THE INFLUENCE OF DISTANCE ON THE TRANSFER OF TACIT KNOWLEDGE

AN EMPIRICAL STUDY WITHIN THE MULTINATIONAL CORPORATION PAPERFOAM

'We can know more than we can tell.'

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Abstract

This study investigates the influence of six dimensions of distance on the transfer of tacit knowledge, by using the socialization – externalization – combination – internalization (SECI) model by Nonaka & Takeuchi (1995), in the context of the Multinational Corporation. The results reveal that the influence of distance is particularly important in the initial phase of the process. Spatial dispersion mainly influences the transfer process by impeding the ability for the sender and receiver to see each other, which is crucial for the socialization phase of the transfer process. Contextual differentiation impedes the ability for the sender and receiver to understand each other, which is crucial for the externalization phase to take place. Each dimension of distance has its effect on a particular part of the transfer process and the role of distance is depended on the tacitness of the knowledge.

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Chapter 1 – Introduction

1.1 Background

"Knowledge is power" (Hobbes & Molesworth, 1841, p. 69) argued Thomas Hobbes already in 1841. This quote has been cited many times and used within many disciplines to express the importance of knowledge. When considering today's society, knowledge is widely discussed in the context of globalization, which is becoming more and more important (Bhagat, Kedia, Harveston, & Triandis, 2002). Within the context of globalization, attention is paid to knowledge in the Multinational Corporation (MNC), a network of units that are dispersed across borders (Schlegelmilch & Chini, 2003).

When focusing on knowledge in the MNC, the transfer of organizational knowledge between the different units of a MNC is getting more and more attention. The reason for this is that the competition between multinational organizations intensifies and effective transfer of organizational knowledge within these organizations can be a source for competitive advantage (Almeida, Grant, & Song, 1998). Therefore, it is valuable for the organization to understand how transfer of organizational knowledge can take place effectively. Furthermore, the transfer process of organizational knowledge across geographic boundaries is changing due to the improvement of communication technologies (Bhagat, Kedia, Harveston, & Triandis, 2002). Because of these improvements, it is getting easier to transfer knowledge between countries within a MNC. Because of the importance of knowledge transfer for the competitive advantage of the MNC on the one hand, and the changing processes of it on the other hand, it is relevant to take a closer look at this process.

When considering knowledge, a distinction can be made between explicit knowledge and tacit knowledge. Explicit knowledge can be seen as the 'know what'. This kind of knowledge is highly codified and is transmittable in formal systematic language (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004). Tacit knowledge is about the 'know how'. The concept of tacit knowledge derives from the work of Polanyi, who argued that "we can know more than we can tell and we can know nothing without relying upon those things which we may not be able to tell" (Polanyi, 1966, p. 4). In this sense, tacit knowledge is more abstract and can be communicated only through active interaction between the sender and receiver of knowledge (Dhanaraj, Lyles, Steensma, & Tihanyi, 2004). Because of this need for active interaction, tacit knowledge requires more than just codification into formal systematic language in order to transfer it. Therefore, the context in which the tacit knowledge is situated, needs to be

understood by the receiver and interactive media are necessary to transfer tacit knowledge between the sender and receiver. Furthermore, tacit knowledge is often embedded within individuals' cognitive processes or is deeply rooted in the processes of an organization's unique culture and values (Daft & Lengel, 1986). It is therefore argued that the transfer of tacit knowledge is more complex than the transfer of explicit knowledge (Nelson & Winter, 1982). For this reason, Nonaka and Konno (1998) argue that the transfer of tacit knowledge requires a conversion process from tacit knowledge into a form of explicit knowledge. This process will be described in further detail in the next chapter. Tacit knowledge is perceived as an important asset in the improvement of productivity in the organization (Haldin-Herrgard, 2000; Hisyam Selamat & Choudrie, 2004). This implies that the transfer of tacit knowledge in relation to the productivity within a MNC, is interesting to investigate because of its complexity and importance for the MNC.

Plenty research has been done regarding the relation between tacit knowledge and knowledge transfer. Many researchers see the abstract characteristic of tacit knowledge as a main source of ambiguity (Reed & DeFillipi, 1990; Szulanski, 1996; Simonin, 1999) and therefore count it as an important barrier to knowledge transfer. This is related to the characteristics of tacit knowledge that make the transfer of tacit knowledge complex. However, when taking a closer look at the transfer of tacit knowledge within the MNC, other barriers to the transfer of tacit knowledge can be found, that are related to an important characteristic of the MNC. This characteristic is the ‘distance’ between the MNC’s units. It is argued that distance can have a great negative impact on the transfer of knowledge in the MNC, due to time differences for example (Ghemawat, 2001).

Distance in the context of the MNC refers to differences between organizational units (headquarters and subsidiary) in terms of structures, processes and values (Schlegelmilch & Chini, 2003). It attempts to capture, for example, issues like differences in approaches towards decision-making. Simonin (1999, p. 473) defines distance as follows: It “captures the degree of dissimilarity between the partners’ business practices, institutional heritage, and organizational culture”. Distance affecting knowledge transfer can be explained in more different ways. A distinction can be made between spatial “dispersion” (distribution of knowledge senders and recipients in space) and contextual “differentiation” (cultural, linguistic, professional differences of knowledge senders and recipients) dimensions of distance (Doz & Santos, 1997). In this research, the concept of ‘distance’ captures both the spatial dispersion and the contextual differentiation between the MNCs units.

1.2 Scientific relevance

Until now, research has paid much attention to the transfer of knowledge within organizations, where a distinction has been made between the transfer of tacit knowledge and the transfer of explicit knowledge (Barney, 1986; Grant, 1996; Szulanski, 2003). Within the context of the MNC, distance as an influence on the transfer of knowledge in general has also been widely discussed (Leonard & Sensiper, 1998; Li & Scullion, 2006). However, here the distinction between the influence of distance on the transfer of tacit knowledge and the transfer of explicit knowledge has received only little attention. Most research in the field of organizational knowledge transfer focuses on explicit knowledge (Szulanski, 1996; Hansen, 2002; Dinur, Hamilton, & Inkpen, 2009). The reason for this is that the transfer of tacit knowledge is complicated to measure as it is rather intangible (Mowery, Oxley, & Silverman, 1996).

Few studies investigated the relation between distance and tacit knowledge transfer and found relevant factors of distance that influence the transfer of tacit knowledge within the MNC (Wesselink, 2011; Lindberg, 2011). However, these studies failed to explain how the relevant factors of distance influence the process of tacit knowledge transfer. This process contains different phases and the level of tacitness of the knowledge that is transferred, changes along the process from highly tacit knowledge to more explicit forms of knowledge (Nonaka & Nishiguchi, 2001). The influence of distance tends to differ for explicit knowledge and tacit knowledge which implies that the influence of distance can change along these phases (Nelson & Winter, 1982). Therefore, it is relevant to consider the different phases of the transfer process when examining the influence of distance on the transfer of tacit knowledge.

This research focuses on how distance influences the process of tacit knowledge transfer within the MNC. It deals with the difficulty of the measurement of tacit knowledge transfer by conducting an in-depth multiple empirical case study research in a MNC where the transfer of tacit knowledge is taking place. This leads to an understanding of the influence of distance on the transfer process of tacit knowledge within the MNC. Therefore, the objective of this study is to contribute to the field of literature that considers the influence of distance on tacit knowledge transfer, by explaining how distance influences the different phases of the process of tacit knowledge transfer.

1.3 Practical relevance

This case study will be conducted at PaperFoam, a MNC in The Netherlands that has to deal with the influence of distance on the transfer of tacit knowledge. PaperFoam is a packaging company based in Barneveld, which is specialized in Bio Based packaging solutions with low carbon footprints. The packaging material, which is also called 'PaperFoam', is made from potatoes and tapioca that leads to industrial starch and which is mixed with cellulose fibers. It is used in a wide range of industries and includes packaging for large and small electronics, cosmetics and accessories, medical supplies and dry-foods (PaperFoam, 2016). All of the research and development, package design and mold manufacturing is managed and carried out from the headquarters in The Netherlands. The production facilities are located in The Netherlands, Malaysia and North-America. Reasons for the dispersion of these production facilities are that the customers of PaperFoam and the raw materials that are needed for the production of PaperFoam's packaging, are located in areas close to the production facilities.

The natural ingredients in PaperFoam's product lead to a dynamic production process, which makes it hard to establish clear expectations on the quality of the product at the end of the production process. Therefore, clear agreements have to be made between PaperFoam and its customers on the quality requirements of a new product. These quality requirements are hard to express in explicit information, because they are based on the 'beauty' 'look' and 'feeling' of the product. An example of a quality requirement is the type of defect in the package. As defects can take on a lot of different forms, it is difficult to explicitly articulate which type of defect is allowed and which one is not.

Insight and assessment from the employee is needed in order to determine if a particular defect in the package is allowed. This insight and assessment is based on experience and judgement which is described as tacit knowledge (Haron & Alias, 2005). Therefore, it is important that employees receive the correct tacit knowledge in order to assess the quality requirements. Because the assessment of quality requirements differs between the production facilities in The Netherlands, North-America and Malaysia, PaperFoam's management wonders if and how distance between the production facilities in terms of spatial dispersion and contextual differentiation, influences the transfer of knowledge regarding the assessment of quality requirements, possibly leading to the differences in assessment.

Because of the importance of tacit knowledge transfer for the competitive advantage of the MNC and the influences of distance on the transfer of knowledge as indicated by literature, it

is relevant to investigate how distance influences this process of tacit knowledge transfer within PaperFoam (Haldin-Herrgard, 2000; Hisyam Selamat & Choudrie, 2004). This will be done by comparing the transfer of tacit knowledge between the headquarters in The Netherlands and the subsidiaries in The Netherlands, North-America and Malaysia. The practical objective of this case study is to explain how distance influences the transfer process of tacit knowledge regarding production skills and the assessment of quality requirements of PaperFoam's product. Based on that explanation, recommendations can be given on how to deal with these influences of distance, in order to reduce the differences in assessment of quality requirements between the different production facilities worldwide.

1.4 Research question

Following the theoretical and practical relevance including the research objectives and the reasoning within this introduction, the following research question is formulated:

> *How does distance influence the transfer of tacit knowledge within a Multinational Corporation?*

In order answer the research question, it is important to create an understanding of the concepts together with their relation mentioned in the research question, both from an academic and practical point of view. Therefore, three sub-questions are formulated that help to create insight into the knowledge needed to answer the research question:

1. *How is tacit knowledge transferred within a MNC?*
2. *How is spatial dispersion related to tacit knowledge transfer within a MNC?*
3. *How is contextual differentiation related tacit knowledge transfer within a MNC?*

1.5 Outline of the thesis

The next chapter discusses the relevant theoretical constructs together with the conceptual model. Reviewing the existing literature provides help in answering the sub-questions formulated above and therefore the sub-questions will used to structure this chapter. Chapter 3 involves the methodology of this research and explains the process of how the answer to the main research question and sub-questions can be found by conducting empirical research within PaperFoam. Chapter 4 is concerned with the analysis and results of the research. Chapter 5 offers a conclusion and discusses the limitations and implications of this research.

Chapter 2 – Theoretical background

This chapter discusses the field of research on knowledge transfer within MNCs. Due to the complexity of knowledge and the focus of this research on the tacit dimension of knowledge, the chapter starts with an explanation of the concept of knowledge, followed by an elaboration on explicit knowledge and tacit knowledge. Afterwards, the transfer of knowledge will be discussed with an emphasis on the process of tacit knowledge transfer that is based on the ideas of Nonaka and Takeuchi (1995). The subsequent paragraph focuses on knowledge transfer within the context of the Multinational Corporation. The last section goes into the influence of distance on the transfer of knowledge.

2.1 Knowledge

Since knowledge, as described earlier, is important for the firms' sustainable competitive advantage, it is relevant to understand the meaning of knowledge when considering the transfer of it. Knowledge consists of a mix of contextual information, values, insight, experience and grounded intuition, which provides a framework and environment for evaluation and incorporating new experiences (Davenport & Prusak, 2000). It is originated and applied in the mind of the knower and within organizations it becomes embedded in organizational processes, routines, practices and norms (Davenport & Prusak, 2000).

When considering knowledge, there have been many suggestions as to how to categorize this concept. A common distinction is between research and development, or that between process and product (Kogut & Zander, 1992). In the management literature, another clear distinction can be found between 'knowing about' and 'knowing how'. 'Knowing about' consists of information about facts and theories, which can be gained without restriction, due to its ease in communication. It is related to explicit knowledge. 'Knowing how' is concerned with the application of knowledge, which can only be acquired through practice. It is related to tacit knowledge (Grant, 1996). This is an important distinction in the context of knowledge transfer, because the transferability and the mechanisms for transfer across individuals, space, and time are different for tacit knowledge and explicit knowledge (Grant, 1996). Therefore, the next paragraph discusses the dimensions of tacit and explicit knowledge in further detail.

2.2 Explicit Knowledge & Tacit Knowledge

The distinction between explicit knowledge and tacit knowledge is based on the work of Polanyi (1966). He explains that 'we can know more than we can tell'. As this is rather abstract, the next illustration helps to understand this phrase. As human beings we know a person's face, and can recognize it among thousands of faces, even among millions of faces. Yet, we usually cannot tell how we recognize a face we know, which means that most of this knowledge cannot be put into words. This is what we call tacit knowledge, which develops from the transfer of context-specific knowledge (Polanyi, 1966). This is personal knowledge that resides in the mind, perceptions and behavior of individuals. Tacit knowledge involves experiences, skills, intuition, judgement and insight. It is shared through stories, discussion and person-to-person interaction (Casonato & Harris, 1999). Because most of tacit knowledge cannot be put into words, tacitness is defined in terms of how difficult it is to articulate and codify a given part of knowledge (Winter, 1987; Bresman, Birkinshaw, & Nobel, 1999; Zander & Kogut, 1995).

Within the field of business, tacit knowledge is perceived as an important asset in the improvement of the quality of work, organizational learning, decision making, the production of goods and customer service (Haldin-Herrgard, 2000; Hisyam Selamat & Choudrie, 2004). Furthermore, it is important for the competitive advantage of the organization (Osterloh & Frey, 2000). With regard to the field of business, tacit knowledge can be categorized into two dimensions, the cognitive and the technical dimension. The technical dimension considers the hard to define skills, expertise, crafts or practical 'know-how' (Haron & Alias, 2005). The cognitive dimension covers the mental models, values, perceptions and beliefs that are embedded within individuals to the extent that they are taken for granted. It shapes the way that people observe the world (Nonaka & Takeuchi, 1995). Knowledge in the cognitive dimension is more abstract than knowledge in the technical dimension. It is therefore argued that knowledge in the cognitive dimension is harder to articulate than knowledge in the technical dimension (Nonaka & Konno, 1998).

In contrast, explicit knowledge is knowledge that has been written down and articulated. Examples are knowledge published in journals, books, guidelines and databases. In the literature, it is referred to as fact-based (Berry, 1987), objective (Schultze, 2000), or informative (Zander & Kogut, 1995) knowledge. It is highly codified, easy to acquire and can be exploited quickly (Polanyi, 1966). Types of explicit knowledge that can be found within businesses are academic or technical data or information that is reported in formal language,

such as mathematical expressions, manuals, copyright and patents (Smith, 2001). This knowledge is easily shared and communicated through electronic communication tools and other formal means.

However, the distinction between tacit knowledge and explicit knowledge is not always that clear. Some knowledge can be seen as a clear example of tacit knowledge, some of explicit knowledge, while other knowledge shares elements of both tacit and explicit knowledge. This is line with the claim by Leonard and Sensiper (1998) that instead of distinct constructs, tacit and explicit knowledge represent a continuum. Furthermore, it is in agreement with Polanyi's point that all knowledge has tacit dimensions (Polanyi, 1966). This means that knowledge is not completely tacit or explicit, but that knowledge can possess a certain degree of tacit knowledge and a certain degree of explicit knowledge. An example that includes elements of tacit knowledge and explicit knowledge along the continuum, is the capacity to write a research report. Explicit guidelines to produce a report can be seen as explicit knowledge. The routines that researchers developed and learned from their mentors and other authors, are located in the middle between explicit knowledge and tacit knowledge, as these routines are not articulated, but this could be done with some effort. Lastly, the ability to 'hook' the reader is a skill that is established by means of experience, which is very difficult or even impossible to articulate completely. This is located at the most tacit side of the spectrum (Griffith, Sawyer, & Neale, 2003).

Because of the importance of tacit knowledge for the organization on the one hand and the difficulty to articulate and transfer it on the other hand, this research focusses on knowledge that is on the tacit side of the continuum (Leonard & Sensiper, 1998). This means that the bodies of knowledge in this research possesses a certain degree of tacitness, wherein the level of tacitness can be different from one body of knowledge to another (Polanyi, 1966). This research keeps this in mind, as the transfer process of tacit knowledge can be different, based on the tacitness of the knowledge that needs to be transferred (Grant, 1996). The next paragraph discusses the transfer of tacit knowledge.

2.3 Tacit knowledge transfer

Because knowledge is a critical asset for the organization, it is important that knowledge is not only created and captured by individuals, but also shared throughout the organization. According to the resource-based view, the transferability of a firm's resources and capabilities is a critical determinant of the firm's capacity to create a sustainable competitive advantage (Barney, 1986). The transfer of knowledge can be defined as a process of exchanges of knowledge between the sender and the receiver. The effectiveness of that transfer depends to some extent on the characters and abilities of the sender and receiver, on the strength of the tie between them, and on the characteristics of the knowledge that is transferred (Szulanski, 2003).

The transferability and the mechanisms for transfer across individuals, space, and time are different for explicit knowledge and tacit knowledge. Explicit knowledge is argued to be easy to communicate. This ease of communication is relevant for the organization and is argued to be the organization's fundamental property. Because of this ease of communication, it is rather simple to transfer explicit knowledge (Grant, 1996).

Tacit knowledge is uncovered by its application. The transfer of tacit knowledge between people becomes costly, uncertain and slow if tacit knowledge can only be acquired through practice, experienced by its application and cannot be codified (Grant, 1996). Therefore, the transfer of tacit knowledge requires understanding of the context of the sender and receiver and the use of interactive media, because tacit knowledge requires more than codification (Bhagat, Kedia, Harveston, & Triandis, 2002). Normally, it is deeply rooted within the cognitive processes of individuals or within the unique culture and values of the organization (Daft & Lengel, 1986).

