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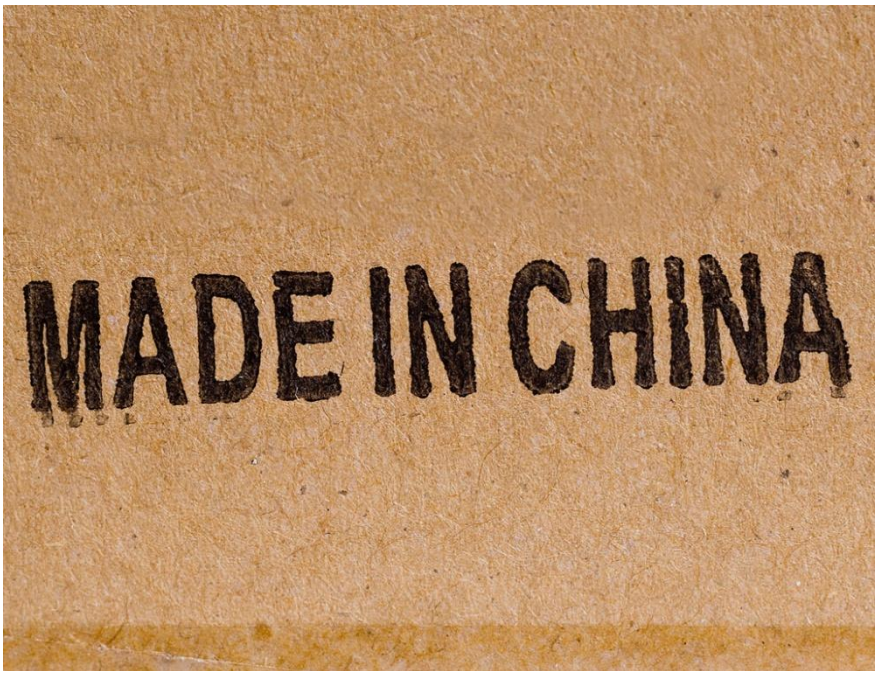
Made in China:
A Norwegian Perspective on How Cultural Differences Affect Technology Transfer



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"The same can be said about doing business in China as with Norway in the Easter sun: Listen to experienced mountaineers!"

Helge Hareland, Chief Financial Officer, Nordic Industrial Park
(Translated by Jørgen Horn Gulliksen)

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I would first like to use this opportunity to thank the cultural diversity of the world.
Without this, there would be no thesis for me to write.

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Without them, this thesis would be way off target.

Finally, I would like to thank my family.
Without them, both the thesis and I would not be.

Abstract

In this thesis, an attempt to incorporate cross-cultural research to an innovation-oriented approach to technology transfer is made. As cultural aspects of international technology transfer long have been neglected, an accepted framework to analyse the phenomenon still is non-existent. In this thesis, a framework for analysing technology transfer from both perspectives is made is made, where many aspects of technology transfer are covered. To try this framework out in action, two newly established Norwegian manufacturing firms in Ningbo, China, are used in a multiple-case study, where I analyse how cultural differences affect technology transfer.

Contents

1 Introduction

1.1 Background

As a part a part of the phenomenon 'globalization', companies are growing more and more borderless. Large, multinational corporations have been operating globally across borders and cultures for years, and companies of all sizes from all industries and sectors are using outsourcing1 and offshoring2 as an increasingly common business strategy.

There are many different factors contributing to the increase of globalization of business activities. One company might want to offshore production to be closer to an existing or get into a new market, another might want to enjoy the spoils of low-cost labour, while a third may want to outsource part of their activities in order to focus more on its own core competences, and yet another company might seek benefits from economies of scale. Whatever reasons and motivations behind a company's decision to outsource or offshore abroad, both these business strategies involve the transfer of knowledge and technology to ensure that the efficiency and quality standards set by the firm are upheld. Another aspect these strategies contain, is that when a company moves an activity abroad, either intra-organizationally or to an external part, they will at some point experience cultural and communicative difficulties.

1 Outsourcing can be understood as contracting out a business service, process or operation to external suppliers or manufacturers.
2 Offshoring can be understood as intra-organizational transfer of a business service, process or operation abroad.
3 The sources I have been in contact with (including the Norwegian embassy in Beijing, two Norwegian Consulate General offices in China and the Norwegian-Chinese Chamber of Commerce) have not been able to provide an exact number, due to the fact that all Norwegian companies in China have not registered their presence with Norwegian authorities. To obtain data of this kind from Chinese authorities is extremely difficult without official backing. Therefore, the number of Norway related companies in China used in this thesis is an estimate made by the NCCC.

As China is increasingly becoming the 'manufacturer of the world' and the label 'Made in China' can be found on nearly everything, a result of China's development in the manufacturing sector is that an ever-increasing number of companies outsource or offshore their production of goods to China. Norwegian firms follow this trend, and while more firms are opening manufacturing sites in China every year, it is today about 200 Norway related companies of all sorts operating in China.3 In this thesis I will look at how the cultural differences between the two countries affect Norwegian firms that set up manufacturing sites in China.

1.2 Focus of the study

Much previous research has been made on knowledge and technology transfer in the past, from several academic fields. In the field of innovation studies, there has been an increased focus on technology transfer as a complicated and dynamic process where the central element is transfer of knowledge that can complement the technology, and a rising consensus on the necessity of placing more emphasis on industrial networks diffusing and sharing knowledge and technology in a continuous systemic process of innovation, rather than a one-time transfer between a transmitter and receiver of technology (Amesse & Cohendet, 2001; Chesbrough, 2003; Cohendet, Kern, Mehmanpazir, & Munier, 1999; Ernst & Kim, 2002; Freeman, 1987; Grant, 1996;

3 The sources I have been in contact with (including the Norwegian embassy in Beijing, two Norwegian Consulate General offices in China and the Norwegian-Chinese Chamber of Commerce) have not been able to provide an exact number, due to the fact that all Norwegian companies in China have not registered their presence with Norwegian authorities. To obtain data of this kind from Chinese authorities is extremely difficult without official backing. Therefore, the number of Norway related companies in China used in this thesis is an estimate made by the NCCC.

Lundvall & Johnson, 1994; Swan, Newell, Scarbrough, & Hislop, 1999; Teece, Pisano, & Shuen, 1997; Tidd & Bessant, 2009).

However, one aspect of knowledge and technology transfer has to a large extent been neglected in most fields of academic research, as well as in the innovation-oriented approach – namely, how cultural differences affect the transfer process. There have been a few attempts to incorporate cultural aspects into existing theory (Bhagat, Kedia, Harveston, & Triandis, 2002; Kedia & Bhagat, 1988; Kostova, 1999; Winkler, Dibbern, & Heinzl, 2008), but cross-cultural perspectives have not yet been properly integrated into research on technology and knowledge transfer, and the cultural aspect of the transfer is usually only mentioned briefly, if mentioned at all. Thus, a functioning and accepted framework to look into this matter is still non-existent.

One possible reason for this lack of emphasis on cultural differences in technology transfer theory is that, in order to combine the two, there is need for a inter-disciplinary approach, and most researchers primarily use their own field of study to look at this phenomenon. Therefore, I believe my inter-disciplinary ESST master programme can prove helpful in providing the necessary research tools to look into this matter and contribute by bringing in and combining several different academic perspectives to look at cross-cultural technology transfer.

Since publishing *Culture's Consequences* (1980) three decades ago, Hofstede has been a dominant figure the field of cross-cultural research. In his book, he identified four dimensions that can be used to describe and compare national cultures. I will in this thesis try to incorporate Hofstede's cultural dimensions to technology transfer theory to

see if the two together can contribute to form a framework for looking at international technology transfer that incorporates how cultural aspects affect the transfer. As mentioned in the background section, there is increasing number of Norwegian firms establishing manufacturing in China, and I will use this context to empirically examine the effect cultural aspects have on technology transfer.

