive dimension of knowing who knows what enables the opportunity to access more knowledge repositories than an individual possesses.

In conclusion, the effects of the cognitive dimension of social relationships increase the motivation, the opportunity and ability of the source and recipient. These relationships are summarized in Figure 13.



**FIGURE 13: EFFECTS OF THE COGNITIVE DIMENSION OF MOA-CONSTRUCTS**

### 2.3.3. Organizational variables

According to Argote and Miron-Spektor (2011), the process of knowledge transfer cannot be seen as an objective process, because it is affected by context variables. This subchapter discusses briefly the organization context variables, conceptualized by the organization theory. The organizational theory studies how an organization's function, based on the organizational structure and organizational culture (Jones, 2013). As stated in the *structural* dimension of social ties, the organizational structure consists of the formal ties in an organization (Nahapiet & Ghoshal, 1998). The organizational culture refers to the set of values and norms that controls organizational members' interactions with each other (Jones, 2013, p. 8). Therefore, the organizational culture involves the informal (*relational dimension*) and the cognitive values in the organization (*cognitive dimension*).

Both organizational culture and organizational structure influence knowledge transfer, mediated by social interaction (Chen & Huang, 2007). Therefore, the organizational structure and culture are briefly discussed. The discussion of organizational structure and culture enables this thesis to develop general design principles in Chapter 4 because it includes the context variables (Van Aken & Berends, 2018).

#### 2.3.3.1. Organizational structure

The organizational structure refers to the formal system of tasks and authority relationships that controls how people are to cooperate and use resources to achieve the organization's goals (Jones, 2013, p. 8) (Jones, 2010, p. 30). The organization structure is based on the strategic choices of an organization, to create a competitive advantage. This formal system is configured by horizontal differentiation, centralization, and formalization. According to Jones (2013), the organizational structure affects the behavior and motivation of employees. In the following paragraphs, these effects are discussed.

##### *Horizontal differentiation*

Horizontal differentiation, the so-called division of labor, reflects on the process of establishing and controlling the degree of specialization in the organization (Jones, 2013, p. 97). The division of labor of the Company is configured by product divisions. These divisions of labor create specialization of knowledge. This improves productivity in work performance because the divisions learn from their experiences (Argote & Miron-Spektor, 2011). However, the knowledge which is obtained is often complex, and therefore it is difficult to recognize the relevance for other divisions (Szulanski, 1996). This specialization leads to a lack of cognitively similar ties. Hence, the product divisions do not share common knowledge.

Also, the divisions work independent from each other (Willem & Buelens, 2009). The low extent of integration results in the lack of formal ties with other product divisions (Van Wijk, Jansen, & Lyles, 2008). Because of the lack of formal ties, the product divisions are dependent on the informal ties to connect the divisions. As stated before, informal ties derived on personal interests and not mandatory (Aalbers, Dolfmsma, & Koppius, 2014). Therefore, the organization cannot control these ties. Because ties enable the accessibility to knowledge sources, the accessibility for the product divisions depends on the coincidence of the two persons in different product divisions liking each other (Nahapiet &



Ghosal, 1998). Furthermore, informal ties may only access the knowledge repository of the source on the surface (Aalbers, Dolfsma, & Koppius, 2014). This decreases the transactive memory: the recipient is not aware of the knowledge which is available in other product divisions. Thus, because of the lack of formal ties, the accessibility and the transactive memory are decreased, impeding opportunities to knowledge transfer.

#### *Centralization*

Centralization refers to the perceived freedom of making own decisions (Jones, 2013, p. 97). A decentralized structure enables employees to make responsible choices and enhance job autonomy (Amabile, Motivating creativity in organizations: On doing what you love and loving what you do, 1997). However, because the divisions work independently from each other, they prioritize their activities before the knowledge transfer towards other divisions.

#### *Formalization*

Formalization refers to the extent activities within a function are determined by guidelines and processes (Jones, 2013). Formalization may impact social relationships in two ways. A positive effect could be derived from the organizational support the individual might perceive (and thus an opportunity). The second way affects the transactive memory of the employees. Because the job roles of employees are vague, other colleagues may not be able to identify the responsibilities and tasks. Therefore, other colleagues are not able to access the knowledge, because they easily do not know that knowledge exists (Argote & Miron-Spektor, 2011).

#### 2.3.3.2. Organizational culture

Another context variable reflects on the organizational culture in the company. The organizational culture refers to the set of shared values and norms that controls organizational members' interaction with each other and with people outside the organization (Jones, 2013, p. 23). This culture is affected by the type of leadership in the organization. However, the culture is hard to establish and therefore different to build (Jones, 2013).

Within the previous subchapter, different aspects of organizational culture are discussed. The extent of hostility in the company reflects on the culture where employees are operating in. As discussed before, the extent of hostility affects to reasons why knowledge sources may be preserving their knowledge (Husted & Michailova, 2002). In the context where the hostility is high, the shared values and norms are based on suspicions, and therefore, activities are performed to survive power games (Husted & Michailova, 2002).

The culture within the knowledge transfer process is important, because knowledge transfer is a voluntary action to perform (Lin, 2007). The culture of the company affects the behavior of an individual to interact on a certain activity (Jones, 2013). For example, Chen and Huang (2007), found that a high degree of innovative and cooperative climate enhances social relations, and therefore are positively affecting knowledge transfer processes.

## 2.4. Theoretical propositions

In the upcoming paragraphs, the theoretical propositions are explained. As stated in the research approach of Chapter 1, it is important to develop a model of the existing situation (Mendel & Yeager, 2010). Therefore, theoretical propositions are made to describe the cause-effect relationships of the MOA-constructs. The theoretical framework in Chapter 2.3. is built on the MOA-framework, suggesting an individual needs motivation, opportunity and ability to transfer knowledge (Argote, McEvily, & Reagans, 2003). This theoretical framework assumes that when one or more constructs are not present, there will be no (or limited) knowledge transfer. Thus, the identification of the constrained constructs enables managers to choose appropriate intervention to enhance that factor (Siemsen, Roth, & Balasubramanian, 2008). The identification of the causes will be important during Phase III, because then interventions will be made to change the causes and therefore improve knowledge transfer.

Therefore, the theoretical propositions answer the following research question:

**RQ<sub>2</sub>:** Which context-related factors cause barriers to individual knowledge transfer behavior?

The following subchapters are structured by the MOA-construct. However, in order to determine the context, the role of social relationships is discussed on forehand.

### 2.4.1. The role of social relations

As stated before, the context variables could not be neglected within knowledge transfer research (Argote & Miron-Spektor, 2011). Although many context variables are discussed at the *opportunity* proposition, it is important to be aware of the extent of hostility between the source and recipient. This is because, the extent of hostility is a cause that affects the motivation constructs for the recipient and source to participate in knowledge transfer processes (Husted & Michailova, 2002). Therefore, the extent of hostility is discussed first.

The extent of hostility is likely to increase when an organization is structured by product divisions. In the case of product divisions, divisions are independent of each other. This means that they do not have to integrate with other divisions to execute their job responsibilities (Willem & Buelens, 2009). In combination with centralization, divisions may differ from performance goals. According to Reagans and McEvily (2003), the extent of hostility is likely to increase in the context of product divisions, because they are aiming to their own goals. However, when the individual and recipient operate in a high hostility, they tend to preserve knowledge to survive in power games (Husted & Michailova, 2002). Also, the lack of internal resources (such as budget, personnel) could lead to competition between the product divisions (Tsai, 2002). In this way, resources need to be allocated to the divisions and the perception of performing better than other divisions may help in receiving priority in those resources. This could also be the case when divisions are competing for a customer.

As discussed before, a high hostility between the source and recipient results in a relationship based on conflict of interest, power, and politics (Schultze & Stabell, 2004) Thus, the following theoretical proposition could be made: (Reagans & McEvily, 2003)

*Theoretical proposition 1: Employees who are performing in product divisions, may derive a high hostility because they might compete with each other. Therefore, the relationships are seen as problematic and they might perceive a loss of value and bargaining power.*

As stated before, organizational culture could affect the extent of hostility within an organization. According to Chen and Haung (2007), a high degree of innovative and cooperative climate enhances social relations. In this way, relationships are built on trust and a common interest (Schultze & Stabell, 2004). As stated before, trust overcomes the perceived costs to participate (Casimir, Lee, & Loon, 2012). Therefore, the following theoretical proposition could be made:

*Theoretical proposition 2: Employees who are performing in an innovative and cooperative climate, may derive low hostility because their relationships are built on trust. Therefore, the employees are likely to engage in knowledge transfer process when the perceived costs are lower than the perceive benefits.*

### 2.4.2. Motivation propositions

In the following the motivation constructs of Table 6 are discussed. In order to formulate theoretical propositions, the causes (social dimensions and organizational variables) are included.

#### *Lack of knowledge self-efficacy*

As stated before, knowledge self-efficacy refers to the belief of the source that his knowledge could help the recipient to solve his problem (Lin, 2007). In the case of high knowledge self-efficacy, the knowledge transfer may gain benefits for the recipient and the organization as a whole (Bock, Zmud, Kim, & Lee, 2005). However, when the source is not sure about the added value of his knowledge, the source may be uncertain of the perceived benefits for the organization. Assuming that knowledge transfer needs investments in terms of time and effort of the source, they say may perceive that the costs

of transferring are higher than the perceived benefits (such as organizational benefits) (Husted & Michailova, 2002). Therefore, the following theoretical proposition could be made:

*Theoretical proposition 3: Sources who are performing in product divisions, may perceive a lack of motivation to provide their knowledge when they lack knowledge self-efficacy. In this case, the source is not motivated to take the risk of investing time and effort, without knowing it is relevant for the recipient.*

Knowledge self-efficacy is affected by the ability to identify and value new knowledge (Kang & Kim, 2007). Therefore, the causes of knowledge self-efficacy are discussed at subchapter 2.4.4 (Ability constructs).

#### *Lack of enjoyment of helping others*

Based on the individual economic concerns, and the assumption that individual perform out of self-preservation, it is assumed that source units and recipients act from self-serving (Casimir, Lee, & Loon, 2012). Sources could gain benefits if they are intrinsic motivation to help other colleagues, by satisfaction and enjoyment (Nguyen, Nham, Froese, & Malik, 2019). However, if they do not perceive this enjoyment, they may lack benefits of the knowledge transfer process. Therefore, the following theoretical propositions could be made:

*Theoretical proposition 4: Based on the individual characteristics of the source, the lack of motivation of the source caused because the perceived costs are higher than the perceived benefits, may indicate a lack of enjoyment in helping others.*

#### *Lack of organizational commitment*

Knowledge transfer is recognized as extra-role behavior, based on voluntary actions (Wang & Noe, 2010). Employees which a high level of organizational commitment are willing into put extra effort in their job, to achieve benefits for the organization. However, when employees are not committed to the organization, they are less likely to perform extra-role behavior (Cabrera, Collins, & Salgado, 2006). In this way, they might do not feel valued enough by the organization to perform extra-role behavior. Therefore, the following theoretical proposition could be made:

*Theoretical proposition 5: Employees within an organization may perceive a lack of motivation to provide their knowledge when they lack organizational commitment. In this case, the do not feel responsible to undertake extra-role behavior, because they lack motivation to put extra effort into organizational benefits.*

#### *Lack of reciprocal benefits*

The lack of motivation could also be caused by the lack of extrinsic motivation. In this way, individuals are not feeling enough compensated by the organization to perform in knowledge transfer activities (Nguyen, Nham, Froese, & Malik, 2019). Also, the units might perceive the relationship between each other not as valuable and do not think the costs of the knowledge transfer will proceed with the investments in the relationships (Lin, 2007). Therefore, the following proposition could be made:

*Theoretical proposition 6: Sources who are performing in product divisions, are likely to be less motivated to provide knowledge to other product divisions, because they do not perceive reciprocal benefits, which may indicate a lack of formal ties.*

#### *Lack of organizational rewards*

As stated before, the motivation of the source to engage in knowledge transfer depends on the perceived benefits and the perceived costs (Wang & Noe, 2010). When sources do not feel enough compensated by the organization, in terms of promotion, monetary rewards or status, they may lack motivation because the costs of knowledge transfer are higher than the perceived benefits (Nguyen, Nham, Froese, & Malik, 2019). Therefore, the following theoretical proposition could be made:

*Theoretical proposition 7: The lack of motivation of the source caused because the perceived costs are higher than the perceived benefits, which may indicate a lack of organizational rewards.*

#### *Perceived costs*

The motivation of the source to participate in the knowledge transfer process is affected by the ease of knowledge transfer (Reagans & McEvily, 2003). Previous research has established evidence of the negative effect of complex, specialized knowledge (Szulanski, 1996). Complex knowledge is often ambiguous, referring to as the inherent and irreducible uncertainty as to precisely what the underlying knowledge components and sourced are and how they interact (Van Wijk et al., 2008, p. 833). To explain complex knowledge, time and effort from the source are necessary to explain the underlying components and how they interacted (Alavi & Leidner, 2001) Therefore, the transfer of specialized knowledge is recognized as a cost and will decrease the motivation of the source to provide knowledge or the motivation to acquire the knowledge.

The assumption is made that the source and recipient participate in the knowledge transfer process when they perceive the benefits higher than the costs (Nguyen, Nham, Froese, & Malik, 2019). This proposition focusses on the high costs of knowledge transfer because of the lack of common knowledge (Reagans & McEvily, 2003). This lack of common knowledge could be caused by divisions that are working without any integration and therefore are getting specialized (Jones, 2013). The costs of transfer could increase for two reasons (Hansen, Mors, & Lovas, 2005). The *first* costs involve the search costs; the time spent on allocating the needed knowledge (Hansen, Mors, & Lovas, 2005). These costs are expected to be high because of the lack of common knowledge decreases the ability to identify value knowledge (Aalbers, Dolfsma, & Koppius, 2014). The *second* costs involve the time spent on knowledge transfer. When there is a lack of common knowledge, much context-related knowledge has to be told, to enhance the chance for the recipient to understand the knowledge (Van Wijk, Jansen, & Lyles, 2008). Therefore, the source and recipient may invest more time into a successful knowledge transfer process. Therefore, the following theoretical propositions could be made:

*Theoretical proposition 8a: Sources who are performing in product divisions, are likely to be less motivated to provide knowledge to other product divisions because they the perceived costs are high as a consequence of the lack of common knowledge.*

*Theoretical proposition 8b: Recipients who are performing in product divisions, are likely to be less motivated to acquire knowledge from other product divisions because they the perceived costs are high as a consequence of the lack of common knowledge.*

Based on the individual economic concerns, and the assumption that individual perform out of self-preservation, it is assumed that source units and recipients act from self-serving (Casimir, Lee, & Loon, 2012). As stated before, informal ties are derived from personal interests and therefore based on emotions (Aalbers, Dolfsma, & Koppius, 2014). According to Casimir et al., (2012), these emotions are decreasing the perceived costs of knowledge transfer. The involvement of informal ties and emotions tends to change the self-serving perspective to a less economic trade-off and are therefore more willing to bear the perceived costs of knowledge transfer. Therefore, if the source and recipient are not motivated to participate in the knowledge transfer process because of the high costs, they may lack informal ties within each other.

*Theoretical proposition 9: The lack of motivation of the source and recipient, could be caused by the high perceived costs of transfer, which may indicate a lack of informal ties.*

Employees within the Company have to prioritize their activities that they perform. As discussed before, participation in the knowledge transfer process acquires an investment of time and effort (Husted & Michailova, 2002). However, as stated before, the product divisions aim to increase their product performance. Yet, the time and effort, which is will be invested in the knowledge transfer process, could not be invested in activities which contribute directly to product performance. Therefore, based on the individual economic concerns, it is argued that when units (both the source and recipient) have to participate in the knowledge transfer process, the perceived costs are high (Lin, 2007). Therefore, it

reduces the willingness (the motivation) to participate in knowledge transfer. Thus, the following theoretical proposition could be made:

*Theoretical proposition 10: The lack of motivation of the source, could be caused when units do not perceive an improvement in product performance, which may indicate a lack of shared goals.*

#### *Loss of value or bargaining power*

According to Figure 14, individual units could reject (recipient) or preserve (source) value knowledge. An important cause of knowledge rejecting, or knowledge preserving is the extent of hostility between the source and recipient (Husted & Michailova, 2002). If the hostility is high, the source could preserve his knowledge because he may perceive a loss of ownership and therefore a loss of value and bargaining power in the organization. Hence, the source possesses specific knowledge crucial for an organization. The knowledge transfer of this knowledge makes the source replaceable (Husted & Michailova, 2002). This construct is shown in *Theoretical proposition 1*. Therefore, the following proposition could be made:

#### *Preference of developing own knowledge*

Product divisions are able to operate without any coordination or communication with other product divisions, and product divisions are self-managing, thus they have the ability to determine their own strategic and focus, there is no formal integration among the product divisions. According to Jones (2013), the lack of communication could result in a subunit orientation. Subunit orientation refers to the tendency to view one's role in the organization strictly from the perspective of the time frame, goals and interpersonal orientations of one's subunit (Jones, 2013, p. 99).

Recipient may perceive that the source does not have the appropriate knowledge the recipient needs to fulfill the gap in his knowledge. The distrust of this knowledge is referred to task credibility; how much a member trusts the knowledge of the recipient (Argote & Ren, 2012). Because the recipient does not trust the knowledge, he might lack of transactive memory. Therefore, the following theoretical proposition could be made:

*Theoretical proposition 11: The lack of motivation of the recipient to engage in the transfer knowledge process, could be caused by a lack of transactive memory, because the recipient does not trust the sources has the appropriate knowledge.*

### 2.4.3. Opportunity propositions

As discussed before, the opportunities reflect on the environmental constructs which enable units to participate in knowledge transfer (Siemsen, Roth, & Balasubramanian, 2008). These constructs are generally the result of organizational context variables. However, because knowledge transfer is a dyadic process, the behavior of the other unit also affects the opportunity to knowledge transfer. In the following paragraphs, four propositions are done to explain the barriers to opportunity to knowledge transfer behavior.

The next proposition reflects on the knowledge which is needed. However, in case the knowledge which is needed is complex, it might not be available in the company. Especially in companies that are operating in a high-technology environment, organizations are often finding it difficult to acquire people with the right set of knowledge and expertise (Storey & Tether, 1998). Therefore, the following proposition is made:

*Theoretical proposition 12: The lack of opportunity for the source and recipient to participate in knowledge transfer behavior, is likely to be caused by the lack of knowledge available, indicating a lack of common knowledge.*

The next proposition reflects on the accessibility of knowledge within the organization. In this case, the knowledge source is found, however, the recipient could not access the knowledge. As stated before, knowledge is generally stored in individuals' heads, and therefore needs the participation of another unit to transfer the knowledge successfully (Grant, 1996b). The source could reject knowledge acquisition because he is not willing to participate in the process (based on individual economic

concerns or loss of ownership) (Husted & Michailova, 2002). Additionally, according to Inkpen and Tsang (2005), ties facilitate access to knowledge sources. Hence, when the recipient has no information to contact the source (email, physical presence), it may not approach the source.

*Theoretical proposition 13: The lack of opportunity for the recipient to participate in knowledge transfer behavior, is likely to be caused by the lack of knowledge accessibility, which may indicate a lack of ties or reluctant behavior of the source unit.*

As stated before, transactive memory refers to the opportunity to know which individual knows what (Borgatti & Cross, 2003). However, the low level of formalization decreases to identify where employees are responsible for (Argote & Miron-Spektor, 2011). The transactive memory could increase, with the presence of ties. Hence, the presence of ties facilitates coordination and communication. This enhances the opportunity to work together and talk with each other about the activities they are performing at that moment. Therefore, the transactive memory increase and the following proposition is made:

*Theoretical proposition 14: The lack of opportunity for the source and recipient to participate in knowledge transfer behavior, is likely to be caused by the lack of transactive memory, which may indicate a lack of ties.*

*Theoretical proposition 15: The lack of opportunity for the source and recipient to participate in knowledge transfer behavior, is likely to be caused by the lack of transactive memory, which may indicate a low extent of formalization.*

The last proposition reflects on the time availability of the employees. Organizations who facilitate an innovative climate, facilitate exploration activities (Gibson & Birkinshaw, 2004). Exploration activities are recognized as activities that encompass search, variation, experimentation and discovery (Raisch & Birkinshaw, 2008). Within exploration activities, the organizational return is uncertain and investments in time and effort are needed to enable those activities (March, 1991). Also, because these activities are often based on trial and error, it may take a while for these activities to finish. Therefore, exploration activities often lead to time constraints for employees.

Siemens et al (2008) found that the lack of time available not only decreases the opportunity to participate in knowledge transfer. However, it also decreases the ability and the motivation to participate. This could be explained by the preference of doing formal job requirements over voluntary behavior (such as knowledge transfer) (Lin, 2007). Also, employees who are feeling they lack time available, often do not participate in social activities, and therefore misses the opportunity to notice valuable knowledge (Siemens, Roth, & Balasubramanian, 2008).

Furthermore, time constraints are recognized to decrease the opportunities for both the source and recipient (Siemens, Roth, & Balasubramanian, 2008). Knowledge transfer processes may result in a source and recipient, which are focused on their formal tasks. Therefore, they might avoid informal activities or conversations during the day. Therefore, recipients may feel that they disrupt the activities of the source (Reagans & McEvily, 2003). This leads the assumption that the source is too busy and therefore not accessible.

*Theoretical proposition 16: The lack of opportunity for the source and recipient to participate in knowledge transfer behavior, is likely to be caused by the lack of time availability, which may indicate constrained resources (e.g. personnel) or too many tasks (e.g. customers, administrative tasks, exploration activities).*

#### 2.4.4. Lack of ability

The lack of ability could be caused by horizontal differentiation. The differentiation on a certain product enables divisions to focus on specific demands of high-potential customer segments and therefore exploit niche opportunities for growth (Eisenhardt & Brown, 1999). Therefore, product divisions are becoming specialized. However, when every product division is becoming specialized in one specific aspect, they will lack eventually common knowledge (Nahapiet & Ghoshal, 1998). The common

knowledge between the source and recipient is necessary to enable in-depth communication (Cohen & Levinthal, 1990). This in-depth communication is needed for the source and recipient to enhance the ability to identify, value and apply new and relevant knowledge (Szulanski, 1996). Thus, specialized knowledge decreases the overlapping knowledge bases between product divisions and are therefore the ability to absorb relevant knowledge.

According to Aalbers et al., (2014), a sense of common knowledge is needed to identify value knowledge from another unit. This assumption was made because shared knowledge helps the source and recipient to understand the context-related variables. Therefore, they are able to identify what knowledge is new for them and identify this knowledge as valuable (Reagans & McEvily, 2003). However, when the knowledge is complex and specialized, it is more difficult to create a common knowledge base, because in this case, you need both a source and recipient which is specialized in this knowledge (Willem & Buelens, 2009)

Furthermore, the common knowledge base could be achieved through cooperation between the source and recipient (Aalbers, Dolfsma, & Koppius, 2014). When ties are formal (in case of rich and formal ties), the source and recipient have to work together, to achieve a certain company goal. Because of the experience of working together, the source and recipient find out about each other expertise and therefore generate a similar knowledge base (Aalbers, Dolfsma, & Koppius, 2014).

Also, a centralized position in the organization is recognized to have a positive effect on absorptive capacity (Reagans & McEvily, 2003; Tsai, 2001). The underlying assumption is that a unit in a centralized position is facing many knowledge sources, from different perspectives. Therefore, the units generate a broad overview of the knowledge and will not get specialized (Reagans & McEvily, 2003). Because the knowledge is not specialized, it might overlap with many other units, which means there is a shared knowledge base. For the source units, the following theoretical propositions could be made:

As stated before, the ability of identifying value and relevant knowledge for the recipient is determined by a centralized position (Figure 11) and the extent of common knowledge (Figure 13). Furthermore, because the existence of strong and formal ties results in common knowledge (Figure 12), these ties have an indirect positive effect on knowledge self-efficacy.