Previous research indicates that tacit knowledge is harder to transfer than explicit knowledge. Nelson and Winter (1982) argue that the transfer of tacit knowledge is expected to be more complex than the transfer of explicit knowledge, for three reasons: (1) transferring tacit knowledge is more time-consuming because of the context that needs to be transferred; (2) there is causal ambiguity because it is hard to tell what the source is of tacit knowledge and (3) because of the unity of the knowledge structure in tacit knowledge, one part cannot be seen without the whole (Nelson & Winter, 1982). In addition, Grant (1996) argues that tacit knowledge is more difficult to transfer than explicit knowledge, because tacit knowledge is embedded in individuals.

2.3.1 The SECI-model

Nonaka and Takeuchi (1995) proposed a model to frame the issue of tacit knowledge transfer. They propose that the transfer of tacit knowledge requires it to be made explicit, after which it can again become tacit in the mind of the recipient. This model is called the Socialization-Externalization-Combination-Internalization Model (SECI), which can be found in Figure 1. It explains the interaction and conversion between tacit and explicit knowledge and forms the basis for the transfer of knowledge (Nonaka & Takeuchi, 1995). The interaction between the two dimensions of knowledge constitutes a dynamic model of knowledge conversion, separated into four distinct phases. These phases are 'socialization', 'externalization', 'combination' and 'internalization'.

The tacit knowledge transfer studied in this research is related to the first three phases of the model. The reason for this is that research is interested in the transfer of knowledge. As the last phase is not concerned with knowledge transfer, this phase is not involved in this research. Therefore, this chapter discusses the socialization, externalization and combination phase in more detail than the internalization phase. The SECI-model is used as a conceptual basis for the knowledge transfer process in this research and therefore an understanding of the different phases is important for the explanation of how distance influences the knowledge transfer process.

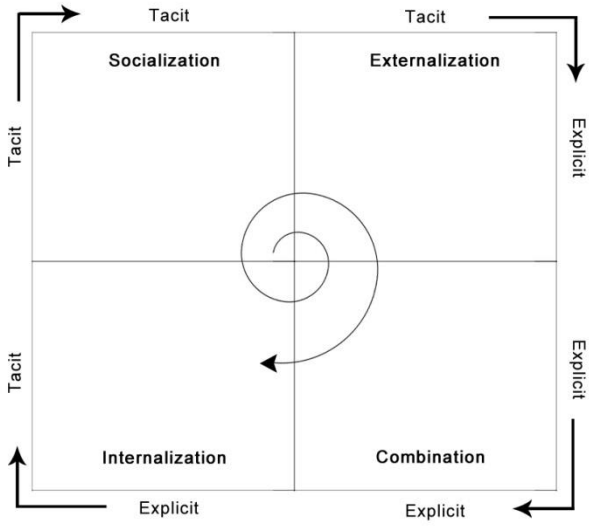


Figure 1. The SECI-model (Nonaka & Nishiguchi, 2001, p. 13)

Socialization

Socialization involves transferring tacit knowledge between individuals. Through imitation and observation between the members of an organization, tacit knowledge is shared, whereby new tacit knowledge is created (Nonaka & Takeuchi, 1995). In this phase, little communication is required, the focus is on interaction between persons and involvement in the experiences of another person. It is very time consuming because the sender and receiver of knowledge are dependent on direct contact between each other (Nonaka & Takeuchi, 1995). Therefore, socialization is basically a tool for the transfer of tacit knowledge between two members in the organization. It is, however, not the most efficient tool for the transfer of knowledge between groups of people within the MNC, because of the time and effort it requires. If knowledge needs to be transferred effectively within a MNC, a conversion to explicit knowledge is better suited, because the spatial distance between the departments of a MNC decreases the opportunity for interaction between persons and involvement in the experiences of another person (Allen, 1977).

Externalization

Externalization involves the conversion of tacit knowledge into explicit knowledge. It is the most crucial, but also the most difficult phase of knowledge transfer within MNCs (Nonaka & Takeuchi, 1995). Externalization signifies the articulation of tacit knowledge with the assistance of models, concepts, analogies and metaphors. In this phase, the individual is able to make their tacit knowledge explicit, for example through a process of communication and dialogue with others (Hislop, 2009). It is the phase where a member's personal knowledge becomes useful for the organization (Nonaka & Takeuchi, 1995). Interaction between individuals is still required, because explicit knowledge is created through a creative and social process that is connected to problem solving and brainstorming in a group (Nonaka & Takeuchi, 1995). In this creative process, each individual uses their own tacit knowledge to come up with new explicit knowledge. Externalization is also a time consuming process. Therefore, it is important that it is well implemented to be beneficial for the knowledge transfer process. In the context of the MNC, distance can be of influence on the conversion of tacit knowledge into explicit knowledge as, for example, spatial dispersion prevents partnering between employees, which is needed for the conversion process. (Allen, 1977).

Combination

In this phase, explicit bodies of knowledge are linked together, to create a more complex body of knowledge (Hislop, 2009). It involves the conversion of explicit knowledge into new explicit knowledge. It is a form of knowledge transfer with the aim of problem solving and innovation (Nonaka & Takeuchi, 1995). The main issues are the systemization of knowledge, the processes of diffusion of knowledge and communication (Nonaka & Konno, 1998). This phase is based on three processes. First of all, the capturing and integration of new explicit knowledge is important. This includes the collection of externalized knowledge within and outside the organization and combining these data afterwards. The second process is the dissemination of explicit knowledge. This is done by transferring explicit knowledge directly with the use of meetings or presentations. The last process is the editing of explicit knowledge to make it more usable, for example through the use of plans, market data and reports (Nonaka & Konno, 1998). Within the context of the MNC, electronic communication tools are mostly used for the communication and systemization of knowledge and the processes of diffusion of knowledge between the MNC's units (Wesselink, 2011).

Internalization

In this phase, an individual converts explicit knowledge into tacit knowledge, through applying it into their work tasks (Hislop, 2009). It requires learning from the receiving unit to embed the explicit knowledge into the routines of the individual. It is then finally rooted in the individual as tacit knowledge.

The process of socialization, externalization, combination and internalization can take place within different contexts, such as the context of the MNC. As this context can shape the process of knowledge transfer, Nonaka & Konno (1998) propose the concept of BA, a space wherein the transfer of tacit knowledge takes place.

2.3.2 The concept of BA

Ba is defined as 'a shared space for emerging relationships' (Nonaka & Konno, 1998, p. 1). It is a space where knowledge is created, shared and utilized (Nonaka, Konno, & Toyama, 2001). This space can be physical, for example an office or a dispersed business space. Furthermore, this space can be mental, for instance by means of shared experiences, ideas and beliefs. This space can also be virtual, for example in the use of e-mail or a teleconference. It can also be a combination of these spaces (Nonaka & Konno, 1998). Ba is different from average human interaction because of the concept of knowledge creation. It serves as a

foundation for advancing individual and collective knowledge (Nonaka & Konno, 1998). Both tacit and explicit knowledge is embedded in Ba. It is intangible and acquired through people's own experience or considerations of others experiences. When knowledge is separated from Ba, it becomes information. This can be communicated exclusively from Ba. Information is tangible and is embedded in media and networks (Nonaka & Konno, 1998).

The SECI-model is linked to the concept of Ba, as Ba offers the foundation for where the stages of the SECI-model can take place. There are four types of Ba that match the four stages of the SECI-model. Each type of Ba offers a platform for specific steps in the transfer of knowledge. 'Originating Ba' serves as a platform for the socialization phase. It is the place where individuals share emotions, feelings, experiences and mental models (Nonaka & Konno, 1998). The 'interacting Ba' is related to the externalization phase and is the place where individual's skills and mental models are converted into common concepts and terms through dialogue. It is the place where tacit knowledge is converted into explicit knowledge. The third type of Ba is 'Cyber Ba'. Here, interaction in a virtual world is taking place instead of in real space and time. It embodies the combination phase. Information technology and electronic communication tools are used to combine explicit knowledge with existing information. The last type of Ba is 'Exercising Ba'. This type of Ba facilities the conversion of explicit knowledge into tacit knowledge by focusing on continued exercises so that explicit knowledge is internalized in real life. Therefore, it supports the internalization phase (Nonaka & Konno, 1998).

In the context of the Multinational Corporation (MNC), the concept of Ba as a shared physical, mental and virtual space can be placed in another perspective when describing an important characteristic of the MNC; the distance between the headquarters and its subsidiaries. In order to understand the relation between the distance in the context of the MNC and the concept of Ba, a deeper explanation is needed on the concept of the MNC and the concept of distance.

2.4 The Multinational Corporation (MNC)

In international business research, the Multinational Corporation (MNC) is generally conceptualized as a network of units (Schlegelmilch & Chini, 2003). It consists of a group of organizations, which include the head-quarters and different national subsidiaries, that are geographically dispersed and have different goals. This group of organizations can be described as an inter-organizational network that must interact with customers, suppliers, regulators and so on in an external network (Ghoshal & Barlett, 1990). As pointed out, the transfer of knowledge is important for the sustainable competitive advantage of the firm (Almeida, Grant, & Song, 1998). This also holds for the MNC.

Research has revealed that knowledge creation and knowledge development not only takes place at the home base of the MNC, but in all of a corporation's locations. Important in studies on the 'geocentric' firm (Perlmutter, 1969) and the 'transnational' corporation (Bartlett & Ghoshal, 1989) is the idea that market, technical and functional knowledge is being created continuously, in all the parts of a corporation (Almeida, Song, & Grant, 2002). Therefore, it is important that knowledge between the different locations is managed well, so that this knowledge can be beneficial for the organization. Furthermore, it is relevant to notice that a considerable advantage of the MNC is its ability to access local knowledge in multiple locations. In the research of Almeida (1996), it is shown that the technology of local companies is important for the subsidiaries of United States' MNCs. Other research on knowledge transfer within MNCs indicates that the use of knowledge cannot be separated from its creation (Cohen & Levinthal, 1990). Consequently, the capacity of the recipient firm to absorb new knowledge is a function of that recipient's knowledge base. This means that the ability of a MNC to transfer knowledge from the home base to the overseas subsidiaries depends on the extent to which the overseas subsidiaries are engaged in knowledge development (Almeida, Song, & Grant, 2002). This is related to the argument of Szulanski (2003) mentioned earlier that the effectiveness of knowledge transfer depends on the ability of the sender and receiver. The reason for this is that the overseas subsidiaries need to have the ability to engage in knowledge development in order to effectively transfer knowledge between the MNC's home base and its overseas subsidiaries.

The distance between the headquarters and the subsidiaries can impede this ability to engage and thereby knowledge transfer can be affected. As distance could play a role in the transfer of knowledge, it is relevant to create a better understanding of this construct and its relation with knowledge transfer.

2.5 Distance

An extensive body of research has explored the influence of distance on the transfer of knowledge in the context of the MNC (Li & Scullion, 2006). With regard to the transfer of tacit knowledge, this body is not that large. Some researchers examined this topic. Leonard & Sensiper (1998) argue that distance is a barrier to the transfer of tacit knowledge, because distance complicates the creation and transfer of knowledge through physical demonstrations of skill and through body language, which is inherent to tacit knowledge. Furthermore, Howard Gardner (1993) argues that some types of tacit knowledge are more difficult to express over distances, for example interpersonal knowledge. Moreover, a certain level of personal intimacy is argued to be necessary to create comfortable communication of tacit knowledge and distance obstructs this intimacy (Leonard & Sensiper, 1998).

Research regarding the influence of distance on the transfer of knowledge, distinguishes the concept of distance into different dimensions, such as organizational distance, cultural distance, geographical distance, linguistic distance, norm distance etcetera. Within research, there is no clear view on the definition of distance in the context of the MNC and the categorization of the different dimensions. For example, Simonin (1999) uses the words organizational distance to define distance in the context of the MNC as follows: It "captures the degree of dissimilarity between the partners' business practices, institutional heritage, and organizational culture". In this definition, culture is seen as an aspect of organizational distance. In contrast, in the research of Johanson & Vahlne (1977), culture is included in their definition of distance. They refer to physic distance to define distance in the context of the MNC and define it as a set of factors such as education, language, culture, business practices and industrial development which disturb or prevent the information flows between organizations and foreign markets.

Doz and Santos (1997) make another separation and distinguish between spatial dispersion and contextual differentiation. As these authors are one of the few that explored the dimensions of distance that influence knowledge transfer in MNCs, their conceptualization of distance is used in this research (Ambos & Ambos, 2009). Therefore, distance is defined as the spatial dispersion and contextual differentiation between the MNC's headquarters and its subsidiaries. The spatial dispersion is the distribution of knowledge senders and recipients in space and the contextual differentiation is the cultural, linguistic and knowledge differences of knowledge senders and recipients (Doz & Santos, 1997).

When comparing the research on the dimensions of distance, four dimensions come forward that are used in most studies: physical distance, cultural distance, linguistic distance and knowledge distance. Physical distance is related to the spatial dispersion from the definition of distance used in this thesis, because physical distance can be explained as the distribution of knowledge senders and recipients in space (Doz & Santos, 1997). Cultural distance, linguistic distance and knowledge distance are related to the contextual differentiation of the definition of distance used in this thesis as contextual differentiation is defined as the cultural, linguistic and knowledge differences of knowledge senders and recipients (Doz & Santos, 1997).

Within current literature, these four dimensions are used to study the influence of knowledge transfer in general, without making the distinction between the transfer of tacit and explicit knowledge. However, research by Wesselink (2011) indicates that some of these dimensions are relevant in influencing the transfer of tacit knowledge. In that study, communication tools were found as an influencing factor. This can be seen as a result of the geographical distance. Furthermore, the differences in culture were significant factors and can be related to the cultural distance. Based on findings in earlier research, the dimensions of distance that are included in this research are: Physical distance, Cultural distance, Linguistic distance and Knowledge distance.

Spatial dispersion

2.5.1 Physical distance

Physical distance can be explained as the spatial distance between two units of the MNC (Ambos & Ambos, 2009). This spatial distance is the distance in space between the sender and receiver of the knowledge (Doz & Santos, 1997). Different studies have revealed that spatial distance prevents partnering between employees, where the sharing of knowledge is key (Allen, 1977). Units of the MNC may be less likely to interact if spatial distance between them is high. Furthermore, when interaction is started, obstacles like long transmission channels and different time zones limit the effectiveness of knowledge transfer because the cost and complexity of knowledge search and communication increases due to spatial distance (Daft & Lengel, 1986; Cyert & March, 1992). Other studies investigating the influence of geographical distance, found that when distances between parties increases, the transfer of technology will go slower (Galbraith, 1990; Lester & McCabe, 1993). In all of these cases, findings indicate that the development of good communication between the parties was based on the social capital embedded within the regional or group relations.

Social capital is defined as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1998, p. 243). Social capital is created through close interaction between members of the organization. This is related to the socialization and externalization phase of the SECI-model, as in these phases close interaction is also needed for the transfer of tacit knowledge (Nonaka & Takeuchi, 1995). Such social capital is harder to develop between physically distant parties (Allen, 1977).

Another study found that face-to-face meetings are more effective than other meeting or transfer formats when transferring knowledge that is of strategic importance (Athanassiou & Nigh, 2000). Within this study, the authors do not specifically mention tacit knowledge in the light of strategically important knowledge. However, as Osterloh & Frey (2000) indicate that tacit knowledge is of strategic importance for the organization, it could be argued that face-to-face meetings could be more effective than other meeting or transfer formats in tacit knowledge transfer. This is related to the findings of Wesselink (2011) that prove that the use of communication tools, such as Skype, affects tacit knowledge transfer. ICT is used as a tool to transfer knowledge, but face-to-face interaction is critical to transfer tacit knowledge (Wesselink, 2011). Therefore, the use of communication tools other than face-to-face meetings can be seen as a result of the spatial distance and this will be used to examine the influence of spatial distance on the transfer of tacit knowledge.

Contextual differentiation

2.5.2 Cultural Distance

GLOBE (Global Leadership and Organizational Behavior Effectiveness) defines organization culture as "shared motives, values, beliefs, identities, and interpretations or meanings of significant events within organizations that result from common experiences of members of collectives and are transmitted across age generations" (Javidan, Stahl, Brodbeck, & Wilderom, 2005, p. 61). It consists of the deep patterns of meaning and the taken-for-granted, basic assumptions shared by organizational participation (Slocum, 1995). Cultural distance in the context of the MNC is then defined as the difference in organization culture between the knowledge sender and the knowledge receiver.

An instrument to point out the differences in organization culture is the Organizational Culture Assessment Instrument (OCAI) (Cameron & Quinn, 1999). The instrument measures six dimensions of organizational culture. These dimensions are stemming from a theoretical

framework of how organizations function and the values upon which their cultures are based, the competing values framework by Cameron & Quinn (1999), which can be found in Figure 2. Four types of organizational culture are determined, each named after its most important characteristic: Market, Hierarchy, Adhocracy and Clan. It is argued that organizations who possess a similar organizational culture cooperate in a better way than organizations with competing cultural profiles (Cameron & Quinn, 1999). It could be argued then that knowledge transfer between parties with similar organizational cultures should take place with more ease than between parties with competing cultural profiles.

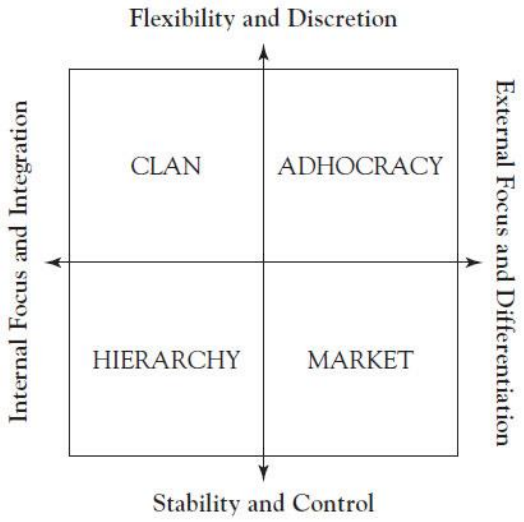


Figure 2. The Competing Values Framework (Cameron & Quinn, 1999, p. 31)

The difference in cultures of the knowledge sender and the knowledge receiver can have significant influence on knowledge transfer across borders (Bhagat, Kedia, Harveston, & Triandis, 2002; Javidan, Stahl, Brodbeck, & Wilderom, 2005; Pérez-Nordtvedt, Kedia, Datta, & Rasheed, 2008; Dinur, Hamilton, & Inkpen, 2009). Research on technology transfer has confirmed that differences in work values and organizational cultures can damage knowledge transfer (Allen, 1977; Tushman, 1977). The explanation for this is that similar cultures permit a steady working relationship between the knowledge transfer parties. In this reasoning, culture defines what is acceptable and unacceptable in a work place (O'Reilly & Chatman, 1996). Agreed norms provide predictability and understanding between the parties and ensure that a common approach will be adopted in the transfer process. culture and value systems (Cummings & Teng, 2003).