Using an innovation-oriented approach, I will in this paper first explain two transfer approaches and provide relevant definitions in terms of technology transfer. Second, I will explain how an organization can create knowledge by diffusing knowledge with its individuals. Then, thirdly, strategies for transmitting technology will be elaborated, and their relevance for international technology transfer discussed. Fourth, I will then take a look at the receiver of technology, and discuss important aspects for used the transfer to build competence and capabilities. Sixth, I will look at how cultures can be quantified and measured to explain national cultural differences in using Hofstede's conceptual framework. After explaining research design and methods used in this thesis, I will examine empirical data collected from two Norwegian companies, Marine Aluminium and Mascot Power Supplies, who both have manufacturing facilities located in Ningbo (宁波), China, and analyze the empirical findings in the main part of my thesis. Here, I link up empirical findings with theory and discuss what implications cultural differences have for technology transfer between Norway and China. Finally, I will have a concluding discussion of the thesis, including proposals for future research and discussion of limitations with the thesis. The underlying research question for my thesis will be as follows: 'how do cultural differences affect technology transfer from Norway to China?'

With this, I hope I can confirm my hypothesis that national variations with regard to culture affect the interactions involved when transferring technology between organizational entities located in different countries, and doing so I will hopefully also be able to raise the level of consciousness this effect of cultural variations with scholars looking into the same topic.

2 Technology transfer theory and definitions

Ever since the industrial revolution started in England, technology transfer has occurred on a large scale4. It was not until the 1970's, however, that the topic was subject to extensive research by scholars. From then on, several different approaches to technology transfer have been developed.5 In order to simplify the overview, I will stay with Autio and Laamanen's (1995) broad categorisation between the *traditional approach* and the *innovation-oriented approach* in the vast body of literature on technology transfer.

2.1 The traditional approach

In the traditional approach, the focus has primarily been on technology transfer between industrialized and developing countries, where most of the benefits from the transfer lie with the receiving part (i.e. the less developed participant), a concept influenced by the contemporary ideas on economic convergence and catch-up theory, although not necessarily accurate in all cases (Abramovitz, 1986). In this approach, it is not assumed any changes in the technology during the transfer, and reverse engineering without requirements to generating new knowledge is a central element (Kim & Nelson, 2000, ch. 1).

4 Bruland (1989) takes a look at technology transfer in the 19th century between England and Norway.
5 For a thorough historical review of knowledge transfer literature, see Cummings & Teng (2003).

2.2 The innovation-oriented approach

Although the international element also is strongly present in the more evolutionary, dynamic and systemic innovation-oriented approach, it is not automatically taken into account. In this approach, the co-development of industrial and technological systems through recurring interchanges between different actors sets the premise for technology transfer. In this way, a constant search for new knowledge in a more open and co-operative innovation process is the description of how organizations build up competence.

2.3 Definitions

Taking the perspective of the knowledge-based economy, Amesse and Cohendet (2001) proposed a model where technology transfer is viewed as a specific knowledge transfer process that depends on how the transmitter and recipient of the technology transfer manage knowledge. In my thesis I will follow this line of thought and look at technology as involving both a body of practice, manifest in the artefacts and techniques that are produced and used, and a body of understanding, which supports, surrounds and rationalizes the former (Jensen, Johnson, Lorenz, & Lundvall, 2007). Here, it is implicitly stated that technology not only consists of embedded knowledge in the devices it self, but also consists of necessary know-what and know-how to operate and run the transferred technology efficiently. This is to say that buying blueprints and machines, i.e. technology, is insufficient to make the transfer successful, but the knowledge about how

to operate and run the technology is equally important to include in the transfer process.

Knowledge and technology are transferred through transfer mechanisms, which are any specific form of interaction between two or more social entities during which they are transferred, both formal and informal.6 There are several ways to categorize transfer mechanisms. One is to make a distinction between technology transfer mechanisms and complementary transfer mechanisms for knowledge/information to utilize the first (Teece, 1977), while others prefer to process mechanisms and output mechanisms (Autio & Laamanen, 1995). Further, in following the innovation-oriented approach, I will define innovation quite broadly as the successful exploitation of new ideas7, because if technology transfer is to be viewed as a distinct knowledge transfer process, the key to a successful transfer is to successfully and efficiently implement, integrate and utilize the new knowledge (i.e. new ideas) transferred.

While following this approach, I will in the empirical section look at the technology transfer involved when Norwegian companies open manufacturing sites in China. Before moving deeper into how knowledge is managed and transferred in this approach, however, I will start the by explaining how the diffusion process of individual knowledge in an organization works, and how the dynamics of organizational knowledge creation is essential to be able to transfer technology.

6 From Autio and Laamanen (1995, p. 648), although slightly altered.
7 As, for instance, the Innovation Unit in the UK Department of Trade and Industry (2004) have defined it before me (Tidd & Bessant, 2009, p. 16)

3 Organizational knowledge creation

Taking the view that technology transfer is a specific knowledge transfer process, I will in this section first break the big pieces of the puzzle down to knowledge in its simplest form – with the individual – and explain the characteristics of knowledge transfer between individuals. Then, in using Nonaka's (1994) dynamic theory of organizational knowledge creation, I will explain how new knowledge with individuals can be converted and diffused into organizational knowledge, and further transferred between different entities in an organization, something that is highly relevant for competence building when establishing a new manufacturing facility in another country.

3.1 Types of knowledge

Knowledge can be defined as 'justified, true belief' (Nonaka, 1994, p. 15). In the same article, Nonaka refers to Polanyi's (1966) classification of knowledge into two types – *'tacit knowledge'* and *'explicit knowledge'* – where:

> "Explicit" or codified knowledge refers to knowledge that is transmittable in formal, systematic language. On the other hand, "tacit" knowledge has a personal quality, which makes it hard to formalize and communicate.
> (Nonaka, 1994, p. 16)

Further, tacit knowledge contains both cognitive and technical elements, where the cognitive element consists of what has been called 'mental models' that contain paradigms, schemata, beliefs and viewpoints which provides an individual with

perspectives to perceive and define their world, while the technical element involves skills and know-how8 in specific contexts which are difficult to capture and convert into storable and codified explicit knowledge.

At an organizational level, new knowledge cannot be created without individuals and the organization can only contribute with a context in which individuals create new knowledge. This means that organizational knowledge creation can be understood as 'a process that 'organizationally' amplifies the knowledge created by individuals, and crystallizes it as a part of the knowledge network of organization' (Nonaka, 1994, p. 17). To follow this line of thought further, the same can then be said about organizational learning, that an organization can only learn of its members or by hiring new members who possess knowledge the organization did not have from before (Grant, 1996). It is by accumulating knowledge with its individuals an organization can build up competence and capabilities. I will elaborate on this in section 5.

3.2 Individual commitment

Commitment is essential to all new individual knowledge creating activities and therefore also to organizational knowledge creation and learning, and there are three factors that contribute to stimulating this (Nonaka, 1994). *Intention*, the first, is the notion that a person becomes conscious of something when he or she pays attention to an object or activity in the context of a purposeful environment. Without intention it is impossible to conceptualize the value of new information or knowledge, and it is the

8 For further elaboration on know-how, see Lundvall and Johnson (1994).

firm's responsibility to provide the right environment through offering necessary incentives and direction to stimulate the individual knowledge acquisition (Grant, 1996). Next, *autonomy* increases an individual's self-motivation to pursue and form new knowledge and thus increases an organization's chances of acquiring unexpected knowledge and possibilities. Here it should be mentioned that motivations can both be *intrinsic* in character, something that refers to doing something because it is inherently interesting or enjoyable, and *extrinsic* in character, referring to doing something because it leads to a separable outcome (Ryan & Deci, 2000). The final factor, *fluctuation*, implies that when individuals continuously interact with the external world and are exposed to new information or knowledge, they start questioning their routines and habits, something that again might change their personal perspectives and definitions of their environment.