*Theoretical proposition 17: Sources who are performing in product divisions are likely to be less motivated (and able) to provide knowledge to other product divisions, because they lack knowledge self-efficacy, which may indicate a lack of common knowledge.*

*Theoretical proposition 18: Sources who are performing in product divisions are likely to be less motivated (and able) to provide knowledge to other product divisions, because they lack knowledge self-efficacy, which may indicate a lack of formal ties.*

*Theoretical proposition 19: Sources who are performing in product divisions are likely to be less motivated (and able) to provide knowledge to other product divisions, because they lack knowledge self-efficacy, which may indicate a lack of centralized position.*

For the recipient units, the following theoretical propositions could be made:

*Theoretical proposition 20: Recipients who are performing in product divisions, are likely to be less motivated to acquire knowledge of other product divisions, because they lack absorptive capacity, which may indicate a lack of common knowledge.*

*Theoretical proposition 21: Recipients who are performing in product divisions, are likely to be less motivated to acquire knowledge of other product divisions, because they lack absorptive capacity, which may indicate a lack of formal ties.*

*Theoretical proposition 22: Recipients who are performing in product divisions, are likely to be less motivated to acquire knowledge of other product divisions, because they lack absorptive capacity, which may indicate a lack of centralized position.*

## 2.4.5. Overview theoretical propositions

Table 10 shows an overview of the discussed theoretical propositions in the previous subchapters.

**TABLE 10: THEORETICAL IMPLICATIONS (TP)**

	<b>Context</b>	<b>Mechanism</b>		<b>Outcome</b>
<b>TP</b>	Context variable	Social dimension	MOA-construct	
<b>1</b>	Product divisions (horizontal differentiation and decentralization)	Problematic relationships	Loss of value and bargaining power	Lack of motivation source and recipient
<b>2</b>	Innovative and cooperative culture (organizational culture)	Relations facilitate knowledge transfer process	Perceived costs higher than perceived benefits	Lack of motivation source and recipient
<b>3</b>	Individual characteristic	X	Lack of knowledge self-efficacy	Lack of motivation source
<b>4</b>	Individual characteristic	X	Lack of enjoyment in helping others	Lack of motivation source
<b>5</b>	Individual characteristic	X	Lack of organizational commitment	Lack of motivation source
<b>6</b>	Product divisions (horizontal differentiation and decentralization)	Lack of formal ties	Lack of reciprocal benefits	Lack of motivation source
<b>7</b>	Organizational variables	X	Lack of organizational rewards	Lack of motivation source
<b>8a</b>	Product divisions (horizontal differentiation and decentralization)	Lack of common knowledge	High perceived costs	Lack of motivation source
<b>8b</b>	Product divisions (horizontal differentiation and decentralization)	Lack of common knowledge	High perceived costs	Lack of motivation recipient
<b>9</b>	Individual interests	Lack of informal ties	High perceived costs	Lack of motivation source and recipient
<b>10</b>	Product divisions (horizontal differentiation and decentralization)	Lack of shared goals	Perceived costs higher than perceived benefits	Lack of motivation source
<b>11</b>	Product divisions (horizontal differentiation and decentralization)	Lack of transactive memory	Preference of developing own knowledge	Lack of motivation recipient
<b>12</b>	Product divisions (horizontal differentiation and decentralization)	Lack of common knowledge	Lack of knowledge availability	Lack of opportunity recipient
<b>13</b>	Product divisions (horizontal differentiation and decentralization)	Lack of ties	Lack of knowledge accessibility	Lack of opportunity recipient
<b>14</b>	Product divisions (horizontal differentiation and decentralization)	Lack of transactive memory	Lack of knowledge accessibility	Lack of opportunity recipient
<b>15</b>	Product divisions (horizontal differentiation and decentralization)	Lack of transactive memory	Lack of knowledge accessibility	Lack of opportunity recipient
<b>16</b>	Organizational and environment variables	Lack of ties	Time constraints	Lack of opportunity source and recipient
<b>17</b>	Product divisions (horizontal differentiation and decentralization)	Lack of common knowledge	Lack of knowledge self-efficacy	Lack of ability source
<b>18</b>	Product divisions (horizontal differentiation and decentralization)	Lack of formal ties	Lack of knowledge self-efficacy	Lack of ability source
<b>19</b>	Product divisions (horizontal differentiation and decentralization)	Lack of centralized position	Lack of knowledge self-efficacy	Lack of ability source
<b>20</b>	Product divisions (horizontal differentiation and decentralization)	Lack of common knowledge	Lack of absorptive capacity	Lack of ability recipient
<b>21</b>	Product divisions (horizontal differentiation and decentralization)	Lack of formal ties	Lack of absorptive capacity	Lack of ability recipient
<b>22</b>	Product divisions (horizontal differentiation and decentralization)	Lack of centralized position	Lack of absorptive capacity	Lack of ability recipient



### 3. Empirical analysis

This chapter discusses the empirical analysis. The empirical analysis has two objectives. The *first* objective is to discover why individuals in the Company do not participate in knowledge transfer behavior. This has done by the identification of MOA-constructs on knowledge transfer behavior. The *second* objective aims to identify the context-related factors, which could cause the identified barriers. Therefore, this chapter aims to answer the following research questions:

**RQ<sub>3</sub>:** What are the barriers to individual knowledge transfer behavior in the Company?

This chapter starts by explaining the methods used to obtain empirical data (Chapter 3.1). Then, barriers of the knowledge transfer are identified in Subchapter 3.2 (*Empirical findings*). This chapter ends with the identification of the context-related factors, to determine the *Empirical propositions* (Subchapter 3.3). At the same time, these *Empirical propositions* constitute the current empirical situation for Phase I- What “is”.

#### 3.1. Methodology

This subchapter discusses the methodology used to gather empirical data. The *objective* of this subchapter is to explain which methods are used and enhances transparency, by enabling the readers’ reliability and validity (Van Aken & Berends, 2018). This subchapter starts with an explanation of qualitative methods (Chapter 3.1.1.). The two chapters afterward elaborate on the two different methods used: In Subchapter 3.1.2., the method of interviews is discussed. Followed by the methodology of observations (Chapter 3.1.3.).

##### 3.1.1. Qualitative methods

In organization studies, empirical data is gathered by quantitative, qualitative methods, or a combination of those two methods (Lee, 1992). Quantitative methods aim to develop facts, where the results are presented in numbers. Qualitative methods are more exploratory and focus on interpretation, experiences, and definitions. These methods are presented in words (Easterby-Smith, Thorpe, & Jackson, 2015). The decision on which method to use depends on the view of the situation studied (Lee, 1992). In particular, quantitative methods are investigated from an ‘objective’ point of view, meaning the event (in this case knowledge transfer) is independent of the individual characteristics (Lee, 1992). In contrast, qualitative methods suggest a ‘subjective’ point of view, including individual characteristics to explain an event (Lee, 1992).

Within this thesis, qualitative methods are used to gather empirical data. This choice was made based on *three* reasons. The *first* reason reflects on the objective to discover underlying antecedents *why* individuals do or do not participate in knowledge transfer behavior. As stated in the theoretical framework, individual behavior is affected by individual (perceived) characteristics (such as motivation, opportunity, and ability). The subjective point of view includes individuals’ characteristics to explain an event (Van Aken & Berends, 2018). Therefore, qualitative methods are more appropriate to describe knowledge transfer behavior.

The *second* reason for adopting qualitative methods is the ability to elaborate on one specific event (knowledge transfer behavior) on the detail level (Van Aken & Berends, 2018). The phenomenon of knowledge transfer behavior is complex, involving many context-related variables (Alavi & Leidner, 2001). Also, individuals could differ from each other under the same context-related variables. Therefore, it is not effective to employ qualitative methods, such as standardized measuring instruments (Easterby-Smith, Thorpe, & Jackson, 2015).

The *third* reason encompasses the difficulty of conceptualizing knowledge transfer behavior. As stated before, knowledge repositories manifest themselves when knowledge successfully transferred. However, these changes are difficult to measure (Argote & Miron-Spektor, 2011). Therefore, knowledge transfer behavior is conceptualized in outcomes, such as innovation or business performance (e.g. growth or sales) (Van Wijk, Jansen, & Lyles, 2008). However, qualitative methods enable the conceptualizing of knowledge transfer as a process (Easterby-Smith, Thorpe, & Jackson, 2015).

To gather empirical data for this thesis, a combination of two qualitative methods is used; interviews and observations. According to Van Aken and Berends (2018) people do not always say what they do, and vice versa. Therefore, a combination of both interviews and observations were done. This combination of research methods is defined as triangulation (Yin, 2003). The usage of triangulation increases the reliability of this research (Van Aken & Berends, 2018) The reliability is further discussed in the Discussion (Chapter 7).

Also, the use of both interviews and observations provides the researcher to investigate the knowledge transfer process from two perspectives. Hence, the interviews enable a perspective of an insider; why he or she performs a certain behavior. In contrast, the observations enable a perspective of an outsider, to detect if the insider perspective of the interviewee was correct. Mixed methods may impede the probability of replication. However, it increases the validity of the research and presents a greater diversity of views (Easterby-Smith, et al., 2015). The upcoming three sub-chapters elaborated on the two qualitative methods; interviews and observations.

### 3.1.2. Interviews

The first qualitative method used interviews. Interviews consist of face-to-face verbal exchanges in which the interviewer pursues knowledge from the participant (interviewee), to understand the behavior of the participant (Rowly, 2012). The *objective* of the interviews is to discover *why (and why not)* employees in The Company participate in knowledge transfer behavior and under which circumstances. Also, the employee's perspective on the effect of social capital is discussed.

The choice of interviews as a source for empirical data has based on three reasons. The *first* reason is the high response rate and the quality of the obtained information (Williamson, 2018). Because interviews are scheduled on the agenda, the participants tend to make time free for the interview. Also, because the participants are in conversation with the interviewer, they are less distracted and focused on the conversation.

The *second* reason to use interviews is the knowledge base of the participants and the complexity of the subject. Because the participants are not specialized in knowledge management, they might misinterpret the questions (Williamson, 2018). With the advantage of direct feedback, it becomes clear if the recipient and the source do understand each other (Van Aken & Berends, 2018). This direct feedback could express itself when the participants indicate he or she is not understanding the question, or the interviewer's ability to detect facial expressions of confusing or awkwardness (Rowly, 2012).

The *third* reason compasses the ability to interrogate specific answers which are provided by the participant. The interrogating is valuable when the researcher aims to understand *why* a certain behavior is performed. The answers on *why* a certain behavior is performed are important because it constitutes the mechanisms needed in the CIMO-logics. These underlying thoughts on *why* a certain behavior is performed is recognized as tacit knowledge. As stated in the theoretical framework, tacit knowledge is easier transferred through face-to-face contact (Alavi & Leidner, 2001).

A *disadvantage* of interviews is the physical attendance of the interviewer. Because the interviewer has the option to influence the participant, this could lead to a lower validity (Van Aken & Berends, 2018). To minimize this decreased validity, the participants are assured of their anonymities. However, attendance could also positively influence the behavior of the participant. The person's atmosphere could lead to participants to tell things more open.

In the following subchapters, the process of interviews is discussed. This is done by the three subchapters, divided into chronological order of the preparation (Chapter 3.1.2.1.), conduction (Chapter 3.1.2.2.) and assimilation of interviews (Chapter 3.1.2.3.).

#### 3.1.2.1. Preparation for the interviews

In this subchapter, the phase before the conduction of the interviews is discussed. Within the preparation, the following activities and choices have been made semi-structured interviews, the deployment of topics and questions and sampling.

### *Semi-structured interview*

The face-to-face interviews were designed as semi-structured. Within a semi-structured interview, general questions are formulated before, based on the most important topics. However, semi-structured interviews enable the interviewer to interrogate on questions to obtain detail information a specific topic (Williamson, 2018). Also, when the participant does not understand the question, the interviewer has the ability to rephrase the question. Thus, the semi-structured interview is chosen because it leaves room for flexibility (Williamson, 2018).

Another advantage of the semi-structured interviews is the ability to find similarities and the easiness of coding (Rowly, 2012). Yet, the data could be divided within the important themes, creating an overview in the first step of coding (see Chapter 3.1.2.3.1.). However, comparing to structure interviews, the use of a semi-structured interview gains a lower validity (Easterby-Smith, Thorpe, & Jackson, 2015).

### *Deployment of topics and questions*

A semi-structured interview refers to a guided open interview (Easterby-Smith et al., 2015). Within these types, a topic guide will be made on the selection of topics and issues to be covered. The topics in these interviews were based on the theoretical framework, as discussed in Chapter 2. Thus, the list provided the following topics: Motivation, Opportunity, Ability, structural ties, relational ties, cognitive ties, and context variables, such as organizational structure (formalization, differentiation, and centralization) and organization culture (hostility).

Before the interviews, three test interviews were held under the same circumstances of the *real* interviews. This so-called *member check* increases the reliability of the research (Van Aken & Berends, 2018). Two of the three chosen test participants were not involved the further interviews. The Company supervisor, and old TU/e innovation management student and another intern at the Company were tested. They provided feedback concerning the time, the questions (more open-ended), the interrogation, the explanation of the definition. At the same time, the electronica (to record) was tested. Moreover, it provides the researcher with an opportunity to train the interview skills.

Based on the member check, the opportunity and ability were combined by adding the question if participants are facing any barriers. The change of the questions has mainly done, because the proposed questions were too long, and disables the interviewer to interrogate and the participant to tell things in detail. The choice to include motivation was because the literature suggested that motivation was the most important factor in the MOA-framework (Siemsen, Roth, & Balasubramanian, 2008). The social network dimensions were used because the interviews have the objective to formulate practices-design principles. To do so, it is needed to discover which dimensions have a positive effect on knowledge transfer behavior and why.

### **Sampling**

Due to the time-consuming characteristic of face-to-face interviews (and the evaluation of the data), a sample was made of participants within the Company. During the selection of this sample, both *random sampling* and *ad-hoc sampling* was used. Random sampling refers to a probabilistic selection of interviewees such that the sample is likely to reflect on the target population (Easterby-Smith et al., 2015). Therefore, a sample was chosen composed of all the seven divisions within the Company. Additionally, the sample composed different functions, such as *developers*, *product managers*, *sales employees*, and *marketing employees*. Furthermore, the support departments were involved, because they are likely to have an overall view of the problems on knowledge transfer among divisions. However, the inclusion of support functions could decrease the validity of the research, because the support groups have a centralized position in the Company and are therefore assumed to be more connected.

Subsequently, employees who have been working longer for the Company were preferred over employees who just joined the Company. This was determined for every division, whether to choose the marketing or sales employee. This decision was made because of the assumption they do have a better feeling of what is happening in the Company. However, this decision could also negatively affect

the validity of the research, because they have gained more experience in coordination. Therefore, it is likely they have more social relationships in the Company.

Besides random sampling, ad-hoc sampling was used. Ad hoc sampling refers to the selection of interviewees based on availability and ease of access. In particular, every interviewee had to be available at the headquarters at the Company between 13 and 27 May 2019. From the 24 participants invited, every participant accepted the invitation.

### 3.1.2.2. Conducting face-to-face interviews

So, a number of 24 face-to-face semi-structured interviews were held, within a timeframe of three weeks. Table 10 provides an overview of the employees interviewed. The interviews had a duration between 30 and 45 minutes and were conducted in the headquarters of the Company. The script of the interviews could be found in the interview protocol at Appendix F. Interviews were recorded with permission, to make it easier to transcribe the conversations after the interviews. Except for one interview who was held in English, all the interviews were held in Dutch. The decisions of language were made based on the mother tongue of the participant.

**TABLE 11: OVERVIEW OF THE INTERVIEWED EMPLOYEES**

	Product manager	Development	Marketing	Sales	Total
Division A	1	1		2	4
Division B	1	1		1	3
Division C	1			1	2
Division D	1	1	1		3
Division E	1		1		2
Division F	1	1		1	3
Division G	1		1		2
Support		1	2	2	5
<b>Total</b>	7	5	5	7	24

After the execution of the interviews, it was discovered that choices in the organizational structure are important in knowledge transfer behavior. However, this topic was neglected during the interviews, because the assumption was made it could derive from observation. Therefore, an additional email was sent in August 2019 to the participants with two questions about the perceived extent of decentralization and formalization. Within a week, 12 participants replied to the request. After a reminder was sent, two more participants answered the questionnaire, resulting in 14 answers. Because the fourteen obtained answers were generally consistent, there was no need to send another reminder. Thus, saturation was achieved. The mail with the two additional questions can be found in Appendix G. Because they overlap between these answers was high, and saturation was achieved. Therefore, there were no reminders send afterward.

The usage of email over face-to-face interviews was chosen for the following reasons: it was easy and fast for the researcher and the participants were able to email back in their own time (so no meetings had to be scheduled). Also, because of the face-to-face interviews before the email, the interviewees already experienced some background information about this project. Therefore, they have gained a certain knowledge base, which enables them to articulate the context by themselves.

### 3.1.2.3. Data analysis

To analyze the data, two activities were used subsequently. These activities are explained in the following paragraphs.

#### 3.1.2.3.1. Transcription

Interviews were recorded (by phone) and transliterated manually in Microsoft Word in the language of interviews. This has been done in two rounds. During the *first* round, verbatim transcription is used, meaning every word, including pauses, hesitations and any kind of emotion was written down as well (Lapadat, 2000). Subsequently, the audio records were listened to again for the *second* round. This round was more on focusing on the content and eliminated the interruptions. Meaning the second round, an intelligent verbatim transcription was used. In this transcription method, all the unnecessary words

(such as ‘uhm’) were eliminated. Also, grammar mistakes were fixed. This enhances the reliability and enables to use of phrases in this thesis. However, indicators of emotions or emphasizes are getting lost.

### 3.1.2.3.2. Coding

To analyse the qualitative interviews, coding was used. Coding is used to derive meaning from qualitative data (Saldaña, 2013). A code is defined as a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data (Saldaña, 2013, p. 3). To link the data with meaning, the codes are generalized in two cycles of coding processes (Saldaña, 2013).

#### *NVivo*

To follow the coding processes, the qualitative analysis software NVivo 12 was used. The license of NVivo was received from the TU/e. Also, during the pre-master NVivo was also used to code interviews. Therefore, this program was chosen to facilitate the coding process. To use NVivo, the transcript word documents were uploaded.

#### *First cycle coding process*

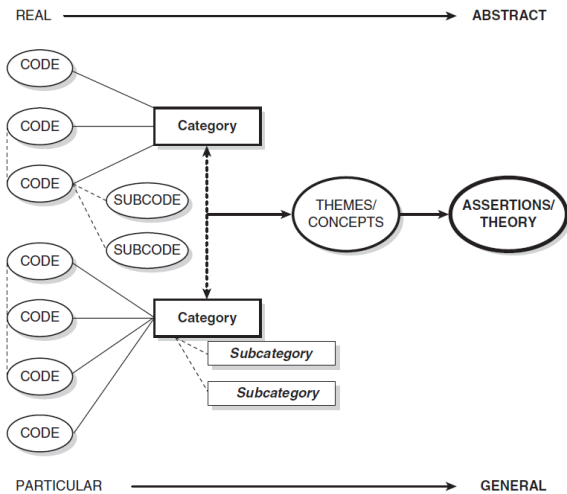
The first order cycle focusses on the labeling of data (Saldaña, 2013). This labeling was done regarding a deductive approach. The deductive approach means the starting points of the codes are determined before the coding process (Miles, Huberman, & Saldaña, 2014). This approach was chosen because the empirical analysis is used to harmonize with the theoretical framework of Chapter 2 (Saldaña, 2013). Therefore, the labeling was done by the template approach. This approach follows the labeling through existing concepts and theories (Van Aken & Berends, 2018). However, a big amount of data is collected, which makes it difficult to start with the template approach. Therefore, the data is divided into themes, adopting a holistic approach. (Miles, Huberman, & Saldaña, 2014). In this approach, the data is divided into groups of Motivation, Opportunity, and Ability. The indicators of these groups were subtracted from Blumberg and Pringle (1982). These indicators are summed in Appendix H.

Furthermore, sub coding was conducted. This approach was done to divide the themes into codes. According to Miles and Huberman (1994), it is recommended to start labeling with a start list of codes. This start list is abstracted from the theoretical analysis in Chapter 2. The starting list is also found in Appendix H. Also, to detect cause-effect relations in the second cycle, a start list of social capital was also made. Also, this start list is provided in Appendix H.

#### *Second cycle coding process*

In the *second* order, the labels and their codes are generalized to give meaning to the empirical data (Saldaña, 2013). To do so, pattern coding is used. Patterns coding refers to a way to group segments in a smaller number of sets, themes or constructs (Miles & Huberman, 1994, p. 69). The use of segments of data and subsequently pattern coding enables to create an overview in large data sets. Also, it enables the researcher to get more focused on a specific segment, which might be important (Miles & Huberman, 1994). The patterns were created by comparing the codes with a solid coding scheme. The coding scheme could be found in Appendix I.

Subsequently, relationships between constructs are searched in the data (Van Aken & Berends, 2018). This has been done through searching for categories that interact and interplay and therefore derive an interrelationship (Saldaña, 2013). *First*, the relationship between the MOA-factors and Social capital factors were detected. *Second*, the context variables of the social capital and the MOA-factors were searched. This process is overviewed in Figure 15.



**FIGURE 14: THE CODING PROCESS (SOURCE: SADAÑA, 2013)**

Due to time restrictions, this coding process was done by one student. Therefore, the validity of this research may become questioned. However, with the use of a coding scheme, based on questionnaires in the literature, the validity is expected to increase.

### 3.1.3. Observations

Besides the interviews, observations were done to collect more qualitative data. The conduction of observations complemented the interviews in two different ways. The *first* reason was the opportunity in observations to include context-related variables to the research (Merriam & Tisdell, 2016). As stated in the theoretical analysis, the knowledge transfer process is affected by many context-related factors. Therefore, observations were used, to include the context-related factors.

The *second* reason to use observation is the ability of triangulation. Within interviews, interpretations of the interviewees are discussed. However, the use of observations enables the interpretations of the observer, which may recognize other factors (Merriam & Tisdell, 2016). The ability to investigate the process of knowledge transfer within multiple perspectives enhances the validity of this research.

To use observations for this research, a systematic tool was needed to analyze the observations in this research. Therefore, the checklist of Merriam and Tisdell (2016) is used. This checklist provides insights into which factors may affect which activity. Therefore, it helps the research to structure the observations and conduct learning points. A further explanation and the elaboration of the observations done are found in Appendix J. Also, Table 11 provides an overview of the observations done.

**TABLE 12: OVERVIEW OF OBSERVATIONS**

Events	Date	Unit of analysis	Role
Conducting interviews	May 2019	Various product divisions and support divisions	Participant as an observer
Sales meeting	18-06-2019	Division A and B, two-way communication	Complete observer
Feedback acquisition	17-07-2019	Employee of Division D, asked feedback of colleagues	Complete observer

Due to ethical values, it was asked before if these observations could be used for this thesis. Therefore, observations were only focused on formal, initiated meetings. Also, the situations were chosen to cover as many functions as possible. For example, conduction and feedback acquisitions were cross-functional. The sales meeting was only a cross-product division. Also, the plan was initiated to use the developers meeting, however, this meeting was not initiated in the time of the research (May-December 2019).

## 3.2. Motivation, opportunity and ability constructs

This subchapter discusses the findings of the empirical analysis (interviews and observations). This subchapter aims to identify which constructs affect knowledge transfer behavior from both the source and the recipient. Subsequently, the impact of the identified constructs on knowledge transfer behavior is discussed. Afterward, this subchapter ends with the implications of the empirical findings to answer the following research question:

**RQ<sub>3</sub>:** What are the barriers to individual knowledge transfer behavior in the Company?

As discussed in the theoretical analysis, this thesis mainly focusses on the barriers in the knowledge acquisition phase.

### 3.2.1. The extent of hostility in the company

As stated in the theoretical analysis, the hostility within an organization affects the reasons why sources preserve their knowledge, or the recipient rejects the knowledge provided (Husted & Michailova, 2002). Therefore, it is important to determine the extent of hostility, because it affects the motivation factors *not* to participate.

All the interviews were consistent with the Company having a low degree of hostility. This proposition was made based on the following indicators: there is no competition between product divisions and there are a positive attitude and value against knowledge transfer, without power games. These indicators are discussed in the following paragraphs.

The first indicator concerns the lack of competition between product divisions. As confirmed by the interviewees, individuals feel responsible to increase the product performance of his or her division. Also, they are facing restrictions because of the slack of internal resources. Thus, choices have to be made in which divisions are getting prioritized. According to the interviewees, this does not lead to competition between product divisions. And the interviewees who indicated a low competition did not perceive it as a bad thing, including knowledge preserving. Furthermore, interviews did not perceive any external competition between product divisions. This external competition could occur when a customer (or prospect) was served by two product divisions. In contrast to the extent of competition, interviewees indicated coordination when two product divisions are serving the same customer.