Cultural distance is also related to the rules that exist in a particular context of the knowledge transfer parties (Schlegelmilch & Chini, 2003). The authors argue that transferred knowledge

has to fit the rules that exist in the context of the recipient party, in order to be successful. Other research found that the transfer of knowledge from one cultural context to another is likely to fail, unless the system of understanding of the recipient organization fits the system of understanding of the sending organization (Macharzina, Oesterle, & Brodel, 2001).

Furthermore, multiple researchers found that national culture is an important determinant in the success of knowledge transfer between two parties. (Wesselink, 2011; Bhagat, Kedia, Harveston, & Triandis, 2002; Winkler, Dibbern, & Heinzl, 2008). The reason for this is that the organizational culture is shaped by the national culture (Ajmal & Koskinen, 2008). Hofstede, Pedersen and Hofstede (2002) classified numerous national cultures by five dimensions: Power Distance, Individualism / Collectivism, Uncertainty Avoidance, and Long-term Orientation. The study by Lievre & Tang (2015) researched the influence of these cultural dimensions on the transfer of knowledge and found that differences in cultural dimensions between France and China led to difficulties in knowledge transfer between a French and a Chinese organization.

The difference in level of power distance and individualism are expected to have the largest impact on knowledge transfer, according to Winkler et. al. (2008). This is confirmed by the study of Li et al. (2014). The dimension of Individualism / Collectivism is relation to knowledge transfer by means of communication. In collectivist cultures, people tend to communicate only with people from their own group and these may be very limited in the organization. Within individualist cultures, people tend to communicate with anyone in the organization. Therefore, within individualist cultures, knowledge transfer is expected to work better. It is argued that organizations who are located in individualistic cultures, are better able to absorb and transfer knowledge that is more explicit, whereas organizations located in collectivistic cultures are better able to absorb and transfer knowledge that is more tacit (Bhagat, Kedia, Harveston, & Triandis, 2002). Therefore, the transfer of tacit knowledge might be more difficult between particular cultures which is relevant to take into account in this research.

Power distance can be explained as the degree to which less powerful members of organizations and institutions accept and expect that power is distributed unequally (Hofstede, Pedersen, & Hofstede, 2002). When the distance in power increases, more communication barriers arise (Bhagat, Kedia, Harveston, & Triandis, 2002). In the relation with cross-border knowledge transfer, vertical and horizontal dimensions need to be explained. In a vertical

society, knowledge flows primarily from the top to the bottom, while in a horizontal society, knowledge flows both from top to bottom and from bottom to top. This difference in knowledge flows leads to the expectation that knowledge is more easily transferred in a horizontal society and therefore knowledge transfer is expected to work better when power distance is low (Wesselink, 2011).

To conclude, the expectation is that knowledge transfer within the context of the MNC is negatively influenced by the difference between cultures of the sender and the receiver.

2.5.3 Linguistic distance

Linguistic distance can be seen as the differences in language between the sender and the receiver of knowledge within the MNC. The differences between two parties in terms of language can have a great impact on transfer or trade between these two. For example, all other things being equal, trade between countries that share the same language, will be three times greater than between countries that do not share the same language (Ghemawat, 2001). Other research has found that our thinking is affected by our language (Hofstede & Hofstede, 2001). This means that language could work as an inhibitor in cross-national knowledge perception (Ambos & Ambos, 2009). Marschan-Piekkari et al. (1999) concluded that collaboration across linguistic boundaries involves misunderstandings. The distance between the headquarters and the subsidiaries of a MNC in terms of language can then have a negative influence on the transfer of knowledge.

As argued by Polanyi (1966) and mentioned earlier, highly tacit knowledge cannot be put into words. As the use of words are the basis for language, this means that highly tacit knowledge cannot be transferred with the use of language. However, when the level of tacitness in knowledge decreases and it can be articulated and converted into explicit knowledge, language can be used to convert tacit knowledge into explicit knowledge in the form of words. However, this is hard as tacit knowledge consists of beliefs and perceptions that are not easy to capture in language (Nonaka & Takeuchi, 1995).

When knowledge is transferred to a country with a language other than that of the knowledge sender, the knowledge needs to be translated into the language of the receiving party, so that the receiver can understand the knowledge. This translation process can lead to a decrease in the value of knowledge that is shared, because knowledge can be lost when translating. In this way, linguistic distance is expected to influence tacit knowledge transfer.

2.5.4 Knowledge distance

Knowledge distance can be defined as: 'the degree to which the source and recipient possess similar knowledge' (Cummings & Teng, 2003). It refers to the level of overlap of the knowledge bases of the sender and receiver. Hamel (1991) found that the knowledge distance between two parties cannot be too great for organizational learning to take place. This is because too many learning steps will be necessary if knowledge distance is large. Therefore, it is argued that overlapping areas of knowledge make the process of knowledge transfer more easy (Nonaka & Takeuchi, 1995). Hamel (1991, p. 47) provides the same explanation: 'If the skill gap between partners is too great, learning becomes almost impossible'. This is because the recipient is not able to identify the intermediate learning 'steps' between his own competence level and that of the sender. Dinur et al. (1998) further argued that there needs to be an alignment between two parties in terms of knowledge in order to successfully transfer knowledge.

The concept of 'absorptive capacity' is also linked to knowledge distance. Absorptive capacity is the ability of the organization to recognize the value of new knowledge and to learn from it. An organization's ability to learn is related to the alignment between the knowledge of the source and that of the recipient (Cohen & Levinthal, 1990). Dixon (2000) argues that organizations with a large amount of common knowledge would have a high 'absorptive capacity'.

The distance in knowledge is especially relevant for this research, because of the differences between the head-quarters (the sending unit) and the subsidiaries (the receiving unit) in possibilities to acquire knowledge. At the head-quarters of PaperFoam-NL all departments that are involved in the creation of a new product are located in the same building, including the sales department, the design department, the research & technology department and the production department. Employees of these different departments interact with each other and therefore can more easily share tacit knowledge with each other (Polanyi, 1966). The subsidiaries of PaperFoam in the United States and Malaysia, consist of only the production department. Therefore, there is reason to believe that there is a difference in the knowledge base between the headquarters and the subsidiaries. In relation to absorptive capacity, this means that the subsidiaries in the United States and Malaysia could have a lower absorptive capacity' than the headquarters in The Netherlands.

2.5.5 Distance in relation to Ba

Now that distance in the context of the MNC is explained in detail, we go back to the concept of Ba, in order to see if and how distance is related to Ba.

As the definition of distance told us, distance is about the spatial dispersion and the contextual differentiation between the MNC's units. The spatial dispersion can be seen as the inverse of the physical space in terms of Ba. The spatial dispersion between the MNC's units implies that there is no shared physical space in terms of Ba (Nonaka & Konno, 1998).

The contextual differentiation between the MNC's units can partly be related to the mental space in terms of Ba, as contextual differences between the MNC's units are based on different ideas, experiences and beliefs which stem from the contextual background of the MNC's unit (Nonaka & Konno, 1998). This implies that the contextual differentiation between the MNC's units diminishes the mental space (Javidan, Stahl, Brodbeck, & Wilderom, 2005). However, this relation is not the same as the relation between spatial dispersion and physical space in terms of Ba, as the mental space can be found within the mind of a person, while context has a broader scope and includes aspects outside the mind, such as the environment (Doz & Santos, 1997).

The virtual space is indirectly related to the definition of distance in this research. The virtual space can be seen as a consequence of distance as the spatial dispersion of the MNC's units makes it necessary to use a virtual space to transfer knowledge (Nonaka & Konno, 1998). Therefore, the virtual space is not expected to be influenced by distance.

In sum, the distance between the MNC's units in terms of spatial and contextual dispersion makes it difficult for the physical and mental space of Ba to exist. If there is no distance in terms of spatial dispersion and contextual differentiation between the MNC's units, then Ba can be present. However, if distance comes into play because of spatial dispersion and / or contextual differentiation, than Ba is obstructed. However, a deeper understanding of the relation between distance and Ba is not possible at this point as Nonaka does not provide detailed information on the physical, mental and virtual space of Ba (Nonaka & Takeuchi, 1995).

2.6 Conceptual model

As can be subtracted from the previous paragraphs, current literature indicates that the dimensions of distance influence the transfer of knowledge in general. However, existing literature did not succeed in adequately describing how distance influences the transfer of tacit knowledge. An exception can be made for the research of Wesselink (2011) regarding the influence of ICT versus face-to-face contact as part of physical distance and cultural distance where the dimensions power distance and individualism were found as influencing factors for the transfer of tacit knowledge. However, that study fails to explain how distance is actually influencing the transfer process of tacit knowledge.

By focusing on tacit knowledge transfer and using the SECI-model, this research thesis can adequately describe how the tacit knowledge transfer process occurs and how it is influenced by the dimensions of distance. In order to visualize the possible relation between the relevant variables for this study, a conceptual model has been developed.

The conceptual model consists of one independent variable, 'Distance', and one dependent variable, 'Transfer of tacit knowledge'. 'Distance' can be seen as the differences between the MNC's units in terms of geography, culture, language and knowledge, as captured by the different dimensions explained in this chapter. 'Transfer of tacit knowledge', involves the process of tacit knowledge transfer between the MNC's units, according to the SECI-model by Nonaka & Takeuchi (1995). The arrow between the two variables means that there is the expectation that distance influences the transfer of tacit knowledge. This expectation is based on the literature review described in this chapter. The aim of this study is to explain the relationship between the mechanisms of 'Distance' and 'Transfer of tacit knowledge'. The next chapter elaborates on the methodology of the research.

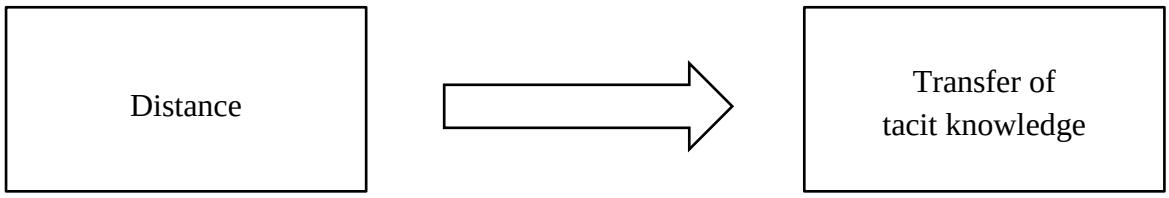


Figure 3. Conceptual model

Chapter 3 - Methodology

This chapter discusses the research methodology used to collect the necessary data for the research. Paragraph 3.1 describes the research strategy and paragraph 3.2 discusses the operationalization. Paragraph 3.3 goes into the research design selected for this thesis. Paragraph 3.4 explains the research methods used in this thesis. Paragraph 3.5 describes the intended data analysis procedure and paragraph 3.6 considers the ethical issues.

3.1 Research strategy

Qualitative research is conducted for this thesis. Qualitative research is interested in the way in which we understand and experience the world through our behavior and interactions in life (Mason, 1996). The decisions made in this research regarding the research methodology are in line with qualitative research, which becomes clear in the next paragraphs.

3.1.1 Deductive approach

The main research approach is deductive, which implies the use of existing theory as a starting point to study a phenomenon in the empirical field (Bryman, 2012). With regard to the construct of distance, literature already indicated dimensions that influence the transfer of knowledge in general. However, current literature does not explain how distance influences the transfer of tacit knowledge. Therefore, the four dimensions of distance as explained in the previous chapter will be used as concepts that guide the research. They will be operationalized to the context of this research in order to investigate how these dimensions influence the transfer of tacit knowledge instead of the transfer of knowledge in general. Furthermore, the SECI-model by Nonaka and Takeuchi (1995) is an existing theoretical model that is used as a starting point to understand the process of tacit knowledge transfer within the empirical setting.

However, as current research does not succeed in explaining the relation between distance and the process of tacit knowledge transfer, the goal is to create a deeper understanding of the mechanisms in this relation. New empirical findings are needed to reach this goal. Therefore, this research can be considered exploratory, which means that there is an open approach to the data collection, keeping in mind the concepts found in theory (Symon & Cassell, 2012).

3.2 Operationalization

The variables mentioned in the conceptual model are operationalized to conduct the research in the context of PaperFoam.

Dependent variable: Transfer of tacit knowledge

The transfer of tacit knowledge is operationalized as the exchanges of tacit knowledge regarding the production skills and the assessment of quality requirements of the product, between Paperfoam's headquarters, the sender of tacit knowledge, and the subsidiaries of PaperFoam, the receivers of tacit knowledge. The headquarters of PaperFoam consists of the departments Marketing & Sales, Project Management, Design & Molds, Research & Technology and Quality Assurance. Within the next chapters, the headquarters will be referred to as PaperFoam-NL. The subsidiaries are the production departments located in Barneveld (The Netherlands), Leland (The United States) and Penang (Malaysia). The subsidiaries will be referred to as Production-NL (The Netherlands), Production-US (The United States) and Production-ML (Malaysia).

Independent variable: Distance

'Distance' is operationalized in the light of the four dimensions of distance discussed in the previous chapter, which leads to an operationalization into six dimensions:

1. Physical distance

Physical distance is operationalized as the spatial distance between PaperFoam's headquarters, PaperFoam-NL, and the subsidiaries, Production-NL, Production-US and Production-MY (Ambos & Ambos, 2009; Doz & Santos, 1997). In chapter two, physical distance was described together with the use of communication tools and time difference. In order to investigate both concepts, these concepts will be separated from physical distance and operationalized as separate dimensions. Possible relations between these dimensions as described in the previous chapter will be kept in mind when conducting the research.

2. Communication distance

Communication distance is operationalized as the distance between the sender and receiver of knowledge in terms of communication. Distance is minimal when the sender and receiver are able to have face-to-face contact and increases when the sender and receiver can only communicate by means of information and communication technology (Athanassiou & Nigh, 2000).

3. Time distance

Time distance is the difference in time zones between the sender and receiver. Within PaperFoam, this is the difference in time zones between PaperFoam-NL and Production-US (minus 6 hours) and between PaperFoam-NL and Production-MY (plus 6 hours).

4. Knowledge distance

Knowledge distance is operationalized as the difference in the amount of tacit knowledge that PaperFoam-NL possesses, regarding the assessment of quality requirements and production skills, compared to Production-NL, Production-US and Production-MY (Cummings & Teng, 2003).

5. Cultural distance

Cultural distance is operationalized as the difference in organization culture between PaperFoam-NL and Production-NL, Production-US and Production-MY in terms of values, beliefs, identities, motives and interpretations of important events within the MNC (Javidan, Stahl, Brodbeck, & Wilderom, 2005). This organization culture is influenced by national culture, wherein two dimensions are particularly relevant for the transfer of tacit knowledge. Therefore, these two dimensions are used in this operationalization:

- *Individualism*: the degree to which there are strong ties between the individuals working at PaperFoam-NL, Production-NL, Production-US and Production-MY (Hofstede, Pedersen, & Hofstede, 2002).
- *Power distance*: the degree to which less powerful members of PaperFoam accept and expect that power is distributed unequally (Hofstede, Pedersen, & Hofstede, 2002).

A cultural profile of The Netherlands, the United States and Malaysia can be found in appendix A.

6. Linguistic distance

Linguistic distance is operationalized as the differences in language between the sender and receiver of knowledge within PaperFoam. It is related to the difficulty for the sender and / or receiver to communicate in a language other than the mother language. English is used in the communication between the headquarters and the subsidiaries in the United States and Malaysia, while Dutch is used between the headquarters and the subsidiary in The Netherlands.

3.3 Research design

The research design in qualitative research refers to planning the data collection and analysis, and selecting empirical material in order to be able to answer the research question within the available time and with the available resources (Flick, 2011).

3.3.1 Multiple nested case study research

This research will use the case study as research design, because the focus is on a current phenomenon in a real-life context, which is the transfer of tacit knowledge within the context of PaperFoam (Yin, 2009). Furthermore, the aim is to create a deeper understanding of the mechanisms in the relation between distance and the transfer of tacit knowledge, which can be accomplished with a case study (Yin, 2009). Moreover, a case study is the preferred strategy when the researcher has little control over events (Yin, 2009). This is also the case in this research, as the researcher cannot control the transfer of tacit knowledge within PaperFoam and can only observe the phenomenon.

Multiple cases will be studied that deal with the transfer of tacit knowledge in relation to distance. In the multiple case study, the focus is not on the case itself, but on the object. The phenomenon of which the case is an example of, is the focus (Thomas, 2011). In this research, the cases are an example of the distance between two units who transfer tacit knowledge between each other. When comparing two or more cases, circumstances in which a theory will hold or will not hold can be better established by the researcher (Yin, 2009). Therefore, the use of the multiple case study can contribute to theory building (Bryman, 2012). As this is the intention of this research, the multiple case study is suitable. Because the MNC as a whole can be seen as the wider connected context wherein comparisons of the cases occur, this type of case study is called a nested case study (Thomas, 2011).

3.3.2 Case selection

Appropriate cases within the organization are selected on the basis of judgement of the researcher in order to generate a relevant answer to the research question and to meet the research goal (Neuman, 2005). In order to find appropriate cases, two criteria are developed that stem from the research question and research objective:

- The cases should deal with the transfer of tacit knowledge.
- The cases should contribute to the understanding of the influence of distance on the transfer of tacit knowledge.

By means of critical case purposive sampling, three cases (A, B and C) are compared that deal with the transfer of tacit knowledge, but that differ in the level of distance. Within critical case purposive sampling, cases are chosen on the basis of either their ability to make a point dramatically or their importance in addressing the research aim (Symon & Cassell, 2012). This is the case as the research aim is to create understanding of the influence of distance on the transfer of tacit knowledge. Furthermore, as the cases differ in the level of distance, comparing these cases contributes to the understanding of the relation between distance and tacit knowledge transfer.

The next paragraph elaborates on each case, which is related to the assessment criterion of transferability in qualitative research. In order to reach transferability, the researcher needs to provide enough detail about the specific research case, so that the reader can judge what other contexts might be informed by the findings (Symon & Cassell, 2012). There is the possibility that the results are biased by the context of PaperFoam and thereby are difficult to transfer to another context. However, by providing enough detail about the specific research case, this research attempts to meet this criterion.

Case A – PaperFoam-NL to Production-NL

This case embodies the process of tacit knowledge transfer between PaperFoam-NL, the sender of tacit knowledge, and Production-NL, the receiver of tacit knowledge. Tacit knowledge is created within the headquarters, PaperFoam-NL, after which it is transferred to the subsidiary, Production-NL. The differences in terms of distance are expected to be low, because both PaperFoam-NL and Production-NL are located in the same building in Barneveld (NL). Because this case is expected to deal with low levels on the dimensions of distance, it contributes to the understanding of distance by providing a comparison with the second and third case in which higher levels of distance are expected. A more detailed description of this case can be found within Appendix B.