3.3 Knowledge conversion

The notion that it is possible to create new knowledge from already existing knowledge has led to the concept of a 'spiral of knowledge' (Nonaka, 1994), where four different modes of knowledge conversion through social interaction between individuals can expand and diffuse knowledge throughout an organization. In order to do so, it is an imperative to utilize and convert both tacit and explicit knowledge on the path to organizational knowledge creation.

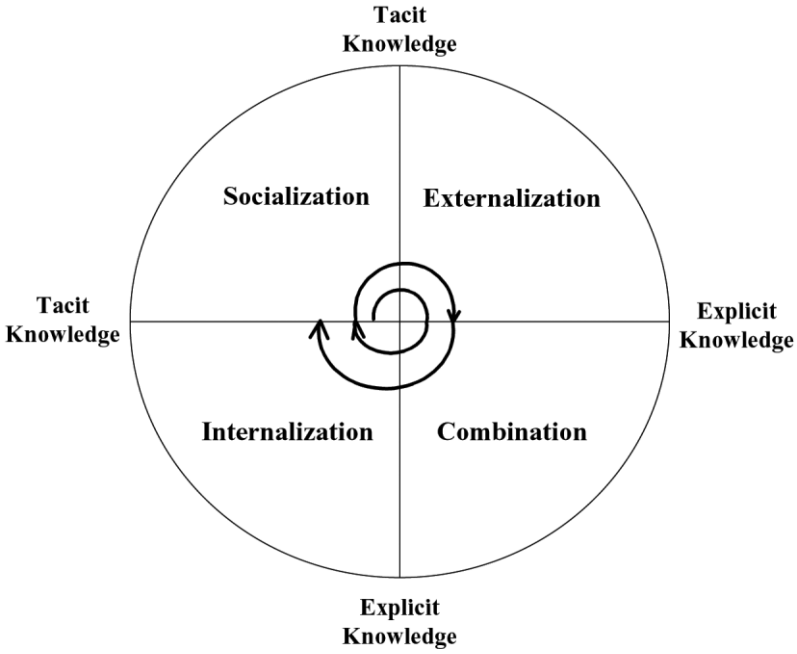

FIGURE 3.1. Knowledge conversion

Source: Nonaka (1994)

The first type of knowledge conversion is *socialization*, a process where interacting individuals through language and observation transfer tacit knowledge from the one to the other. A common platform is created through sharing mental models and know-how9, quite similar to how a novice through observation and practice learns from the experienced master. As Cohendet et al. (1999) points out, however, socialization has a highly localized dimension to it, making individual commitment geographically limited, meaning that this mode difficult to utilize across large distances, even by use of information and communication technology (ICT).

The next mode, rooted in information processing, also employ social interaction to convert knowledge; in *combination*, however, the interaction ensures the exchange and

9 For an introduction to the concepts of know-how, know-what, know-why and know-who, see Lundvall and Johnson (1994).

combination of explicit knowledge between individuals through mechanisms such as meetings, presentations and conversations, something that can expand an individual's knowledge base and lead to new knowledge through reconfiguration and re-contextualization. After the revolution in ICT, this mode has become geographically independent, although a vital notion is that the individuals responsible for encoding and decoding should have related backgrounds or environments to avoid misunderstandings (Kogut & Zander, 2003), as the codified message would seem meaningless without a shared context (Teece, 1981).

Both the third and the forth modes of conversion involve tacit as well as explicit knowledge, implying that the two knowledge types are complementary and that the one can expand the other and visa versa. *Internalization*, conversion from explicit to tacit knowledge, has much to do with what we usually understand as 'learning', both individually and in an organizational context. Here, it is important to note that internalization contain both transmission and application, where the first stage is dependant on communication of explicit, codified knowledge, and the latter stage involves getting the necessary experience and know-how through practice (Cohendet, et al., 1999).

The fourth, *externalization*, is when tacit knowledge is codified and made explicit. As tacit knowledge supposedly is inexpressible, however, this is the theoretically least developed mode of conversion, though it is stated that through the use of metaphor, models, concepts, analogies and so on, codification of tacit knowledge can be promoted (Cohendet, et al., 1999; Nonaka, 1994). If converted successfully, this implies that local, tacit knowledge without any regard for geographical proximity can be transferred

globally. However, as some aspects of tacit know-how often are specific and related to its original context, they are impossible to codify (Lundvall & Johnson, 1994).

3.4 The spiral of knowledge

As we can see, there are several factors that affect the process of organizational knowledge creation: type of knowledge involved, individual commitment and utilization of knowledge conversion. By creating dialogue between existing bases of tacit and explicit knowledge with the individuals of an organization, a dynamic spiral of creating knowledge within an organization can be achieved (Cohendet, et al., 1999). This process allows knowledge to be diffused throughout the organization, and thus complies with the already mentioned definition of organizational knowledge creation.

Moreover, the principles are the same when knowledge (i.e. also technology as explicit, codified knowledge embedded10 in devices and machinery) is transferred between to organizational entities, no matter how far apart from each, although some of the conversion modes are more geographically dependant than others, making transfer more problematic across large distances. In the next section, I will make clear the importance of having a conscious knowledge management strategy in an organization to be able to utilize intra-organizational knowledge transfer between different entities.

10 Blackler (1995) defines and uses a finer typology of knowledge than provided by Nonaka, where embedded knowledge, among other types, is explained.

4 The transmitter of technology

After reviewing the different types of knowledge and modes of knowledge conversion, it will be helpful, with regard to knowledge and technology transfer, to take a look at the knowledge management strategies the transmitting part in an organization can apply to improve the pace of knowledge diffusion. In my thesis, knowledge management (KM) will be defined rather broadly to include any processes and practices concerned with the creation, acquisition, capture, sharing and use of knowledge, skills and expertise (Swan, et al., 1999, p. 264), all of which are relevant with regard to technology transfer.

After studying KM practices in several industries, with a special emphasis on the knowledge intensive consulting firm industry, Hansen et al. (1999) identified two major KM strategies – namely the *codification strategy* and the *personalization strategy*. These different approaches to managing knowledge emphasize its own type of the two knowledge classifications elaborated on above, *tacit* and *explicit*, and can provide a more practical dimension to observing how knowledge is managed in firms and organizations. Further, in terms of technology transfer, these two strategies can help shed light on the tacit and explicit dimensions involved in the transfer as well.

4.1 The codification strategy

As the name suggests, the codification strategy centres on codification of knowledge, i.e. converting tacit knowledge to explicit knowledge. Even though Nonaka (1994) claims

this conversion type to be the least explored and most novel within academic research, he still argues that the transformation can be done in a process of conceptualization and crystallization, as I have already mentioned in the section on externalization. In Hansen et al.'s (1999) article, the conversion process itself is not called attention to, it is simply stated that some companies have developed elaborate ways to codify, store and reuse knowledge by extracting it in what is called a "people-to-documents" approach. This makes computers and databases central in the codification strategy.

As Tidd and Bessant (2009, ch. 11) point out, a KM strategy depends on more than the implementation of technology in order to be successful. Therefore, while firms utilizing this strategy hire able people, more emphasis is usually put on training in internal systems and programs than the excellence of employees. By pursuing this strategy, knowledge becomes independent from any one individual and knowledge can efficiently be shared throughout the organization, and in this way the organization can prevent it self from "inventing the wheel" several times.