The second indicator that would indicate a low extent of hostility is that sources do not preserve their knowledge. Many interviewees indicated that they would not preserve their knowledge if a recipient would task for it. Additionally, the level of trust did not impact this knowledge sharing. The perception was made, that knowledge preserving was unprofessional behavior and contradictory against the company interest. Some interviewees reinforce this proposition by saying there weren't any power games within the company. For example, a marketing support employee said: 'I think our company culture is based on helping each other and share things. Undertake actions instead of machismo behavior. I think our company culture is also determining our extend of sharing and openness'.

Based on the previous indicators, the following empirical finding could be made:

*Empirical finding 1: The extent of hostility within the Company is low because employees do not feel competition or power games. Therefore, relationships between employees are based on trust and facilitate knowledge transfer behavior.*

According to *Empirical finding 1*, the company is not operating in a high hostility environment. Therefore, employees within the company do not preserve their knowledge to other employees because they are afraid to lose value or bargaining power in the organization (*Empirical finding 9*). This implicates that the motivation of the source is based on the trade-off between perceived costs and benefits. Thus, the lack of motivation could be explained by the perceived costs exceeding the perceived benefits. Therefore, the following empirical proposition could be made:

*Empirical proposition 1: The company derives a low extent of hostility. Therefore, the lack of motivation is explained by the perceived costs exceeding the perceived benefits.*

The formulation of this proposition is important for the implications of the motivation constructs. Therefore, it was made here. However, the rest of the empirical propositions are made in Chapter 3.3.

### 3.2.2. Motivation constructs

As stated in the methodology (Chapter 3.1), empirical data obtained from the interviews were grouped into categories to get grip on the amount of data. In order to group motivation-related data, the following indicators were adopted from Blumberg and Pringle (1982): *Motivation, job satisfaction, job status, anxiety, legitimacy of participation, attitude, perceived task characteristics, job involvement, ego involvement, self-image, personality, norms, values, perceived role expectations, feeling of equity* (p. 562). Also, extra attention was given on empirical data obtained from Interview Question 4 (See Appendix F for the interview questions), because this question encompasses the question of whether the interviewee was intrinsic or extrinsic motivated to participate in the KT process.

The constructs were made based on a comparison of the motivation related phrases with the identified literature motivation constructs of Table 6. Furthermore, the findings of the observations were used to complete the constructs.

#### 3.2.2.1. Motivation constructs of the source

The following motivation constructs of the source are discussed: knowledge self-efficacy, organizational commitment, enjoyment of helping others, extrinsic motivation factors, loss of value and bargaining power. These constructs were identified in the theoretical analysis. In addition, new constructs are identified through empirical data: the initiation of the recipient, the rejection of the recipient and job-demand for knowledge transfer. As discussed in the methodology, the code scheme of the constructs is found in Appendix I.

##### *Knowledge self-efficacy*

The construct of knowledge self-efficacy refers to the belief people have that their knowledge can help to solve job-related problems and improve work efficacy (Lin, 2007, p. 139). Knowledge self-efficacy is conceptualized as the judgment if the knowledge is valuable and contributing to solving problems, business opportunities, improving work processes, increasing productivity and help the organization achieve its performance goals (Bock, Zmud, Kim, & Lee, 2005). According to the theoretical analysis, a high level of knowledge self-efficacy would lead to higher (intrinsic) motivation to participate in the knowledge transfer process.

The empirical data obtained from the interviews indicated the extent of *knowledge efficacy* was an important construct in the determination if the source would participate in knowledge transfer behavior or not. A consistent statement was made on the relevance of knowledge. The lack of relevant knowledge, and thus the lack of knowledge self-efficacy led to a lack of motivation for the source initiating the knowledge transfer process. One employee indicated: ‘My motivation to share my knowledge reflects on the benefits for the Company. So, I’m not going to share knowledge if it is not relevant for the recipient. In spite of the knowledge, it is fun to know... I will judge if the recipient obtains benefits to improve his performance. And if his performance will be better, it will be better for the Company. If not, I won’t share it’.

Based on the empirical data of the interviews, the following finding is done:

*Empirical finding 2: Within the Company, employees are not motivated to provide knowledge when they do not have knowledge self-efficacy. Thus, knowledge self-efficacy has a positive influence on the motivation to participate in the knowledge transfer process.*

As can be read in the knowledge self-efficacy phrase, the value (if knowledge self-efficacy is high or not) is based on the ability to identify which knowledge is relevant for the recipient. Therefore, the value of the construct is discussed in Chapter 3.2.3 (Ability constructs).



### *Organizational commitment*

Organizational commitment refers to the strength an individual's identification with, and involvement in a particular organization (Mowday, Steers, & Porter, 1979, p. 224). Organizational commitment within the Company is conceptualized by the perception the organization is good for the employees, employees are concerned how the Company is doing, employees are putting extra effort to make the Company succeed and employees tell other with pride about the Company.

All interviewees emphasize their commitment to the company. A most common indicator for organizational commitment is the employees are concerned about how the company is doing and therefore are motivated to contribute to this success. For example, one employee answered: Sharing knowledge... Am I doing it for myself? No. Am I doing it for another? Yes. Am I doing it for the company? Yes, I think it will contribute to the bigger goal we want to achieve'. Another example: 'I share my knowledge because I think it is important to improve as a company and not making the same mistakes again'.

Another example was found in the motivation of an employee: "I am motivated to share my knowledge because of brand identity. We have people who are good at sales, but we don't have people with experience in understanding every component in the business. For example, when we are at an event and people encounter a colleague. Then, a colleague could have no idea what he is talking about, it is simply embarrassing'.

Also, organizational behavior is recognized as innovative. This behavior leads to many new products, customers and projects. The achievement of those activities is regularly seen as to why employees are proud of the company. One employee argued: "I'm proud of what the company has achieved. And I'm feeling part of it because I've been here for a long time. I could tell really proud what the Company is doing, our successes, to enthusiasm other people'.

Furthermore, observations indicate a high level of organizational commitment. Employees are putting extra effort to contribute to the success of the company by sometimes working after worktimes and at the weekend. Also, employees share proud messages on their social media channels about achievements of the Company.

*Empirical finding 3: Within the Company, employees have a high organizational commitment. Therefore, they are motivated to perform extra-role activities, such as knowledge transfer behavior.*

### *Enjoyment of helping others*

The enjoyment in helping others refers to the employee's perception of pleasure through sharing knowledge (Lin, 2007, p. 140). The majority of the employees indicated they were fine with helping colleagues; however, they were not intrinsically motivated to perform the actions. Hence, many employees indicated they were only willing to participate in knowledge transfer when they thought it would be valuable for the company. In this line, employees felt enjoyment in helping colleagues, however, this enjoyment mainly arises of the thought that the source contributed to the company performance.

An inconsistently in the assumption above could be found in interviews of the support employees. They argued that their job was to help people. For example, the marketing support employee said: 'I really enjoy it when I could help people with their communication goals. The next time my help is asked again, I see the improvement of these employees, and my guidance is less needed. That is something I enjoy, because I know I have learnt them something. This indicates that they like and valuable the subject, otherwise they won't assimilate the knowledge. Also, it is always much more fun to provide positive feedback instead of being critical'. The empirical finding about enjoyment of helping others could be made:

*Empirical finding 4: Within the product divisions of the company, source units are enjoying helping others; however, this does not contribute to the motivation to participate in knowledge transfer process.*

According to Lin (2007), the construct of *enjoyment of helping others* is conceptualized by the enjoyment of *helping* colleagues by sharing knowledge and the enjoyment of *sharing* knowledge with colleagues. Although Empirical finding 4 indicate that enjoyment of helping others was not affecting the motivation to participate, it was found that it contributes to unconscious knowledge transfer behavior. Many employees indicated that they enjoy sharing their accomplishments (such as new customers and new features on the product) to their colleagues during informal activities (lunches, drinks, waiting at the coffee machine). When someone else overheard this knowledge and it would be relevant for them, the recipient started a knowledge transfer process. Thus, the enjoyment of the source to share his accomplishments in an informal context, could trigger a KT process, because employees know where the knowledge is located (transactive memory). Therefore, the following Empirical finding is done:

*Empirical finding 5: Within the employees of the company, the enjoyment of sharing accomplishments with colleagues in informal settings, affects the transactive memory of the recipient. Therefore, it increases the opportunities for employees to participate in the knowledge transfer process.*

#### *Extrinsic motivation*

In contrast to the intrinsic motivation factors, extrinsic motivation factors are found to a lesser extent. Some employees recognized that knowledge transfer participation leads to reciprocal benefits. They signaled that if they have shared knowledge with a colleague, the colleague often involves the source in new knowledge transfer activities when the recipients detect new valuable knowledge. However, it is said that is given is not seen as a motivation to start knowledge transfer processes.

The perception that employees would participate in knowledge transfer processes because of organizational rewards, such as promotion is turned down. Employees say that they are not feeling financially compensated when they share or acquire more knowledge. Also, because they do not feel the culture is based on power games (*Empirical finding 1*), they also do not feel that they are gaining power when they participate more in knowledge transfer activities. The following empirical findings could be made about extrinsic motivation factors:

*Empirical finding 6: Within the company, source units are not motivated by reciprocal benefits to participating in the knowledge transfer process*

*Empirical finding 7: Within the company, source units are not motivated by organizational rewards to participate in the knowledge transfer process.*

#### *Loss of value and bargaining power*

As indicated in the theoretical analysis, sources may perceive a loss of value or bargaining power when they share their knowledge (Husted & Michailova, 2002). Many interviewees indicated that they would not preserve their knowledge un purpose. Additionally, the level of trust did not impact this knowledge sharing. The perception was made, that knowledge preserving was unprofessional behavior and contradictory against the company interest. Some interviewees reinforce this proposition by saying there weren't any power games within the company. For example, a marketing support employee said: 'I think our company culture is based on helping each other and share things. Undertake actions instead of machismo behavior. I think our company culture is also determining our extend of sharing and openness'.

*Empirical finding 8: Within the company, source units do not preserve their knowledge to colleagues, because of they are afraid to lose value or bargaining power in the organization.*

#### *Perceived costs*

Another costs the source may perceive is the effort and time involved with knowledge transfer behavior (Wang & Noe, 2010). According to the interviewees, sources are perceiving time as costs for participating in knowledge transfer processes. Within the interviews, two general reasons were found; the time needed to locate the recipient (search costs) and the time to transfer the knowledge (transfer costs). Many interviews indicate that they do not know for who the knowledge is relevant (*Empirical*

*finding 2*). The motivation of the source to initiate the knowledge transfer process is low because of the high perceived costs and the low perceived benefits. Employees recognize knowledge transfer with other product divisions as pro-social behavior, which would not fall under the responsibility of the daily activities of employees. One interviewee said about organizing product training for his colleagues: “We are now on the point our product is becoming relevant. Before that, nobody wanted to consume our product. There were no requests. In this case, it is useless to invest effort in sharing”.

*Empirical finding 9: Within the company, source units perceive high costs with knowledge transfer process, because of search and distribution costs. Because the perceived benefits are low, the source is likely not to be motivated in knowledge transfer behavior.*

#### *Behavior of the recipient*

The previous empirical finding indicated the uncertainty of benefits when the costs of transfer are high. Employees indicated that, when someone in the organization asked for the knowledge, people were willing to make these costs. A reason for this could be given in the decreasing uncertainty of the recipient is going to use the knowledge. One employee said: ‘The statement is that I only provide knowledge when it is asked. Assuming the time and effort investment you really want that the knowledge is used. The initiation of the recipient decreases this uncertainty’.

In line with this statement, some interviews indicate the rejecting behavior of the recipient as a construct decreasing the perceived benefits of knowledge providing. One developer said: ‘We are all just stubborn people with a motivation to develop our own knowledge or doing even better’. In case the recipient initiates the knowledge transfer process, it shows the recipient is open for experiences from someone else. This increases the perceived benefits, because sources are stimulated to help colleagues to increase organizational performance. Therefore, the following statements could be made:

*Empirical finding 10a: Within the company, sources are motivated to participate in knowledge transfer process when the recipient initiates the process.*

Some interviews refer to the norm of acquiring knowledge if you need it. Because this perception, the sources are not likely to actively provide their knowledge with people for who the knowledge might be interesting. For example, a product manager said: ‘People know what my activities are. The case is not that I’m not willing to share my knowledge. I just do not put the effort into it. I don’t invest any effort in informing other people. When it is relevant, you will always find each other and then share the knowledge’. Therefore, the following empirical finding is made:

*Empirical finding 10b: Within the company, there is norm of knowledge transfer to obtain the knowledge by yourself. Therefore, sources are not motivated to actively provide knowledge to a recipient.*

### 3.2.2.2. Motivation constructs for the source and recipient

#### *Job-demand requirements for knowledge*

The last motivation related construct was the demand for knowledge transfer to perform their job. A common view among the interviewees was the high intrinsic motivation to perform their own job requirements. As stated before, employees within a product division are responsible for the development, launch and product performance of their product. Because the employees obtain high job autonomy, the employees are feeling responsible for their jobs.

The empirical data indicated that employees within the product divisions do not feel responsible for actively initiated their knowledge. One developer said: ‘Our goal is to make the best platform in the world. Divisions are contributing together to this goal. However, my focus or my contribution stays within the product divisions. Therefore, my knowledge stays also in the product divisions. Within my previous job as developer support, we had a we-feeling. Back then, we were the glue between the product divisions.

*Empirical finding 11: Within the product divisions, employees are less motivated to participate in knowledge transfer processes, because knowledge transfer is not required for their job.*

### 3.2.2.3. Motivation constructs of the recipient

#### *Preference of developing own knowledge*

The motivation of the recipient to initiate the knowledge transfer process was low because of the preference of developing own ideas and trying new things. A product manager said: ‘Developers feel an urge of sense to make develop their product and obtain grow. This urge of sense may be derived to emulate the success of Product A. This is something that is not determined by the management. It is the pure intrinsically motivation to develop something new and make the product successful. They just want to make something valuable’. Thus, because developers are intrinsic motivated to build and develop, they are not motivated to search or initiated the knowledge transfer process.

Also, it was found in the empirical data that the customer orientation of the employees resulted in a rejection of knowledge, which was provided through other product divisions. One product *manager* said: I’m led by our biggest customers. I prefer to obtain my knowledge from these clients because they are the users of our products. I’m receiving many internal ideas for the improvement of the product; however, I’m putting those on hold. This is because I could come up with the same ideas by myself. However, I want to hear from customers which improvements I have to make. Because those improvements make my job easier’. Based on the intrinsic motivation to develop own knowledge and the customer orientation, the following findings could be made:

*Empirical finding 12: Recipients working in product divisions, are less motivated to participate in the knowledge transfer process, because they are intrinsic motivated to develop own ideas.*

*Empirical finding 13: Recipients working in product divisions, are less motivated to initiate the knowledge transfer process because they do not feel that the knowledge is useful.*

#### *Perceived costs*

Interesting to see was that there were no statements made on the costs for the recipient. Within some interviews, phrases were said about why people do not acquire knowledge of other divisions. However, no one mentioned the perceived costs as a reason to not acquire this knowledge. Therefore, no findings were done on the perceived costs of recipients.

### 3.2.3. Opportunity constructs

To detect opportunity constructs, phrases were coded by using the following indicators: Tools, equipment, working conditions, actions of coworkers, leader behavior, mentorism, organizational policies, rules and procedures, information, time and pay (p. 562). In addition, the answers to question 5 of the interviews (See Appendix F), were used. Then, theoretical concepts obtained of Table 7 (theoretical analysis) were used to conceptualize the codes into a construct.

#### *Organizational support*

The first opportunity construct was organizational support, in the shape of a low extent of formalization. The degree of formalization refers to which jobs within the organization are standardized and the extent to which employee behavior is guided by rules and procedures (Chen & Huang, 2007). The empirical data showed a consistent value of a low extent of formalization. Interviewees indicated that there were no guidelines or rules to perform their jobs. The tasks of the job were often adjusted to other employees within the product division. The formation of the activities was often based on own interpretation. For example, one product manager said: ‘Projects derive from intrinsic motivation: you signalize something within the Company, it frustrates you, or you will see other people struggle. Then, I just want to improve it and I feel responsible for it’.

Thus, because of the low extent of formalization, employees have the freedom to perform extra-role behavior, such as knowledge transfer. Therefore, the following finding is done:

*Empirical finding 14: The employees within the company derive a low extent of formalization. Therefore, employees have the opportunity to participate in extra-role behavior. Therefore, they have the opportunity to initiate projects enhancing knowledge transfer or by providing knowledge to someone.*

*Knowledge accessibility*

The next construct encompasses the accessibility of knowledge. The accessibility of knowledge refers to the extent of access the recipient has (Borgatti & Cross, 2003). Within this construct, two indicators are detected: the accessibility on itself and the timely accessibility.

An important statement about knowledge accessibility could be made through the combination of interviews and observations: if you know where the knowledge is (transactive memory), it will be accessible for the recipient. This was confirmed by a majority of the interviews, indicating that they were not preserving their knowledge. In addition, if they were asked to provide the knowledge, they were motivated to do so (Motivation construct- recipient initiation).

The proposition of providing help when it is asked, is controlled by observations. 24 employees were asked to participate in the empirical analysis. All of the 24 employees were willing to spend 45 minutes (or more) to provide knowledge on knowledge transfer processes in the organization. An interesting finding was the presence of ties (and the content of those ties), did not affect the willingness of employees to provide face-to-face knowledge. In Table 14 the ties between the participants and the me are shown. This observation leads to the proposition that, despite of the (lack of) ties, employees are motivated to help the recipient, if the recipient requests.

**TABLE 13: OBSERVATION RESULTS INTERVIEWS**

	<b>Formal ties</b>	<b>Informal ties</b>
<b>Strong ties</b>	3	9
<b>Weak ties</b>	2	3
<b>No ties</b>		7

As stated in the *Empirical finding 10a*, sources are always willing to provide knowledge, if the recipient asks for this knowledge. Therefore, it is assumed that the lack of knowledge accessibility does not play a significant role in the limited knowledge transfer behavior. However, to detect the needed knowledge, transactive memory is needed (Subchapter 3.2.2.3).

*Empirical finding 15: Despite the lack of ties between the recipient and source, the recipient has to opportunity to access the knowledge. However, to identify the knowledge, transactive memory is needed.*

Transactive memory refers to the extent the recipient knows who knows what (Borgatti & Cross, 2003). According the empirical data, the transactive memory is mainly derived through informal contacts, overhearing updates at social gatherings (at the coffee machine, at the lunch table) and hearing updates of employees if they have reached something exited.

However, the lack of structural integration between product divisions decreases the transactive memory. Employees are mainly focused on the activities within their own divisions. Based on observations, it was recognizing that there are many developments in sales processes, customer projects, new features within the product. Therefore, it was hard to keep on track who possess which knowledge and who was performing a certain activity. For example, within the launch of a new service in Product A, an employee dedicated a lot of time on a competitive analysis of the new service. However, at the same time, marketing support was doing the same. This implicates that employees do not know what the other product divisions are doing. Therefore, they lack of transactive memory. The following empirical finding was made:

*Empirical finding 16: Because the rapidly changing processes, products and services, it is hard to stay up to date of the knowledge of each other. Therefore, employees between product divisions often do not know what knowledge is obtained. Therefore, there is a lack of transactive memory.*

#### *Time constraints*

As stated before, the time available refers to the extent to which an employee has slack time available at work (Siemsen, Roth, & Balasubramanian, 2008). This construct is conceptualized as the amount of free time and the workload employees are perceiving.

According to the interviews, time constrains are seen as a major barrier to participate in knowledge transfer processes. However, when the question was asked if more time would lead to more knowledge transfer among product divisions, the participants answered they won't. Therefore, it could be questioned if the improvement on time resources would improve the lack of knowledge transfer processes between product divisions in the company.

However, many interviewees acknowledge constrained resources, in particular, in time. Within the empirical analysis, two causes are detected for these constrained resources. The first refers to the low formalization of employee's tasks. The low formalization enables employees to participate in project which they are intrinsic motivated to do. This may lead that employees are involved in too many projects, which may lead to a lack of time availability.

The second cause is derived from the culture of the company. This culture is based on helping each other and providing knowledge when this is requested. However, these requested may distract employees to fulfill their job requirements. Therefore, they feel that there is less time left to perform the formal tasks. This leads to a perception of time availability.

Although it was discussed that the time constrains do not lead to a lack of motivation, it does result in a lack of opportunities. The lack of time may force employees to choose participating in informal activities, workshops, deep dives and other knowledge transfer activities. Because cross-division knowledge transfer often derived from overhearing and coincidence overhearing information, which would be interesting for the employee as well, they miss opportunities to obtain knowledge from other divisions. In summation, the following empirical finding was done:

*Empirical finding 17: Time constrains enhances the opportunity to get involved in informal activities, which are often the source of knowledge transfer initiations.*

#### **3.2.4. Ability constructs**

As stated before, data was groups in categories to get grip on the data. In order to do so, the following indicators were adopted from Blumberg and Pringle (1982): Ability, age, health, knowledge, skills, intelligence, level of education, endurance, energy level (p. 562). In addition, the answers to question 5 of the interviews (See Appendix F), were used. Then, theoretical concepts obtained from Table 8 (Theoretical analysis) were used to conceptualize the codes into a construct.

As stated in the theoretical analysis, the absorptive capacity improves the success of knowledge transfer. Within the empirical analysis, this ability is referred as knowledge self-efficacy (*Empirical finding 2*) According to the empirical data, employees face difficulties in identify recipient for which the knowledge is relevant. Employees of the Company indicate that the knowledge they need often differs from what is available in other product divisions. Also, employees are often facing difficulties in identifying value knowledge because product divisions often work in a paradigm, without telling or informing other people. This is caused by the independency of the product divisions, and the lack of overlap between the divisions. Therefore, knowledge which is obtained in a certain product division, often is not relevant in another division.

Therefore, the following empirical proposition is made:

*Empirical finding 18a: Because the divisions are working within their own systems and the overlap between divisions is small, it is hard to identify relevant knowledge which could be used in other product divisions.*

*Empirical finding 18b: Because the divisions are working within their own systems and the overlap between divisions is small, it is hard to identify relevant knowledge which could be used in other product divisions.*

### 3.2.5. Implications MOA-constructs

In the previous subchapters, the motivation, opportunity and ability constructs of the source and recipient are discussed. This subchapter focusses on the implication of the empirical findings, aiming to identify what the finding means in terms of barriers (current situation). The identification of the barriers is important, because it reflects to the reasons why there is limited knowledge transfer between the product divisions within the Company. Therefore, these barriers have to be taken away to improve the knowledge transfer behavior. Table 15 overviews the interpretations of the empirical findings on the MOA-constructs.