Case B – PaperFoam-NL to Production-US

Case B contains the process of tacit knowledge transfer between PaperFoam-NL, the sender, and Production-US, the receiver. Also in this case, tacit knowledge is created within the headquarters and transferred to the subsidiary, Production-US. The differences in terms of distance are expected to be high. Thereby, this case contributes to the understanding of the influence of distance on the transfer of tacit knowledge. A deeper explanation of this case is given in Appendix B.

Case C – PaperFoam-NL to Production-ML

Case C involves the process of tacit knowledge transfer between PaperFoam-NL, the sender, and Production-MY, the receiver. The same type of proces between the knowledge sender receiver can be found as in case A and B, which means that tacit knowledge is created within PaperFoam-NL and is transferred to Production-MY. This case is also expected to deal with high levels of distance and therefore contributes to the understanding of the influence of distance on the transfer of tacit knowledge. Appendix B provides a detailed case description.

3.4 Research methods

In collecting the data, semi-structured interviews will be used, together with participant observation, observation and document analysis.

3.4.1 Semi-structured interviews

Semi-structured interviews are used as the primary method for data collection, because a certain degree of openness in the data is preferable to create understanding of the relation between distance and tacit knowledge transfer that is not yet described by the literature. The semi-structured interview provides the required flexibility for employees to give input on how they experience the transfer of tacit knowledge over distance (Bryman, 2012). An interview guide will be developed, which can be found in Appendix C, based on the dimensions and other themes found in the literature. The interviews will be recorded and field notes will be made during the interviews, so the interview can be transcribed in detail later on.

Selection of the interview participants

- Employees within PaperFoam-NL who are involved in the creation and transfer of tacit knowledge regarding production skills and the assessment of quality requirements of the product. The departments that are involved in this process, are Marketing & Sales, Design & Molds, Research & Technology, Project Management and Quality Assurance. At least one employee with relevant experience, per department, will be selected as interview participant.
- Employees within Production-NL, Production-US and production-MY that receive the tacit knowledge from PaperFoam-NL. Within these production facilities, the production manager is the one who is in contact with PaperFoam-NL. Therefore, the production managers of these production facilities will be selected as interview participants. At least one production manager per production department will be selected, also based on their experience and knowledge within their production facility.

3.4.2 Participant Observation

In order to create a better understanding of the process of tacit knowledge transfer, participant observation will be used in this research, which is based on direct contact between the researcher and the social objects of interest (Symon & Cassell, 2012). As the socialization phase and externalization phase of the SECI-model includes interaction and direct contact between the members of the organization, participant observation is the right method to observe and experience the socialization and externalization phases of the SECI-model and thereby the transfer of tacit knowledge (Nonaka & Takeuchi, 1995). This is also pointed out by Lievre & Tang (2015), that used participant observation in their research to explain the phases of the SECI-model. Participant observation demands that the researcher is actually present in the social milieu in which the researcher is interested (Symon & Cassell, 2012). The researcher will be present at PaperFoam-NL on a regular basis, for six months, approximately 10 hours a week. By means of this presence, the researcher aims to achieve prolonged engagement, which means that the researcher spends enough time at the research site and with the participants so that the researcher goes beyond superficial observation and so that immersion into the subject is reached (Symon & Cassell, 2012). The researcher will write and keep memos of important, relevant and or remarkable circumstances that take place on the work floor of PaperFoam and which can be related to the research subject.

3.4.3 Observation: Kick-off meeting

Next to the participant observation during the daily operations, a specific meeting will be observed multiple times. This is the so-called ‘kick-off meeting’ between PaperFoam-NL and Production-NL and between PaperFoam-NL and Production-US. Both the quality requirements and production skills are discussed during the kick-off meeting, which is the tacit knowledge in this research. Therefore it is relevant to observe the possible transfer of tacit knowledge in this meeting. By comparing the meetings between the cases, it can become clear if and how the expected differences in terms of distance between the cases influence the tacit knowledge transfer during the meeting. The observation protocol for this kick-off meeting can be found in Appendix D. In this observation protocol, notes will be made on the different types of interaction, e.g. verbal and non-verbal between the participants in the kick-off meeting, to identify which phase of the SECI-model is taking place during the meeting.

3.4.3 Document Analysis

Two documents will be analyzed that are relevant for the transfer of tacit knowledge between PaperFoam's headquarters and its subsidiaries. These documents can be seen as the outcome of converting tacit knowledge into explicit knowledge in the externalization phase of the SECI-model. They can be found in Appendix E , together with additional information:

- The document that describes the characteristics of a new product and how to produce it (RF-95). It is linked to the production skills and therefore it is relevant to analyze.
- The document that describes the quality requirements of a new product (WI-31). This document is needed for the assessment of the quality requirements of PaperFoam's product and is therefore relevant to investigate.

The use of interviews, document analysis and observations leads to triangulation, which means that if diverse research methods lead to one and the same result, more confidence is created regarding a result (Bogdan & Biklen, 2006). In this way, the assessment criterion of credibility can be realized, which is reached by illustrating a good fit between the realities that are constructed by the participants and the reconstructions attributed to the participants (Symon & Cassell, 2012). Moreover, credibility will be reached by means of prolonged engagement, as explained in paragraph 3.4.2 and progressive subjectivity, which implies that the researcher keeps a record of initial constructions of the research, with the aim to check whether the original constructions have been changed and challenged through the consideration of the participant's constructions (Symon & Cassell, 2012). Furthermore, member checking will be used to meet credibility, which means that the researcher's interpretation of the data will be discussed with the participants within PaperFoam to examine if the participants' views have been precisely captured (Symon & Cassell, 2012).

3.5 Data analysis

As interpretation of the researcher is needed to analyze the open data stemming from the interviews and observations, open coding will be used to analyze the interviews and observations conducted in this research (Bryman, 2012). The theoretical concepts described in chapter two and operationalized in paragraph 3.2, will be used as themes in the coding process. An illustration of the coding structure, can be found in Appendix F. The analysis of documents in qualitative research consists of finding underlying themes in the materials being analyzed (Bryman, 2012). In this research, the documents described in 3.4.3 will be analyzed with the theoretical concepts in mind. When analyzing the documents, the focus will be on the conversion process of tacit knowledge into explicit knowledge, because the documents can be

seen as the outcome of that conversion process. By describing the research methods and intended data analysis, this research tries to meet the qualitative assessment criterion of confirmability. In order to reach confirmability, the researcher seeks to explain where the data are stemming from and how the data are transformed into the findings. In this way, the reader is assured that interpretations and data are originated within persons and contexts apart from the researcher (Symon & Cassell, 2012).

3.6 Research ethics

Research ethics is about understanding how research affects and effects the research field that the researcher is interested in (Symon & Cassell, 2012). The researcher will enter the field of PaperFoam as the role of 'observer as participant', which implies only a brief engagement in the research setting, in order to limit the influence and exposure of the researcher on the subject of study, the tacit knowledge transfer within PaperFoam (Symon & Cassell, 2012). As the researcher is submerged in the research object, he or she can lose an awareness that he or she is influencing the research object. In order to prevent this from happening, the researcher will keep a research diary where changes and shifts are written down, so the reader is able to judge why particular decisions were made (Symon & Cassell, 2012). Moreover, the researcher will step out of the research setting from time to time, to question their actions regarding the research. In this way, the researcher tries to keep an objective view on the research subject and tries to limit his or her influence. The aim thereby is to meet the qualitative assessment criterion of dependability. It refers to illustrating how methodological shifts and changes in constructions have been made available and captured for evaluation (Symon & Cassell, 2012).

With regard to the openness and confidentiality in the interviews, the participants will be informed on the wider nature and the objectives of the research, before authorization is given by the participant. Furthermore, the participant will be asked for their permission to record the interview and for the identification in the report in order to respect the privacy of the participant. Moreover, the interview transcripts and reports will be sent to the participants, so that they can withdraw any statements. This is related to deliberative conversation, which means that findings should be discussed in the practical field, in clear speech, with room for others to speak. This is done by reporting outcomes or discussing issues at stake (Symon & Cassell, 2012). In this research, this will be done by presenting the results of the research during a meeting at PaperFoam. In this meeting, the results together with their interpretations will be discussed with the members of the organization.

Chapter 4 – Analysis & Results

In this chapter, the analysis and results of the research will be discussed, based on the findings in the interviews, observations and documents. The structure of the chapter is based on the sub-questions, formulated in the first chapter. Paragraph 4.1 deals with the results that are related to the first sub-question. Paragraph 4.2 describes the results that are linked to the second and third sub-question. The quotes used in this chapter stem from the interviews. After every quote, the name (P1 – 15), function and corresponding location of the participant are noted. Further details regarding the interviews and participants can be found in Appendix G. The data from the interviews were analyzed by allocating codes to relevant parts of the interview transcripts. The reason of thought regarding this coding process, can be found within the coding structure in Appendix F. Furthermore, concepts such as PaperFoam-NL, Production-NL, Production-ML and Production-US are used, which stem from the operationalization.

4.1 The transfer of tacit knowledge within PaperFoam

This paragraph deals with the results related to the first sub-question: *How is tacit knowledge transferred within a MNC?* By describing the transfer process within each case, it becomes clear how tacit knowledge is transferred within cases that contain various levels of distance.

4.1.1 Case A: PaperFoam-NL to Production-NL

This case embodies the process of tacit knowledge transfer between the headquarters, PaperFoam-NL, and the subsidiary, Production-NL. The three phases of the SECI-model come forward when looking at the transfer process of knowledge regarding the quality requirements and production skills.

Socialization

The process starts in the first meeting at PaperFoam's headquarters, between a project manager of PaperFoam and a new customer. During this meeting, the project manager creates an image of the customer, which the project manager unconsciously relates to certain tacit quality requirements. The next quote explains the creation of this image: 'The whole atmosphere during the meeting with that customer indicated that the customer wanted a high-end product' (Interview with P4, Project manager, PaperFoam-NL). In this way, the atmosphere works as an indicator for the desired quality requirements of a new product. This atmosphere can be experienced by observation of and direct interaction with the customer during the meeting. As observation and direct interaction are necessary for socialization to take place, the obtaining of atmosphere can be related to socialization (Nonaka & Takeuchi,

1995). Furthermore, during the first meeting, the customer takes a tour around the production facility, Production-NL. Thereby, the employees of the production department interact with the customer and also create an image of the customer, which they unconsciously relate to certain tacit quality requirements. This image can help the employees in assessing the quality requirements of the product of that customer. After the meeting, the project manager saves the image in his mind: 'This image is already for two months in the back of my head, while I had only one face-to-face conversation with that man' (Interview with P4, Project manager, PaperFoam-NL). Saving this image can be helpful in the transfer of tacit knowledge later on in the process.

Externalization

The second part of the transfer process within PaperFoam, is the articulation of the atmosphere into explicit quality requirements by means of a dialogue between the project manager and the production manager during the kick-off meeting. The stored image can help the project manager in the articulation of tacit knowledge into explicit knowledge, as explained in the next quote: 'I can reply to questions with more certainty during the kick-off meeting' (Interview with P4, Project manager, PaperFoam-NL[1]). This is related to the externalization phase, as this phase is concerned with the articulation of tacit knowledge into explicit knowledge by means of communication and dialogue (Nonaka & Takeuchi, 1995).

Next to the articulation of tacit into explicit knowledge by means of dialogue, tacit quality requirements are converted into explicit knowledge in the form of text, by means of the quality requirements document WI-31. This document consists of text together with photos that describe and indicate what type of errors should result in rejecting the product. It becomes clear that this articulation is difficult: 'The text of the WI-31 document states: "a rip should not be bigger than one-third of the total surface". It is really difficult to decide what to choose as a reference of the total surface and therefore it is difficult to understand the text concerning quality requirements' (Interview with P4, Project manager, PaperFoam-NL). This is underpinned by the next quote: 'It is just really difficult to capture the quality requirements on paper, because then it becomes a lengthy story' (Interview with P4, Project manager, PaperFoam-NL). The reason for the difficulty of converting tacit into explicit quality requirements, is that the content of the knowledge is highly tacit, as it becomes a lengthy story

[1] 'Met meer zekerheid kun je vragen beantwoorden tijdens een kick-off. Als ik die klant niet zou hebben gesproken en ik zou een vraag krijgen tijdens de kick-off, dan moet ik alweer terug naar Willem omdat ik niet weet hoe of wat' (Interview with Project manager, PaperFoam-NL)

to articulate the quality requirements into words. Furthermore, as the first citation explains, it is difficult to understand what the text actually means.

The use of text to transfer tacit knowledge also leads to difficulties in the application of knowledge in the production department, which is the last part of the process. Therefore, photos, product samples and metaphors are used for the assessment of quality requirements, instead of the text in the WI-31 document. The reason for this is the difficulty to determine the approval or disapproval of a product, which is explained by the quality manager: 'Sometimes it is very difficult, as a crack in the product is sometimes too small or too big to determine if it can go through' (Interview with P14, Quality manager, Production-NL). Photos, product samples and metaphors can then be useful in these cases, as the production employees can then easily make a link between the stored image of the quality requirements in their minds and the visualization of the quality requirements in the form of photos, product samples and metaphors.

Combination

The quality requirements in the WI-31 document are not only related to the externalization phase, but also to the combination phase, as it captures and integrates explicit knowledge regarding quality requirements into one document (Nonaka & Konno, 1998). The document captures, for example, information regarding work instructions and acceptance criteria for each possible type of defect.

4.1.2 Case B: PaperFoam-NL to Production-US

Case B contains the tacit knowledge transfer between PaperFoam-NL and Production-US. The process follows the same structure as within case A, which means that the process starts in the first meeting between a customer and a project manager at PaperFoam's headquarters, after which the project manager transfers the tacit knowledge to the production department in Leland (US). However, the transfer process takes place in a different way than in case A, because of the geographical distance between PaperFoam-NL and Production-US.

Socialization

First of all, it is not possible for employees of each department to involve in the experiences of the other person because no direct interaction is possible due to physical distance (Nonaka & Konno, 1998). Such interaction, however, is important for the production facility in the US in order to produce the correct product: 'It would be valuable to see what they actually do in the test runs' (Interview with P6, Production manager, Production-US). As the employees at

Production-US cannot see how a new product at PaperFoam-NL was developed, they are not involved in the socialization phase wherein employees closely interact with each other, imitate each other and experience what is actually happening (Nonaka & Konno, 1998). Therefore, socialization is taking place at PaperFoam-NL, without involvement of Production-US.

Externalization

As Production-US is not involved in socialization due to physical distance, the project manager converts the tacit knowledge from the socialization phase into two types of explicit knowledge at PaperFoam-NL, before transferring the knowledge to Production-US. The first explicit form is the dialogue in the kick-off meeting between PaperFoam-NL and Production-US. Because Production-US is not involved in socialization, much more details are discussed regarding quality requirements and production skills during the kick-off meeting in case B, compared to case A. This becomes clear in the next quote: 'I try to be more clear during a kick-off meeting with the US than during a kick-off meeting here in The Netherlands' (Interview with P1, Sample tester, PaperFoam-NL).

Next to the use of dialogue, text in the form of documents is used to convert tacit knowledge into explicit knowledge. These documents are described in more detail than the documents used in case A, for the same reason of missing the socialization. This is pointed out by the sample tester of PaperFoam-NL: 'I try to be more clear in the documents that I send to the US, so that they can read it back later, also on moments that I am not here to answer their questions' (Interview with P1, Sample tester, PaperFoam-NL). This means that externalization is taking place in different way than in case A, as more detail is involved in the conversion process from tacit into explicit knowledge.

Combination

With regard to the combination phase where explicit knowledge is combined and shared, there is a shared computer network where employees from PaperFoam-NL and PaperFoam-US can share documents with each other: 'The main passive form of communication is the cloud. We are working on the same documents. So knowing where certain information is, is important' (Interview with P5, Production manager, Production-US). As the employees of PaperFoam-NL and PaperFoam-US do not communicate with each other every day, it is important that they keep each other up to date on the documents that they place and or change on the server or delete from the server.

4.1.3 Case C: PaperFoam-NL to Production-ML

The process of tacit knowledge transfer from PaperFoam's headquarters in The Netherlands to its subsidiary in Malaysia is, on paper, similar to case B. This means that the process starts in the first meeting between a customer and a project manager at PaperFoam's headquarters, after which the project manager converts the tacit knowledge into explicit knowledge and transfers it to the production department in Penang (Malaysia). Therefore, the socialization phase and part of the externalization phase is taking place in The Netherlands, which means that the socialization phase cannot be experienced in Malaysia. This leads to differences in tacit knowledge transfer and dealing with tacit knowledge, in comparison to case A and B.

Socialization

As socialization with regard to the quality requirements and production skills, is taking place in The Netherlands, without notice from Production-ML, there is also socialization taking place within Production-ML without notice from PaperFoam-NL. It means that Production-ML internally creates and shares tacit knowledge that is different from PaperFoam-NL: 'We were not always there to support them. Then you develop your own vision, knowledge and way of thinking about the quality requirements of a product' (Interview with P15, Technical specialist, Production-NL & ML). This could lead to differences in the way of working: 'They handle some projects in their own way, because they think that their way works better (Interview with P15, Technical specialist, Production-NL & ML). This means that because of the physical distance between PaperFoam-NL and Production-ML, each of the departments establish their own socialization phase which could lead to differences in handling the quality requirements of a product or dealing with technical problems that require tacit knowledge.

This is related to the theory of practical drift, stemming from the emergency response literature (Snook, 2000). This theory argues that although organizations realize procedures and develop plans to deal with crises and risky scenarios, these procedures and plans are liable to local changes as the people who are charged with implementation of the plans and procedures find ways to work around (Haynes, Schafer, & Carroll, 2007). Within this case, the employees at Production-ML who have to deal with the procedures are sometimes forced to locally change the plans that are sent by PaperFoam-NL: 'If the technical specialist from The Netherlands is not here, I try to solve the problem myself. Then, if I need help, I text him. I try to send a message to The Netherlands after two pm Malaysian time, so they are awake. If there is anything happening in the morning, I have to fix it myself'(Interview with P10, Technical specialist, Production-ML). In this case the time difference is the cause for this

practical drift. It means that because of the time difference, it is not possible to transfer tacit knowledge at the required moment, which results in practical drift.