In terms of technology transfer, the codification strategy can be identified through transfer of blue prints, software, formulas, and routines, and so on, to a receiving part. Further, an important property of codification strategy is that 'the more a given item of knowledge or experience has been codified, the more economically it can be transferred' (Teece, 1981, p. 83). This implicitly makes mature technologies in general cheaper to transfer since they often are better codified (Kogut & Zander, 2003).

4.2 The personalization strategy

On the other hand, in the personalization strategy, knowledge is closely linked with an individual. The sharing and transfer of knowledge is done by personal contact through dialogue, either directly or by use of information technology (ICT). To facilitate this, organizations pursuing this strategy focus on building networks and "people-finder-databases" to map the location of knowledge, and the hiring of highly competent people is seen as an imperative to ensure the development of tacit knowledge with the employees. However, as the personalization strategy implies that knowledge that has not been codified cannot be extracted from an individual and diffused through other means that personal contact such as dialogue, Hansen et al.'s observations might somewhat collide with Nonaka's view that tacit knowledge, due to its inexpressibility, is difficult to acquire only through dialogue as people know more than they can express.

Instead, in terms of technology transfer, this strategy involves sending personnel (transferors) with necessary experience and know-how to the receiving part of the transfer. In doing so, it is possible to help the recipient decode and explain codified knowledge that lies out of a shared context with the recipient, and also letting the recipient acquire tacit knowledge through observation. With this, the transferor can help the receiver internalize new codified knowledge, while at the same time diffuse non-codified tacit knowledge through socialization. However, as sending transferors either on short-term stays or as expatriates often is a necessary, although expensive, compliment or alternative to only converting tacit to codified knowledge, it is in using the personalization strategy a critical factor that the technology being transferred is completely understood by the transferor (Teece, 1977, 1981).

Another point worth mentioning in terms of utilizing the personalization strategy, and also of relevance to reduce costs in terms of time needed to successfully transfer and implement both tacit and explicit knowledge, is previous experience in similar transfer processes, something Kogut and Zander (2003) point out to be among the most persistent findings in literature with regard to transfer costs in technology transfer theory. This indicates that it is possible to accumulate some sort of technology transfer know-how with the individuals of an organization, and that these individuals can function as a sort of 'transfer experts', depending on the transferor's personal qualities and accumulated knowledge about transfer processes through experience.

4.3 Combining the two strategies

After reviewing both the personalization and the codification strategy, it seems as though each of them can serve its rightful purpose in a knowledge transfer process, all depending on which type of knowledge an organization want to transfer. In a technology transfer process, however, there will always be an embedded component of codified knowledge in the devices and machinery, as well as an embodied11 tacit component of know-how (i.e. how to operate and run the codified knowledge efficiently).

This implies that the personalization and the codification strategy are not in conflict with each other; rather, they are both needed in a technology transfer process where they can provide complementary knowledge needed for a successful transfer. Further,

11 Also taken from Blackler's (1995) typology.

because of technology transfer's dual involvement with both tacit and explicit knowledge, it is plausible to expect the two strategies to overlap in a transfer process. As Hansen et al. (1999) opt for an 80-20 split between either of them, where one is the predominant KM approach, and the second is used to support the first. However, this 80-20 split may not be advantageous in all transfers processes. In the case of technology transfer, it is perhaps more likely that this split rather depends on the 'degree of tacitness' involved in the process (Nelson & Winter, 1982).

'The degree of tacitness' does nevertheless not alone determine which strategy a firm should give priority; another determinant is transfer costs, as codified knowledge is easy to communicate and diffuse, while the tacit knowledge that cannot be codified must be observed and applied through practice, making the latter slow, uncertain and expensive to transfer (Grant, 1996; Kogut & Zander, 1992). Hence, maturity of the technology and previous experience in transferring it matters, something Kogut and Zander's claim that 'experience in internal transfers encourages more internal transfers in the future' can be seen as a confirmation of. (Kogut & Zander, 2003, p. 520). Therefore, as already mentioned, mature technologies with its higher degree of codification and thus a higher degree of applicability to new users will probably be less costly to transfer and the preferable transfer strategy for firms. Following this line of thought further, prospective transferors have a higher probability of fully understanding the technology and having accumulated previous experience in similar transfer processes for diffusing the knowledge still tacit with the technology.

However, success of the transfer lies not only with the transfer strategies implemented by the transmitter. As explained in the next section, it also lies with the receiving part's ability to implement and learn how to use the knowledge and technology transferred.

5 The receiver of technology

According to Nonaka, an organization can build up competence and capabilities by accumulating knowledge with its individuals, both tacit and explicit. In the case where a Norwegian company decides to set up a new manufacturing site in China, the managers have to build up a knowledge base from scratch, and then it is important to manage this in a way so that competences and capabilities are efficiently transferred, absorbed and accumulated with the new employees to secure a spiral of knowledge creation. In this way, the new manufacturing site can start producing according to expected time and set standards as fast as possible.

But what exactly does competence and capability in an organizational context involve, and through which mechanisms can they be transferred? Moreover, how can an organizational entity integrate competence and capabilities, and learn how to improve its competences by it self?

5.1 Competence and capabilities

After reviewing the characteristics of knowledge and knowledge transfer in a technology transfer context, it is time to see how competences and capabilities can be replicated[12] at a new manufacturing site. First, however, as many scholars have used these two terms interchangeably, I will define what the concepts of competences and capabilities imply.

12 An assumption here is of course that the technology transferred is mature, and that the transferring part already possesses competence with regard to that technology.

I prefer to look at competence in terms of what appears from the learning process in a firm or organization that requires combined skills and knowledge. This necessitates that a firm can have basic, reproductive competences which are static, and also 'core competences' defined by the competences that can provide a sustainable competitive advantage for a firm through performing certain activities (Prahalad & Hamel, 1990). To say it simple, 'competences express what a firm can do' (Cohendet, et al., 1999, p. 229).

While capabilities also involve the competences of a firm, it has a more dynamic aspect where both internal and external competences are integrated, built and reconfigured to help the firm adapt to a changing environment (Teece, et al., 1997). Thus, dynamic capabilities entail the ability of changing routines and promoting innovation to further create new capabilities and competitive advantage (Cohendet, et al., 1999). Hence, a firm or an organization can by transferring the necessary knowledge that complements the use of technology help the receiver enhance their competences and by this also contribute to the formation of capabilities. In the two following sections I will, first, explain how competence building can be facilitated, and then look at how capability formation can form and develop.

5.2 Competence building

As Grant noted, 'transferring knowledge is not an efficient approach to integrating knowledge' (Grant, 1996, p. 114). The first step to building up competence from scratch is obviously the recruitment of able people possessing the desired person-embodied

knowledge base (both informal and formal, i.e. tacit and explicit) and commitment that will enable them to learn how to perform the required job tasks in a fast and satisfactory way.

In replication of routines and operating procedures, existing personnel and training operations in place with the transferring part already provide the necessary capability to select and modify the sorts of employees required, and can contribute by defining the formal requirements of the different sorts of employees (Nelson & Winter, 1982). An important notion here is that it might be difficult to assess the level of tacit knowledge possessed by individuals, and in the recruitment process managers can only assume their level of embodied knowledge by looking at previous experience and formal training.

After building a knowledge base by recruiting people that fulfil the desired requirements, the firm can start building competences by effectively utilizing knowledge conversion that lead to productive learning and internalization of new knowledge with its workers. Diffusion of technology is completed only when transferred knowledge is internalized and translated into the capability of the receiver (Ernst & Kim, 2002)13. Before moving on to capabilities, I will take a closer look at some competence integration mechanisms, and discuss their implications.

5.2.1 Integration mechanisms

13 Here, I suspect that Ernst and Kim are using the concepts of competence and capability somewhat interchangeably.

In the mentioned work by Grant (1996), he identifies four mechanisms for integrating specialist knowledge by joining together literature on explicit and implicit coordination mechanisms that can promote and enhance the competences of a firm through learning.