**TABLE 14: INTERPRETATION OF THE EMPIRICAL FINDINGS ON MOA-CONSTRUCTS**

EF	Construct	Impact on knowledge transfer process	Interpretation
2	Knowledge self-efficacy	Positive impact on the motivation of the source	Because the knowledge self-efficacy is often low (EF 18a), the lack of knowledge self-efficacy is seen as a barrier.
3	Organizational commitment	Positive impact on the motivation of the source	In the current situation, the value of the organizational commitment is high. Therefore, the are motivated to provide knowledge when they think it contribute to the organizational benefits. Therefore, in this situation, the lack of organizational commitment is not a barrier.
4	Enjoyment of helping others	No impact on the motivation of the source	Employees indicate that they enjoy helping others. However, this construct is not the reason to engage in the knowledge transfer process. Therefore, the enjoyment of helping others is not a barrier.
5	Enjoyment of telling achievements	No impact on motivation, increase opportunity	Employees indicate that they enjoy telling other colleagues about their achievements. However, they do not indicate this to their motivation to transfer. Therefore, the enjoyment of telling achievements is not a barrier.
6	Reciprocal benefits	No impact on the motivation of the source	Employees indicate that they receive an increase factor of reputation from their colleagues by participating in knowledge transfer processes. However, this is not seen as a reason to participate in knowledge transfer. Therefore, the lack of reciprocal benefits is not seen as a barrier.
7	Organizational rewards	No impact of the motivation of the source	In the current situation, the value of organizational rewards is low. Furthermore, employees do not feel they would participate more in knowledge transfer processes if they are rewarded by the company. Therefore, organizational rewards are no barrier.
8	Loss of value or bargaining power	No impact on the motivation of the source	Employees indicate that they do not perceive any costs in terms of losing value or bargaining power. Therefore, the loss of value or bargaining power is not a barrier for the source.
9	Perceived costs source	Negative impact on the motivation to initiate the knowledge transfer process	Employees indicate that the provision of knowledge involves the investment of time and energy. Therefore, the perceived costs are a barrier for the source to not initiate the knowledge transfer process.
10a	Recipient initiates	Positive impact on the motivation of the source	Employees indicate that if the recipient initiates the knowledge transfer process, by asking for knowledge. They are motivated to provide knowledge. In this way, the benefits exceed the perceived costs. Therefore, the lack of recipient initiation (see EF 11, 12 and 13) is a barrier in the knowledge transfer process.
10b	Norm of recipient initiating	Negative impact of the motivation of the source	Employees indicate that they expect the recipient to initiate the knowledge transfer process. Therefore, sources are not motivated to initiate the knowledge transfer process. This empirical finding strengths the lack of recipient initiation as a barrier.
11	Lack of job-demand requirement	Negative impact on the motivation of the source and recipient	Employees indicate that they are working independent from each other. Thus, knowledge transfer is not part on their formal job requirements and an extra-role behavior. Therefore, they do not feel responsible to participate in the knowledge transfer process. Therefore, the lack of job-demand requirement is seen as a barrier.
12	Intrinsic motivation to develop own knowledge	Negative impact on motivation for the recipient	Employees indicate that they are intrinsic motivated to use their own knowledge instead of reusing other knowledge. Therefore, the intrinsic motivation of the recipient to develop own knowledge is seen as a barrier.
13	Knowledge availability	Negative impact on motivation for the recipient	Employees indicate that the knowledge of the other product division is not applicable to them. Therefore, they are motivated to develop their own knowledge instead of reusing other's knowledge. This empirical finding strengths the barrier of the recipient developing his own knowledge (EF 12).

14	Formalization	Positive effect on the opportunity for the source and recipient	Employees indicate that the low extent of formalization enables them to participate in new projects and knowledge transfer behavior. Therefore, the low extent of formalization is not seen as a barrier.
15	Knowledge accessibility	Positive effect on opportunity for the recipient	Employees indicate that knowledge is accessible, even when there are no ties between the source and recipient. However, in order to identify the right knowledge source, transactive memory is needed (EF 16). Knowledge accessibility is not seen as a barrier.
16	Lack of transactive memory	Negative effect on the opportunity for the recipient	Employees indicate that they do not know what other colleagues are doing. Also, they do think that the knowledge in other product divisions is useful for them (EF 13). Therefore, recipients lack opportunity because they are not accessing the knowledge repositories. Therefore, the lack of knowledge accessibility is seen as a barrier.
17	Time constrains	Negative effect on the opportunity of the source and the recipient	Employees indicate time constraints as an important barrier, because it affects the opportunity to participate in knowledge transfer process. Therefore, time constraints are seen as a barrier.
18a	Lack of knowledge self-efficacy	Negative effect on ability of the source	Employees indicate that they are only motivated when they feel that the knowledge is relevant for the source (EF2). However, they lack knowledge self-efficacy because they do not know should be relevant for the recipient. Therefore, the lack of knowledge self-efficacy is a barrier to engage in the knowledge transfer process.
18b	Lack of absorptive capacity	Negative effect on the ability of the recipient	Employees indicate that do not initiate the knowledge transfer process, because they do not know if the knowledge is relevant for them. Therefore, the lack of absorptive capacity is a barrier to initiate the knowledge transfer process.

As can be read in Table 15, some MOA-constructs are seen as a barrier to not participate in the knowledge transfer process. In summation the following barriers are identified in Table 16:

**TABLE 15: IDENTIFIED BARRIERS ON KNOWLEDGE TRANSFER BEHAVIOUR**

#	Barrier	Unit	Category	Derived from
1	Lack of knowledge self-efficacy	Source	Motivation/ability	EF 1 and 18a
2	Lack of absorptive capacity	Recipient	Ability	EF 18b
3	High perceived costs	Source	Motivation	EF 9
4	Preference of developing own knowledge	Recipient	Motivation	EF 12 and 13
5	Lack of job-demand requirement	Source and recipient	Motivation	EF 11
6	Lack of knowledge accessibility	Recipient	Opportunity	EF 15 and 16
7	Time constraints	Source	Opportunity	EF 17

Also, Table 15 identified a barrier of the recipient not initiating the knowledge transfer process (*Empirical finding 10a and 10b*). However, it is assumed that this barrier is caused by the lack of ability (absorptive capacity), the lack of motivation (preference of developing own knowledge) and the lack of opportunity (lack of knowledge accessibility) of the recipient. Therefore, the assumption is made that the improvement of these barriers will likely result in the recipient initiation the knowledge transfer process.

### 3.3. Practical CIMO-logics

As stated in the introduction, this thesis aims to design a solution for the Company to improve knowledge transfer behavior. This subchapter focusses on the practices in the Company which was executed. The input of these practices was gained through interviews and observations.

#### 3.3.1. Cross-division customer

According to the empirical analysis, many customers of the Company are only using products of one product divisions. This could be cause by the organizational structure of the Company. Because product divisions aim to improve their product performance, sales employees are generally focused on selling one product. However, the interviewees of Division D and F emphasized the importance of cross-division customers. They argue that the combination of multiple products enhances the unique selling point of the Company.

According to the empirical data, the a cross-division customer improves the social dimensions by creating ties and improving common knowledge. For example, the one employee of Division F said; We started customer projects with Divisions D. In the beginning, there was too little communication.



This has led to the customers speaking with four different employees of the Company, to get what he wanted. We have learned from this experience and we are trying to meet up more and go through the status of our joined customers. So, everyone is aware of the current customers in the pipeline'. Therefore, the following CIMO-logic could be made:

*Practical CIMO-logic 1: Within the Company (C), the introduction of a cross-division customer (I), will increase the common knowledge between the source and recipient (O), because the customer project increases the ties strength between the divisions (M).*

Also, it was found that knowledge transfer processes were stated based on customer requests. One employee said: 'Ties are initiated because a customer demands for products of multiple divisions. Therefore, the following CIMO-logic could be made:

*Practical CIMO-logic 2: Within the Company (C), the introduction of a cross-division customer (I), will increase the motivation for the recipient to initiate the knowledge transfer process (O), because the recipient is motivated to satisfy the customer (M).*

### 3.3.2. Centralized positions

According to the empirical analysis, the majority of the product divisions do not have a centralized position in the Company. However, empirical data implicates the role of centralized positions in the organizations. This position was found in the support teams of the Company. It was suggested that support departments (such as marketing or sales) had created an overview of the activities within the product divisions. Therefore, the following CIMO-logic could be made:

*Practical CIMO-logic 3: Within the Company (C), the introduction of a centralized position (I), will increase the ability of the employees to participate in knowledge transfer behavior (O), because they obtained a more generalized view within the Company (M).*

*Practical CIMO-logic 4: Within the Company (C), the introduction of a centralized position (I), will increase the opportunity of the employees to participate in knowledge transfer behavior (O), because they know what activities are performed within the product divisions (M).*

### 3.3.3. Social activities

According to the empirical analysis, the Company facilitates social activities, such as lunches, drinks, company vacations. Therefore, the following CIMO-logic is made:

*Practical CIMO-logic 5: Within the Company (C), the facilitation of social activities (I), will increase the opportunity for the recipient (O), because is enhances the access of knowledge (M).*

### 3.3.4. Training

The company facilitates trainings for employees to increase their skills and knowledge. Therefore, the following CIMO-logic is made:

*Practical CIMO-logic 6: Within the Company (C), the introduction of a training (I), will increase the common knowledge between the source and recipient (O), because the knowledge base of the recipient is likely to be improved (M).*

## 4. Synthesis

This chapter combines the theoretical insights obtained from Chapter 2 with the empirical insights obtained from Chapter 3. The synthesis has two objectives. The first objective is to build the theoretical framework of the current situation (Phase II- Model of What “is”). The second objective is to build a theoretical framework on the desired situation (Phase III- Model of What “could be”).

### 4.1. Synthesis of Phase II: Model of What “is”

This subchapter discusses the underlying mechanisms of the six barriers identified in Chapter 3.2. The objective of this theoretical framework is identifying the underlying mechanisms, explaining *why* these barriers occur. The underlying mechanisms are discussed through the combination of social network dimensions and MOA-constructs. In order to do so, the parameters of the social network dimensions could be identified. The identification of those parameters is important, because it displays the current value of social dimensions of the relationships. Thus, in the upcoming subchapters, the eight barriers are discussed, including their social dimension values and underlying causes.

#### 4.1.1. Barrier 1: The lack of knowledge self-efficacy of the source

The first barrier to discuss was the lack of knowledge self-efficacy of the source. For many employees the knowledge transferred should be relevant for the recipient. The extent of knowledge self-efficacy refers to the belief of the source to possess knowledge that would be relevant for other divisions (Lin, 2007). The lack of knowledge self-efficacy results in the lack of motivation of the source, because the time invested in knowledge transfer does not lead to any benefits for the recipient or organization. This finding was found in both the theoretical data (*Theoretical proposition 3*) and the empirical data (*Empirical finding 2*). Therefore, the following validated proposition could be made:

*Validated proposition 1: Sources who are performing in product divisions, may perceive a lack of motivation to provide their knowledge when they lack knowledge self-efficacy. In this case, the source is not able to estimate if the organizational benefits exceed the perceived costs of knowledge transfer.*

Adopting the Theoretical propositions of 17, 18 and 19, the lack of knowledge self-efficacy is caused by the lack of common knowledge, the lack of formal or strong ties, or the lack of a centralized position within the organization. These social constructs are discussed, and their context-related factors are discussed in the upcoming paragraphs.

##### *Structural dimension: Lack of centralized position*

Theoretical proposition 19 identified the lack of knowledge self-efficacy as the result of the lack of a centralized position of the source. Hence, if the source lacks a centralized position, he is likely to obtain his knowledge with a narrow focus, without considering other perspectives (Reagans & McEvily, 2003). Therefore, the knowledge base of the source is specialized and the chance of overlapping with another division is small. This is confirmed by Empirical finding 13, which indicated that the knowledge of one product division was not applicable at another division. Therefore, the following validated proposition could be made:

*Validated proposition 2: The lack of knowledge self-efficacy of the source, is likely to be caused by the lack of a centralized position, of the source. This results in a specialized knowledge base of the source, which is not applicable for other divisions.*

##### *Relational dimension: Lack of strong and formal ties*

Theoretical proposition 18 identified the lack of knowledge self-efficacy as the result of informal or weak ties. Hence, when the source and recipient lack of frequent, in-depth communication and coordination, they are not capable to identify each other strengths and expertise (Aalbers, Dolfsma, & Koppius, 2014). As a result, they lack a common knowledge base. This cognitive dimension is discussed in the next paragraph.

#### *Cognitive dimension: Lack of common knowledge*

Theoretical proposition 17 identified the lack of knowledge self-efficacy as a result of the lack of common knowledge. Hence, the extent of common knowledge resulted in recognizing and understanding activities within the other opponent (Cohen & Levinthal, 1990). This is facilitated by the ability to understand the context-related variables from each other (Szulanski, 2000). As a result, the source could identify a gap in knowledge at the recipient side (Reagans & McEvily, 2003). Therefore, the source has the ability to provide his knowledge to fill this gap, which would lead to an enhanced knowledge repository of the recipient. This lack of common knowledge could be caused through the specialization of the product division (Willem, Buelens, & Scarbrough, 2006). Product divisions in the Company are deriving their knowledge from the market, enabling the creation of high specialized products to satisfy the customers of the division (Empirical finding 13). Therefore, the following cause-effect relation is found:

*Validated proposition 3: The creation of knowledge through the interaction with customers results in specialized divisions. This results in a lack of overlapping knowledge and thus the lack of common knowledge. Therefore, the source does not have the ability to identify relevant knowledge for the recipient unit. This results in a lack of motivation, because the source does not want to invest time, without knowing if the recipient or the organization as a whole will benefit from the knowledge.*

#### **4.1.2. Barrier 2: Lack of absorptive capacity**

Barrier 1 discussed the lack of knowledge self-efficacy of the source. According to the synthesis, the lack of knowledge self-efficacy is based on the lack of a centralized position, the lack of common knowledge and the indirect lack of formal ties. According to the Theoretical propositions 20, 21 and 22, these causes also apply the lack of absorptive capacity of the recipient. Therefore, the causes of these barriers are not further discussed. There are overlapping with the first barrier. Therefore, the following validated propositions are made:

*Validated proposition 4: The lack of absorptive capacity of the recipient, is likely to be caused by the lack of a centralized position, of the recipient. This results in a specialized knowledge base of the recipient; therefore, the recipient needs complex knowledge to fulfill his knowledge gap.*

*Validated proposition 5: The creation of knowledge through the interaction with customers results in specialized divisions. This results in a lack of overlapping knowledge and thus the lack of common knowledge. Therefore, the recipient does not have the ability to identify relevant knowledge for the recipient unit.*

#### **4.1.3. Barrier 3: High perceived costs of the source**

As discussed in *Empirical proposition 1*, the Company is operating in a low extent of hostility. According to Husted and Michailova (2002), the extent of hostility determines the reasons for the source and the recipient to participate in knowledge transfer behavior. In case of low hostility, the relationships are based on common trust and interest (*Theoretical proposition 2*). Therefore, a source may be motivated to provide knowledge in a knowledge transfer process when they perceive the benefits higher than the perceived costs (*Empirical finding 9*). Therefore, the following validated proposition could be made:

*Validated proposition 6: The Company is operating within a low extent of hostility between the source and recipient; the lack of motivation of the source is caused by the perception of higher costs than perceived benefits.*

#### *Cognitive dimension: Lack of common knowledge*

As discussed in Barrier 1, the lack of common knowledge was projected as decreasing the ability of the source to identify relevant knowledge for the source. However, the lack of common also decreases the motivation of the source by increasing the perceived costs. Based on theoretical proposition 8a, the lack

of common knowledge also results in the need to transfer much context-related knowledge, to explain the cause-effect relations of the knowledge transferred. Therefore, the transfer requires a higher investment in terms of time and effort. Therefore, the following validated proposition is made:

*Validated proposition 7: The lack of common knowledge might increase the perceived costs, because many context-related variables need to be transfer, to enhance successful knowledge transfer. Therefore, the lack of common knowledge negatively effects the motivation to transfer, by increasing the perceived costs.*

#### 4.1.4. Barrier 4: Preference to develop own knowledge

Empirical finding 12 and 13 indicated that individuals prefer to develop their own knowledge rather than using other knowledge. Therefore, the recipient lack of motivation to initiate the knowledge transfer process (Empirical finding 10a). According to the Theoretical proposition 11, this is caused by the lack of transactive memory. However, the empirical analyses indicated another cause of this barrier; the opportunity arrived from job autonomy. The two causes are discussed in the paragraphs below.

##### *Cognitive dimension: Lack of transactive memory*

As stated in *Theoretical proposition 11*, individuals prefer to develop their own knowledge, because they perceive that the knowledge in other product divisions is not applicable for them. This proposition is validated by *Empirical finding 13*. Which indicates that in order to create value knowledge, their own customers are used. This is because the knowledge created through customer interaction is likely to contribute directly to the product performance of the division. Therefore, the following validated proposition could be made:

*Validated proposition 8: Recipients are more motivated to develop their own knowledge, because they assume that knowledge created in other divisions is not useful for them. Therefore, they lack of transactive memory.*

##### *Organizational characteristics: low extent of formalization*

According to Empirical finding 12, employees are operating with a low extent of formalization. Therefore, they have the freedom to perform their job as they prefer. Within this Empirical finding, it was indicated that they were intrinsically motivated to devote all their time to the improvement and selling of their own product (division). This process is guided by the opportunity of the employees to make mistakes and perform entrepreneurial behavior. Therefore, the following validated proposition could be made:

*Validated proposition 9: Recipients are more motivated to develop their own knowledge, because they are intrinsically motivated to build and sell their own product.*

#### 4.1.5. Barrier 5: Lack of job-remand requirement

As stated in *Empirical finding 11*, employees within product divisions are not motivated to participate in knowledge transfer because the transfer is not needed to perform their job. This construct was not found in the theoretical analyses. However, with the help of *Theoretical proposition 10* (Shared goals) and *theoretical proposition 6* (lack of formal ties), this barrier could be explained.

##### *Cognitive dimension: lack of shared goals*

Knowledge transfer between product teams is seen as a pro-extra behavior, which is not needed to reach their performance goals (*Theoretical proposition 11*). According to *Empirical finding 11*, employees are focused to performing activities to achieve their product performance goals. However, because the decentralization of the product divisions, the product divisions all have their own goal. Therefore, the lack of shared goals. Thus, the following validated proposition could be made:

*Validated proposition 10: The lack of employees to participate in knowledge transfer processes is likely to be caused by the lack of shared goals, because the product divisions aim to different goals. Because*

knowledge transfer does not directly contribute to their own product performance, they are less likely to be motivated to invest time in this process.

*Relational dimension: lack of formal ties*

Formal ties are ties which are needed for employees to perform their job. In this way, units are depending on each other to full fill their job. In this way, employees could be more motivated to participate in knowledge transfer, because it might increase the easiness of their jobs.

*Validated proposition 11: The lack of employees to participate in knowledge transfer processes is likely to be caused by the lack of formal ties, because the product divisions are working independently from each other. Therefore, they are not depending from the performance of the other product division.*

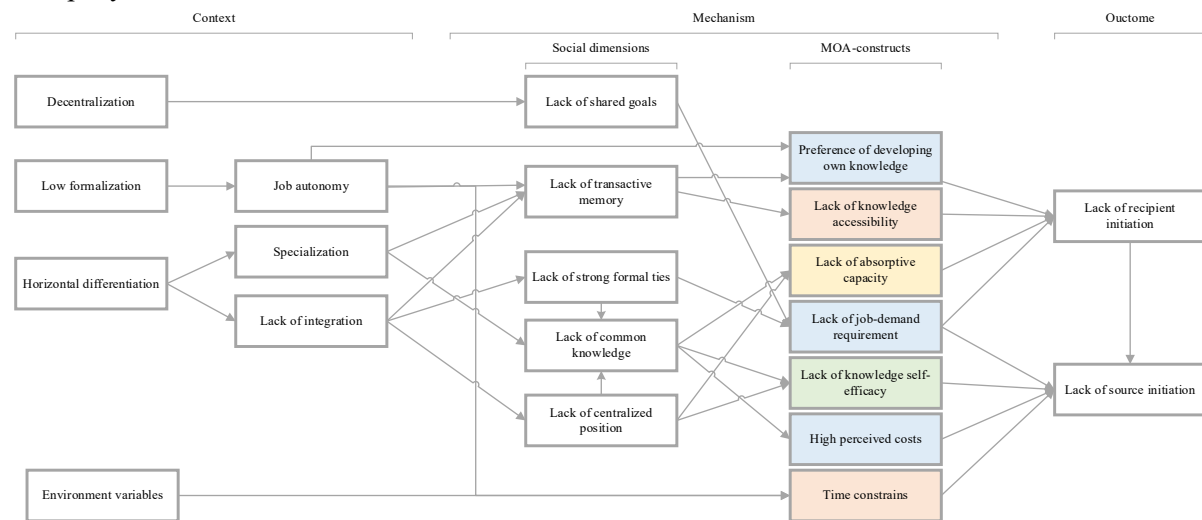
**4.1.6. Barrier 6: Time constraints**

Empirical finding 17 reflects on the time constraints the employees are facing. As stated in the empirical analysis, this barrier is caused by the low extent of formalization and environmental variables. However, there are no mechanisms found which indicate an improvement of social dimensions to decrease time constrains. Therefore, this barrier is neglected from this research.

**4.2. Phase II: Model of What “is”**

Figure 16 shows an overview of the barriers (indicated as MOA-constructs) and the causing social dimensions. These cause-effect relationships are derived from the validated propositions in the previous subchapter (Subchapter 4.1). This figure aims to answer the following research question:

**RQ5:** Which barriers and underlying constructs explain the lack of knowledge transfer behavior of the Company?



**FIGURE 15: MODEL OF WHAT “IS”**

As can see in Figure 16, the following social dimensions are causing the eight barriers. Based on the figure above, the following conclusion about the current situation could be made:

*Source and recipient units within the company are not engaged in knowledge transfer processes because: the prefer to develop their own knowledge, they lack of knowledge accessibility, the lack of absorptive capacity, they lack of job-demand requirements, they lack of knowledge self-efficacy, they perceive high transfer costs and they are facing time constraints. This is cause because the source and recipient lack of shared goals, lack of transactive memory, lack of formal ties, lack of common knowledge and/or lack of a centralized position in the organization. These dimensions of relationships are cause by the organizational structure (decentralization, low formalization, horizontal differentiation) and environmental variables.*

## BOX 4: CONCLUSION CURRENT SITUATION IN THE COMPANY

### 4.3. Phase III: Model of “what could be”

In this phase, the theoretical model of the desired situation is discussed. As discussed in the research methodology, the model is based on science-based design principles. Within this approach, design principles are used to bridge the practice and the scientific literature (Van Burg et al., 2008). Also, this thesis assumes the positive impact of social relations and his dimensions.

This chapter answers the following research question:

**RQ<sub>6</sub>:** Which design principles could be made, which are both grounded and field-tested?

#### 4.3.1. Methodology

This subchapter discusses the methodology of how the desired solution and the design principles are determined.

##### *Desired situation*

Within Phase III, the desired situation to improve knowledge transfer processes within the company are discussed. As can see in Box 4, there are four social five social dimensions which explain the five within the company. Thus, the goals are to improve the social dimensions. Therefore, the design principles are based on the improvement of shared goals, transactive memory, formal strong ties, common knowledge and a centralized position.

##### *Design principles*

Within the synthesis, design principles are produced. Design principles are defined as tested in the practices as well as grounded in the existing body of research (Van Burg et al., 2008, p.118). The design principles are produced based on practice-based principles (derived from practice) and research-based principles (based on scholarly knowledge). The involvement from both theory and empirical context aims to build a bridge between the academic world and the world of practitioners (Van Aken & Berends, 2018).

Practices-based principles are principles, obtained from the practice which indicate interventions which are made in the organization, and their effect on the motivation, opportunity and ability of individuals to participate in knowledge transfer behavior. Also, the underlying mechanisms of these interventions are explained by the science-based principles. These principles are extracted from the theoretical background in Chapter 2.3. The combination of both practice-based principles and science-based principles enables an explanation of mechanisms with scientific literature in a certain context (Van Burg, Gilsing, Reymen, & Romme, 2008). These design principles are discussed in Chapter 4.3.2.

Subsequently, the definitive design principles arise by combining the CIMO-logics to one. Some of the practice-based principles where not (yet) found in the theory. However, because of time constraints, there were no further researched and neglected from the research.

##### *Possible interventions*

To identify the possible interventions, both theoretical and empirical data is used. In the following two paragraphs, the methodology of those two inputs are discussed.

In Chapter 2, the methodology of the systematic literature review is explained. During this search to relevant literature, many articles were found indicating possible solutions to enhance knowledge transfer. Thus, during the systematic literature review, interesting articles were written down. Then, the articles were read during this phase.

Also, empirical data has been used as input for the interventions. This has been done by observations and the interviews. Within the observations, examples of interventions were chosen to see how this was affecting the knowledge transfer process. Furthermore, during the interviews; it was asked if the

participants has any examples of social dimensions (such as trust, shared goals) were used to enhance the knowledge transfer process. These results were discussed in Chapter 3.3.

### 4.3.2. Design principles

In the following subchapters, the design principles are discussed. These design principles aim to improve the social dimensions, as discussed in Chapter 4.2.

#### 4.3.2.1. Design principle 1: Improvement of shared goals

As stated in the *Empirical finding 11*, product divisions are aiming to improve the product performance of the indicated product divisions. However, this research aims to improve knowledge transfer between product divisions, therefore, the source and recipient are not aiming the same goal. As stated in Phase II; this has a negative effect the job demand requirement of their jobs. Therefore, they are less motivated to engage in the knowledge transfer process. According to the empirical and theoretical analyses; shared goals could be reached by a change in the work design, performance appraisal and compensation (Cabrera & Cabrera, 2005). These interventions are discussed in the following paragraphs.