Externalization

The conversion of tacit into explicit quality requirements in the WI-31 document takes place at the headquarters, after which it is sent to Production-ML, where it is distributed to the production employees who need to use this document to assess the quality requirements. However, once the quality requirements arrive at PaperFoam-ML a discrepancy arises: 'These quality requirements are not always in line with our quality requirements' (Interview with P9, Production manager, Production-ML). This discrepancy develops from the practical drift explained before, as PaperFoam-ML developed their own procedures on quality requirements. Another reason for this discrepancy, is the difference in cultures between The Netherlands and Malaysia, which will be explained in paragraph 4.2.5, Cultural distance.

4.2 Dimensions of distance and their influence on tacit knowledge transfer

This paragraph discusses the results regarding the influence of each dimension on the transfer process of tacit knowledge as discussed in the previous paragraph.

Spatial Dispersion

The spatial dispersion consists of the physical distance, communication distance and time distance. By describing the results regarding each of these dimensions, the answer is given to the second sub-question: *How is spatial dispersion related to tacit knowledge transfer within a MNC?*

4.2.1 Physical distance

Socialization

Physical distance is the spatial distance between PaperFoam's headquarters, PaperFoam-NL, and the subsidiaries, Production-NL, Production-US and Production-MY. It directly and indirectly influences the transfer of tacit knowledge. The direct influence is the obstruction of physical distance on the socialization phase of the transfer process within case B and C. Physical distance means that the sender and receiver cannot be at the same physical place, which means that the sender and receiver cannot interact closely and cannot imitate, see and observe each other. This close interaction, imitation and observation is needed for socialization, i.e. the development of tacit knowledge, to take place which is impeded by physical distance (Nonaka & Takeuchi, 1995).

This influence on socialization is in line with the results of a previous study by Lievre & Tang (2015), where tacit knowledge transfer between a French organization and a Chinese organization failed because no socialization was established between the two organizations as the result of spatial dispersion.

In relation to the concept of 'Ba', the physical distance between the sender and receiver impedes the creation of 'originating Ba', a shared mutual context where individuals share emotions, feelings, experiences and mental models which serves as a platform for socialization (Nonaka & Konno, 1998). Close interaction is needed to create this shared mutual context and this is impeded by physical distance. Therefore, physical distance should be as low as possible in order for originating Ba to exist and in order to facilitate socialization.

Externalization

As physical distance implies that the sender and receiver cannot interact closely, it is thereby not possible to transfer tacit knowledge directly over distance. Therefore, tacit knowledge needs to be converted into explicit knowledge first at PaperFoam-NL, before it can be transferred to the subsidiaries. Once the tacit knowledge is converted into explicit knowledge, the influence of distance decreases as direct interaction between the sender and receiver is not necessary for the transfer of explicit knowledge (Nonaka & Konno, 1998).

Furthermore, physical distance influences this conversion of tacit into explicit knowledge. Interaction by means of communication and dialogue between employees is needed for this conversion (Nonaka & Konno, 1998). Physical distance complicates this conversion process as employees cannot physically be at the same place at the same time to interact in communication and dialogue. This means that the 'interacting Ba', the place where individual's skills and mental models are converted into common concepts and terms through dialogue, is impeded by physical distance (Nonaka & Konno, 1998).

Combination

The influence of physical distance cannot only be found within case B and C, but also within case A. Within this case, physical distance emerges as a result of the differences in the agendas of PaperFoam's employees: 'Not everyone is always present at the office, therefore a lot of the communication happens via e-mail' (Interview with P4, Project manager, PaperFoam-NL). In this situation, the result of physical distance is the switch from face-to-face interaction into the use of e-mail to transfer tacit knowledge. Here, the indirect influence of physical distance comes forward. Physical distance has an indirect influence on

communication distance, because an increasing physical distance leads to the use of communication tools that are related to communication distance. With regard to Ba, the process of knowledge transfer over a physical distance by means of electronic communication tools such as e-mail, is related to 'cyber Ba', where interaction in a virtual world is taking place instead of in real space and time. It embodies the combination phase (Nonaka & Konno, 1998). As cyber Ba is not dependent on a real space and time, physical distance does not influence cyber Ba. Physical distance has also indirect influences on other dimensions of distance, which will be discussed later on.

4.2.2 Communication distance

Socialization

Communication distance is the distance between the sender and receiver of knowledge in terms of communication. Distance is minimal when the sender and receiver are able to have face-to-face contact and increases when the sender and receiver can only communicate by means of information and communication technology (Athanassiou & Nigh, 2000). Communication distance mainly influences socialization in case B and C, as communication distance impedes the possibility for the sender and receiver to see each other, which is important for socialization to take place. This result is in line with the findings by Wesselink (2011) who found that face-to-face interaction in comparison to communication tools is critical in the transfer of tacit knowledge. PaperFoam pays attention to facilitating face-to-face interaction, especially with regard to discussing the quality requirements with the customer, as is explained in the next quote: 'That is why we do have an office in the United States, in order to be able to speak with the customer face-to-face' (Interview with P3, Sales Manager, PaperFoam-NL & ML & US). PaperFoam tries to close the communication distance, and thereby the physical distance, by placing an office near the customer.

However, even in the case of some communication distance, socialization can take place by means of communication tools that allow the sender and receiver to see each other. Examples of such communication tools are the use of 'Skype' and 'FaceTime', which are related to low levels of communication distance and facilitate socialization: 'In the US, we have Skype-calls which results in speaking to each other face-to-face and the possibility to discuss issues with each other. That works good. We do not have such meetings with Malaysia' (Interview with P3, Sales manager, PaperFoam-NL & ML & US). This quote indicates that Skype facilitates close interaction and thereby facilitates the possibility for socialization to take place.

In relation to Ba, communication distance complicates the existence of originating Ba. Originating Ba is the place where individuals share emotions, feelings, experiences and mental models and this can only be realized by means of a minimal level of communication distance, i.e. face-to-face interaction (Nonaka & Konno, 1998).

Externalization

As the conversion of tacit into explicit knowledge does not require the sender and receiver to see each other, communication distance has a lower impact on the externalization phase than on the socialization phase (Nonaka & Konno, 1998). Communication and dialogue between the sender and receiver, which are needed for the conversion of tacit into explicit knowledge, can be established under a degree of communication distance that allows the sender and receiver to communicate directly, for example by means of a telephone conversation.

Communication tools can facilitate the conversion of tacit into explicit knowledge and afterwards the transfer of that knowledge. Here, the level of tacitness of the knowledge determines the preferred form of conversion and transfer of knowledge. An example is the use of video: 'When it is hard to explain, we send a movie where we point to the error and explain how the error takes place. When we send a text-message, it would be 20 or 30 sentences long, which is not convenient' (Interview with P10, Technical specialist, Production-ML). In this case, the video operates as the converter of tacit knowledge regarding a production error into explicit knowledge in the form of a video, after which it can be sent to the headquarters. As the content of the knowledge contains an important amount of tacit knowledge, the employees make the choice to use a video instead of a long text, which would be inconvenient to transfer. Regular phone calls are used when knowledge needs to be discussed between the sender and receiver without the need for visual contact: 'If something is not totally clear, it is better to call' (Interview with P15, Technical specialist, Production-NL & ML). 'E-mail' and 'WhatsApp' are used when tacit knowledge is transferred that can be converted into text, which is related to tacit knowledge that can be converted more easily into explicit knowledge. An example is the conversion of the tacit image around a colour into a textual colour code, which is transferred via E-mail or WhatsApp.

Within literature, the use of electronic communication tools to support externalization and sharing of tacit knowledge is contentious. Opponents argue that electronic communication tools are too limited to support the sharing of tacit knowledge. They argue that these tools support explicit rather than tacit knowledge (Haldin-Herrgard, 2000; Panahi, Watson, &

Partridge, 2012). The findings of this research are contradictory to these claims as the findings of this research support the transfer of tacit knowledge via the use of videos as electronic communication tools.

With regard to Ba, interacting Ba is the place where externalization takes place through dialogue (Nonaka & Konno, 1998). As dialogue can be realized with low levels of communication distance, via face-to-face contact, Skype and phone calls, this does not influence interacting Ba. However, when communication distance increases and E-mail needs to be used, this impedes the ability for dialogue and thereby communication distance impedes interacting Ba.

Combination

With regard to the combination phase, the theory by Nonaka & Konno (1998) mentions the use of communication tools to combine explicit knowledge with existing knowledge. Within PaperFoam, combination is represented by the shared computer network, as explained in paragraph 4.1.2. The results did not indicate an influence of communication distance on the combination phase and cyber Ba, where combination takes place. The reason for this could be that cyber Ba is based on the use of electronic communication tools and is not depended on a physical space and time or close interaction between persons (Nonaka & Konno, 1998). To summarize, Table 1 illustrates which communication tools could be used, based on the type of knowledge that needs to be transferred and the phase of knowledge transfer.

Knowledge transfer / **Communication tools**	*Type of knowledge*	*SECI*
Face-to-face	Highly tacit knowledge (atmosphere)	Socialization & Externalization
Skype / FaceTime	Cognitive tacit knowledge (tacit quality requirement) Technical tacit knowledge (difficult machine error)	Socialization & Externalization
Phone call	Technical tacit knowledge (machine settings)	Externalization
WhatsApp	Explicit knowledge (photos / videos / words regarding machine settings)	Externalization & Combination
E-mail	Explicit knowledge (photos / videos / words regarding machine settings)	Externalization & Combination

Table 1: Knowledge & Communication tools

4.2.3 Time distance

Time distance is the difference in time zones between the sender and receiver and can be seen as a result of physical distance. The reason for this is that the physical distance within case B and case C leads to time differences, because it crosses different time zones. Times distance influences the transfer of tacit knowledge by delaying the transfer process and by decreasing the value of the transferred knowledge.

The delay in knowledge transfer is explained by the next quote: 'If it is late at night in The Netherlands, I have to wait a night to get my answer' (Interview with P6, Production manager, Production-US). Within case C, the same type of influence can be found: 'When I send an e-mail, I have my answer only at 4 p.m. Malaysian time. At 6 p.m. I leave my office, so I can only follow up these things the next morning' (Interview with P10, Technical specialist, Production-ML). Because of the different time zones, the sender and receiver of knowledge are not able to directly interact, which results in a delay in the transfer process.

Furthermore, time distance can lead to losses in the transfer of knowledge as it may not be convenient for employees to be in contact with each other on certain times, as is explained in the next quote: 'If it is 9 a.m. in the United States, than it is 6 p.m. in The Netherlands. Then you're having dinner and you don't like to call at that moment. The conversations may become shorter because of that' (Interview with P8, Sales manager & Designer, Production-US). This is underlined by another employee: 'Philip [Sales manager, Production-US] in America feels burdened to call in the evening, when the employees in The Netherlands are free. Because of that, certain matters are not discussed, while they would be relevant to discuss' (Interview with P12, Project manager, PaperFoam-NL). The time distance may thereby influence the transfer process of tacit knowledge as not all relevant knowledge is articulated during the interaction between employees from PaperFoam-NL and employees from Production-US. This is related to the externalization phase, as not all relevant tacit knowledge is converted into explicit knowledge because of the time distance.

Time distance has a different influence on tacit knowledge in comparison to explicit knowledge. As is explained by Nonaka & Konno (1998), once tacit knowledge is separated from originating Ba and interacting Ba, related to socialization and externalization, it becomes explicit information that can be transferred independently from Ba. However, when it is tacit knowledge and situated within originating Ba and interacting Ba, it cannot be separated from its space and time. As cyber Ba, which is related to the combination phase, does not restrict

persons to interact at the same time, time distance does not influence the combination phase and cyber Ba (Nonaka & Konno, 1998). The time difference between PaperFoam-NL and Production-US and Production-ML impedes originating Ba and interacting Ba to exist as Ba is based on one and the same time. Therefore, tacit knowledge first has to be separated from Ba by the conversion into explicit knowledge, before it can be transferred. Once it is converted into explicit knowledge and transferred, the receiver can absorb the knowledge at the moment in time that suits best. To conclude, the influence of time distance is different for tacit knowledge than for explicit knowledge as time distance forces the process of tacit knowledge transfer to convert tacit knowledge into explicit knowledge before knowledge can be transferred over distance (Nonaka & Konno, 1998).

Contextual differentiation

The contextual differentiation consists of the knowledge distance, cultural distance and linguistic distance. By describing the results regarding each of these dimensions, the answer is given to the third sub-question: *How is contextual differentiation related tacit knowledge transfer within a MNC?*

4.2.4 Knowledge distance

Socialization

Knowledge distance is the difference in the amount of tacit knowledge that PaperFoam-NL possesses, regarding the assessment of quality requirements and production skills, compared to Production-NL, Production-US and Production-MY (Cummings & Teng, 2003). The level of tacit knowledge is higher at PaperFoam's headquarters than in the production facilities in the US and Malaysia, because all the research & technology, design, project management, sales and production are taking place in the same building in The Netherlands. This means that the knowledge distance within case A is lower than within case B and C, as explained in the next quote: 'The level of knowledge is high in The Netherlands, as we walk around here every day. If I walk along the production workplace and I see that something is not working well, then I tell the employees how to fix it. That is not possible in Malaysia' (Interview with P15, Technical specialist, Production NL & ML). The reason for this is that PaperFoam-NL and Production-NL, i.e. the departments within case A, are located in the same building in Barneveld. In this way, socialization can take place more easily and thereby tacit knowledge can be developed more easily than within case B and C (Nonaka & Konno, 1998).

Externalization

As a result of this knowledge distance between PaperFoam-NL, the sender, and the subsidiaries abroad, the receivers, misunderstanding is created between the sender and receiver. This misunderstanding is expressed by assumptions that PaperFoam-NL makes towards the foreign subsidiaries: 'Because the level of knowledge is higher in The Netherlands, the assumption is made "everybody will understand this", while not everyone actually understands it' (Interview with P3, Sales manager, PaperFoam-NL & ML & US).

Another expression of the misunderstanding between PaperFoam-NL and the foreign subsidiaries, is the lack of insight towards each other's activities, as explained in the next quote: 'I don't know how busy people are in The Netherlands' (Interview with P8, Sales manager & Designer, Production-US). Within case C, the same issue can be found: 'The production manager in Malaysia does not know what is happing in The Netherlands. At the moment that we are handling a research project and he receives documents about that project, then he does not know what to do with them, because he did not see the whole process of that project' (Interview with P3, Sales manager, PaperFoam-NL & ML & US).

PaperFoam tries to solve this issue of misunderstanding by being more clear in the documents that are transferred: 'In that document I elaborate on all the issues that I encountered in the process' (Interview with P1, Sample tester, PaperFoam-NL). This means that PaperFoam tries to include some of the socialization process in the transfer of tacit knowledge towards the foreign subsidiaries to create a better understanding. To summarize, knowledge distance influences the transfer of tacit knowledge by impeding the understanding between the sender and receiver.

This is linked to absorptive capacity, the ability of the organization to recognize the value of new knowledge and to learn from it (Cohen & Levinthal, 1990). In this case, the Malaysian production manager, cited in the second last quote, does not recognize the value of the documents regarding the new research project and therefore does not learn from it. Therefore, PaperFoam could look at ways to increase the absorptive capacity of its subsidiaries in order to decrease the knowledge distance.

Furthermore, knowledge distance can be related to the practical drift discussed in case C, where Production-ML is internally creating and sharing tacit knowledge which is different from PaperFoam-NL. This practical drift leads to differences in knowledge between PaperFoam-NL and Production-ML, or in other words, knowledge distance.

This is related to the mental space of Ba, the shared experiences, ideas and beliefs between employees (Nonaka & Konno, 1998). It means that the practical drift results in differences in mental space between PaperFoam-NL and Production-ML. This impedes the shared mental space that is needed to transfer tacit knowledge (Nonaka & Konno, 1998).

4.2.5 Cultural distance

Cultural distance is the difference in organization culture between PaperFoam-NL and Production-NL, Production-US and Production-MY in terms of values, beliefs, identities, motives and interpretations of important events within the MNC (Javidan, Stahl, Brodbeck, & Wilderom, 2005). The most important influence of cultural distance on the transfer of tacit knowledge is related to hierarchy, which is related to the dimension of power distance by Hofstede, Pedersen and Hofstede (2002). The differences in dealing with hierarchy between The Netherlands, North-America and Malaysia lead to differences in tacit knowledge transfer between case A, B and C.

Socialization

Because of the hierarchy in the production departments in case B and C, the production employees do not argue with their supervisors. Within case C, this hierarchy is expressed in the initiative that is not taken by the production employees: 'What you also see in Malaysia is that they do as they get told, they do not take any initiative. Here in The Netherlands, people will more easily take initiative than the people over there' (Interview with P15, Technical specialist, Production-NL & ML). As the production employees do no take initiative, tacit quality requirements are not discussed between the production employees and their supervisors. This results in the prevention of socialization to take place, as the production employees and their supervisors do not closely interact, which is necessary for socialization to take place (Nonaka & Konno, 1998). Within case B, the same type of issue occurs, as is explained in the next quote: 'In The Netherlands, everything is much more horizontal. Here, there is more sense of hierarchy. That is a big difference. People here on the floor are less likely to come up to me and complain basically, because that is just something that people not do so much here in the US' (Interview with P5, Production manager, Production-US). Because people on the floor are less likely to come up to the production manager, this could impede the transfer of tacit knowledge as the employees are not really involved in the transfer of tacit knowledge due to the lack of interaction.

Within case A, there is a greater chance for socialization to take place, between the production employees and their supervisors, as production employees are not afraid to argue with their supervisors: 'Here in The Netherlands you would get a lot of discussion on why certain products should be rejected or approved' (Interview with P11, Production manager, Production-NL & ML). These discussions facilitate socialization to take place, which could lead to a better transfer of tacit knowledge.

In relation to Ba, this means that hierarchy impedes originating Ba to exist, as originating Ba is based on close interaction (Nonaka & Konno, 1998).

Externalization

With regard to externalization, cultural differences influence the transfer of tacit knowledge by creating misunderstanding between the sender and receiver on how to deal with the knowledge that is sent. This comes forward in the next quote: 'We do have a quality-document, WI-31. Here in The Netherlands, this document leaves room for interpretation. In Malaysia this doesn't work. There you have to restrict everything, the people there do not make free choices' (Interview with P15, Technical specialist, Production-NL & ML). This means that in the Malaysian culture, people are not used to make free choices, which means that they are not used to work with quality requirements that leave room for interpretation. Therefore, the Dutch employees need to take into account the Malaysian culture in the conversion of tacit quality requirements into explicit quality requirements in the form of the WI-31 document. Thereby, the externalization phase is influenced by the difference in cultures. PaperFoam changed the quality requirements to suit the Malaysian way of working, as explained by the next quote: 'The areas of damage are pointed out and the employees in Malaysia will measure that, in order to remove the doubt' (Interview with P4, Project manager, PaperFoam-NL).