The first, *rules and directives,* can be understood as standards set by experts to regulate and facilitate interactions between and behaviour of individuals. Further, rules and directives help comprehend and integrate expert knowledge of others, for instance by incorporating HSE (health, safety and environment) regulations at the work place, an HSE experts does not need to teach all the workers all he or she knows about HSE, rather it is incorporated in the production process it self.

Secondly, *sequencing* is a simple method for letting individuals integrate their knowledge to operations in a time saving fashion. A notion here, however, is that some production activities are not suited for sequencing – with factors like product characteristics, physical inputs and production technology deciding the potential, making sequencing technologically determined.

Thirdly, *routines*, while often simple to perform, they have the ability of coordinating relatively complex patterns of interactions and behaviour between individuals and make them function as a unit. This matches quite accurately with Nelson and Winter's perception of routines as embedded organizational memory, as both tacit and explicit organizational knowledge reside in routines (Blackler, 1995; Nelson & Winter, 1982).

Finally, *group problem solving and decision-making* require more personal and communication based interaction. This mechanism can be both face-to-face and group

based (meetings etc.), and can supplement the first three mechanisms for implementation and integration of knowledge. The biggest strength of this mechanism is that individuals can indirectly communicate their expert tacit knowledge, through expressing their views, although because of the difficulties of expressing this accurately it is usually not easy to reach consensus in this kind of decision-making.

5.2.2 Reviewing the mechanisms

As we can see from Grant's four knowledge integration mechanisms, the first three are highly related to the codification strategy mentioned earlier. The codified knowledge of the transmitter are implemented with the receiving part, and in the process also internalized with the workers who eventually develop the know-how embedded in the organizational practice (Ernst & Kim, 2002). Further, the argument that the encoder and decoder need a common knowledge base and context for this process to work, once again highlights the importance of selecting and recruiting the right people to fill the empty positions at the new site. However, some degree of assistance to the receiving part's employees must be expected in the learning processes involving these mechanisms - the degree of course depending on the maturity and complexity of the technology ('degree of tacitness').

Here as well, transaction costs will play a part in the selection of integration mechanisms, as all three 'seek efficiency of integration through avoiding the costs of communication and learning' (Grant, 1996, p. 115).

Another notion is that the degree of tacitness in a technology (and its complementary knowledge), is decided by how well the technology is understood by the transferring part for the knowledge involved to be properly codified (Jensen, et al., 2007), and if the knowledge needed to operate and run the technology derives from experience or not (Asheim & Gertler, 2005). If the tacit component is big, trial and error through learning by doing, using and interacting is necessary to incrementally14 improve the products or processes involved15. This can cumulatively improve efficiency as the users get more familiar with the technology, something Kline and Rosenberg's (1986) example of improvements in the electric power generation industry exemplifies.

However, in the Doing, Using and Interacting (DUI) mode of innovation (Jensen, et al., 2007), where learning by doing, using and interacting are rightfully considered efficient ways to enhance the skills and know-how of the workers, it is emphasised that in the learning form of interacting in or between teams it might be beneficial with assistance from the transferring part to speed up this process. This bears similarity to Nonaka's socialization mode of conversion, although generally carried out more at a group level where several knowledge bases are brought together to create new knowledge, preferably under the supervision and guidance of an experienced transferor that completely understands the technology, as suggested in the personalization strategy.

That brings me over to group problem solving and decision-making, which involves a lot of tacit knowledge. As utilizing this mechanism can be considered a learning process

14 Freeman & Perez (1988) have an excellent taxonomy of innovation where incremental innovations also are distinguished. The others are radical innovations, changes in 'technology system' and changes in 'techno-economic paradigm' (technological revolutions).
15 In Fagerberg (2005) it is explained that the cumulative impact of incremental innovations have 'just as great (if not grater)' impact on economical and societal change as radical innovations.

that pulls on and combines the different skills and knowledge bases of the employees, this mechanism, according to the definition of competence mentioned above, should contribute to building competence(s) within an organization. Here, as in the DUI mode of innovation in general, new or changed routines or procedures shared for the organization can often be the outcome of such a process (due to the new knowledge generated by the interaction between employees). As these innovative changes can be considered dynamic, parts of these competence building knowledge integration mechanisms involve aspects associated with capabilities.

The four elaborated implementation mechanisms have been centred on intra-organizational transfer of knowledge. However, it is not enough for a company to just build competences without regard to the world outside the organization in order to gain or maintain a competitive advantage. Therefore, I will now explain the importance of inter-organizational interaction to further enhance the competence base of a firm and capabilities formation.

5.3 Capabilities building

In the already mentioned articles by Ernst & Kim (2002) and Amesse & Cohendet (2001), much emphasis is put on the importance of local capabilities formation, something that is essential to an effective organization capable of efficient production.16

16 Here it should be noted that producing custom made products (or novel products) require more in terms of capabilities than producing standard products (mature), although standard product's design and production processes are constantly (though slowly) changed as a respond to changing market demands, technological opportunities and so on, thus also requiring some degree of adaptability to changing environments. Asheim and Gertler (2005) make a relevant distinction between a 'synthetic' knowledge base that corresponds to industries where incremental innovation through application or novel

Firms and other organizations operate in changing environments, and have to be flexible as to adapt to their new environment accordingly. This requires the formation of capabilities. In order to build capabilities in an organization there are two major facets that need to be in place, namely the ability to reconfigure and upgrade the knowledge base within the firm and to develop and exploit networks for knowledge sharing in order to internalize and make use of external knowledge.

5.3.1 Absorptive capacity

As already mentioned, to utilize intra-organizational knowledge conversion and promote organizational knowledge creation, an existing knowledge base and commitment to learning are important (Ernst & Kim, 2002; Nonaka, 1994). Another relevant point with regard to this can be taken from the influential work on absorptive capacity (AC) by Cohen and Levinthal, where they defined it as 'the ability of a firm to recognize the value of new, external information, assimilate it and apply it to commercial ends' (Cohen & Levinthal, 1990, p. 128). This implies that the firm must use its knowledge and competence base to search out, select and implement new, external knowledge that can complement and enhance (and perhaps even alter) its existing knowledge and competence base.

Initially, Cohen and Levinthal emphasised the importance of R&D to build AC in a firm (Cohen & Levinthal, 1990; Tidd & Bessant, 2009, ch. 5). There is little doubt that R&D

combinations of existing knowledge based on know-how and some applied research are predominant, and an 'analytical' knowledge base that include knowledge-intensive industries where scientific knowledge is essential, and radical innovations are more likely to occur. As this thesis looks at manufacturing, it is the synthetic knowledge base that is the most relevant.

can lead to expansion of a firm's knowledge base (know-why and know-what17) when managed properly, and by this also increase its AC by being more able to identify and recognize valuable external knowledge. This line of thought has some resemblance to the linear model of innovation (Kline & Rosenberg, 1986) and the Science, Technology and Innovation mode of innovation (Jensen, et al., 2007), where R&D may be overemphasised in the slightly credulous way that, by investing heavily in R&D, increased efficiency in routines and production will 'automatically' be facilitated while at the same time promoting innovation.

While the fact that R&D undeniably brings benefits in terms of a more profound understanding of technologies by generating information and knowledge and codification, and also occasionally develop radical or even more significant innovations, it is important to note that this does not automatically imply technological or organizational advance. Also, even if a firm can recognize, value and acquire external knowledge, it does not necessarily mean they can exploit it commercially or that it will lead to innovation.