##### *Interventions through changing the work design*

As discussed in the empirical CIMO-logic 1, individuals are motivated to engage in the knowledge transfer process when a customer request multiple product from different product divisions. In this way, helping this customer would contribute to both the product performance of the source and recipient. Therefore, cross-divisions teams are seen as an applicable intervention to improve the knowledge transfer process. Thus, the following CIMO-logic could be made:

*CIMO-logic 1: In the case the source and recipient are motivated to improve their own product performance (C), the introduction of a customer project team (I), is likely to increase the motivation of the source and recipient to engage in knowledge transfer process (O), because the activity will contribute to both the product performance of the source and the recipient (M).*

##### *Interventions through the change of performance appraisal and compensation*

In the current empirical situation, individuals within the company aim to maximize their product division. This is because the product divisions are decentralized. However, when the company introduce company goals in stead of product goals, the source and recipient focus on the same goals. Therefore, the following CIMO-logic could be made:

*CIMO-logic 2: In the case the source and recipient are motivated to improve their own product performance (C), the introduction of overall company goals (I), is likely to increase the motivation of the resource and recipient to engage in the knowledge transfer process (O), because they contribute to the same goal (M).*

#### 4.3.2.2. Design principle 2: Improvement of transactive memory

As stated in Empirical finding 16, the company may lack of opportunity, because employees do not always know who knows what. Therefore, the following design principle is based on the improvement of transactive memory. Transactive memory could be improved a change in the work design, interventions based on training and the facilitation of technology. These interventions are discussed in the following paragraphs.

##### *Interventions through changing the work design*

Transactive memory is facilitated by ties in the organization (Theoretical proposition 14). As stated in the theoretical analyses, ties differ in informal and formal ties. The work design reflects to the formal ties, based on the organizational structure. Thus, in order to create formal ties between product divisions, a change in work design is needed. Within the empirical analyze, two interventions are detected; the introduction of a centralized position and the introduction of cross-division teams.

As stated in the theoretical analysis, units with a centralized position in an organization, are often aware of many knowledge repositories and therefore have created a broad view of knowledge. Centralized positions could be made through the set-up of integrating roles or departments (Mintzberg, 1992). Therefore, the following CIMO-logics are derived

*CIMO-logic 3: In the case an organization structure by product divisions (C), the introduction of integrating departments (I), enhances the ability to detect value knowledge (O), because this department overviews the knowledge within multiple divisions (M).*

*CIMO-logic 4: In case the source and recipient do not know what other individuals know (C), the introduction of cross-division teams (I), may increase the opportunity through the improvement of transactive memory (O), because it will improve the coordination because the establishment of formal ties (M).*

#### *Interventions through training and development*

As stated in the previous intervention, transactive memory could also be enhanced by informal ties. According to Empirical CIMO-logic 5, informal ties could be created by socialization activities. According to the observations, the Company invests in many socialization activities, such as informal drinks, company lunches company vacations, sport activities. According to this proposition, these informal activities are the source of ‘overhearing’ from each other activities. In this way, individuals are getting up to date what employees are doing. Therefore, the following CIMO-logic is proposed:

*CIMO-logic 5: In case of the source and recipient do not know what, other individuals know (C), the introduction of socialization activities (I), may increase the transactive memory (O), because they overhear the activities of other employees (M).*

As stated in Empirical finding 14, employees within the company derive a low extent of formalization. Therefore, employees have the freedom to determine their tasks. Since knowledge is created through experiences, the performed tasks are important to determine which knowledge is obtained (Argote & Miron-Spektor, 2011). However, when the employees are not aware of the tasks of the other employees, they lack of transactive memory. Therefore, a training aiming to work process is likely to enhance the transactive memory. In this way, employees are less likely to perform the tasks as they think is good. Therefore, the following CIMO-logic is made:

*CIMO-logic 6: In case the source and recipient do not know what other individuals know (C), the introduction of formalization trainings (I), could enhance the opportunity to engage in knowledge transfer process (O), because function titles will indicate the activities they perform and therefore, it is easier to detect what an individual should know (M).*

#### *Intervention through Technology*

Furthermore, the theoretical analysis emphasis the supporting role of technology in the personalization strategies (Hansen et al., 1999). For example, the introduction of a system where individuals could find characteristics of individuals (such as education, department, responsibilities, experiences), could improve the transactive memory. Therefore, the following CIMO-logic could be made:

*CIMO-logic 7: In an environment where employees have to freedom to decide their own job responsibilities (C), the introduction of characteristic database (I), enhances the transactive memory (O), employees have the opportunity to share their experiences and capabilities (M).*

#### **4.3.2.3. Design principle 3: Improvement of strong ties**

Recipients are likely to initiate the knowledge transfer process when they have strong relations outside the division (Hansen, Mors, & Lovas, 2005). These strong relations enable the recipient to identify value knowledge, because the source and recipients have gained common knowledge base (Aalbers, Dolfsma, & Koppius, 2014). Furthermore, strong ties occur when the source and recipient are in contact for at least two times a week (Murray, Rankin, & Magill, 1981). The intervention to facilitate



workplaces within the same room or facilitate formal ties by introducing a common goal (CIMO-logic 1) are recognized as interventions to stimulate the recipient to initiate the knowledge transfer process. Therefore, the following CIMO-logics are proposed:

*CIMO-Logic 8: In the case the motivation is not willing to initiate the knowledge transfer process (C), the introduction of strong ties between the source and recipient (I), will may increase the probability the recipient initiates the knowledge transfer process (O), because it enhances the ability of the recipient to identify valuable knowledge (M).*

Also, the introduction of strong ties between the source and recipient also enhances the knowledge self-efficacy of the source. Therefore, the following CIMO-logic is proposed:

*CIMO-logic 9: In the case the initiation of the source is needed (C), the introduction of strong ties (I), increases the motivation of the source (O), because the source has the ability to determine if the knowledge is valuable for the recipient (M).*

#### 4.3.2.4. Design principle 4: Improvement of common knowledge

As can read in Chapter 4.2, the lack of common knowledge between the source and recipient causes a lack of knowledge self-efficacy (Barrier 1), high perceived costs for the source (Barrier 2), and the lack of absorptive capacity (Barrier 8). Also, because the improvement of common knowledge decreases the high perceived costs, the barrier of time constraints is weakened (Barrier 7). In the following paragraphs, the following interventions are discussed; work design, staffing, training, and development.

##### *Intervention through work design*

As discussed in theoretical proposition 18; the source and recipient increase their common knowledge base when they create strong ties. Strong ties are shaped through formal ties. Adopting the theoretical analyses, formal ties are shaped through formal job requirements. Thus, in order to change the formal job requirements, the work design has to be changed. Within the empirical data, this has been done by customer projects (Empirical CIMO-logic 1). Therefore, the first intervention is based on the change of the work design for the employees:

*CIMO-logic 10: In the case the source and recipient lack of common knowledge (C), working in a customer project team (I), is likely to increase the absorptive capacity of the recipient (O), because it increases the common knowledge. Therefore, the recipient understands the context-related factors of the knowledge of the source and increases the ability to identify valuable knowledge (M).*

##### *Intervention through staffing*

As discussed in the theoretical proposition 8, people with the same education share common knowledge. Therefore, the second intervention is based on the employment of people with the same education. Therefore, the second intervention discusses the possibility of employment of employees with the same education:

*CIMO-logic 11: In the case the source and recipient lack of common knowledge (C), the employment of people with the same education (I), is likely to increase the absorptive capacity of the recipient (O), because it increases the common knowledge. Therefore, the recipient understands the context-related factors of the knowledge of the source and increases the ability to identify valuable knowledge (M).*

##### *Intervention through training and development*

As discussed in Empirical CIMO-logics, product divisions could increase their common knowledge by training the opponent unit. Therefore, the third intervention discusses the possibility of training as an intervention.

*CIMO-logic 12: In the case the source and recipient lack of common knowledge (C), the introduction of training (I), is likely to increase the absorptive capacity of the recipient (O), because it increases the*

*common knowledge. Therefore, the recipient understands the context-related factors of the knowledge of the source and increases the ability to identify valuable knowledge (M).*

#### 4.3.2.5. Design principle 5: Improvement of a centralized position

The improvement of a centralized position is done by the improvement of integration between product divisions. This can be done by interventions based on the work design.

##### *Interventions on work design*

A centralized position can be achieved through the introduction of interdependencies between product divisions. In the current situation, the product divisions are self-managing. Therefore, the product divisions are able to reach their product performance without integration of other product divisions. However, when project teams are introduced, the performance of the team relies on the integration of the product teams. Therefore, the following CIMO-logic could be made:

*CIMO-logic 13: In case the product divisions are independent from each other (C), the introduction of customer project teams (I), will improve the centralized position of the divisions (O), because their knowledge is generalized (M).*

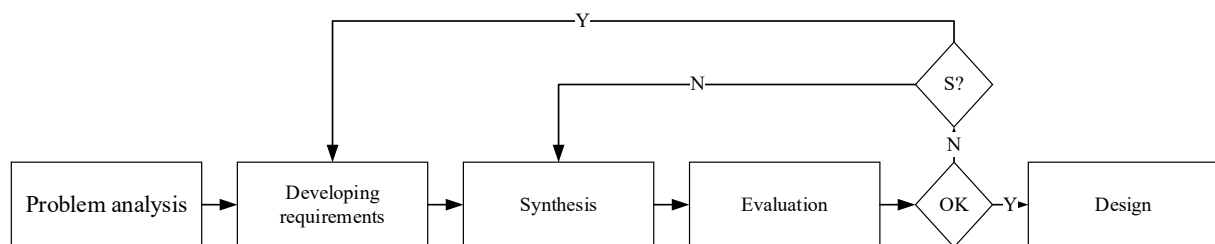
## 5. Solution design

This chapter elaborates on a solution design, aiming to improve knowledge transfer behavior in the Company. As discussed in the introduction, a field problem refers to a situation that in relation can or should be improved to enhance business performance (Van Aken & Berends, 2018). This improvement is made by proposing the desired situation, elaborated in solution design. Thus, this chapter implicates the key to the research, focusing on the research objective:

*This research aims to develop a solution design to increase the knowledge transfer behavior of individuals between product divisions of the Company.*

### 5.1. Solution design methodology

The solution design is built, guided by the following steps:



**FIGURE 16: ACTIONS IN ITERATION DESIGNING ARTEFACT, SOURCE: VAN AKEN AND BERENDS (2018, P. 210)**

The design process starts with a problem analysis. As stated before, the problem analysis reflects on the gap between the current situation and the desired situation, aiming to improve business performance (Van Aken & Berends, 2018). Subsequently, the developing requirements are made. These requirements reflect on the demands the desired situation should meet. Furthermore, the synthesis reflects on the elaboration of the empirical and theoretical propositions, combined with the design principles.

A core component in this design science is the development of a solution, offering interventions professionals could take to address the field-problem (Van Aken & Berends, 2018). In particular, solution-oriented compasses generic solutions for types of field problems, together with their indications and contradictions, as well as support on when and how to apply them in the field (Van Aken & Berends, 2018, p. 225). These generic solutions aim to create a prediction of how, and if, the interventions will lead to de desired outcome. Also, the solutions are generalized. Therefore, it is assumed that the solutions can be applied in a range of problems. This applicability gives the opportunity to test the generic solutions, resulting in an increase in support for the interventions. The obtained evidence results in a higher perception of the quality of the solutions (Van Aken & Berends, 2018).

#### *Design parameters*

Chapter 4.2 describes, with the help of CIMO-logic, the interventions needed to trigger a mechanism, which results in a desired outcome. These interventions are also recognized in a solution design; however, they are called parameters in here. Parameters are the variables which can or will change, to create the desired situation (Reymen, 2017). These parameters have a certain value (such us parameter is communication, and value is low), which define the effect of the solution. The right set of these parameters eventually decides the most preferred solution of the Company (Baldwin & Clark, 2000).

The usage of parameters could lead to elaborate the design on a detail level (Van Burg, 2011). In this way, the role of the parameters in the design could be determined. This role is important to discover contradictions, and to determine if the design would have the desired effect. This would help in design decision making, which solution would be the best solution for the Company (Reymen, 2017).

In this thesis, the parameters, their current, and desired value have to determine the most appropriate solution for the Company. An overview of the determination of the parameters and the values are shown in Table 17.

**TABLE 17: DETERMINATION OF PARAMETERS AND VALUES (REYEMEN, 2017)**

<b>Determination parameters</b>	<b>Determination values</b>
Empirical analysis: the identification of the barriers in Chapter 3.2.	Theoretical analysis (Chapter 2.3) – preferred situation
Theoretical underpinning theories of the social network perspective (Chapter 2.3)	Empirical analysis (Chapter 3.2) – current situation
Design requirements (Chapter 5.3)	Practical CIMO-logics (Chapter 3.4) – preferred situation

## 5.2. Central research question

As stated in the introduction, the solution design aims to solve the following question:

*How should the Company improve the limited individual knowledge transfer behavior between product divisions?*

## 5.3. Developing design requirements

This subchapter answers the following research question:

**RQ7:** What are the design requirements for the proposed solution design?

As stated before, the design requirements reflect on the demands the realized design has to meet. According to Van Aken and Berends (2018), four types of requirements have to be taken into consideration; functional requirements, user requirements, boundary conditions, and design restrictions. The input for the requirements is derived from theoretical research, empirical research (interviews and observations), and general requirements given by Van Aken and Berends (2018).

### *Functional requirements*

Functional requirements constitute the performance demands on the design (Van Aken & Berends, 2018). These requirements are obtained from the design principles in Chapter 4. The following functional requirements are elaborated:

- The implementation of the design should improve knowledge transfer
- The implementation of the design should involve social relationships
- The implementation of the design should increase the motivation, opportunity and/or ability of the source and recipient.
- The implementation of the design should improve the structural, relational and/or cognitive dimension of social relationships.

### *User requirements*

The user requirements constitute the requirements adopted from a user's point of view.

- The design has to be easy to adopt by the users (a small change in behavior).
- The design for coordination has to be valuable for the users.
- The design has to be clearly communicated with the users.
- The solution design fits in the time restrictions of the employees (Barrier 6).

### *Boundary conditions*

Design specifications from a more general point of view.

- The design should fit within the present flat company culture.
- The design should fit in low formalization and decentralization.
- The design should be implemented within the headquarters of The Company.
- Participation within the solution has to be voluntary.

- The design should be implemented within the current knowledge management systems and communication tools.

*Design restrictions*

Restrictions to determine the best solution

- The realization of the solution should change as little as possible in the present business system.
- The design should be supported by the management team of the Company and its employees.

## 5.4. Design parameters

This subchapter focusses on the parameters which are likely to change when a certain intervention is facilitated by the management. Because this report focusses on the improvement of knowledge transfer behavior by enhancing social dimensions, the parameters reflect to the parameters which have to be improved to decrease the barriers. Therefore, the parameters are derived from the design principles in Chapter 4.2. In addition, the list of parameters is expended by parameters of the requirements. This is done, because a change in these requirements could result in new barriers. Table 20 provides an overview of the design parameters which are used to determine the solution model.

**TABLE 16: OVERVIEW OF THE DESIGN PARAMETERS**

Category	Parameter	Value range	Desired action	Affecting barrier
<b>Structural dimension</b>	Centralized position	Low- high	Improve	Lack of knowledge self-efficacy, lack of absorptive capacity
<b>Relational dimension</b>	Formal ties	Absence or presence	Improve	Lack of job-demand requirement, indirect: lack of knowledge self-efficacy, lack of absorptive capacity, high perceived costs
<b>Cognitive dimension</b>	Common knowledge	Low – high	Improve	lack of knowledge self-efficacy, lack of absorptive capacity, high perceived costs
<b>Cognitive dimension</b>	Shared goals	Company, division, customer or individual	Improve	Lack of job-demand requirement
<b>Cognitive dimension</b>	Transactive memory	Low-high	Improve	Preference of developing own knowledge
<b>Requirement</b>	Time constraints	Low-high	Remain or decrease	Time constraints
<b>Requirement</b>	Extent of formalization	Low-high	Remain low	
<b>Requirement</b>	Organizational commitment	Low-high	Remain high	
<b>Requirement</b>	Involvement of social dimensions	Yes- No	Remain involved	
<b>Requirement</b>	Extent of hostility	High-low	Remain low	

In the following paragraph, the values of the design parameters are determined per intervention.

## 5.5. Design parameters of interventions

To identify the desired intervention for the Company. The interventions of the CIMO-logics are judged on their values of the design parameters. The results of this determination are seen in Table 21.

**TABLE 17: DETERMINATION OF THE VALUES OF THE DESIGN PARAMETERS**

Parameter	Customer project team	Supporting department	Socialization activities	Offering trainings	Technological support	Introduction of company goals
Centralized position	Yes	Yes	Yes	No	No	No
Formal ties	Presence	Absence	Absence	Absence	Absence	Presence
Common knowledge	Medium	Medium	Low	High	Low	Medium
Shared goals	Customer	Organizational	No	No	No	Organizational
Transactive memory	Medium	High	High	Medium	Medium	Low
Time constraints	Increases	Remains the same	increases	increases	Remains the same	Remains the same
Extent of formalization	Low	Low	Low	Low	Low	Low
Organizational commitment	Remains the same	Remains the same	Remains the same	Remains the same	Remains the same	Remains the same
Involvement of social dimensions	Yes	Yes	Yes	Yes	No	Yes

In the following paragraphs, the parameters are discussed, including their desired value. In the process of doing so, interventions are judged on whether they are applicable for the solution design or not.

### *Requirements*

According to Table 21, the design has the following design requirements; the extent of formalization has to remain low; the organizational commitment has to remain high and the requirements should involve social dimensions. As can be seen in Table 21, all interventions expect the technological support complies these requirements. Therefore, the intervention of technological support is neglected.

### *Shared goals*

As stated in the empirical analysis, shared goals are important for the employees to participate in knowledge transfer. When the employees differ in goals, they see knowledge transfer recipient as an extra-role behavior. Therefore, the interventions of socialization activities and offering trainings are neglected in the further process.

The judgement made above results in three possible solutions for the Company to facilitate to improve the knowledge transfer behavior. These solutions are discussed in the paragraphs below.

### *Customer project teams*

This solution was proposed to several employees. Employees indicated that the introduction of customer project teams do not often directly positive influence the product performance, because the project often takes a lot of time. Therefore, employees are facing more time constraints. However, based on empirical data, less than 20 present buys multiple products of different product divisions. Therefore, there is an opportunity to increase the product performance by locking-in those customers. With the extra product performance gained, new employees could get hired. Therefore, the time constraints are likely to decrease.

### *Supporting department*

This solution was proposed to several employees. The introduction of a supporting department is likely to improve the knowledge transfer behavior by; adopting a generalized knowledge base, resulting in a medium extent of common knowledge. However, because of the number of ties, employees within a supporting department derive a high extent of transactive memory. However, based on the empirical analysis, product divisions do not have formal ties with the supporting department. Therefore, the job-demand requirement for knowledge is likely to be low. Thus, the supporting department is neglected.

### *Introduction of overall company goals*

This solution was proposed to several employees. However, employees indicated that the product range of the Company was not applicable for an overall goal. The employees argued that an overall company goal would not result in more knowledge transfer behavior. In addition, the employees were scared to obtain vague goals. Therefore, the introduction of an overall company goal is neglected.

## 5.6. Final solution design- Phase IV: What ‘Could be’

This subchapter answers the following research question:

**RQ<sub>8</sub>:** What is the most preferable solution design for the Company to improve the limited individual knowledge transfer behavior between product divisions?

The final solution design is based on the introduction of project teams. According to the empirical analysis, the functions within the product division are influenced by customer initiation. Therefore, it is assumed that the customer is involved in this final solution. The involvement of the customer provides participants to share a common knowledge base; they translate their expertise towards what they could offer the customer. Therefore, it is argued that to enhance knowledge transfer behavior, more customer projects need to be set up.

As stated before, the solution should: established shared goals (design principle 1), improve the transactive memory (design principle 2), improve strong ties (design principle 3), improve the common knowledge (design principle 4) and improve the centralized position (design principle 5). In the following paragraphs, the solution design is judged on the effect if the design principles. Also, a reflection of the barriers is made.

The introduction of customer project teams will establish a shared goal of satisfying a customer. Therefore, the solution complies to the first design principle. This principle is important because units within the company are generally motivated by satisfying customers and therefore improving the product performance. To satisfy the customer, knowledge of multiple products is needed. Therefore, the job-demand requirement increases (Barrier 5). Thus, the introduction of customer project teams complies the establishment of shared goals. Therefore, the barrier of job-demand requirement (and not feeling responsible for knowledge transfer) is decreased.

The introduction of customer project teams will establish a certain extent of transactive memory (design principle 2). Because employees in a customer project team have to coordinate their activities, employees will discover each other’s expertise’s. Therefore, employees are improving their transactive memory, because they know who possesses which knowledge. Also, because the project teams are temporary, employees are constantly working with other employees. The improvement of transactive memory will raise the opportunity in the future to access knowledge. Because the recipient is aware of someone’s expertise, he is likely to earlier consult this person, instead of developing his own knowledge (Barrier 4).

The introduction of customer project teams will establish formal ties. Hence, employees within teams need each other to fulfill their job requirements. To satisfy the customer in a short time, much interaction is needed between the employees. Therefore, strong ties are created (design principle 3). Also, the

establishment of formal ties increases the independency of the employees. Therefore, the need for knowledge increases (Barrier 5).

The establishment of strong, formal ties will increase the common knowledge (design principle 4). Therefore, they increase the ability to identify relevant knowledge from each other (Barrier 1 and 2). Also, this common knowledge results in a lower perceived costs of knowledge transfer, because the transferred knowledge needs less context-variables. Therefore, the knowledge transfer involves less time and effort.

The temporary character of the customer project teams will increase the number of ties within the organization. Therefore, individuals obtain a centralized position within the organization (design principle 5). This centralized position enables employees to obtain generalized knowledge.



## 6. Conclusion

This chapter provides an overview of the research project conducted at The Company. The conclusion is guided by the four phases of the analysis-synthesis bridge model.

### 6.1. Phase I: Empirical current situation – What ‘is’

In Phase 1, the current empirical situation is identified, aiming to answer the following question:

*What are the barriers to individual knowledge transfer behavior in the Company?*

The barriers are shown in Table 18.