The difference in the hierarchy and its influence on the transfer of tacit knowledge between case A, B and C is expressed by the directness in communication within the cases. The Dutch way of communication is very direct, which is more in line with the American sense of hierarchy than the Malaysian sense of hierarchy, as become clear in the next quotes. The first quote explains how a Dutch expat from PaperFoam experiences the communication with Americans: 'I am very direct in my communication, the Americans appreciate that' (Interview with P13, Sales manager, Production-US). The next quote explains how the Malaysian employees experience this directness: 'Dutch people are very open, out of the box, rough,

direct. In Malaysia they are not used to that' (Interview with P11, Production manager, Production-NL & ML). The Malaysian employees are not used to this directness in comparison to American employees, because the Malaysian employees put more emphasis on hierarchy than the American employees. This results in a better transfer within case B than within case C, as is explained in the next quote: 'The communication with the VS is functioning better than the communication with Malaysia regarding the quality requirements' (Interview with P3, Sales manager, PaperFoam-NL & ML & US).

In relation to existing literature, these findings provide evidence for the findings by Winkler et. al. (2008) that the dimension of power distance has a considerable impact on knowledge transfer, as power distance is measured by the level of hierarchy (Hofstede, Pedersen, & Hofstede, 2002). However, no support was found for the finding by Winkler et. al. (2008) that the dimension of individualism / collectivism has a large impact on knowledge transfer. With regard to the competing values framework by Cameron and Quinn (1999), the results of this research cannot be directly linked to the cultures as categorized in the framework and therefore no direct statements can be made regarding the cooperation between these cultures. However, as the hierarchy expressed at the headquarters, which is part of the culture, is more in line with the hierarchy at Production-US than at Production-ML, it can be argued that the culture of PaperFoam-NL is more in line with the culture of Production-US than with the culture of Production-ML. Since it appeared that the transfer of tacit knowledge between the headquarters and Production-US occurs with more ease than between the headquarters and Production-ML, this supports the argument by Cameron & Quinn (1999) that organizations who possess a similar organizational culture cooperate in a better way than organizations with competing cultural profiles.

4.2.6 Linguistic distance

Linguistic distance is the differences in language between the sender and receiver of knowledge within PaperFoam. It is partly linked to cultural distance, as every culture speaks its own language. Within this research, the influence of language on the transfer of tacit knowledge was not found to be important compared to the other dimensions of distance. However, an interesting aspect is the translation of the mother language into the language of the receiver when transferring knowledge. Some influence on the transfer of tacit knowledge was found, because of this translation. As became clear, technical tacit knowledge that is hard to explain in words is even more difficult to explain in another language: 'If I want to explain something about hard to define technics, then I can do that quite well, but it could happen that

I use the wrong English word, which results in noise in the communication' (Interview with P8, Sales manager & Designer, Production-US). When the sender is not able to translate the knowledge correctly from the Dutch mother language to English, this could lead to misunderstanding and misinterpretation between the sender and the receiver.

Externalization

This issue is related to the externalization phase of the SECI-model, as in this phase tacit knowledge needs to be converted into explicit knowledge which can be seen as the translation of technical tacit knowledge from the mother language into explicit knowledge in another language (Nonaka & Konno, 1998). This indicates that linguistic distance influences the second part of the transfer process. Furthermore, language can be seen as already a conversion of tacit knowledge into explicit knowledge. It is situated within interacting Ba, as interacting Ba is the place where knowledge is converted by means of dialogue (Nonaka & Konno, 1998). Therefore, language distance influences interacting Ba by complicating the dialogue between persons who speak different languages.

4.3 Bridging the distance: Expat

Another important results shows how the influence of distance can be reduced. This is the use of expats: employees who originally worked at PaperFoam-NL and moved to Production-US or Production-ML. The expat can be seen as a bridge between the sender and receiver, as explained in case B: I am from The Netherlands and I know how the company has developed, so I am funnelling information from The Netherlands, like translating'. (Interview with P5, Production manager, Production-US). This funnelling or translating, works in two ways. First of all, because the production manager experienced the socialization at PaperFoam-NL, he is better able to relate this knowledge to the context of PaperFoam-NL than the employees at the subsidiary who did not experience that socialization. This results in a better understanding by the receiver of the knowledge that is sent. Secondly, as the expat understands the local company culture at Production-US, he is able to translate the tacit knowledge that is transferred from PaperFoam-NL into explicit knowledge that is comprehensible for the employees at Production-US. In order to achieve this advantage, it is important that the expat embodies both the language, culture and knowledge of the headquarters and subsidiary.

Within case C, the use of an expat is also mentioned as an important factor in bridging the distance: 'When the technical specialist from The Netherlands is here, it is easier. If I have a problem, I ask him to come to the machine and we solve it together' (Interview with P10,

Technical specialist, Production-ML). In this case, the expat decreases the influence of distance by making it easier for the technical specialist to interact directly with the expat regarding production skills to solve a machine problem. This is related to both socialization and externalization, as interaction is needed to establish these phases and therefore the function of the expat can be seen as a facilitator for tacit knowledge transfer and as a way to reduce the influence of distance on tacit knowledge transfer (Nonaka & Konno, 1998). Within this chapter, other possible solutions to bridge the dimensions of tacit knowledge were discussed, which are summarized in Table 2.

Distance / **Bridging**	***Physical distance***	***Communic. distance***	***Time distance***	***Knowledge distance***	***Cultural distance***	***Linguistic distance***
Shared computer server	Server is not depended on a physical place	Server is not depended on direct interaction	Server is not depended on a time zone	Equal level of knowledge for sender and receiver		
Communic. tools to see each other	Seeing each other leads to direct interaction				Seeing each other leads to involvement in culture	
Sending contextual knowledge	Understanding of physical place of the other			Knowledge base of the receiver increases	Culture is embodied in contextual knowledge	
Expat	Bringing sender and receiver together	Expat speaks face-to-face with receiver		Expat brings knowledge to receiver	Expat understands culture of both parties	Expat speaks language of sender and receiver

Table 2. Bridging the distance

To summarize, the process of tacit knowledge transfer differs per case as a result of the influence of distance in the cases. The most important difference is that in case A, both the sender and receiver are involved in the socialization and externalization phases of the knowledge transfer process, while in case B and C involvement of the receiver in socialization and externalization is impeded. Therefore, these phases mainly take place at the side of the knowledge sender. The reason for this is that distance impedes the possibility for socialization and externalization to take place over distance. Here, the dimensions of distance related to the spatial dispersion, are especially influencing socialization as these dimensions obstruct the ability for the sender and receiver to see each other. The dimensions related to the contextual differentiation, are mainly influencing the externalization phase, as these dimensions impede the understanding between the sender and receiver.

The next chapter captures the conclusion and discussion. It provides the answer to the main research question and discusses the meaning of the results in the light of theory and practice.

Chapter 5 – Conclusion & Discussion

The final chapter of this thesis, contains the conclusion and discussion. First of all, a short summary of the study will be given, together with the answer on the main research question. Next, the theoretical, managerial and societal implications will be discussed. The last paragraph includes the reflection, limitations and suggestions for further research.

5.1 Conclusion

The main purpose of this study was to create understanding in how distance influences the transfer of tacit knowledge in the MNC. The research questions were formulated to create insight into the transfer process of tacit knowledge in the context of the MNC and to develop understanding of the relation between distance and the transfer of tacit knowledge. The literature review gave support to the explanation of the theoretical concepts related to the transfer of knowledge, the concept of distance and their relations. The SECI-model by Nonaka and Takeuchi (1995) was chosen to investigate the knowledge transfer process. Six dimensions of distance were used to study the influence of distance on tacit knowledge transfer.

This study took place through a case study wherein the transfer of tacit knowledge between PaperFoam's headquarters and its subsidiaries was examined. The research was carried out by means of observations, document analysis and interviews. The case study provided a rich explanation on how the process of tacit knowledge transfer takes place in the MNC and how distance influences this process. Thereby, the results contribute to the initial purpose of this study. Three cases were investigated and compared with each other to create understanding of the process. The distance between the headquarters and the subsidiary in the first case was different from the distance in the second and third case which resulted in the possibility to compare the cases with regard to the influence of distance on tacit knowledge transfer.

The first case investigated the transfer of tacit knowledge between the headquarters and the production department in The Netherlands. Both parties are located within the same building. However, the results reveal some influence of physical and communication distance on the transfer of tacit knowledge, as the agendas of the employees do not allow them to be at the same physical place at the same time. The second case covered the tacit knowledge transfer between the headquarters and the subsidiary in the United States. Physical distance was found to be the main influencing factor in the transfer of tacit knowledge, as the employees at the subsidiary were not able to experience the socialization phase that occurred at the

headquarters. The last case contained the tacit knowledge transfer between the headquarters and the subsidiary in Malaysia. Here, the cultural distance was the main influencing factor in the transfer of tacit knowledge, because of the difference in hierarchy between the headquarters and the subsidiary. The results in the previous chapter provided answers to the sub-questions. Therefore, this conclusion deals with answering the main research question:

> *How does distance influence the transfer of tacit knowledge within a Multinational Corporation?*

Distance influences the transfer of tacit knowledge by impeding the ability for the sender and receiver to see each other, which is crucial for the socialization phase to take place and by impeding the ability for the sender and receiver to understand each other, which is crucial for the externalization phase to take place. The influence of distance is particularly important in the initial phase of the process. Each dimension of distance has its effect on a particular part of the transfer process and the role of distance is depended on the tacitness of the knowledge.

The spatial dispersion, which consists of physical distance, communication distance and time distance are mainly influencing the first part of the transfer process, the socialization phase. This phase involves transferring tacit knowledge between individuals, through close interaction, imitation and observation between the members of an organization, whereby new tacit knowledge is created (Nonaka & Takeuchi, 1995). Originating Ba needs to be present, in order to establish socialization. Ba is a physical, mental and virtual space where knowledge is created, shared, transferred and utilized and offers the foundation for where the stages of the SECI-model can take place. There are four types of Ba that match the four stages of the SECI-model. Originating Ba is the first type of Ba, which is the place where individuals share emotions, feelings, experiences and mental models on the basis of close interaction. It serves as a platform for socialization, the start of tacit knowledge transfer.

The spatial dispersion impedes the possibility to closely interact and to see each other, which is needed for originating Ba to exist and thereby for tacit knowledge transfer to take place within the socialization (Nonaka & Takeuchi, 1995). Current literature does indicate that spatial dispersion impedes the possibility to see each other in the transfer of tacit knowledge (Cummings & Teng, 2003; Wesselink, 2011), but does not relate this to a specific phase of the transfer process, as is done within this research. Cummings and Teng (2003) also found the influence of differences in time zones on the transfer of knowledge, but do not make the distinction between the transfer of tacit and explicit knowledge, as established in this research.

The contextual differentiation, which consists of knowledge distance, cultural distance and linguistic distance is especially influencing the second part of the transfer process, the externalization phase. This phase involves the conversion of tacit knowledge into explicit knowledge, by means of dialogue and communication between the members of the organization (Nonaka & Takeuchi, 1995). Interacting Ba is needed to establish externalization. It is the place where individual's skills and mental models are converted into common concepts and terms through dialogue (Nonaka & Konno, 1998). The contextual differentiation impedes the understanding between the sender and receiver, which is needed for the conversion of tacit knowledge into explicit knowledge by means of dialogue and communication and thereby to establish interacting Ba and externalization. In relation to literature, the impeding of understanding by distance was found by Hamel (Hamel, 1991), who explains that knowledge distance between two parties cannot be too big for learning and understanding to take place. Nonaka and Takeuchi (1995) explain that overlapping areas of expertise facilitate knowledge transfer. Current literature, however, does not relate this to a specific part of the transfer process, as is done within this research. The next table explains how each dimension of distance influence these phases of the transfer process.

SECI & Ba / **Dimension of distance**	*Socialization*	*Externalization*
Spatial dispersion		
Physical distance	Distinct places impedes the possibility to *see* each other in the exchange of tacit knowledge	Distinct places impedes the *involvement* of receiver in the conversion of tacit knowledge
Communication distance	Communication distance impedes the possibility to *see* each other in the exchange of tacit knowledge	Communication distance impedes *direct interaction* in the conversion of tacit knowledge.
Time distance	Distinct time zones impedes the possibility to *see* each other in the exchange of tacit knowledge	Distinct time zones impedes *direct interaction* in the conversion of tacit knowledge.
Contextual differentiation		
Knowledge distance	Difference in knowledge base impedes *understanding* each other in the exchange of tacit knowledge	Difference in knowledge base impedes *understanding* in the conversion of tacit knowledge
Cultural distance	Cultural differences impede *understanding* each other in the exchange of tacit knowledge	Cultural differences impede *understanding* each other in the conversion of tacit knowledge
Linguistic distance	Linguistic differences impede *understanding* each other in the exchange of tacit knowledge	Linguistic differences impede *understanding* each other in the conversion of tacit knowledge

Table 3. Influence of distance on the transfer of tacit knowledge

The influence of distance is particularly important in the socialization phase as, the knowledge within this phase is tacit and can only be understood in the context wherein it is developed. It is necessary to be present at the physical place of that context, which is obstructed by distance. In the case of PaperFoam, this context involves the image that is created around a customer which is needed for the assessment of quality requirements. The image is created by means of a certain atmosphere that is attributed to the customer. As the yield of PaperFoam's production is based on the assessment of quality requirements, transferring this contextual knowledge is important for PaperFoam's revenues. As costs and time are involved in the sending of contextual knowledge, the goal of sending the contextual knowledge, in this case achieving the best yield, needs to be taken into account when considering sending contextual knowledge.

Distance plays a minor role in the combination phase. This phase involves the capturing, integration, dissemination and editing of explicit knowledge via the use of electronic communication tools (Nonaka & Konno, 1998). These activities can be carried out without a shared space and time, which means that there is little necessity for Ba to be present. As distance is especially influencing this shared space and time, the combination phase is hardly influenced by distance.

Furthermore, the content of knowledge determines the preferred form in which this knowledge can be converted and transferred over distance. For example, when the content of knowledge is really on the tacit side of the spectrum, photos and videos are used for the conversion and transfer of this knowledge. Table 1 on page 54 illustrates the relation between the content of knowledge and the preferred transfer form.

The influence of distance is different for each form and thereby the influence of distance depends on the content of the knowledge. In the example of the use of photos and videos to convert and transfer knowledge, it is important that the knowledge base of the sender needs to be aligned to that of the receiver, i.e. the knowledge distance needs to be as small as possible, in order for the receiver to understand these photos and videos. When the differences in knowledge bases between the sender and the receiver increase, i.e. the knowledge distance increases, this could lead to misunderstanding of the photos and videos by the receiver in this case. Current literature does describe that mechanisms for transferring knowledge differ, based on the content of knowledge (Grant, 1996), but no explanation is given regarding the influence of distance on this relation between transfer mechanisms and content of knowledge.

5.2 Discussion

5.2.1 Theoretical implications

The first theoretical contribution of this study is that understanding is created regarding the influence of distance on the transfer of tacit knowledge. While most research in the field of organizational knowledge transfer focuses on explicit knowledge (Szulanski, 1996; Hansen, 2002; Dinur, Hamilton, & Inkpen, 2009), this study focused on the tacit side of knowledge, which is regarded as difficult to investigate (Mowery, Oxley, & Silverman, 1996).

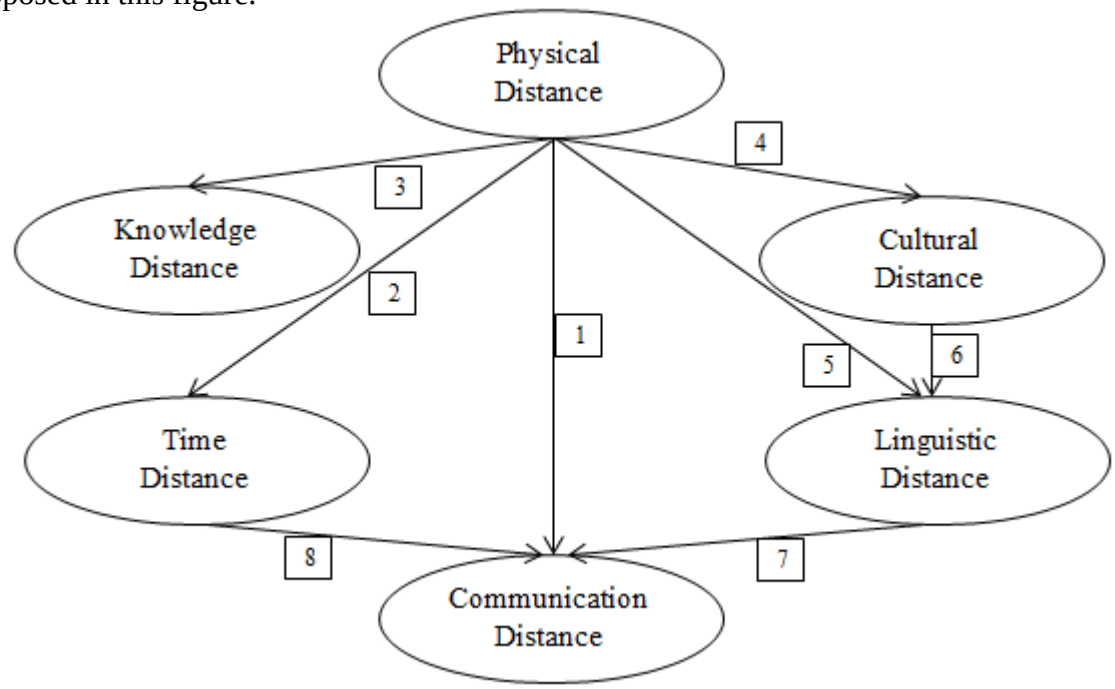
The results contribute to the literature, by providing conditions under which tacit knowledge can be transferred over distance. First of all, tacit knowledge can be transferred over distance when it can be converted into explicit knowledge. Communication tools can be helpful in this conversion process. Previous research explains that communication tools are helpful for sending tacit knowledge over distance (Roberts, 2000; Kalling, 2003), but did not indicate that these are helpful for the conversion of tacit into explicit knowledge.