5.3.2 Potential and realized absorptive capacity

To make up for this, Zahra and George (2002) came up with an extension to existing theory in an article reviewing previous absorptive capacity research, where, rather than a single absorption, several different processes were involved in two types of absorptive capacity – *potential* AC and *realized* AC. The first, potential AC, involves the capability to

17 Know-what (knowledge about facts) and know-why (knowledge about the principles and laws behind the facts) are part of the taxonomy of knowledge mentioned earlier by Lundvall and Johnson (1994).

acquire and assimilate new knowledge, and reflects the search and select phase (recognition of value) in Cohen and Levinthal's original paper, and for potential AC it is important to have a solid knowledge base to recognize valuable knowledge through shared context.

Secondly, realized AC is the utility of a transformation and an exploitation process. In the transformation process, new knowledge is revised and combined with existing knowledge to create a new platform of knowledge that can help firms to streamline or change routines, and also see new entrepreneurial opportunities. Further, the exploitation process is similar to what Cohen and Levinthal emphasised about application to commercial ends. In the article, exploitation is defined as 'an organizational capability […] based on the routines that allow firms to refine, extend, and leverage existing competencies or to create new ones by incorporating acquired and transformed knowledge into its operations' (Zahra & George, 2002, p. 190). So, in viewing AC in terms of potential *and* realized AC, it captures the importance of building up the knowledge base within the firm, both by internal and external knowledge sources, *and* the ability to utilize new knowledge.

After introducing Zahra and George's distinction between the two types of AC, each with two dimensions to it, it is tempting to once again mention Lundvall and Johnson's (1994) categorization of knowledge. In the search for useful knowledge, know-who[18] implies that not only the facilitation of acquisition, assimilation, transformation and exploitation of external knowledge, but also that it is important to first find out where the needed knowledge is to be found and then develop links to the external sources that

18 Know-who directs attention to specific and social relations, meaning that a firm knows 'who knows what and can do what' (Lundvall & Johnson, 1994, pp. 28).

possess this knowledge, thus building a network. In order to utilize a network, know-who can be equally important as internal R&D. And know-who is, as know-how and tacit knowledge, difficult to codify and transfer (Lundvall & Johnson, 1994), and can therefore not easily be transferred between organizational entities.

Further, when searching the market and recognizing valuable knowledge, it is in AC theory important to internalize this knowledge and adapt existing knowledge and practices to better suit the changing environment the firm operates in. This makes AC highly relevant, if not essential, to develop the dynamic capabilities needed to promote innovation and renewal of the firm. In terms of technology transfer, it is for the receiving part important not to rely solely on the origin of the transfer (the transmitter) for complementary knowledge input, but through a network develop several sources of knowledge that can further enhance the knowledge base and competences of a firm.

5.3.3 Networks

Another way to emphasis the importance of creating large, extensive networks, either locally or between geographically dispersed groups (by use of ICT), to promote the creation of innovation, is to use the concepts of 'exploitation'19 and 'exploration'20 (March, 1991; Swan, et al., 1999), although here different meanings are added to the concepts than discussed earlier. While exploitation of knowledge is relevant to innovation by its purpose of preventing firms from 'reinventing the wheel', it is largely exploration of knowledge that can generate genuinely new approaches. Developing an

19 I.e. where existing knowledge is captured, transferred and deployed in other similar situations.
20 In this article, exploration is defined as sharing and synthesising knowledge, thus leading to new knowledge, a somewhat more blurry and broad definition that the one offered by Zahra and George.

extensive network will support the utility of both strategies, the former by making it easier to monitor technological development in the market, and the latter by increasing co-development of knowledge with external knowledge bases.

However, the problems of transferring tacit knowledge are once again highlighted in this article, where they claim that 'sharing and exchange of tacit knowledge may arguably be even more difficult where innovation processes are interactive' (Swan, et al., 1999, p. 270), because of increased chances of the required shared context and environment needed to understand the 'language' of the knowledge transferred being absent. So, while it in Swan et al.'s view is important to develop several sources of knowledge in a network to promote innovation, the possibility of not being able to transfer complementary tacit knowledge seems to increase in a network.

When operating in a network, one way to make up for increased difficulties of context understanding is to develop stronger inter-organizational ties. That brings me over to the research by Chesbrough (2003) on how 'open' or 'closed' an organization is to knowledge or technologies from external sources. In his article, he explains the current trend of moving from a closed innovation model, where companies generate, develop and commercialize their own ideas, toward an open innovation model, where companies are constantly on the search for external knowledge. In opening up the innovation process, development of close ties to partners, suppliers and customers in extensive networks is essential, something that also corresponds to the systemic innovation-oriented approach. In the network, external sources are searched for knowledge and monitored for technology development, while in-house R&D-generated knowledge at the same time can be brokered in a way quite similar to commodities in a market to

secure the flow of useful knowledge in interacting with the external sources in the network. Doing this, firms can commercialize both their own ideas *and* innovations coming from other sources to maximize value, while at the same time strengthening the ties to partners, suppliers and customers.

The general idea behind this concept is that organizations have to open up their innovation processes, and although large-scale internal knowledge sources in a firm (including R&D) are essential as knowledge brokers and for implementation of external knowledge in the firm, they are insufficient to keep or gain competitive advantage without external influences (Tidd & Bessant, 2009), and networks offer a way to share and exchange the knowledge complementarities needed to make up for this (Cohendet, et al., 1999).

Therefore it is justifiable to say that the knowledge flows involved in technology transfer is getting more bi- or multidirectional, where the key is co-evolvement of absorptive capacity and emitting capacity in networks (Amesse & Cohendet, 2001). This statement complies with Ernst and Kim's (2002) perception of the evolution of global production networks (GPN), in which a network flagship and its suppliers co-develop absorptive capacity by increasing each others knowledge base through knowledge transfer and interaction, while, at the same time, these local suppliers develop their own local 'mini-GPNs' , in which their own suppliers in co-operation help with the accommodation of local capabilities formation. However, as we have seen earlier, the manufacturing industry mainly relies on what Asheim and Gertler (2005) called a 'synthetic' knowledge base that has high tacit component to it, and in transferring this the main source of knowledge will often come from intra-organizational sources located far away, and

there is still the problem with tacit knowledge transfer being geographically limited and difficult to transfer, both intra-organizationally and in networks.

5.3.4 Geographical limitations and advantages

In a network the firm can function as an entity similar to KM's perception of the individual in an organization in need of enhancing both its tacit and explicit knowledge base to develop and improve its performance. In organizational knowledge creation knowledge conversion between individuals is essential to enhance the organizational knowledge base, and in networks firms have to exchange knowledge and interact with one another to facilitate the implementation and internalization of external knowledge to increase its own knowledge base. In both organizational knowledge creation and network theory, there are nevertheless still unsolved questions of tacit knowledge transfer.

One of the controversies with regard to transfer of tacit knowledge in recent years has been whether or not use of ICT can make up for proximity limitations. Some are confident that ICT through promotion of written practices can advance codification of know-how and at the same time increase the sociability of all involved in the transfer process (Cohendet, et al., 1999), implicitly meaning that any type of knowledge can be codified and made universally accessible.

Morgan has answered to what he calls the 'death of geography' thesis in saying that 'virtual proximity may well be a surrogate for physical proximity in the context of

standardized transactions, but not in the context of transactions which are high in complexity, ambiguity and tacitness' (Morgan, 2004, p. 5). With this he is stating that ICT and face-to-face communication will co-evolve as knowledge transfer strategies, something that conforms to the complementary personalization and codification strategies mentioned earlier. Therefore, although ICT certainly can help strengthen ties between geographically dispersed clusters of knowledge, the mere fact that tacit knowledge is geographically 'sticky' with the individuals possessing it can help explain why specialized clusters and regional advantage still exist and thrive, as for instance in the well-known Silicon Valley (Brown & Duguid, 2000a) and Zhongguancun. As Brown and Duguid (Ibid.) noted, for many years scholars have predicted that technological development will provide the necessary means of communication replace clusters21, and still this has not happened, which is especially the case in more knowledge-intensive activities.