**TABLE 18: OVERVIEW OF BARRIERS TO PARTICIPATE IN KNOWLEDGE TRANSFER BEHAVIOR**

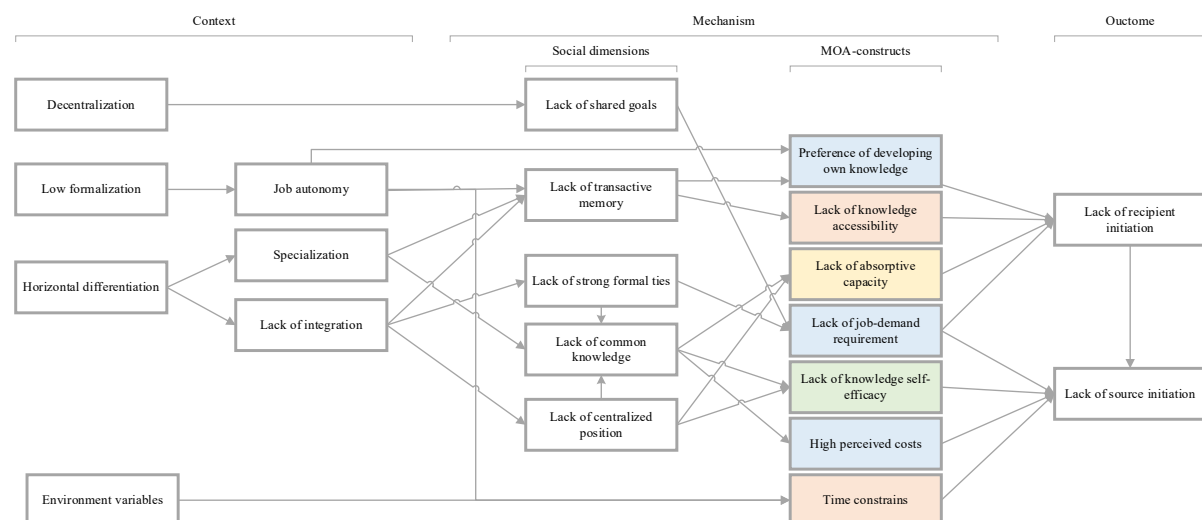
#	Barrier	Unit	Category
1	Lack of knowledge self-efficacy	Source	Lack of motivation and lack of ability
2	Lack of absorptive capacity	Recipient	Lack of ability
3	High perceived costs	Source	Lack of motivation
4	Preference of developing own knowledge	Recipient	Lack of motivation
5	Lack of job-demand requirement	Source and recipient	Lack of motivation
6	Lack of knowledge accessibility	Recipient	Lack of opportunity
7	Time constraints	Source	Lack of opportunity

### 6.2. Theoretical current situation (Phase II: Model of what “is”)

To identify the causes of the barriers in Table 18, the current situation is explained through the use of theoretical insights. These insights enable the identification of the underlying theories and causes of the barriers. As stated in Figure 17, the underlying theories and barriers are explained by the organizational variables (organizational structure and culture) and the social relationship established between the source and recipient units. In this phase, the answer is given to the following research question:

*Which barriers and underlying constructs explain the lack of knowledge transfer behavior of the Company?*

**FIGURE 17: PHASE II: MODEL OF WHAT "IS"**



Assuming the cause-effect relationships of Figure 17, the following assumption could be made on the current situation of the Company:

*The source and recipient units within the company are not engaged in knowledge transfer processes because: they prefer to develop their own knowledge, they lack of knowledge accessibility, the lack of absorptive capacity, they lack of job-demand requirements, they lack of knowledge self-efficacy, they perceive high transfer costs and they are facing time constraints. This is caused because the source and recipient lack of shared goals, lack of transactive memory, lack of formal ties, lack of common knowledge and/or lack of a centralized position in the organization. These dimensions of relationships are caused by the organizational structure (decentralization, low formalization, horizontal differentiation) and environmental variables.*

### 6.3. Phase III: Model of what “Could be”

The third phase focusses on the desired situation for the Company. Because this report focusses on the improvement of knowledge transfer behavior through the effect of social relationships, the desired situation focusses on the desired values of the social dimensions. Therefore, the following social dimensions have to be improved: the lack of shared goals, the lack of transactive memory, the lack of strong formal ties, the lack of common knowledge and the lack of centralized position.

In order to do so, interventions are proposed. These interventions are derived from practical CIMO-logics. These design principles are based on interventions, derived from the empirical situation. Therefore, they are grounded and field-tested, which enhances the relevance of the Company. The following categories of interventions were found:

- 5) A change in the work design; referring to the organizational structure of the Company
- 6) Interventions based on training and development
- 7) Interventions based on hiring the right employees
- 8) The introduction of supporting technologies

### 6.4. Solution design (Phase IV: What “could be”)

In the solution design, the answer is given to the next research question:

*How should the Company improve the limited individual knowledge transfer behavior between product divisions?*

This report suggests the introduction of cross-division teams to improve the individual knowledge transfer behavior between divisions. In particular, these teams are set-up by request of (potential) customers and are temporary. The introduction of cross-division customer project teams is likely to enhance knowledge transfer behavior because:

- The introduction of project teams leads to the introduction of formal ties between the product divisions. Therefore, divisions are likely to improve their interaction. As a result, the source and recipient will become aware of each other’s expertise and tasks. This enhances the transactive memory and creates a common knowledge base.
- Because of the common knowledge base, the perceived costs are likely to decrease. Hence, less context-related variables are needed to be transferred in order for the source and recipient to understand each other.
- The introduction of formal ties increases the job-demand requirement for knowledge. Therefore, knowledge transfer is not recognized as a pro-social behavior. This is because the knowledge transfer is needed to satisfy the (potential) customer.
- Because the customer project teams aim to satisfy the customer, the source and recipient aim to maximize the same goal. Therefore, knowledge transfer is not seen as lost time.
- The temporary character of the customer project teams will increase the number of ties within the organization. Therefore, individuals obtain a centralized position within the organization. This centralized position enables employees to obtain generalized knowledge.

## 7. Discussion

The objective of the discussion is to reflect on the research. This is done by reflecting on the conclusions, through the discussion of theoretical and managerial implications. Also, the research is reflected by discussing quality and limitations. Furthermore, suggestions are made for further research.

### 7.1. Theoretical implications

This research combined multiple frameworks to identify *who* (the source or recipient unit), *when* (acquisition, distribution or assimilation phase) and *why* (motivation, opportunity, and ability framework) participates in a knowledge transfer process. This combination is used to obtain a broad overview of bottlenecks, aiming to identify which interventions would lead to an improvement in knowledge transfer behavior. Through the introduction of the social capital theory, it could be determined *how* certain interventions improved knowledge transfer behavior. This framework has led to insights that could be used to enrich the knowledge transfer literature.

This thesis adopted knowledge transfer as a process of three phases: knowledge acquisition, knowledge distribution, and knowledge assimilation. This statement was obtained from Szulanski (1996; 2000), who stated that each phase encounters different barriers for a successful knowledge transfer. This research findings confirm this statement by finding different barriers for every phase. Also, it was found that source and recipient units had different roles and involvements within each phase. Hence, within the context of the Company, it was found that if the barriers of the acquisition phase were overcome, the distribution phase was likely to continue without major barriers. Thus, to improve the knowledge transfer process, interventions have to be made to improve the motivation, opportunity, and ability of the source and recipient in the knowledge acquisition phase. Therefore, this research contributed to the perspective of recognizing knowledge transfer as a process.

An interesting theoretical implication is the role of intrinsic motivation in the knowledge transfer process. Former research indicates the need for intrinsic motivation (enjoyment of helping others and self-efficacy) for long term participation in knowledge transfer behavior (Lin, 2007). Although literature acknowledges knowledge transfer as a voluntary action, triggered by extra-role behavior, they neglected individuals' motivation to fulfill their in-role behavior. Within the context of the Company, it was found that individuals were motivated to help their colleagues. However, it was not the main reason to decide to participate. Therefore, this research suggests including the role of job-demand knowledge requirement as a motivation construct for analyzing knowledge transfer behavior. The majority of the consulted literature implicates an improvement for intrinsic motivation constructs (such as knowledge self-efficacy and enjoyment of helping others) to improve knowledge transfer behavior. Within the context of the Company, employees experience a low extent of formalization, resulting in high job autonomy. Because of this high job autonomy, employees within the Company feel responsible for their work outcomes. Within product divisions of the Company, employees were intrinsically motivated to develop, improve and launch the best product they could. Although they were intrinsically motivated to share knowledge, they were more intrinsically motivated to work on product improvement. Therefore, it is suggested that only considering intrinsic motivation constructs (such as enjoyment in helping others and knowledge self-efficacy) were not enough to determine the behavior of employees to participate in the knowledge transfer process.

This thesis adopted the design science research paradigm with the objective to develop grounded and field-tested principles, resulting in a design solution for the Company (Van Aken & Berends, 2018). In contrast to the consulted literature, this research executed qualitative data. The usage of qualitative data enabled the identification of underlying theories, explaining *why* an individual was motivated, whether there was the opportunity and they were able to engage in knowledge transfer behavior. Therefore, this thesis complements to consulted literature by identifying underlying mechanisms. Hence, the impact of certain interventions could be discussed.

## 7.2. Managerial implications

Besides the theoretical implications, this research has also derived managerial implications. These managerial implications are discussed in the following paragraphs.

The concept of knowledge transfer is a socially embedded activity, influenced by many context-related variables (Argote & Ingram, 2000). Therefore, a broad understanding of the concept of knowledge transfer is needed. However, many scientific and practitioners research and recommendations are specialized and specified. Therefore, it is recommended for organizations to combine multiple perspectives and articles to generate a broad understanding of the concept. A framework to generate a broad understanding, is the framework of motivation, opportunity and ability. Therefore, it is recommended for companies to adopt the MOA-framework to determine employee behavior, because this framework enables a broad understanding of the issues.

In succession of the previous implication, it may be helpful for company to barriers in the knowledge transfer process. Knowledge management literature has been dominated by positive constructs; constructs which would improve knowledge transfer behavior. However, for a company who aims to improve his knowledge transfer behavior, it is important to detect the barriers in the process. The identification of barriers enables managers to facilitate effective interventions.

Besides the managerial implications, additional recommendations are developed. An important recommendation concerns the job-demand requirement of knowledge. This construct was neglected through researches before; however, in the context of the company, it seems to play an important role for the motivation to participate in knowledge transfer. This study gave insights about the context-related constructs which created the influence of job-demand requirement for knowledge. Hence, in the context of low formalization and have the opportunity to set their own goals, employees derive a lot of job autonomy. Therefore, they do feel responsible for their job requirements. Because knowledge transfer is an extra-role behavior for people in product divisions, they lack responsibility to participate actively in knowledge transfer processes. Thus, in the context of employees with a high job autonomy, it is recommended to increase the job-demand requirement of knowledge, to enhance knowledge transfer behavior. This can be done by improving the independency of the ties or by introducing new roles (or departments) where the job-demand requirement for knowledge (such as support teams) are high. In the context of the Company, it is recommended to improve the independency of the ties, because the introduction of support teams generalizes the knowledge. Hence, because the Company is operating in a high-technology and complex environment, specialization is needed to meet the customer requirements.

## 7.3. Research quality

The objective of this research was to develop a solution design, which is applicable in the empirical context of the Company. Therefore, it was important to derive insights about the current situation, explaining why there is limited knowledge transfer between product divisions. However, because these insights were produced in a specific context, insights might be subjective (Van Aken & Berends, 2018). Therefore, it is important to discuss the research quality. The research quality enables the researcher to detect if the insights which were obtained were projecting on the truth.

Therefore, a variety of methods and protocols are used to enhance the reliability and validity of this research (Van Aken & Berends, 2018). The discussion of those two quality criteria enhances the controllability of this research. *Controllability* refers to as prerequisite for the evaluation of validity and reliability and is achieved by how the study is executed (Van Aken & Berends, 2018, p. 186). Therefore, every conducted step in this report starts with the methodology of that step. The determination of the methodology was based on information provided by Van Aken and Berends (2018) and Easterby-Smith,

Thorpe, and Jackson (2015). Also, experiences and tips were provided by the supervisors of the TU/e, company supervisor and (old) Innovation Management students, working at the Company.

### 7.3.1. Reliability

The reliability of the study is determined by the ambiguity of the results (Van Aken & Berends, 2018). The reliability manifests itself by results who show the actual cause-effect relationship, reflecting is the outcome is independent of other characteristics (Yin, 2003). Therefore, the results have to be context-related free and should be consistent if the research is repeated in another context (Van Aken & Berends, 2018). However, during the conducting of the research, biases could occur. Bias arises when context elements influence the research outcomes. According to Van Aken & Berends (2018), reliability recognized four different biases, namely: the researcher, the instrument, the respondents and the situation.

#### *Research bias*

A research bias could occur when the involvement of the researcher influences the research outcomes. This could be done by the influence of interests and motivation (hot biases) or the tendency to satisfy the company (cold biases) (Van Aken & Berends, 2018). Thesis biases could result in subjective interpretations, which are not reflecting on the *truth*. The conduction of qualitative research methods, such as interviews and observations are likely to create a research bias. According to Van Aken and Berends (2018), the contribution of a second independent researcher will decrease the research bias. However, due the time constrains and the resource restriction, it was not possible to involve a second researcher. However, to minimize the research bias, interviews were codified by using coding schemes derived from the scientific literature (see Appendix I). Additionally, the research process was guided by standardized methodologies, such as the adoption of the design science paradigm, establishing an interview protocol and working with CIMO-logic design propositions to determine the input for the solution design.

#### *Instrument bias*

An instrument bias could occur when the methods used do not measure the true outcomes (Van Aken & Berends, 2018). To decrease the instrument bias, triangulation was done in this research. Triangulation is the combination of multiple methods to decrease the chance a certain outcome was biased by the instrument used. Within the empirical analysis, interviews and observations were done to derive triangulation and therefore decrease the instrument bias.

#### *Respondents' bias*

Within the empirical analysis, interviews are conducted. Through the conduction of interviews, the researcher is dependent on the perspectives of the respondent in order to obtain objective insights. In order to minimize this bias, a large number of participants (24 employees) was invited to participate in this research. The respondents covered different backgrounds (function, divisions, age, tenure). Also, the execution of observations increases the extent of respondents' bias. Hence, within observations, the perspective of the researcher is used to explain a certain phenomenon. So, the use of observations enables the researcher to control the respondents' interview outcomes.

#### *Circumstances*

Finally, errors could arise through the circumstances during the interviews. Therefore, the interviews were executed within two weeks. In addition, all the interviews were done in the same room. Therefore, the circumstances' bias was confined to the minimum.

### 7.3.2. Validity

The validity refers to the relationship between a research consult or conclusions and the way it has been generated (Van Aken & Berends, 2018, p. 192). The validity of the research is composed of the following types: construct validity, internal validity, and external validity. These are discussed in the following paragraphs.

The *construct validity* refers to the extent to which a measuring instrument measures what it is intended to measure (de Groot, 1969). The construct validity is decreased through 1) the explanation of the definition of knowledge transfer before the interviews and 2) the usage of validated definitions in both the interviews and coding scheme.

Also, the combination of triangulation methods gave the possibility to generate propositions from multiple sources.

The *internal validity* concerns conclusions about the relationship between phenomena existing within the boundaries of the system under consideration (Van Aken & Berends, 2018, p. 194). The subject of knowledge is drawn on a wide range of literature. Therefore, multiple theoretical sources were used to circumstantiate a construct.

The *external validity* refers to the generalizability of research results (Van Aken & Berends, 2018). According to Argote and Ingram (2000), the concept of knowledge transfer is socially embedded. Hence, knowledge transfer is affected by many context-related variables. This decreases the possibility to generalize the outcomes of this research. However, the use of propositions and CIMO-logic design principles will result in the identification of these context-related variables. The use of these methods increases the generalization of the outcomes.

## 7.4. Limitations

Due to several limitations, the problem had to be demarcated so that it was possible to analyze it within the limits of this thesis. These limitations are elaborated in the following paragraphs.

To begin, the research and report were constrained by the available time. These time constraints were a result of the deadlines which were set up by the guidelines of the master thesis project. Due to time constraints, the quality of the research was reduced. For example, the involvement of a second researcher for the empirical analysis was not possible. This decreased the quality of the research, based on the researcher's bias. Also, the time constrains led to the need for delineation of the research. For example, the research was mainly based on the knowledge acquisition phase and neglected in other phases. Also, the support of knowledge management systems was neglected. This is a delineation because knowledge management systems have a supporting role in the personalization strategy and are therefore influencing the knowledge transfer process.

Furthermore, there was no time for a second empirical analysis based on the empirical findings of the first round of interviews. Hence, the interviews did not result in many findings of the role of the recipient. Due to the time constraints, there was no time to investigate the MOA-constructs of the recipient in-depth. However, the MOA-constructs of the recipient appear to be really important, because the empirical analysis indicated that the source was always motivated to engage in the knowledge transfer process if the recipient initiated the process.

The research is also limited because it does not identify the constraining factor in the knowledge transfer process. According to the constraining model of Siemsen, Roth, and Balasubramanian (2008), it is important to identify which of the three MOA-factors is the bottleneck for employees. Instead of identifying the constraining factor, this research identified multiple barriers, without knowing which barrier was more important than the other. Therefore, it is difficult to identify the factor which has to be improved, leading to the introduction of an effective intervention. In contrast, multiple interventions were considered to improve multiple barriers.

Furthermore, the activity of knowledge transfer has not been conceptualized in this report. Thus, there is no quantitative underpinning to identify if the knowledge transfer problem is a true problem in the organization. This field-problem was based on the perception of the stakeholders in the organization. Because of the lack of quantitative proof, the knowledge transfer problem might stay a perceived problem of the management.

Additionally, the empirical data is obtained for one specific- case, the findings are hard to generalize. It would improve the validity of the results when the research could be repeated. However, the findings might still give new insights for further research, which enhances the generalization. The section further directions will explain what the next steps could to improve and extend the current research.

## 7.5. Further directions

Reflecting on the limitation of this research in Subchapter 7.4, the following further directions are suggested.

One of the limitations concerns the role of the recipient in the knowledge transfer process. This research discovered an important role of the recipient initiation of the process. However, only the construct of *preference for developing knowledge* was identified as a negative effect on recipient initiation. Therefore, further research has to be done to identify the underlying constructs of the recipient. Subsequently, interventions focused on the recipient could be found. This is suspected to obtain a broader view of the underlying theories of why individuals are limited engaged in the knowledge transfer process.

Also, further research concerning the assimilation phase is needed. The consulted articles in the systematic literature reviews were mainly focused on the knowledge acquisition and distribution phase. Therefore, the knowledge assimilation phase was rejected in the consulted articles. However, this study emphasizes the construct of the recipient rejecting the knowledge, as an important construct why sources are not motivated to initiate the knowledge transfer process. Therefore, further research is needed in why the recipient rejects this knowledge.

Furthermore, research towards the constraining MOA-factor in the company is needed to identify the most effective intervention. As stated in the limitation, multiple barriers were identified for the source and the recipient unit. However, the reciprocal hierarchical ratio of those barriers was not found. In order to discover this hierarchy, a canonical analysis could be done. In this quantitative analysis method, the weight refers to as the contribution of each barrier. Therefore, the relative importance of each barrier could be identified (Szulanski, 1996).

Another interesting direction is the involvement of physical barriers in the research. This research was focused on the knowledge transfer processes within the headquarters of a high-tech company. The overall assumption in the company was 'you know where to find me'. Indeed, the employees were willing to provide knowledge when the recipient asks it. However, this knowledge transfer was mainly done by socialization. When someone asked information or knowledge through the email, the sources often forgot the emails. However, foreigner employees are dependent on IT-tools. Therefore, it will be interesting to see which factors (motivation, opportunity and/or ability) are affected when the colleagues are not at the same physical building.

Also, further research could be done to the conceptualization of knowledge transfer behavior. Knowledge transfer has generally been conceptualized through the intention to engage in the knowledge transfer process (Lin, 2007). In the consulted literature review, this intention was only investigated for the motivation factor. However, this research emphasizes the importance of including the opportunity and ability factors. Hence, if an employee has the intention to engage, it may face a lack of opportunity or ability to eventually fulfill the action.

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## List of abbreviations and acronyms

TABLE 19: ABBREVIATIONS AND ACRONYMS

Term	Explanation
TU/e	Eindhoven University of Technology (Technische Universiteit Eindhoven)
PLC	Product life cycle
COO	Chief operating officer
DSR	Design science research (paradigm)
CIMO	Context, Intervention, Mechanism and Outcome
MOA	Motivation, opportunity and ability
SCT	Social Capital Theory
e.g.	Example given
MT	Management team
IST	Current situation
SOLL	Desired situation
KT	Knowledge transfer
TP	Theoretical propositions
EF	Empirical findings (MOA-construct mechanisms – Outcome)
EP	Empirical propositions (Social dimension mechanisms, MOA-construct mechanisms – Outcome)

## List of definitions used

TABLE 20: DEFINITIONS

Definition	Meaning	Source
Knowledge	Valuable information from the human mind.	(Davenport & Prusak, 1998)
Knowledge transfer (in the organization)	The process through which one unit (e.g. individual, group, department, division) is affected by the experience of another.	(Argote & Ingram, 2000)
Network range	Relationships that span multiple knowledge pools	(Reagans & McEvily, 2003)
Tacitness	The degree to which knowledge is difficult to codify (e.g. in writing) or articulate	(Reagans & McEvily, 2003)
Social capital	The goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relationships. Its effects flow from the information, influence, and solidarity it makes available to the actor	(Adler & Kwon, 2002, p. 23)
Organizational structure	The organizational structure refers to the formal system of tasks and authority relationships that controls how people are to cooperate and use resources to achieve the organization's goals	(Jones, 2013, p. 30)
Findings	MO- statement. Thus, the constructs affecting the outcome.	
Propositions	CMO-statements. Thus, in a certain context (C), these constructs affect the outcome (O), because ... (M)	
Design principles	CIMO-statements. Thus, in a certain context (C), the intervention (I), affects the outcome (O), because... (M).	
Field problem	An empiric situation that could and should be improved, determined by the Company	(Van Aken & Berends, 2018)
Motivation	Refers to the willingness to participate in the knowledge transfer process	(Szulanski, 1996)



Opportunity	<i>Opportunity</i> reflects on the context of antecedents, such as accessibility and time availability	(Borgatti & Cross, 2003)
Ability	reflects on the capacities and skills of the individual to perform knowledge transfer activities	(Argote, McEvily, & Reagans, 2003).

# Appendices

## Appendix A: (Knowledge) Resource-based view

This appendix elaborates on the underlying theory of why internal resources are important for organizations (resource-based view) and why knowledge is recognized as an important internal resource (knowledge resource-based view).

### A.1. The resource-based view (RBV)

The resource-based view suggests the importance of internal firm resources as a source for sustainable competitive advantage in a changing and competitive environment (Barney, 1991). The underlying assumption was made that sustainability sources require to be stable over time and usable for the whole organization. These sources are used to determine a company's strategy. Hence, a strategy is defined as the match an organization makes between its internal resources and skills and the opportunities and risk created by its external environment (Grant, 1991, p. 114). Many researchers have been done on creating a competitive advantage based on the external environment (e.g. Five forces model of Porter) (Barney, 1991). However, the resource-based view adopts the importance of internal resources to develop a strategy to create a competitive advantage.

The underlying assumptions are based on the changing environment, which would force organizations to continuously change their strategy of changing customer needs (Grant, 1996b). Instead of *servicing markets* as the foundation for strategy (outside-in), sustainable strategies are built on *firm resources* (inside-out) (Barney, 1991).

Firm resources refer to assets, capabilities, organizational processes and knowledge, which are controlled by the organization and could be expressed in strategies through increasing efficiency and effectiveness (Barney, 1991). For example, a well-organized customer contact service, highly trained sales employees or fast delivery through efficient processes may be recognized as a competitive advantage among competitors. Because these firm resources may be applicable in different industries, organizations can expand their markets, without changing the strategy (Barney, 1991). Therefore, the transferability of firm resources is an important characteristic to comply as a strategic advantage resource (Grant, 1991).

Furthermore, firm resources are embedded in organization operations and often intangible. Therefore, it is difficult for competitors to replicate the resources (Barney, 1991; Grant, 1991). In contrast, a product (such as a new telephone) is tangible and might be imitational for competitors. However, a short cycle of production and launching may be harder to duplicate, because it depends on many processes and policies within an organization.