Secondly, when knowledge is tacit to such a degree that it is not possible to convert it into explicit knowledge, it is still possible to transfer this knowledge over distance by means of expats and communication tools that allow the sender and receiver to see each other. The reason for this is that expats and such communication tools make it possible to let the knowledge receiver experience the emotions, feelings, experiences and mental models of the sender over distance. In this way, the conditions of originating Ba, the place where individuals share emotions, feelings, experiences and mental models, are fulfilled. When these conditions are met, socialization, i.e., the transfer of tacit knowledge in the initial phase, can take place. Previous research indicates that tacit knowledge transfer requires the use of interactive media in the transfer of tacit knowledge, but did not explain in which phase of the transfer process these are required, as explained in this research (Bhagat, Kedia, Harveston, & Triandis, 2002). Moreover, researchers found the effectiveness of expats for transferring explicit knowledge within MNCs (Tsang, 1999; Downes, 2000; Wesselink, 2011), but the effectiveness for tacit knowledge is only briefly mentioned by Nonaka, Konno and Toyama (2001).

Another contribution of this research is that it explains how the relevant dimensions of distance influence the process of tacit knowledge transfer, while other studies fail to explain this relation and are more focused on establishing the relation instead of explaining the relation (Wesselink, 2011; Lindberg, 2011). This research explains this relation by disentangling the transfer process using the SECI-model and describing how each phase of the

transfer process is influenced by particular dimensions of distance. The physical, communication and time dimension of distance influence the initial phase of the transfer process by impeding the possibility for the sender and receiver to see each other. The knowledge, cultural and linguistic dimension of distance influence the second phase of the transfer process by impeding the possibility for the sender and receiver to understand each other. As is explained within the conclusion, other researchers do describe the influences of these dimensions (Nonaka & Takeuchi, 1995; Hamel, 1991; Cummings & Teng, 2003; Wesselink, 2011), but cannot relate them to the phases of the transfer process.

Furthermore, by providing insights in how the dimensions of distance are related towards each other, this study tries to clear the indistinctness in literature regarding the categorization of the dimensions of distance and their relations. A visualization of these relationships, together with an explanation can be found in Figure 4. The figure can be considered a step in the direction of future research. Future research can validate and refine the relationships proposed in this figure.



1. Distinct places lead to using communication tools that require tacit knowledge conversion
2. When physical distance between sender and receiver crosses time zones, time distance emerges
3. Knowledge base of sender and receiver differ due to physical distance
4. Distinct places could lead to differences in cultures.
5. Physical distance that crosses national borders, lead to differences in languages.
6. Cultural differences between countries lead to the use of different languages.
7. Differences in languages leads to using communication tools that require tacit knowledge conversion
8. Time distance impedes direct interaction, leading to using communication tools without direct interaction

Figure 4. Relations between dimensions of distance in the context of the MNC

5.2.2 Managerial implications

Based on the results of this study, practical recommendations can be given on how to reduce the influences of distance within each phase of the transfer process. In relation to the socialization phase, the use of expats is an important factor in the reduction of the influence of distance. The reason for this is that the expat experienced the socialization phase at the headquarters of the MNC and thereby knows the organization's culture, speaks the same language as the sender and has the same type of knowledge as the sender. When the expat moves from the headquarters to the subsidiary, this leads to an advantage in the transfer of tacit knowledge, as the expat can more easily understand what is meant with the transferred knowledge and adjust it to the organization culture, language and knowledge level of the subsidiary. In order to achieve this advantage, it is important that the expat embodies both the language, culture and knowledge of the headquarters and subsidiary. Both expats that were represented in this study who went from the headquarters to the subsidiaries in Malaysia and the US, explained that experiencing the socialization phase at the headquarters helped them in transferring tacit knowledge to the employees at the subsidiaries in Malaysia and the US.

Therefore, MNCs who face the issue of distance as an influence on the transfer of tacit knowledge, could look at possibilities to use expats. However, as the use of expats is expensive, the costs and benefits should be measured within each case. Costs that needs to be taken into account, based on the experiences of expats within PaperFoam, are related to traveling, housing and replacing the expat at the headquarters. Benefits in this context are related to increasing profits due to a higher level of knowledge at the subsidiary, a better assessment of quality requirements which leads to a higher production yield, and a more efficient transfer of tacit knowledge leading to a decrease in communication costs.

Furthermore, electronic communication tools could be used to reduce the influence of distance within the socialization phase. Technologies that allow people to closely interact, facilitate socialization. Within PaperFoam, it was found that the use of Skype and FaceTime helped the knowledge sender and receiver in understanding each other, because of the possibility to see each other's facial expression leading to more involvement in the experience of the other person, which is critical in the socialization phase. Furthermore, electronic communication tools can be used to send contextual knowledge, which is needed to understand the context of the socialization phase of the sender and thereby to reduce the distance between the sender and receiver. Within PaperFoam, the use of video's helped to transfer contextual knowledge, as part of the context of the sender was captured by the video.

With regard to the externalization phase, the use of expats and electronic communication tools are here too an important factor to reduce distance. The use of expats ensures that tacit knowledge does not need to be converted into explicit knowledge before sending it to the receiver. The expat can do this conversion process at the subsidiary, the receiver's side, which means that the knowledge is less vulnerable for the influences of distance. Electronic communication tools can contribute to the conversion process over distance. Within PaperFoam, Skype and FaceTime made it possible to show an example tray of a product to point out tacit quality requirements, which can be seen as the conversion of tacit quality requirements into explicit quality requirements with the help of a communication tool.

In relation to the combination phase, electronic communication tools are important for the reduction of distance as they make it possible to collect, combine and integrate different types of explicit knowledge. Within PaperFoam, the shared computer network allows employees from all over the world to work in the same documents. Table 2 on page 58 summarizes the possible solutions to reduce the influence of distance.

Another recommendation is related to the content of tacit knowledge. As the content of knowledge determines the preferred transfer form, practitioners should take into account the content of the knowledge, when choosing the transfer form. For example, when knowledge is highly tacit, face-to-face interaction is needed in order to successfully transfer this knowledge. The content of the knowledge also determines the preferred communication tool to transfer the knowledge over distance, which should also be taken into account. Highly tacit knowledge, for example, could better be transferred via Skype, a communication tool that allows people to closely interact, than via E-mail, a tool that does not allow people to closely interact. Table 1 on page 54 illustrates which communication tools could be used, based on the type of knowledge that needs to be transferred and the phase of the transfer process.

The practical recommendations were discussed within PaperFoam by means of a presentation during the monthly staff meeting, a session with the management team and an advisory report. The outcome of this discussion was that an efficient communication structure, which is supported by matching communication tools and includes the transfer of contextual knowledge, could lead to improvement in tacit knowledge transfer. This provides support for the practical recommendations given in this paragraph regarding communication tools and the transfer of contextual knowledge. The use of expats were not discussed in detail, as PaperFoam already works with expats, which moved the focus to the other recommendations.

5.2.3 Societal implications

This study provides both a direct and indirect contribution to society. The direct contribution is related to the transferability to other contexts than that of the MNC, where distance plays a role in the transfer of tacit knowledge. In the context of the MNC, tacit knowledge is transferred between organizations that are geographically dispersed and that must interact with customers, suppliers, regulators and so on in an external network (Ghoshal & Barlett, 1990). The characteristics of this context can be applicable to other types of institutions.

Within the political domain, for example, there is the issue of policy transfer between political institutions: a process whereby knowledge on administrative arrangements and policies is used across space and time in building administrative arrangements and policies elsewhere (Stone, 2001). These institutions must interact with citizens, regulators, private and public organizations in an external network. As these institutions have to deal with distance in the transfer of knowledge in the interaction in an external network, which is similar to the context of the MNC, the findings of this study could contribute to the understanding of the influence of distance on the transfer of tacit knowledge within the context of political institutions. However, as another context, such as that of political institutions could have other specific characteristics that do not match those of the MNC, the findings of this research cannot directly be transferred and used in another context. A further elaboration on the methodological issues regarding transferability can be found in paragraph 5.2.4.

The indirect contribution of this study to society is that this research provides insights for a better collaboration between people around the world, based on the practical recommendations given in the previous paragraph. When the influence of distance can be reduced, tacit knowledge transfer within the MNC can improve, which means that persons around the world are better able to collaborate with each other. This could lead to a better understanding of the culture of another person which has a positive effect on the coexistence of different cultures. Furthermore, with regard to the sending of contextual knowledge, involvement is created in the experiences of the other person. The reason for this is that the context wherein that person developed and shared the knowledge, can more easily be understood by the receiver. This could lead to a global society where people are more able to emphasize with others and can develop more understanding of each other's cultures and experiences.

5.2.4 Reflection, limitations and suggestions for further research

This paragraph discusses the reflection, limitations and suggestions for further research according to the assessment criteria for qualitative research, discussed in the methodology. The first criterion is validity, which can be divided into internal validity and external validity. External validity is concerned with defining the domain to which a study's findings can be generalized (Yin, 2009). Within this research, the external validity is limited, as only three cases were studied, which means that there is almost no basis for generalizing the findings to a broader population.

Furthermore, the characteristics of the sector in which this study has taken place, were not taken into account in the research, which makes it difficult to generalize the findings of this study to another sector. This study was conducted in the sustainability sector. It could be that certain characteristics that are specifically related to this sector, are also of influence on how the transfer process of tacit knowledge takes place. Therefore, a suggestion for further research is to conduct this research within other sectors in order to see if there are any differences in how the transfer process of tacit knowledge takes place in another sector and how distance influences this transfer process.

However, the focus of this research was not so much on reaching external validity, as this is mainly related to quantitative research, but more on achieving transferability and credibility, which is related to the social-constructivist view on research (Symon & Cassell, 2012). The reason for this is that the purpose of this research was to explain the relation between distance and tacit knowledge transfer. This purpose can be achieved by meeting the criteria of transferability and credibility. Instead of external validity, which is associated with statistical generalization, transferability is concerned with analytic generalization. In analytic generalization, the researcher strives to generalize a particular set of results to a broader theory. It compares the results of the case study to an earlier developed theory (Yin, 2009).

As a deep understanding was needed on the knowledge transfer process within each case, this resulted in the decision to investigate three cases in depth, within the time frame of the research. The advantage of these three cases is that the cases are really different from each other in relation to the dimensions of distance. Therefore, the three cases were relevant to study the influence of distance on the transfer of tacit knowledge. The suggestion for further research is to study more cases from different countries in which distance has an influence on the transfer of tacit knowledge, in order to compare those results with this research.

This is related to another limitation of this study. The SECI-model developed by Nonaka and Takeuchi is based upon case studies in the product development processes in Japanese organizations. Within literature, there is certain critique on the applicability of this theory to organizations outside Japan (McLean, 2004). This is also applicable to this study as the working culture of PaperFoam might be different from that of Japanese organizations, which means that the SECI-model could take on a different shape at PaperFoam than at the case studies of the research by Nonaka and Takeuchi in Japan (1995). However, as the SECI-model is already successfully studied in different contexts and in different countries around the world, this issue is not concerned to be a major problem (Lievre & Tang, 2015).

With regard to credibility, triangulation in research methods was used. Interviews were the most important source. The findings that derived from observations and documents supported the findings from the interviews. Thereby, the triangulation strengthened the results and let to more credibility. However, a limitation to the triangulation is that the observation protocol for the kick-off meeting was adjusted, as the design of the protocol was not suitable for the first observation. This meant that the protocol was only suitable for the second observation of the kick-off meeting, which means that the quality of the documentation of the observations was not as high as desired. This could impede the quality of the triangulation. Furthermore, prolonged engagement was achieved as the researcher spent a lot of time at the research site and with the participants. This supported the credibility of the research as a relation was built with the participants of the research which resulted in accessing certain data more easily and in going beyond superficial observation. Moreover, credibility was achieved by means of member checking, which was accomplished by presenting and discussing the results within PaperFoam. This also leaded to deliberative conversation, as discussed within paragraph 3.6.

The next criterion discussed in the methodology, is dependability. It refers to illustrating how methodological shifts and changes in constructions have been made available and captured for evaluation. By keeping a research diary the reader is able to judge these changes and shifts (Symon & Cassell, 2012). In this research, memos were written regarding the line of thoughts of the researcher, the development of the process and the shifts and changes that were made in the process. These memos were not included in this version of the thesis due to privacy reasons, but can be consulted on request.

An example of a change that was made during the process, was the change of the interview protocol after the first interviews were held. During the first interviews it became clear that

the order of questions did not support the flow of the interview. For example, one of the first questions was related to cultural distance, which proved to be a complex subject for the participants. Therefore, this topic was moved to a later stadium in the interview. This could jeopardize the dependability of the research because it is difficult for future research to duplicate the interviews when the interview protocol has changed.

The last qualitative assessment criterion discussed in chapter three, is confirmability. It is concerned with explaining where data are stemming from and how the data are transformed into the findings so the reader is assured that interpretations and data are originated within persons and contexts apart from the researcher (Symon & Cassell, 2012). By providing data regarding the data analysis procedures, such as the coding structure in Appendix F, this research met this criterion.

Another limitation is that not all possible influences on the transfer of tacit knowledge were investigated. Next to the dimensions that were selected based on the literature review, there might be other dimensions of distance that affect the transfer of tacit knowledge. However, based on the literature review, the selected dimensions were argued to be the most important ones in affecting knowledge transfer. Thereby, this research tried to provide a complete overview of distance as an influencer of tacit knowledge transfer. A suggestion for further research is to search for other dimensions of distance that influence the transfer of tacit knowledge.

There is also the possibility that other constructs than distance, were influencing the tacit knowledge transfer under study. Alice Lam (2000), for example, found that a flexible organizational structure limited the capacity to accumulate tacit knowledge within the organization. In order to diminish the possibility for other influences, the interviewer asked the participant if they experienced any influences on the transfer of tacit knowledge, other than the dimensions of distance discussed during the interview. No relevant findings came forward by asking his question. However, this does not mean that there were no other influences on the transfer of tacit knowledge. As it was not possible from a practical point of view to take into account all other possible influences, the suggestion for further research is to explore possible influences for tacit knowledge, other than the dimensions of distance.

As tacit knowledge is a challenging and valuable subject for both practitioners and researchers, the quest for these dimensions of distance and potentially other influences on tacit knowledge transfer, will be at least as exciting as the subject itself.

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Appendixes

Appendix A – Cultural profiles NL, US & MY

In this appendix, the cultural profiles of The Netherlands, the United States and Malaysia are described with regard to two dimensions of Hofstede, Pedersen and Hofstede (2002) that were found to influence the transfer of tacit knowledge. These dimensions are 'Individualism' and 'Power Distance'. Individualism is the extent to which individuals are integrated into groups. In an individualistic society, the ties between individuals are loose. In a collectivistic society, people are integrated into strong, cohesive in-groups, often extended families, which continue protecting them in exchange for unquestioning loyalty (Hofstede, Pedersen, & Hofstede, 2002). Within this research, Individualism is defined as the degree to which there are strong ties between the individuals working at PaperFoam-NL, Production-NL, Production-US and Production-MY.

Power distance is the degree to which less powerful members of organizations and institutions accept and expect that power is distributed unequally (Hofstede, Pedersen, & Hofstede, 2002). Within this research, Power distance is defined as the degree to which less powerful members of PaperFoam accept and expect that power is distributed unequally.

Cultural Profile – The Netherlands

The Netherlands is a horizontal-individualist society (Hofstede, Pedersen, & Hofstede, 2002). This means a high level of individualism and implies that communication flows both from bottom to top and from top to bottom. Furthermore, it means that people within this type of society prefer articulating and absorbing explicit knowledge. It also means that people within the organization tend to easily communicate with each other. This communication is direct and participative. The transfer of knowledge is regarded most effective between the same type of societies, so the transfer of knowledge to another horizontal-individualist culture is regarded most effective for The Netherlands (Bhagat, Kedia, Harveston, & Triandis, 2002). Furthermore, The Netherlands scores low on the dimension of power distance. This means that Dutch people prefer equal rights and being independent. Managers count on the experience of their team members and power is decentralized. This means that Dutch organizations are very flat in general, which indicates that people in the lower levels of the organization have high levels of decision-making power (Hofstede G. , 2016).

Cultural Profile – The United States

The United States is also a horizontal-individualist society (Hofstede, Pedersen, & Hofstede, 2002). This means that the same characteristics regarding the communication flow between employees in the organization is occurring as in The Netherlands. Employees and managers expect to be consulted and knowledge is shared frequently. Communication is direct, informal and participative. Furthermore, the American people prefer articulating and absorbing explicit knowledge. The transfer of knowledge with The Netherlands is regarded most effective, as The Netherlands has the same cultural profile. This implies that the transfer of explicit knowledge between the United Sates and The Netherlands should run effectively (Bhagat, Kedia, Harveston, & Triandis, 2002). The United States scores fairly low on power distance, a bit higher than The Netherlands. This is reflected in the American premise of "liberty and justice for all". The hierarchy in organizations is established for convenience, superiors are accessible and managers rely on individual employees for their expertise (Hofstede G. , 2016).

Cultural Profile – Malaysia

Malaysia is a vertical-collectivist society. This means a low score on individualism and a high score on power distance. In this society, strong relationships and loyalty are important. Everyone takes responsibility for other members of their group. The relationship between the employer and employee is perceived in moral terms. Considering hiring and promotion, the employer takes into account the members of their group (Hofstede G. , 2016). The communication is formal and only flows from top to bottom. People prefer articulating and absorbing tacit knowledge (Bhagat, Kedia, Harveston, & Triandis, 2002). With regard to the high power distance, people accept the hierarchical order in which everybody has a stand and which needs no justification. In the organization, hierarchy is seen as reflecting inbuilt inequalities and centralization is common. The ideal boss is a kind autocrat and subordinates expect to be told what to do. As the cultural profile of Malaysia is very different from The Netherlands, the transfer of knowledge between the two countries is argued to be not effective (Bhagat, Kedia, Harveston, & Triandis, 2002).

Appendix B – Case descriptions

Case A

This case consists of the process of tacit knowledge transfer between PaperFoam-NL, the sender of tacit knowledge, and Production-NL, the receiver of tacit knowledge. The tacit knowledge is created in the socialization process in PaperFoam-NL and is then send to Production-NL.

The differences in terms of distance are expected to be low. That is, the spatial distance between the PaperFoam-NL and Production-NL is expected to be low, because both units are located in the same building in Barneveld (NL). Because the employees from PaperFoam-NL and Production-NL are all living in The Netherlands, cultural distance is expected to be low. The linguistic distance is expected to be low, as the employees from these units are all native Dutch speakers and communicate in Dutch. Finally, knowledge distance between the two departments is expected to be low, because the units are based in the same location which is expected to lead to a constant flow of communication and information between the two units. This results in the same knowledge base of both units. Because this case is expected to deal with low levels on the dimensions of distance, it contributes to the understanding of distance by providing a comparison with the second and third case in which higher levels of distance are expected.