This underlines the importance of proximity to develop a shared language (i.e. context), something Xerox' failed capability to discover the potential of making the first personal computer elements in the 70's can demonstrate a sad example of. In that case they missed the huge opportunity presented to them due to 'language' difficulties between dispersed organizational entities (Brown & Duguid, 2000b). Clusters can help facilitate a shared language, and a shared language can facilitate knowledge sharing and diffusion, and by this promote innovations. The pattern of innovative activities tending to cluster has given rise to the concept of a regional innovation system22 (RIS), where all parts and aspects of economic structure and institutional set-up affected learning as well as

21 Brown and Duguid draw the line of these kinds of prediction back to Alfred Marshall and his *Principles of Economics* in 1890.
22 Derived from Christopher Freeman's (Freeman, 1987) introduction of National Innovation Systems (NIS).

searching and exploring are included (Asheim & Gertler, 2005). This means that, for a RIS to evolve, government and institutions also need to help facilitate and support the activities conducted by companies located in the region for clusters to thrive.

However, when opening up a new manufacturing site abroad, the main source of the knowledge transferred being intra-organizational codified and tacit knowledge, and a firm cannot solely depend on clusters for enhancing its knowledge base. Rather, a firm should make use of knowledge developed and shared locally as well as develop access to non-local sources of knowledge. As suggested by Bathelt et al. (2004), the local 'buzz' lets a firm enjoy the learning processes taking place among individuals in clusters by just being there, while upholding the channels of communications to other knowledge-producing outside the region, in what they call 'global pipelines', is essential to avoid path-dependency. This mix of the local and global captures what I believe is essential for firms with manufacturing plants abroad, as these often are situated in manufacturing clusters it is important to take advantage of the know-how of workers in the local networks already existent and co-evolve AC and competences with its suppliers and customers, as well as to nurture the knowledge flows intra-organizationally, transferred across long distances.

At the same time it is just as important to not cut the strings to home. Norwegian companies are often hesitant to establishing R&D abroad (Narula, 2002), and development of products and processes are often originated or coordinated in the R&D department, making innovation processes slow and unable to efficiently adapt to changing environments abroad unless intra-organizational transfer channels are utilized and efficiently managed. Further, due to barriers for foreign R&D activities in China,

such as cultural and language difficulties, bureaucracy, piracy of intellectual property and so on (Gassmann & Han, 2004), firms in the less R&D intensive manufacturing industry have few incentives to conduct R&D abroad even if they wish to, making the knowledge transfer flows from “home” even more important to utilize.

6 Cultural differences

> The important thing is for management to utilize the strengths of the local culture.
> (Hofstede & Hofstede, 2005, p. 58)

Since the publication of *Culture's Consequences* in 1980, and later *Cultures and Organizations: Software of the Mind23* in 1991, Geert Hofstede has become a monumental figure within the field of cross-cultural studies by demonstrating that there are national and regional groupings that affect the behaviour of societies and organizations. After studying a large body of survey data from the IBM Corporation, he managed to identify four cultural dimensions that can be measured relative to other cultures. Updated versions of the IBM questionnaire have been used to construct the Values Survey Module (VSM),24 and later a fifth dimension was also identified.25 The results of his research are widely used, and his work has influenced many fields of research, such as management, organizational sociology and psychology.

However, in this section, I will first start by briefly explaining how a culture consists of individual values and practices, before I dig further into Hofstede's five dimensions of national culture and explain their properties. Later, in the analysis section, I will use these five dimensions to see how cultural differences affect the technology transfer process of Norwegian companies with manufacturing sites in China. Finally, since most of this theoretical section on national culture research will be based exclusively on Hofstede, I will present some of the critical research Hofstede's national culture studies

23 Co-authored with his son, Gert Jan Hofstede.
24 Different versions of the VSM can be found at: http://geerthofstede.com/research--vsm.aspx
25 The fifth dimension (long vs. short time orientation) was identified through the Chinese Value Survey (CVS), developed by Michael Harris Bond.

recently have been subject to before moving on to the research design and method section of the thesis.

6.1 Cultural relativism

Central in Hofstede's studies is the notion of *mental programming*. This involves the notion that, although all individuals have the ability to deviate from expected behaviour, the pattern of our acts, the way we think, feel and express our thoughts and feelings, are partially predetermined by our culture. As culture is learned, it must be separated from the human nature and genes. The human nature is what is universal to all human beings, and our basic physical and psychological functioning is decided by it, and this is the reason why Hofstede calls it the human 'operating system'. Further, the personality of an individual is a unique set of mental programs, which is partly culturally learned and partly inherited from the genes. Culture can be understood as 'the collective programming of the mind that distinguishes the members of one group (i.e. a number of people in contact with each other) or category (i.e. people who have something in common - occupation, age etc.) of people from others' (Hofstede, 2001, p. 9).

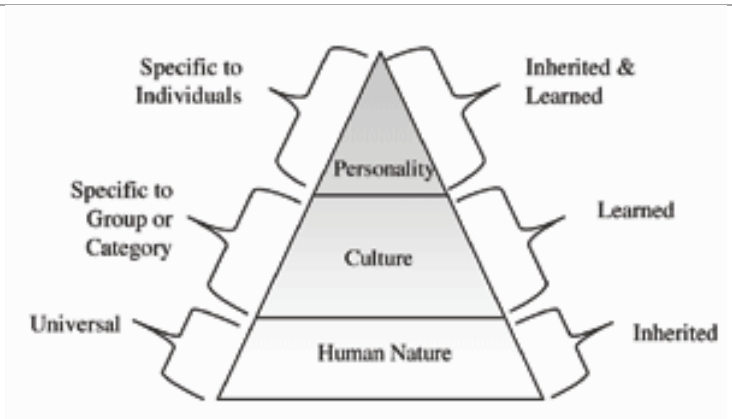

FIGURE 6.1. The three levels of mental programming

Source: Based on Hofstede and Hofstede (2005).

That still leaves culture to be explained in the mental programming of individuals. Our culture is acquired from our social environment, and at the core of culture lays values, which can be understood as 'broad tendencies to prefer certain states of affairs to others' (Hofstede & Hofstede, 2005, p. 8), and most of our values are acquired from our environment already at a young age. This is done by unconsciously absorbing environmental influences in the form of practices, which is constituted by symbols, heroes and rituals. Using the metaphor of an onion, Hofstede argues that the symbols (words, gestures, pictures and objects) are the outermost layer of the onion, meaning that symbols easily come and go and that change of symbols are the most superficial in terms of practices. Heroes are highly esteemed individuals, contemporary or historical, that provide good models for behaviour in a culture. Further, and closest to the 'core' of the onion (values), lays rituals, which are collective activities that are socially vital (ways of greeting, prayer, letting the elderly sit etc.).

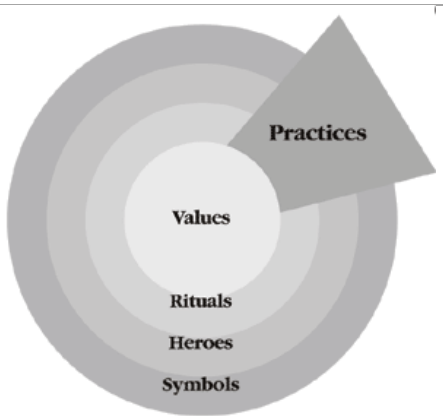

FIGURE 6.2. The onion. The level of depth the different layers have in a culture. Source: Based on Hofstede and Hofstede (2005).

The implications of closeness to the core are how easily the layers can be changed or replaced. For instance, symbols are more fluctuating than heroes, and heroes are more fluctuating than rituals. All of these three are practices, which again are more fluctuating than values. This is because values are acquired at an early age, and thus most of them remain unconscious to their holders. As we grow older, we adopt a more conscious way of learning that is focused primarily on attaining new practices, which are more changeable.