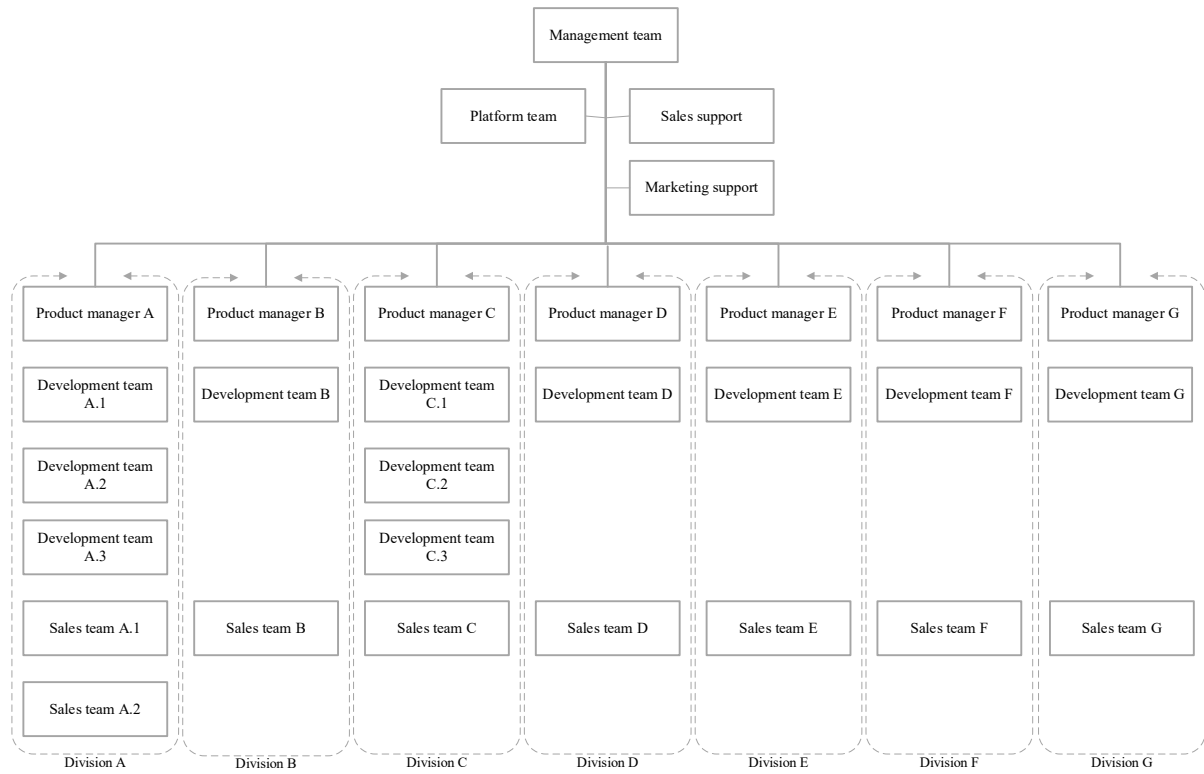
### A.2. The knowledge resource-based view (KBV)

The knowledge-resource view adopts the view of knowledge as a resource for sustainable competitive advantage for organizations (Grant, 1996b). Many researchers advocate the difficulty imitation of knowledge by competitors as the main reason why knowledge is a source for competitive advantage (Zander & Kogut, 1995). An important characteristic of knowledge is the ability of specialization (or depth of knowledge) (Szulanski, 1996). When an employee has learned from many (repeatable) experiences, within a narrow focus, he developed specialized knowledge (Argote & Miron-Spektor, 2011). This specialized knowledge is scanty and valuable, and therefore an important firm resource (Grant, 1991).

Furthermore, specialized knowledge is hard to transfer from one person to another (Szulanski, 1996). To explain the knowledge, many underlying factors have to be explained for the recipient to understand the knowledge (Van Wijk, Jansen, & Lyles, 2008). Because employees within an organization are often sharing a common knowledge base, fewer details need to be explained, because they can assimilate the knowledge in their context (Van Wijk, Jansen, & Lyles, 2008). This concept is also explained in Chapter 2. However, competitors often do not share that common knowledge base, which makes it harder for competitors to fully understand the knowledge and therefore imitate it (Zander & Kogut, 1995).

## Appendix B: Systematic organigram

In Figure 18, a systematic organigram of the Company is shown.



**FIGURE 18: SYSTEMATIC ORGANIGRAM OF THE COMPANY**

## Appendix C: Exploratory research

### C.1. Sources exploratory research- Books

- Argote, L. (2013) *Organizational learning: creating, retaining and transferring knowledge* Boston: Springer
- Easterby-Smith, M., and Lyles, M.A. (eds.) (2011) *Handbook of organizational learning and knowledge management* (2<sup>nd</sup> ed.) Chichester: Wiley
- Hislop, D. (2005) *Knowledge management in organizations: a critical introduction*. Oxford: Oxford University Press
- Davenport, T.H., and Prusak, L. (1998) *Working knowledge: How organizations manage what they know*. Boston: Harvard Business Press
- Jones, G.R. (2013) *Organizational theory, design, and change*. Upper Salle River, NJ: Pearson

### C.2. Sources exploratory research- Search engine results

The following search term was used:

TOPIC:("knowledge transfer" OR "knowledge sharing" OR "knowledge management" OR "organizational learning") Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

This search in the Web of Science resulted in 43,533 results. This amount is refined to 22,821 because the search focused on articles. Also, the first 50 titles and abstracts were considered. Based on titles and abstracts, thirteen articles were read. Eventually, eleven articles were used in this literature review.

- Argote, L. and Ingram, P. (2000) Knowledge transfer: a basis for competitive advantage in firms. *Organizational behaviors and Human decision processes*, 82 (1), p.150-169
- Argote, L., McEvily, B., and Reagans, R. (2003) Managing Knowledge in Organizations: An Integrative Framework and Review of Emerging Themes. *Management Science*, 49 (4), p. 571-582
- Borgatti, S.P. and Cross, R. (2003) A relational view of information seeking and learning in social networks. *Management Science*, 49 (4), p. 432-445.
- Grant, R.M. (1996a) Prospering in dynamically competitive environments: organizational capability as knowledge integration. *Organization Science*, 7 (4), p. 375-387
- Hansen, M.T., Nohria, N., and Tierney, T. (1999) What's your strategy for managing knowledge? *Harvard Business Review*, 77 (2), p. 106
- Huber, G.P. (1991) Organizational learning: the contributing processes and the literatures. *Organization Science*, 2(1), p. 88-115
- Levin, D.Z. and Cross, R. (2004) The strengths of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science*, 50 (11), p. 1477-1490
- Reagans, R. and McEvily, B. (2003) Network structure and knowledge transfer: the effects of cohesion and rang. *Administrative science Quarterly*, 48 (2), p.240
- Szulanski, G. (1996) Exploring external stickiness: impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17, p. 27-43

## Appendix D: Systematic literature review search

### D.1. Resources knowledge transfer and MOA-framework- Search engine results

You searched for: TOPIC:("knowledge transfer" OR "knowledge sharing" OR "knowledge distribution") AND ALL FIELDS:(Motivation AND Ability AND opportunity) Refined by: DOCUMENT TYPES: (ARTICLE) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

The following two articles were used in the systematic literature review:

- Kang, M. and Kim, B. (2017) Motivation, opportunity, and ability in knowledge transfer: a social network approach. *Knowledge management research practice*, 15, p. 214-224
- Siemsen, E., Roth, A.V., Balasubramanian, S. (2008) How motivation, opportunity, and ability drive knowledge sharing: the constraining-factor model. *Journal of Operations Management*, 26, p. 426-445

### D.2. Resources knowledge transfer and barriers- Search engine results

You searched for: TS= ("knowledge transfer" OR "knowledge sharing" OR "knowledge distribution") AND ALL= (barrier\* OR bottleneck\* or impediment\* OR hurdle\* OR boundary) Refined by: DOCUMENT TYPES: (ARTICLE) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

The following articles were used in the systematic literature review:

- Casimir, G., Lee, K. and Loon, M. (2012) Knowledge sharing: influences of trust, commitment and cost. *Journal of Knowledge Management*, 16 (5), p. 740-753
- Cabrera, A. and Cabrera E.F. (2002) Knowledge-sharing dilemmas. *Organization studies*, 23 (5), p. 687-710

### D.3. Resources knowledge transfer and social capital- search engine results

You searched for: TS= ("knowledge transfer" OR "knowledge sharing" OR "knowledge distribution") AND ALL= ("Social capital" OR "Social network") Refined by: DOCUMENT TYPES: (ARTICLE) Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

The following articles were used in the systematic literature review:

- Chow, W.S. and Chan, L.S. (2008) Social network, social trust and shared goals in organizational knowledge sharing. *Information & Management*, 45, p. 458- 465
- Cabrera, E.F. and Cabrera, A. (2005) Fostering knowledge sharing through people management practices. *International journal of human resource management*, 16 (5), p. 720-735

### D.4. Search engine results Knowledge transfer and factors

You searched for TOPIC:("knowledge transfer" OR "knowledge sharing" OR "knowledge distribution") AND ALL FIELDS:(factor\* OR context OR antecedent\* OR influence\*) Refined by: DOCUMENT TYPES: (ARTICLE)

Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI.

- Lin, H.F. (2007) Effects of extrinsic and intrinsic motivation of employee knowledge sharing intentions. *Journal of Information Science*, 33 (2), p. 135-149
- Szulanski (2000) The process of Knowledge Transfer: A diachronic analysis of Stickiness. *Organizational Behavior and Human Decision Processes*. 82 (1), p. 9-27
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## Appendix E: Determination of the Journal Impact Factor

**TABLE 21: DETERMINATION OF JOURNAL IMPACT FACTORS**

<b>Journal</b>	<b>JIF 2018</b>
Academy of Management Review	8.855
Academy of Management Journal	7.191
Administrative Science Quarterly	5.878
British Journal of Management	3.059
California Management Review	3.302
Harvard Business Review	4.374
Human Resource Management Review	3.276
Information & Management	4.120
International Journal of Human Resource Management	2.425
International Journal of Information Management	4.516
Journal of Business & Industrial Marketing	1.833
Journal of Information Science	1.939
Journal of Knowledge Management	2.551
Journal of Management	8.080
Journal of Management Studies	5.329
Journal of Operations Management	4.899
Knowledge Management Research Practice	1.013 JIF 2017
Long Range Planning	3.363
Management Science	3.544
MIS (Management Information Systems) Quarterly	5.430
MIT Sloan Management Review	2.569
Organization Science	3.027
Organization Studies	3.133
Organizational Behaviors and Human Decision Processes	2.259
Organizational Dynamics	1.111
Research Policy	4.661
Strategic Management Journal	5.482
International Journal of Business Communication	1.293

## Appendix F: Interview protocol

To structure the interview protocol, guidelines from Jacob and Furgerson (2012) are used. This appendix elaborates on the steps taken.

### F.1. Topics to be addressed

The thesis elaborates on the use of social capital to improve knowledge transfer between product divisions in the Company. Therefore, five overall themes were chosen (based on the theoretical analysis):

- The extent of perceived differentiation
- The person's motivation to participate in knowledge transfer
- The presence of (informal) ties in the organization
- The presence of shared company goals
- The presents of relation characteristics (trust).

Also, the effect of the competition of internal (budget, marketing support) and the external competition was asked. However, this theme was dropped from the problem analysis, because nobody answered competition would impede knowledge transfer, because the Company operated in a good culture.

### F.2. Interviews preparations

The interviews were practices one week before the first 'real' interview. These interviews were checked on the length, gave the opportunity to practice on the researcher side. Also, the researcher has the ability to reacts on definitions which has to be explained in the further.

### F.3. Interview setting

All interviews were held in a closed room. This has the following advantages:

- It was quite in the room. Because the interviews were recorded, it was important to hear no noise on the background.
- Participants were able to provide information without the change of overhearing
- The participants and the researcher were not distracted.

The interviews were done within the following time settings:

- All interviews were held on working days (Monday-Friday) and working times (9.00-17.00) between 13 may and 27 May 2019.
- The interviews were planned for 30 minutes each. However, to keep marge, 45 minutes were planned in the agendas.

### F.4. Interview script

Before the interview the following actions were taken:

- Definition of knowledge transfer (as used in this thesis)
- Distinction between knowledge and information (as used in this thesis)
- The demarcation was explained (product divisions, at the headquarters)

Afterwards, permission was asked to record the interviews, ensuring the anonymities (except for the function roles).

#### **General:**

1. What are your activities and responsibilities within the Company?
2. Do you have former positions within the Company?
3. How many years do you work at the Company?

#### **MOA-questions:**

4. What motivates you to transfer knowledge outside your division?
5. Do you feel any barriers to participate in knowledge transfer processes?

#### **Social capital questions:**

6. Structural dimension:
  - a. Are you dependent from other product teams to execute your job?



- b. Where do you obtain your input and knowledge?
- 7. Relational dimension
  - a. Do you have contacts who are not used in your formal job description?
    - i. If yes, do and why do you think these ties are affecting knowledge transfer behavior?
  - b. Do you have ties you trust more?
    - i. If yes, do and why do you think these ties are affecting knowledge transfer behavior?
- 8. Cognitive dimension
  - a. Do you think the product divisions have common goals?
    - i. Do you think the (lack) of common goals would affect knowledge transfer behavior?

**Competition (Hostility environment):**

- 9. Do you feel competition between the product divisions concerning internal resources (budget, personnel)?
  - a. If yes, do you perceive this internal competition is a reason for knowledge preserving or rejecting?
- 10. Do you feel competition between the product divisions concerning external resources (such as customers)?
  - a. If yes, do you perceive this external competition is a reason for knowledge preserving or rejecting?

**Ending question:**

- 11. Did I miss something?

## Appendix G: Additional questions formalization and centralization

Last May, you were so kind to help me with an interview concerning information and knowledge sharing within the Company. To implement a solution, I want to include the current organizational structure, from the employees' perspectives. However, I'm missing information about two important dimensions of the organizational structure, which why I'm asking you to answer two additional questions. I have conducted help questions, aiming to enhance the clarity of the two questions. However, they are not mandatory to answer.

Question 1: What is your perception of the extent of formalization within your work?

**\*Formalization:** the extent to which rights and duties the members of the organization are determined and the extent to which these are written down in rules, procedures and instructions.

Help questions:

- 1.1. How do you describe your role to people within and outside the Company?
- 1.2. To what extent are your duties written down in rules, procedures and instructions?
- 1.3. To what extent are your responsibilities clear for you and your colleagues?

Question 2: What is your perception of the extent of centralization/decentralization concerning decision-making within the Company?

**\*\* Centralization:** refers to the extent to which decision-making power is concentrated at the top management level in the organization.

Help questions:

- 2.1. In what extent do you/your team have/has the freedom to make your own strategic decisions?
- 2.2. In what extent do decisions have to get approval from the top management?

It would be nice if you can provide a short explanation (approximately 4 lines) for both questions. Because of the approaching deadline, I would kindly ask to answer before the 23rd of August via

mail. Similar to the interviews, the provided answers will be censored from names and team names. However, your role will be taken into consideration.

## Appendix H: Holistic approach coding

As stated in Chapter 3, the data is segmented by Motivation, opportunity and ability factors. Table 24 provides an overview of the start list, including indicators. The indicators or provided by Blumberg & Pringle (1982, p.562).

**TABLE 22: CODING INDICATORS OF HOLISTIC APPROACH**

<b>Construct</b>	<b>Meaning</b>	<b>Indicators</b>
<b>Motivation to perform</b>	Willingness to perform a certain behavior	Motivation, job satisfaction, job status, anxiety, legitimacy of participation, attitude, perceived task characteristics, job involvement, ego involvement, self-image, personality, norms, values, perceived role expectations, feeling of equity.
<b>Opportunity to perform</b>	Environmental or contextual mechanisms that enable action	Tools, equipment, working conditions, actions of coworkers, leader behavior, mentorism, organizational policies, rules and procedures, information, time and pay
<b>Ability to perform</b>	Capacities related to perform the behavior	Ability, age, health, knowledge, skills, intelligence, level of education, endurance, energy level

## Appendix I: Start list coding

In the following table, the starting list is found, used for the sub coding approach in the coding process. The start list in found in Table 25.

**TABLE 23: MOA- START LIST**

<b>First order construct</b>	<b>Second order constructs</b>	<b>Third order construct</b>
1. Motivation		
	1.1. Intrinsic motivation	
		1.1.1. Knowledge self-efficacy
		1.1.2. Enjoyment
		1.1.3. Organizational commitment
	1.2. Extrinsic motivation	
		1.2.1. Reciprocal benefits
		1.2.2. Organizational rewards
	1.3. Costs	
		1.3.1. Loss of value or power gaining
		1.3.2. Time and effort
	1.4. Preference for developing own ideas	
2. Opportunity		
	2.1. Organizational support	
		2.1.1. Organizational structure
		2.1.2. Organizational culture
		2.1.3. Equipment and facilitators
	2.2. Time available 2.3. Transactive memory 2.4. Knowledge accessibility 2.5. Reaction of the other unit	

3. Ability		
	3.1. Absorptive capacity 3.2. Ability/Skills 3.3. Knowledge	

To find cause-effect relations, also the data was divided in structural, relational and dimensions factors. This start list is found in Table 26.

**TABLE 24: SOCIAL CAPITAL START LIST**

First order constructs	Second order constructs	
1. Structural		
	1.1. Centralized position 1.2. Ties	
2. Relational		
	2.1. Trust 2.2. Informal 2.3. Strength	
3. Cognitive		
	3.1. Shared goals	
		3.1.1. Customer goals 3.1.2. Product goals 3.1.3. Company goals
	3.2. Shared language	
	3.3. Shared function	

## Appendix J: Coding scheme

**TABLE 25: OVERVIEW OF PARTICIPANTS IN INTERVIEWS**

Nr.	Function	Division
R1	Sales	C
R2	Developer	A
R3	Marketing and Sales	D
R4	Product manager	F and Support
R5	Marketing	A and Support
R6	Marketing	Support
R7	Developer	F
R8	Sales	Support
R9	CTO	-
R10	Marketing and Sales	F
R11	Sales	(believes in an overview of all selling all products)
R12	Product manager	G
R13	Marketing	E
R14	Marketing	G
R15	Developer	B
R16	Sales	A
R17	Product manager	E
R18	Product manager	B
R19	Developer	D
R20	Sales	Support
R21	Product manager	D
R22	Product manager	A
R23	Product manager	B
R24	Sales	B

## Appendix I.1. Motivation constructs

### EF 1: Extent of hostility

#### Code scheme

<b>Code name</b>	<b>Hostility culture</b>
<b>Definition</b>	The extend of hostility within the company
<b>Literature questions</b>	(Husted, Michailova, Minbaeva, & Pedersen, 2012) <ol style="list-style-type: none"> <li>1. My company's values and attitudes support knowledge sharing</li> <li>2. In my company practices support open and frank knowledge sharing between different hierarchical levels</li> <li>3. In my company people coordinate across departments</li> </ol>

<b>Code name</b>	<b>Internal resource competition</b>
<b>Definition</b>	The extent to which two units obtain resources from the same source (Tsai, 2002)

<b>Code name</b>	<b>External market competition</b>
<b>Definition</b>	The extent to which two units offer similar products or services in the marketplace (Tsai, 2002)

#### Coding process

Example code	Code	Category	Source
R1: 'When some asks me, I'm definitely share it with them'	Positive intention	My company's values and attitudes support knowledge sharing	(Bock, Zmud, Kim, & Lee, 2005) (Husted & Michailova, 2002)
R1: 'I'm not preserving my knowledge'	No preserving	In my company practices support open and frank knowledge sharing between different hierarchical levels	(Husted & Michailova, 2002)
R6: I think our company culture is based on helping each other and share things. Undertake actions instead of machismo behavior. I think our company culture is also determining our extend of sharing and openness'	No power games		
R19: I am able to tell all my work-related business with everyone in the organization. Whether it is the CTO or anyone else. I have the opportunity to go to the CEO and tell him what is going on. I just am able to have a conversation with everyone in this company'	No hierarchical barriers		
R1: 'When I have a customer who wants another product, I will connect the customer with that department. There is a good interplay between the departments'	Interplay because of customers	Coordination across departments	(Husted, Michailova, Minbaeva, & Pedersen, 2012)
	No competition		

*Sources of the codes*

<b>Respondents</b>	<b>Code</b>
R1, R2, R4	Positive intention
R1, R2, R8, R9, R10, R12, R16, R20, R15, R23	No preserving
R6, R7, R8, R17	No power games
R1, R4, R9, R19	No hierarchical barriers
R1, R10, R17, R24	Interplay because of customers
R3, R4, R11, R13, R14, R16, R18, R19, R21, R22, R24	No competition

**EF 2: Knowledge self-efficacy**

*Code scheme*

<b>Code name</b>	<b>Knowledge self-efficacy</b>
<b>Definition</b>	The believe people have that their knowledge can help to solve job-related problems and improve work efficacy (Lin, 2007, p. 139) The degree of one’s positive cognition based on one’s feeling of personal contribution to the organization (through one’s knowledge-sharing behavior) (Bock, Zmud, Kim, & Lee, 2005, p. 107)
<b>Also known as</b>	Sense of Self-worth (Bock, Zmud, Kim, & Lee, 2005)
<b>Literature indicators</b>	(Bock, Zmud, Kim, & Lee, 2005) <ol style="list-style-type: none"> <li>1. My knowledge sharing would help other members in the organization solve problems</li> <li>2. My knowledge sharing would create new business opportunities for the organization</li> <li>3. My knowledge sharing would improve work processes in the organization</li> <li>4. My knowledge sharing would increase productivity in this organization</li> <li>5. My knowledge sharing would help the organization achieve its performance objectives</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

*Example codes*

<b>Example code</b>	<b>Code</b>	<b>Effect</b>	<b>Category</b>	<b>Source</b>
R18: ‘I share my knowledge to the other divisions because I think it is important to show them the changes of Product C. At the moment, I recognize that people think Product C is scary. They do not get what is possible and what not with Product C’	Business opportunities	Positive	Knowledge self-efficacy	(Bock, Zmud, Kim, & Lee, 2005)
R2: ‘‘If I have faced a problem and I solved it. I’m able to help other teams to improve their productivity with it, I will share it. Especially when we are dependent from those teams’	Productivity in the organization	Positive		
R11: ‘‘I think my knowledge sharing contribute to the long-term strategy of the Company’’	Performance objectives	Positive		

*Sources*

<b>Respondents</b>	<b>Code</b>
R1, R9, R17, R18, R20, R21	Business opportunities
R2, R5, R6, R16, R17, R19, R22, R23, R24	Productivity
R1, R4, R8, R10, R11, R12, R13, R23	Performance

Because the consistency of the effect of knowledge self-efficacy on motivation, no additional observations were done.

### EF 3: Organizational commitment

#### Code scheme

<b>Code name</b>	<b>Organizational commitment</b>
<b>Definition</b>	The relative strength of an individual's identification with, and involvement in a particular organization (Mowday, Steers, & Porter, 1979, p. 224)
<b>Literature indicators</b>	(van den Hooff & de Leeuw van Weenen, 2004) <ol style="list-style-type: none"> <li>1. The organization is a good organization for me to work for</li> <li>2. I'm really concerned about how this organization is doing</li> <li>3. I put extra effort in order to make this organization succeed</li> <li>4. I talk to my friend and acquaintances about this organization as a nice organization to work for</li> <li>5. I take pride in telling others what I work for this organization</li> <li>6. Most of the time, I can agree with the general course of this organization's management.</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

#### Example codes

Example code	Code	Effect	Category	Source
R19: 'I have the freedom to perform how I wanted to. When I deliver something, I feel valued'	The organization is good for me	Positive	Organizational commitment	(van den Hooff & de Leeuw van Weenen, 2004)
R23: 'It always starts with signaling something within the organization, which can be improved for the company's performance. Then, I initiated an improvement because I feel responsible for it'	Concerns how the organization is doing	Positive		
R17: 'I think we need to take time to transfer our knowledge, and if that is outside working hours, that it will be outside working hours'.	Extra effort	Positive		
R21: 'I'm proud on what the Company has achieved. I feel part of it. Therefore, I can tell with pride what our company does'	Pride	Positive		

#### Sources

Respondents	Code
R1, R9, R13, R15, R16, R19, R22	The organization is good for me
R1, R2, R4, R5, R6, R7, R8, R9, R10, R11, R12, R14, R15, R17, R18, R19, R20, R22, R23, R24	Concerns how the organization is doing
R10, R11, R17	Extra effort
R3, R9, R13, R19, R21	Pride

### EF 4: Enjoyment in helping others

#### Code scheme

<b>Code name</b>	<b>Enjoyment in helping others</b>
<b>Definition</b>	Employees perceptions of pleasure obtained through sharing knowledge (Lin, 2007, p. 140)

<b>Literature questions</b>	(Lin, 2007) <ol style="list-style-type: none"> <li>1. I enjoy sharing my knowledge with colleagues</li> <li>2. I enjoy helping colleagues by sharing my knowledge</li> <li>3. It feels good to help someone by sharing my knowledge</li> <li>4. Sharing my knowledge with colleagues is pleasurable</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

*Example codes*

Example code	Code	Effect	Category	Source
R5: 'I like to help my colleagues with their communication objectives. If I notice they are able to do more by themselves in the future, it means I've learnt them something. I just like it when they have learnt something'	Helping colleagues	Positive	Enjoyment in helping others	(Lin, 2007)
R3: 'I'm getting excited when I share my learning with my colleagues'	Enjoying sharing	Positive		
R1: 'Enjoyment in helping other would not be the reason to participate in KT'	No influence	None		

*Sources*

Respondents	Code
R5, R6, R9, R10, R11, R12, R22	Helping others
R3, R9, R13, R15, R21, R24	Enjoying sharing
R1, R2, R4, R6, R7, R8, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R21, R22, R23, R24	No influence on motivation to provide

**EF 5, 6 and 7: Extrinsic motivation constructs**

*Code schemes*

Code name	Reciprocal benefits
<b>Definition</b>	The extent an employee believes that current knowledge sharing would lead to future requests for knowledge being met (Lin, 2007, p. 140)
<b>Literature questions</b>	(Lin, 2007) When I share my knowledge with colleagues, <ol style="list-style-type: none"> <li>1. I strengthen ties between existing members of the organization and myself.</li> <li>2. I expend the scope of my association with other organizational members.</li> <li>3. I expect to receive knowledge in return when necessary</li> <li>4. I believe that my future requests for knowledge will be answered.</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

Code name	Reputation
<b>Definition</b>	The degree to which employees believe that they will receive extrinsic incentives (such as salary incentives, bonuses, promotion incentives or job security) (Lin, 2007, p. 140)
<b>Literature questions</b>	(Wasko & Faraj, 2005) <ol style="list-style-type: none"> <li>1. I earn respect from others by participating</li> <li>2. I feel that participation improves my status in the profession</li> <li>3. I participate to improve my reputation in the profession.</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

Code name	Organizational rewards
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<b>Definition</b>	The degree to which employees believe that they will receive extrinsic incentives (such as salary incentives, bonuses, promotion incentives or job security) (Lin, 2007, p. 140)
<b>Literature questions</b>	(Lin, 2007) <ol style="list-style-type: none"> <li>1. I will receive a higher salary in return for my knowledge sharing.</li> <li>2. I will receive higher bonus in return for my knowledge sharing</li> <li>3. I will receive increased promotion opportunities in return for my knowledge sharing.</li> <li>4. I will receive increased job security for my knowledge sharing</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

## EF 8 and 9: Knowledge sharing costs (source)

### Code scheme

Code name	Perceived costs
<b>Definition</b>	Costs units have to sacrifice to participate in KT processes
<b>Literature questions</b>	(Casimir, Lee, & Loon, 2012) <ol style="list-style-type: none"> <li>1. Sharing knowledge with my colleagues voluntarily costs me too much time</li> <li>2. I stand to lose my standing in the organization if I voluntarily share all of my knowledge with my colleagues.</li> <li>3. Sharing my knowledge of my own accord will reduce my job security</li> <li>4. My colleagues may misuse the knowledge I willingly share with them</li> <li>5. My colleagues may take credit for the knowledge I voluntarily share with them</li> <li>6. Sharing knowledge voluntarily will reduce my chances of being successful in this organization</li> <li>7. Colleagues with who I have willingly shared knowledge may make mistakes for which I am blamed</li> <li>8. Sharing knowledge of my own take too much effort</li> <li>9. Locating the person in the organization with knowledge source cost me too much time</li> <li>10. Sharing voluntarily may reduce my change of promotion because my supervisor may perceive I am more knowledgeable than him/her</li> <li>11. Sharing knowledge voluntarily may reduce my power in my organization.</li> </ol>
<b>Question in interview</b>	Question 4: What motivates you to transfer knowledge outside your division?