Case B

Case B contains the process of tacit knowledge transfer between PaperFoam-NL, the sender, and Production-US, the receiver. The same type of relationship between the knowledge sender and the knowledge receiver can be found as in case A. This means that tacit knowledge is created within PaperFoam-NL and is transferred to Production-US.

The differences in terms of distance are expected to be high. First of all, there is a spatial distance of 6673.98 kilometers. The linguistic distance between the employees of PaperFoam-NL and Production-US is expected to be rather small, because the employees of PaperFoam-NL speak English fluently and English is the native language for the employees of Production-US. There are indications that there is a difference in terms of cultural distance, expressed in a difference in the level of power distance and the level of individualism. The Dutch culture is identified as a horizontal-individualist culture. The American culture is

identified as a vertical-individualist culture. As indicated in chapter two, these differences in culture might influence the transfer of tacit knowledge. Finally, there is an expected distance in terms of knowledge between PaperFoam-NL and Production-US. The level of tacit knowledge needed to produce a new product is relatively low at Production-US in comparison to PaperFoam-NL. This case is expected to deal with high levels of distance and therefore contributes to the understanding of the influence of distance on the transfer of tacit knowledge.

Case C

Case C includes the process of tacit knowledge transfer between PaperFoam-NL, the sender, and Production-MY, the receiver. The same type of relationship between the knowledge sender receiver can be found as in case A and B. This means that tacit knowledge is created within PaperFoam-NL and is transferred to Production-MY.

The differences in terms of distance are expected to be high. First of all, there is a spatial distance of 9865.94 kilometers. The linguistic distance between the employees of PaperFoam-NL and Production-MY is expected to be rather high, because the communication between both units is done in English, which is not the native language of either of the parties. The cultural distance between the two units is expected to be high, because the Dutch culture is identified as a horizontal-individualist culture, while the Malaysian culture is identified as a vertical-collectivist culture. Lastly, the knowledge distance is predicted to be high for the same reason as explained in case B. This case is also expected to deal with high levels of distance and therefore contributes to the understanding of the influence of distance on the transfer of tacit knowledge.

Appendix C – Interview Guide

[Example]

Case B – Production manager Leland (US)

Title:		*Name Interviewee:*
Date & Time: *Length:*		*Name Interviewer:*
Location:	*Approved by:*	*Approved Signature:*

- **Recording**

[Before the interview starts, the interviewer asks the interviewee for permission to turn on the recording device, so that the interview can be recorded. Agreement to record the interview has already been given by the interviewee in the contact that the interviewer and interviewee had before the interview.]

- **Introduction**

[The interviewer explains the research subject towards the interviewee.]

- **Transfer of tacit knowledge**

Introduction into the subject of tacit knowledge by interviewer

1. How do you experience receiving knowledge from PaperFoam in The Netherlands regarding the quality requirements?

- **Physical distance**

2. How do you experience the physical distance between PaperFoam in The Netherlands and Leland in the transfer of knowledge regarding quality requirements and production skills?

- **Communication distance**

3. How do you experience the use of communication tools in comparison to face-to-face contact when discussing knowledge on quality requirements and production skills with PaperFoam in The Netherlands?

- **Time distance**

4. How do you experience the time difference in communicating with PaperFoam in The Netherlands on knowledge of quality requirements and production skills?

- **Cultural distance**

5. How do you experience culture in the transfer of knowledge on quality requirements and production skills from PaperFoam in The Netherlands to Leland?

- **Linguistic distance**

6. How do you experience the difference in language between The Netherlands and Leland in the transfer of knowledge on quality requirements and production skills?

- **Knowledge distance**

7. How do you experience the fact that the sales department, design department, research department and project management department are based in The Netherlands in the knowledge transfer on quality requirements and production skills.

- **Possible other influences**

8. Do you experience other possible influences on the transfer of knowledge on quality requirements and production skills between The Netherlands and Leland?

- **Remaining questions**

[possibility for the participant to ask question]

- **Closing**

Appendix D – Observation protocol

Observation protocol Kick-off meeting

Title: Kick-off meeting		*Name observer:* Stijn van Driessen
Date & Time: *Duration:*		*Names participants:*
Location:	*Approved by:*	*Approved Signature:*

Agenda of the meeting	Kick off agenda: 1. Recipe + RF95 2. Quality Requirements 3. Experience from sample run 4. Skills 5. Anything else we need to discuss

Descriptive notes	*Reflective notes* (= questions to self, observations of nonverbal behavior, interpretations of observer	*Reflective notes*
Physical setting: visual lay-out 	*Overall notes* *Interactions* *Motivation to take part*	*Overall influence of distance*

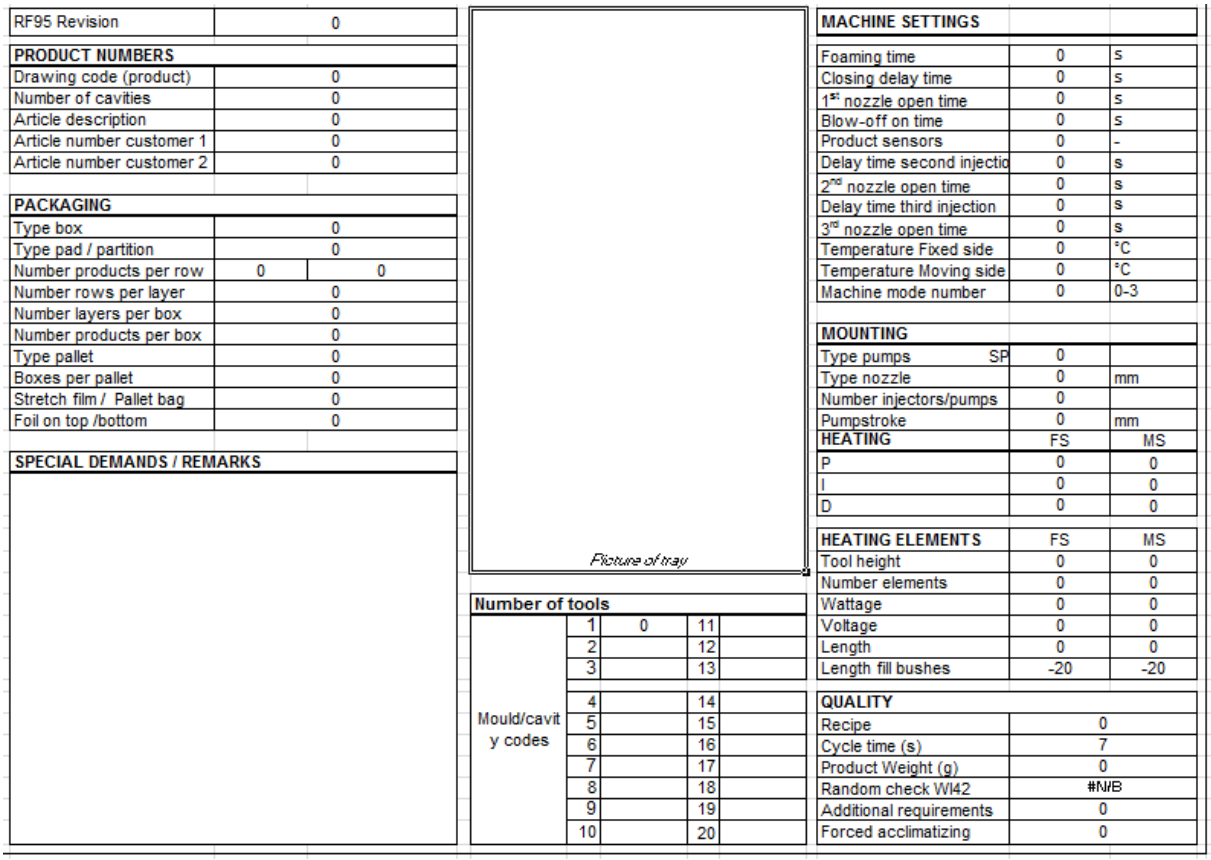
1. Recipe + RF95 *Quote:*	Notable / Interactions	Influence of distance
2. Quality requirements *Quote:*	Notable / Interactions	Influence of distance
3. Experience from sample run *Quote:*	Notable / Interactions	Influence of distance
4. Skills *Quote:*	Notable / Interactions	Influence of distance

5. Anything else we need to discuss. *Quote:*	Notable / Interactions	Influence of distance
6. Sixth topic *Quote*		

Appendix E – Document analysis

1. RF-95

This document describes the characteristics of a new product and how to produce it. It is linked to the skills to produce a new product for PaperFoam and therefore it is relevant to analyze. This document is developed by the Project Management department with input from the other departments within PaperFoam-NL and is transferred to the production department of one of the three production facilities, when a new product is going into production. Figure 5 shows a copy of the RF-95 document.



RF95 Revision	0

PRODUCT NUMBERS	
Drawing code (product)	0
Number of cavities	0
Article description	0
Article number customer 1	0
Article number customer 2	0

PACKAGING		
Type box	0	
Type pad / partition	0	
Number products per row	0	0
Number rows per layer	0	
Number layers per box	0	
Number products per box	0	
Type pallet	0	
Boxes per pallet	0	
Stretch film / Pallet bag	0	
Foil on top /bottom	0	

SPECIAL DEMANDS / REMARKS

Picture of tray

Number of tools				
Mould/cavity codes	1	0	11	
	2		12	
	3		13	
	4		14	
	5		15	
	6		16	
	7		17	
	8		18	
	9		19	
	10		20	

MACHINE SETTINGS		
Foaming time	0	s
Closing delay time	0	s
1st nozzle open time	0	s
Blow-off on time	0	s
Product sensors	0	-
Delay time second injectio	0	s
2nd nozzle open time	0	s
Delay time third injection	0	s
3rd nozzle open time	0	s
Temperature Fixed side	0	°C
Temperature Moving side	0	°C
Machine mode number	0	0-3

MOUNTING		
Type pumps SP	0	
Type nozzle	0	mm
Number injectors/pumps	0	
Pumpstroke	0	mm

HEATING	FS	MS
P	0	0
I	0	0
D	0	0

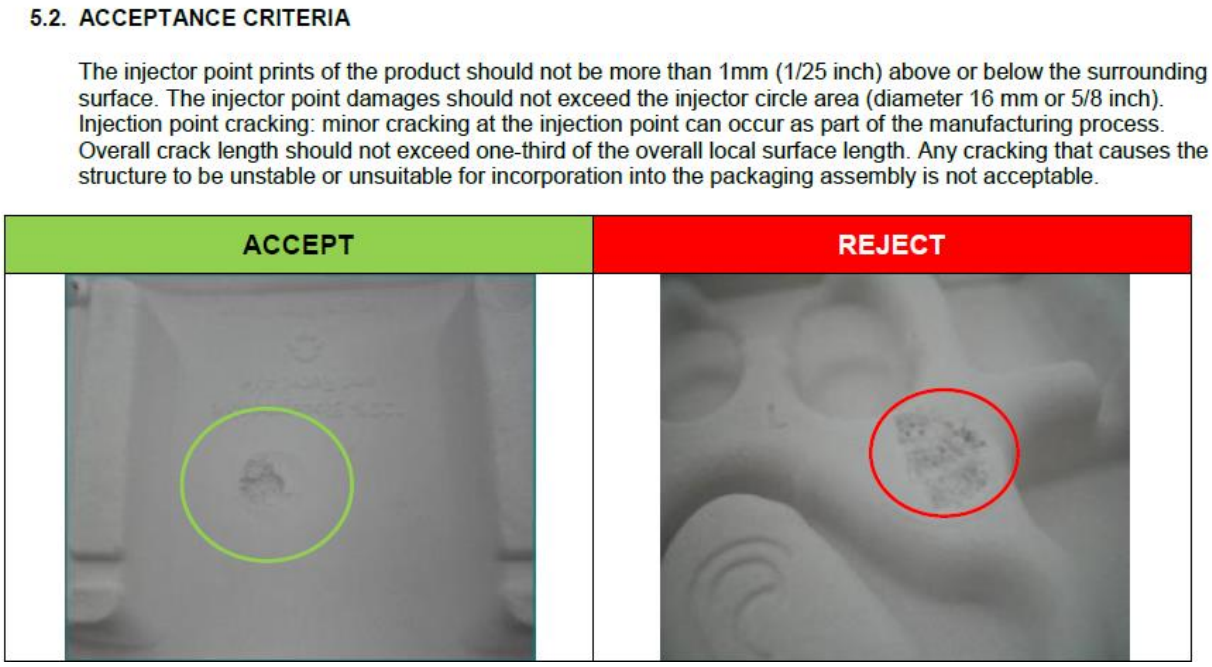
HEATING ELEMENTS	FS	MS
Tool height	0	0
Number elements	0	0
Wattage	0	0
Voltage	0	0
Length	0	0
Length fill bushes	-20	-20

QUALITY	
Recipe	0
Cycle time (s)	7
Product Weight (g)	0
Random check WI42	#N/B
Additional requirements	0
Forced acclimatizing	0

Figure 5. Copy of RF-95 document

2. WI-31

This document describes the quality requirements of a new product. It is needed for the assessment of the quality requirements of the product as agreed with the customer of PaperFoam and is therefore relevant to study. The document consists of 20 pages and includes eleven types of defects that can occur during the production process which can be related to quality requirements. These are: Color Variance Inspection, Tolerance on injector prints, Tolerance on ejector prints, Cracks and Tears, Wrinkles, Ribs and Sink Marks, Hollow Fill or Loose walls, Underfill or Short fill, Gate Point / Vent holes, Flash, Damage and dirt after demolding and Warping. An illustration of on page of the document can be found in Figure 6.



5.2. ACCEPTANCE CRITERIA

The injector point prints of the product should not be more than 1mm (1/25 inch) above or below the surrounding surface. The injector point damages should not exceed the injector circle area (diameter 16 mm or 5/8 inch). Injection point cracking: minor cracking at the injection point can occur as part of the manufacturing process. Overall crack length should not exceed one-third of the overall local surface length. Any cracking that causes the structure to be unstable or unsuitable for incorporation into the packaging assembly is not acceptable.

Figure 6. Copy of WI-31 document

Appendix F – Coding structure

Categories (main themes)	Antecedents (axial codes)	Quote examples
Case	A (58)[2]	That is the danger when you are located as close to each other as here in **The Netherlands**[3]. (P13)
	B (94)	Because that is just something to people not do so much **here in the US**. (P5)
	C (86)	What you also see **in Malaysia** is that they do as they get told, they do not take any initiative. (P15)
Type of knowledge	Tacit cognitive knowledge (= quality requirements) (71)	In new projects, we explain the **quality requirements**. (P15)
	Tacit technical knowledge (44)	When Stephan is here (Malaysia), it is easier. If I have a problem, I ask Stephan to come to **the machine** and **we solve it together**. If Stephan is not here, I try to solve the problem myself. (P10)
	Explicit cognitive knowledge (3)	**I write the quality requirements in my logbook.** Notes of these can be found in the office. The production employees then get to hear these from me. (P14)
	Explicit technical knowledge (7)	**We keep a record** of **the recipes** that we produce for the Design & Molds department. In this way we can look back into which recipe was used for a particular product. **The test reports** are made by the Design & Molds department. (P2)
Dimension of distance	Physical distance (67)	**Service over distance** is by definition difficult, especially to make clear where something went wrong. (P2)
	Communication distance (39)	**WhatsApp works better then E-mail**. It works faster. (P15)
	Time distance (22)	**Time differences** are going to be a problem then, as you cannot be in contact with another person at the moment you want to. (P13)
	Knowledge distance (31)	Because **the level of knowledge is higher** in The Netherlands, the assumption is made "everybody will understand this", while not everyone actually understands it (P3)
	Cultural distance (42)	I have been here for eight years, that makes a difference in **understanding the local culture here**. (P5)
	Linguistic distance (16)	I experience a lot of difficulty in **explaining something detailed in English**. (P2)
Phase of SECI-model	Socialization (76)	You get that **impression** when he says: 'it will be a small edition' […] The whole **atmosphere** indicated that it was something big (P4)
	Externalization (148)	The account manager and sample tester are present to approve the first product and to see what can and cannot be done. **That process is captured on paper**. (P7)

[2] Number of corresponding quotes
[3] Bold: Keywords

	Combination (12)	A lot of things do not have to be **communicated explicitly, because it is already there on the server**. (P5)
Type of Ba	Originating Ba (69)	We were not always **there** to support them. Then you **develop your own vision, knowledge and way of thinking** about the quality requirements of a product. (P15)
	Interacting Ba (142)	You notice **there** (Malaysia) that they do it differently. Then, **you go into conversation with them** (Malaysian production managers) and conclude together that another way working is better. (P15)
	Cyber Ba (12)	What I would like to see is that we **use a CRM** (Customer Relationship Management) system wherein a lot of **knowledge can be shared**. (P13)

Appendix G – Information interview participants

Name	Job description	Relevant case	Interview date	Interview duration	Interview method
Participant 1	Sample tester at PaperFoam-NL	A – B – C	07/06/2016	27 min.	Face-to-face
Participant 2	Research & Technology manager at PaperFoam-NL	A – B – C	08/06/2016	40 min.	Face-to-face
Participant 3	Salesmanager for PaperFoam-NL & Production-US & Production-ML	A – B – C	09/06/2016 & 30/06/2016	35 min. 34 min.	Face-to-face Face-to-face
Participant 4	Project manager at PaperFoam-NL	A – B – C	16/06/2016 & 21/06/2016	54 min. 48 min.	Face-to-face Face-to-face
Participant 5	Production manager at Production-US	B	19/06/2016	24 min.	Skype
Participant 6	Production manager at Production-US	B	19/06/2016	25 min.	Skype
Participant 7	Design manager at PaperFoam-NL & Production-US	A – B	20/06/2016	51 min.	Face-to-face
Participant 8	Sales manager and designer at PaperFoam-NL & Production-US	B	22/06/2016	39 min.	Face-to-face
Participant 9	Production manager ML	C	22/06/2016	15 min.	Skype
Participant 10	Technical specialist ML	C	22/06/2016	20 min.	Skype
Participant 11	Production manager at Production-NL & Production-ML	A – C	22/06/2016 & 30/06/2016	15 min. 43 min.	Skype Face-to-face
Participant 12	Project manager at PaperFoam-NL & Production-US	A – B	23/06/2016	30 min.	Face-to-face
Participant 13	Sales manager at Production-US	B	29/06/2016	25 min.	Face-to-face
Participant 14	Quality manager at PaperFoam-NL	A	29/06/2016	45 min.	Face-to-face
Participant 15	Designer at PaperFoam-NL Technical specialist at Production-NL & Prodution-US & Production-ML	A – B – C	29/06/2016	45 min.	Face-to-face