### Example codes

Example code	Code	Effect	Category	Source
R21: 'I'm not going to initiate the knowledge transfer process without any goal. I can't take time for that; I don't want to take time for that. If it becomes relevant, we will find each other anyway'	Search costs (source)	High	Costs	(Casimir, Lee, & Loon, 2012) (Riege, 2005) (Hansen, Mors, & Lovas, 2005)
R7: 'Because you want to share your knowledge good, it may take hours of preparations'	Transfer costs (source)	High		
R8: 'I'm not preserving my knowledge because I'm afraid to loss value. I disapprove that unprofessional behavior and working in self-interest'	Loss of value	None		
Not found	Costs recipient	-		

### Sources

Respondents	Code
R2, R6, R7, R16, R21	Search costs



R4, R12, R14, R5, R6, R15, R16, R20, R21, R22, R23, R24	Transfer costs
R6, R7, R8, R17	Loss of value

### EF 11: Job-demand requirement

Code name	Job-demand requirement
<b>Definition</b>	The extent the unit demands knowledge transfer activities to fulfill his job
<b>Literature questions</b>	<p>(Casimir, Lee, &amp; Loon, 2012)</p> <ol style="list-style-type: none"> <li>1. My job requires me to share knowledge outside my division</li> <li>2. It is part of my job to share knowledge outside my division</li> <li>3. Sharing knowledge is an important part of my job</li> </ol> <p>(Reinholt, Pedersen, &amp; Foss, 2011)</p> <ol style="list-style-type: none"> <li>4. I share knowledge because I think it is important for my job (identified motivation)</li> </ol> <p>(Hansen, 1999)</p> <ol style="list-style-type: none"> <li>5. Could the product that was leveraged function as 'stand-alone', or was it dependent on other components or products in other divisions? (Highly dependent- mainly stand-alone)</li> </ol>
<b>Question interview</b>	Question 4: What motivates you to transfer knowledge outside your division? Are you dependent from another divisions?

### EF 11 and 12: Preference of developing own knowledge

#### Code scheme

Code name	Preference of developing own knowledge
<b>Definition</b>	The perceived receipt of information and/or knowledge that has a positive impact on a knowledge seeker's work (Levin & Cross, 2004)
<b>Literature questions</b>	<p>(Levin &amp; Cross, 2004)</p> <p>The information/advice I received from this person made the following contribution</p> <ol style="list-style-type: none"> <li>1. Client satisfaction with this project</li> <li>2. This project's overall performance</li> <li>3. This project's value to my organization</li> <li>4. This project's quality</li> <li>5. This project's coming in on budget or closer to coming in on budget</li> <li>6. Reducing costs on this project</li> <li>7. My being able to spend less time on this project</li> <li>8. Shortening the time this project took</li> </ol> <p>(Husted, Michailova, Minbaeva, &amp; Pedersen, 2012)</p> <ol style="list-style-type: none"> <li>1. Knowledge created outside my department is often not of sufficient quality</li> <li>2. I often do not trust knowledge sources outside my department</li> <li>3. I prefer to develop my own knowledge rather than use</li> </ol>

### Construct formalization

Code name	Formalization
<b>Definition</b>	The degree to which jobs within the organization are standardized and the extent to which employee behavior is guided by rules and procedures (Chen & Huang, 2007)
<b>Literature questions</b>	<p>(Chen &amp; Huang, 2007)</p> <ol style="list-style-type: none"> <li>1. The firm has a large number of explicit work rules and policies</li> <li>2. Employees follow the clearly defined task procedures</li> </ol>

	3. The firm relies on strict supervision in controlling day-to-day operation
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### Construct knowledge accessibility

<b>Code name</b>	<b>Knowledge accessibility</b>
<b>Definition</b>	The accessibility of the knowledge for the recipient
<b>Literature questions</b>	(Levin & Cross, 2004) <ol style="list-style-type: none"> <li>1. It would generally be hard to get in touch with this person (R).</li> <li>2. I general I could find the source if I wanted to talk the him or here.</li> <li>3. She would be around is I were to need him or here</li> </ol> (Borgatti & Cross, 2003) Getting information or advice from others is the opportunity to access their thinking. The extent to which you can access another person's thinking and knowledge is a continuum: <ol style="list-style-type: none"> <li>6. People who do not make themselves available to you quickly enough to help solve your problem.</li> <li>7. People who are willing to engage actively in problem solving with you in timely fashion.</li> </ol>

### *Transactive memory*

<b>Code name</b>	<b>Transactive memory</b>
<b>Definition</b>	
<b>Literature indicators</b>	(Borgatti & Cross, 2003) I understand this person's knowledge and skills. This does not necessarily mean that I have these skills or am knowledgeable in these domains, but I understand what skills this person has and domains there are knowledgeable in.

### Appendix: Organization structure

<b>Code name</b>	<b>Centralization</b>
<b>Definition</b>	The locus of decision-making authority lying in the higher level of a hierarchical relationship (Chen & Huang, 2007)
<b>Literature questions</b>	(Chen & Huang, 2007) <ol style="list-style-type: none"> <li>1. Employees have autonomy to do their work.</li> <li>2. Employees participate in the decision-making process.</li> <li>3. Employees search for problem solutions from many channels.</li> </ol>

<b>Code name</b>	<b>Integration</b>
<b>Definition</b>	The extent to which various subdivisions of an organization work interrelatedly. (Chen & Huang, 2007)
<b>Literature questions</b>	(Chen & Huang, 2007) The firm integrates vertically The firm integrates horizontally

<b>Code name</b>	<b>Social interaction</b>
<b>Definition</b>	Refers to the extent to which organizational members interact with each other (Chen & Huang, 2007)
<b>Literature questions</b>	(Chen & Huang, 2007) Communication

	<ol style="list-style-type: none"> <li>1. Employees communicate and discuss with another member frequently</li> <li>2. Employee have wiliness to communicate and discuss with other members in depth</li> </ol> <p>Coordination</p> <ol style="list-style-type: none"> <li>3. The tasks assignment of the employees is well planed</li> <li>4. The work procedures and activities are well scheduled.</li> </ol>
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## Appendix I.2. Opportunity constructs

### *Innovativeness*

<b>Code name</b>	<b>Innovativeness</b>
<b>Definition</b>	The perception that change and creativity are encourage, including risk-taking in new areas where one has little or no prior experience (Bock, Zmud, Kim, & Lee, 2005)
<b>Literature questions</b>	(Bock, Zmud, Kim, & Lee, 2005) <ol style="list-style-type: none"> <li>1. My company encourage suggesting ideas for new opportunities</li> <li>2. My organization puts much value on taking risks even if that turns out to be a failure</li> <li>3. My organization encourage finding new methods to perform a task.</li> </ol>

### *Time availability*

<b>Code name</b>	<b>Time availability</b>
<b>Definition</b>	The degree to which an employee has slack time at work (Siemsen, Roth, & Balasubramanian, 2008)
<b>Literature questions</b>	(Siemsen, Roth, & Balasubramanian, 2008, p. 443) <ol style="list-style-type: none"> <li>1. I have little free time to allocate during work</li> <li>2. I am usually under high time pressure at work</li> <li>3. The extra time I have available at work is limited</li> </ol>

### *Centralization*

<b>Code name</b>	
<b>Definition</b>	
<b>Literature questions</b>	<p>Number of direct contacts an employee is connected (Reinholt, Pedersen, &amp; Foss, 2011).</p> <p>(Tsai, Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation and performance, 2001)</p> <ol style="list-style-type: none"> <li>1. Which units provide your unit with new knowledge or expertise when your unit is seeking technical advice inside your organization?</li> <li>2. Which units do you provide new knowledge or expertise when they are seeking technical advice inside your organization?</li> </ol>

## Appendix I.5. Relational constructs

### *Tie strength*

<b>Code name</b>	<b>Tie strength</b>
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<b>Definition</b>	Closeness of a working relationship and communication frequency (Hansen, 1999)
<b>Literature questions</b>	(Murray, Rankin, & Magill, 1981) How often are you in contact? (Closed) Strong = More than twice per week Weak = Two or less per week No = Never met them before

*Formal and informal ties*

<b>Code name</b>	<b>Formal ties</b>
<b>Definition</b>	Contacts prescribed by the organization out daily job (Aalbers, Dolfsma, & Koppius, 2014)
<b>Literature questions</b>	(Aalbers, Dolfsma, & Koppius, 2014) Are those contacts needed to perform your daily job? Yes = formal No = informal Who are the key people with to successfully

<b>Code name</b>	<b>Informal ties</b>
<b>Definition</b>	Contacts useful in staying informally informed about what is going on within the organization (Aalbers, Dolfsma, & Koppius, 2014)
<b>Literature questions/ indicators</b>	(Aalbers, Dolfsma, & Koppius, 2014) Who are the people that you connect with to discuss what is going on with the organization to get things done that are of personal relevance to you? (Levin & Cross, 2004) <ol style="list-style-type: none"> <li>1. I would have felt awkward talking to this person about non-work-related problems (R)</li> <li>2. I knew this person well outside of work-related areas.</li> </ol>

*Trust*

<b>Code name</b>	<b>Trust1 (Benevolence trust)</b>
<b>Definition</b>	
<b>Literature questions</b>	(Levin & Cross, 2004) <ol style="list-style-type: none"> <li>1. I assumed he or she would always look out for my interests</li> <li>2. I Assumed that he or she would go out of his or her way to make sure I was not damaged or harmed</li> <li>3. I felt like he or she cared what happened to me</li> </ol>

<b>Code name</b>	<b>Trust2 (Competence-Based trust)</b>
<b>Definition</b>	
<b>Literature questions</b>	<ol style="list-style-type: none"> <li>1. I believed that this person approached his or her job with professionalism and dedication</li> <li>2. Given his or her track record, I saw no reason to doubt this person's competence and preparation.</li> </ol>

<b>Code name</b>	<b>Trust (recipient)</b>
<b>Definition</b>	The extent to which a person is confident in and willing to act on the basis of the words, actions and decisions of another (Casimir, Lee, & Loon, 2012)
<b>Literature questions</b>	(Kang & Hau, 2014) <ol style="list-style-type: none"> <li>1. I can talk freely to my colleagues about difficulties I am having at work</li> <li>2. If I share my problems with my colleagues, I know they would respond constructively and caringly</li> <li>3. I can talk frankly to my colleagues about worries I am having at work</li> </ol>

	<p>4. My colleagues approach their job with professionalism and dedication</p> <p>5. I can rely on my colleagues not to make my job more difficult by careless work.</p>
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*Knowledge management strategy*

<b>Code name</b>	<b>Knowledge management strategy</b>
<b>Definition</b>	
<b>Literature questions</b>	<p>(Husted, Michailova, Minbaeva, &amp; Pedersen, 2012)</p> <p>Which of the following strategies does the company mainly follow to support knowledge?</p> <ol style="list-style-type: none"> <li>1. Information technology strategy (my company focuses on using internet, databases etc.)</li> <li>2. Personalization strategies (my company focuses on bringing people together, arranging workshops, etc.)</li> </ol>

*Company tenure*

<b>Code name</b>	<b>Company tenure</b>
<b>Definition</b>	Years of working for the company
<b>Literature/ Interview questions</b>	How long have you been working in this company? (years) (Wasko & Faraj, 2005)
	Answers are provided at Table 20.

*Knowledge construct*

<b>Code name</b>	<b>Tacit knowledge</b>
<b>Definition</b>	
<b>Literature questions</b>	<p>(Levin &amp; Cross, 2004)</p> <ol style="list-style-type: none"> <li>1. Was all this information/advice sufficiently explained to you in writing (in written reports, manuals, e-mails, faxes, etc.).</li> <li>2. How well documented was the information/advice that you received from this person?</li> <li>3. What type of information/advice came from this person? <ol style="list-style-type: none"> <li>a. Mainly reports, manuals, documents, self-explanatory software.</li> <li>b. Half know-how, half reports/documents</li> <li>c. Mainly personal practical know-how, tricks of the trades</li> </ol> </li> </ol> <p>(Bock, Zmud, Kim, &amp; Lee, 2005)</p> <ol style="list-style-type: none"> <li>8. Knowledge means that individual's know-how or something which is helpful in solving problems in the organization.</li> </ol>

**5.6.1.1. Overview of empirical resources of motivation constructs**

Table 12 overviews the empirical sources of the empirical findings. When the source is indicated green, he or she approved this empirical finding. If the source is green, it means there were no phrases linked to the empirical finding and the phrases of that respondent (ND= No data). In addition, the abbreviation PE means that the construct was presence, and it was affecting knowledge transfer behavior. Furthermore, NA means not applicable. Due to time constructs, the table only reflects to the first 15 findings.

**TABLE 26: SOURCES EMPIRICAL FINDINGS (MOA-CONSTRUCTS)**

Source	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R1			TE	ND	ND	ND	ND			ND					ND
R2				ND					ND						
R3	ND	ND							ND			ND			
R4				ND											
R5				PE					ND				NA	NA	NA
R6				NA					ND	ND			NA	NA	NA
R7	ND			ND											
R8					ND					ND		ND	NA	NA	NA
R9				PE									NA	NA	NA
R10						ND			ND						
R11													ND	ND	
R12															
R13					ND										
R14	ND														
R15	ND	ND		ND											
R16															
R17														ND	
R18					ND	ND	ND					ND			
R19															
R20				NA	ND								NA	NA	NA
R21		ND		ND					ND						
R22															
R23		ND													
R24															
Obs.	ND	ND					ND			ND					

## Appendix J: Checklists and notes observations

To analyses the observations, checklists are made, provided by Merriam and Tisdell (2016). These checklists are discussed in the upcoming tables.

### Appendix J.1 Checklist observations

TABLE 27: CHECKLIST OBSERVATION ANALYSES (MERRIAM & TISDELL, 2016, P. 141)

The physical setting	What is the physical environment like? What is the context? What kinds of behavior is the setting designed for? What objects, resources, technologies are in the setting?
The participants	Describe who is in the scene, how many people and their roles/ What brings these people together? Who is allowed there? Who is not here you would expected to be here? What are relevant characteristics of the participants?
Activities and interactions	What is going on? Is there a definable sequence of activities? How do the people interact with the activity and with one another? How are people and activities connected? What norms or rules structure the activities and interactions? When did the activity begin? How long does it last?
Conversation	What is the content of conversations in this setting? Who speaks to whom?

Subtle factors	Less obvious but perhaps as important to the observations are informal and unplanned activities, symbolic and connotative meaning of words, nonverbal communication.
Your own behavior	How much is the observer part of science as participant? How is your role? <i>See Appendix J.2</i>

## Appendix J.2 Observation research methods

**TABLE 28: ROLES OF AN OBSERVER (EASTERBY-SMITH, THORPE, & JACKSON, 2015; CREWSWELL & POTH, 2018; MERRIAM & TISDELL, 2016, P. 144)**

Observation research	Explanation
Complete observer	Researcher maintained complete distance and avoids direct engagement.
Observer-as-participant	Researcher engages in a passive way by asking questions, but not influence the field of study.
Participant-as-observer	Researcher is participating in the activity at the site. This may lead to new insights from an insider's perspective. However, it could be distracting for the observed people, when the researcher is taking notes and the observed people are aware that they are observed. Trade-off between the depth of the information provided by the participants and the confidentiality promised by the researcher.
Complete participant	Researcher is fully engaged with the people to observe. This could lead to more 'true' observations, because the participants may feel natural in their behavior. Because the observer is part of the group, it does not disrupt the activity of the group. However, this could lead to Loss of perspective on the group, being labeled s spy or traitor when research activities are revealed.

## Appendix J.3 Observation Sales meeting

**TABLE 29: OBSERVATION SALES MEETING**

Title and date	Sales meeting – 18-06-2019
The physical setting	Meeting with the sales employees of product A and B. At the informal lunch area at the company. Meeting was initiated by a sales support employee. Normally, this is two weeklies.
The participants	Eight sales employees from product A (4 persons) and B (3 persons) and sales support (1 person). Meeting is initiated by the sales support employee every two weeks. However, meetings are not mandatory. <i>Surprisingly, only sales employees of product A and B were invited. The reason for this was that the sales employees through there was not enough overlap between the divisions.</i> There are no more other initiatives with other product divisions.
Activities and interactions	One-by-one, the sales employees shared their updates about customers working on. Also, the sales support employee announced a sponsor event, which the Company was participating in. The meeting was informal and had a duration of 30 minutes.
Conversation	The sales employees were talking one-by-one, waiting for their turn to tell customer updates. Sometimes, when sales employees were having information for each other
Your own behavior	When I asked at the sales support employee if I could be joining this meeting for this thesis. Therefore, I was expecting to be an observer as a participant.

	However, during the meeting they were asking my updates concerning customer-projects. This would made me a participant as an observer. Also, I asked how this group was conducted to meet.
Learning points/ Memo's	<ol style="list-style-type: none"> <li>9. The content of the knowledge was more information. There were no lessons learnt shared.</li> <li>10. The group was set up between two product divisions, because they had the feeling that their customer overlap. Other product divisions were neglected.</li> <li>11. Meeting was done in an informal place, where people could walk by.</li> <li>12. Informal atmosphere, everyone had the possibility to talk and to react on people.</li> <li>13. The meeting was mandatory, meaning that if a sales employee was not present, it was not really a big deal.</li> </ol>

## Appendix J.4 Observation acquiring feedback

TABLE 30: OBSERVATION FEEDBACK ACQUISITION

Title	Acquiring feedback from colleagues on 17 July 2019
The physical setting	To test a new product for a customer, an employee of Product division D emailed 21 colleagues to provide feedback of the new system. So, the environment depended from where the employees opened their mailbox.
The participants	<p>The recipient sent an email towards 21 colleagues. Eight of them provided feedback. She chooses her <i>participants</i> on several reasons:</p> <ol style="list-style-type: none"> <li>14. People from multiple departments were asked (finance, other product divisions, design, marketing), to provide feedback from different perspectives.</li> <li>15. She asked people who were close to her in the organization because she thought that they were more willing to provide feedback and she didn't have to spend a lot of time to persuade colleagues and indicate why the feedback was important for her.</li> <li>16. She asked one formal colleague who too asked for feedback. This colleague is recognized as central in the organization.</li> <li>17. she taught were willing to provide contact; so, people she had strong informal ties with. Therefore, she didn't have to introduce her case, because these people were knowing where she was working on.</li> <li>18. Additionally, chose multiple language colleagues, because the product was in multiple languages.</li> </ol>
Activities and interactions	The email was sent on Wednesday 17 July. After 2 months, 8 people provided here feedback by email.
Conversation	The conversation was in English, by email. Eight colleagues provided feedback through email.
Subtle factors	The email was sent during the vacation period, so they may have affected the response rate. Also, the email was also sent to colleagues outside the headquarters.
Your own behavior	<p>Afterwards, I spoke to the employee and asked the following questions:</p> <ol style="list-style-type: none"> <li>1. What percent provided feedback?</li> <li>2. Based on which factors did you decide whom to contact for feedback?</li> <li>3. Why did you choose to search for feedback outside your product division?</li> </ol>
Learning points/ memo's	<ol style="list-style-type: none"> <li>19. The employee received from 8 of the 21 people feedbacks.</li> <li>20. The recipient asked for feedback to enhance the quality of the product (product goal).</li> </ol>



	<p>21. She searched for feedback, because she thought it was important for her customers to understand the system. Therefore, she asked people who didn't have pre-knowledge of the system. Formal colleagues did have knowledge of the system.</p> <p>22. They didn't receive any feedback from people outside the headquarters, she acknowledged that she didn't know those people that well.</p> <p>23. To set up a list, she asked her colleague who has a centralized position who she had to ask.</p> <p>24. The employee asked as much as possible different departments (finance, other product divisions, design, marketing) to provide feedback from different perspectives.</p> <p>25. A recipient asked feedback based on informal ties, because these people were knowing what the recipient was doing. Therefore, the recipient that people were more willingness to provide feedback and she didn't need much introduction of her work activities.</p>
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## Appendix J.5: Conducting interviews

**TABLE 31: OBSERVATIONS CONDUCTING INTERVIEWS**

Title	Conducting interviews in May 2019
The physical setting	For this thesis, 24 employees were approached for a face-to-face interview, and thus were approach to share their knowledge with me. The emails were sent in an electronic environment. Also, the interviews were conducted in a closed booked room, at the headquarters of the company.
The participants	In total, 24 employees were reached out to participate in the interviews. The participants were chosen on the following criteria: <ul style="list-style-type: none"> <li>26. The role of a product owner or product manager of a product division.</li> <li>27. The support teams: Technical, marketing, sales.</li> <li>28. From every product divisions: a marketing employee or sales employee (preference on long tenure)</li> <li>29. Additionally, the developers were invited of the biggest divisions.</li> </ul> Afterwards, every participant received an email for the two additional questions.
Activities and interactions	The email was sent on Wednesday 17 July. After 2 months, 8 people provided here feedback by email.
Conversation	The conversation was in Dutch, except for one interview. Based on the mother tongue of the participants. The interviews were two-way communicated. This enabled the interviewer to react on the reaction of the participants.
Subtle factors	One of the interviewees had done also a practice interview. This means she could be influenced, because she knew the questions and had more time to think about questions.
Your own behavior	Participant as an observer. So, I invited the participants, arranged the facilities and conducted the interviews. The questions ask could be found in Appendix F (interview protocol).
Learning points/ memo's	<ul style="list-style-type: none"> <li>30. All the participants were focused during the conversations: they muted their phones or were muting calls.</li> <li>31. All 24 participants were willing to participant in the interviews. Despite the ties the source and recipient had.</li> <li>32. 17 of the 24 participants reacted on the email.</li> </ul>