This implies that even though the world changes, the rapid changes happens in the outer, more superficial layers of 'the onion', while values, and to some extent also rituals, are difficult and slow to change. Thus, it is plausible to argue that cultures 're-produce' it self, as the values remain more or less stable from one generation to the next. However, as there are a large variety of cultures across the world, there is no denial of the fact that cultures gradually do change, meaning that even fundamental values can be altered over time, although this happens slowly. The sources of cultural diversity have been brought about by major impacts of natural forces and forces of humans, such as climate change,

migration, military conquest, trade, and what Freeman (1988) called technological revolutions, to mention a few. Throughout history, forces like this have repeatedly perpetuated the adaption to the changed local environment and slowly created cultural diversity. As the relative scores in the indexes below have remained quite stable over time, so it can be expected that cultures change together.

Thus, we have different cultures, and Hofstede argues that the evolvement of nations, although they should not be equated with societies, does provide the shared context needed to facilitate a common mental programming of their citizens through national education systems, common media and shared language. Of course there are cultural diversity (minorities) and different degrees of the dimensions within a nation as well, yet nations can serve as the most practicable way to collect and analyse data of cultural differences. It should be noted, however, that the country scores on the five dimension indexes introduced below are relative, and even though they can be used to compare societies and nations, this is not to say that one culture is 'better' than another in any way.

6.2 The dimensions of national cultures

Even if cultures are relative, to measure and compare them is another matter entirely. Because values are more stable than practices, they are the presumed measurement for comparing cultures. In the developed questionnaire, the questions are aimed at either the *desirable* or the *desired* in the respondents' preferences. When asked about the desirable, the respondents refer to people in general, and this reflects what kind of place

they think the world should be, often in terms of letting the respondents express their views on virtue and sin, right and wrong and so on. The answers mirror what the respondents believe is ethically right. The desired, on the other hand, reflects what people want for them selves, without regard to the desirable. By expressing what we want for our selves we move closer to how we behave ourselves, although having to choose in real life we might do something different than answered in the questionnaire. The desired reflect the practical choices made by the majority.

By looking at answers related to the desirable and the desired with the respondents in the mentioned IBM questionnaire, and later in the VSM and CVS surveys, five dimensions to a national culture have been identified, and through use of factor analysis and mathematics, each of the countries included in the indexes have been given a score. I will now explain what these dimensions are and what implications they have for human behaviour in their respective cultures.

6.2.1 Power distance

Every society encounters some degree of inequality. This implies that in any given society there are some people who possess the power to decide the behaviour of others, and that the distribution of power is unequal. Other factors that can contribute to inequality are things like wealth, status and respect, although none of these factors necessarily are interconnected. Depending on the ideals of the country in question, the society as a whole might feel that accepting or mixing these factors is a good or a bad

thing, depending on the way inequality is perceived in that society. The way inequality is handled in a society depends on to which extent power distance is accepted.

Power Distance Index (PDI) Values	
Norway	31
China	80

TABLE 6.1: PDI Values for Norway and China
Source: Based on Hofstede and Hofstede (2005)

In this dimension, the *power distance index* (PDI) has 0 as the lowest possible score in low-power-distance countries, and around 100 as the maximum score for large-power-distance.26 It is important to note that all the scores in the indexes are relative and not absolute. As for power distance, within countries there are also different degrees of power distance according to occupation and social class.27 Power distance is 'the extent to which the less powerful members of institutions (basic elements of society) and organizations (places people work) within a country expect and accept that power is distributed unequally' (Hofstede & Hofstede, 2005, p. 46). As we can see, the power distance in China is significantly higher than in Norway. Below, I will focus on the implications the high PDI score for China and low PDI score for Norway have for the work place. However, it should be noted that the implications elaborated is not an

26 Austria has the lowest PDI score (11), and Malaysia and Slovakia (both 104) scored the highest PDI. China ranked as number 12-14, and Norway as number 67-68 out of 74 countries.
27 Countries that scored high on PDI as a whole had the same perception of power distance with all its employees, while in low PDI countries the low-status employees still scored nearly as high as colleagues in high PDI countries. This makes high-status employees' values strongly dependent on nationality, while low-status employees scores higher no matter what the country scores as a whole.

accurate picture of China and Norway, only general descriptions of the extremes in each end of the scale.

In countries with a high PDI, the superiors and subordinates consider them selves to be fundamentally unequal; this contributes and justifies organizational structures to be hierarchical and centralized. The manager type who will make the employees feel the most comfortable and whom they respect the most is what Hofstede terms the 'benevolent autocrat', which acts as a well-meaning father to his or her employees, making the superior-subordinate relationship an emotional one. The leadership style in high PDI countries is that managers rely on their superiors for instructions and formal rules, while subordinates expect to be micro-managed and told what to do. Therefore, there are also more supervisors employed in high PDI countries that make sure everybody does what they are supposed to. Still, it is expected that the superiors will be presented with more privileges and a substantially higher salary than his/her subordinates. This is because privileges and status symbols are normal in high PDI countries, and because white-collar jobs are more valued than blue-collar jobs. This line of thought is consistent further down to the bottom of the organization, and makes wages, status symbols and privileges decrease significantly the further down you go.

On the other hand, in low PDI countries like Norway, the inequality of roles in hierarchical structures is established for convenience, and organizations are more decentralized and flat in structure. The subordinates and superiors are basically equal, and the roles are simply pragmatic and can be changed in the future. Further, managers are to a large extent expected to consult employees on decisions that affect their work. Thus, the ideal manager type is democratic in addition to being resourceful, as they rely

more on their own experience and subordinates than their superiors. This makes supervisors more superfluous in low PDI countries. Because there are no existential differences between superiors and subordinates, manual work has more or less the same status as office work, and the range of wage levels are not sizeable, while privileges and status symbols are unpopular.

6.2.2 Individualism vs. collectivism

The second dimension identified evolves around whether a member of a society identifies him or herself in thought and action as an individual or as part of a group or as an. The former can be considered an *individualist* society, where the nuclear family is predominant and individual freedom prevails, while the latter is a *collectivist28* society, where the extended family, or the 'in-group', is the most important. These differences can be measured by the *individualism index*, and this dimension can be understood as follows:

> Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetimes continue to protect them in exchange for unquestioning loyalty.
> (Hofstede & Hofstede, 2005, p. 76)

Below are the scores on the individualism index for Norway and China:

28 The term 'collectivist' bears no political notion what so ever in Hofstede's research.

Individualism Index (IDV) Values	
Norway	69
China	20

TABLE 6.2: IDV Values for Norway and China
Source: Based on Hofstede and Hofstede (2005)

In this index, low scores indicate a more collectivist society while a high score indicate a society where individualist values are dominant.29 A notion here can be that in Hofstede's research there is a strong negative correlation between PDI and IDV scores, meaning that in collectivist cultures where the 'in-group' is important, there is usually also dependence on power figures. Cultures more independent from 'in-groups' will in general also be less dependent on power figures. As seen from table 6.2, Norway scores relatively high on the individualism index, while China scores relatively low.30 Underneath are descriptions of how a highly individualistic and a highly collectivist society affect the workplace.

In highly individualistic countries, management focus on management of individuals, not groups. The relationship between employer and employee is considered a 'buy-sell' business transaction, and there is a high degree of mobility both intra-organizationally and in terms of turnover. This is reflected by incentives and bonuses given according to an individual's performance, and that skills and rules serve as the basis for promotion and hiring. As mentioned in the power distance section, it is in low-PDI countries expected that managers consult employees, and in high-IDV cultures employees are

29 The USA scored the highest with 91, and Guatemala had the lowest score with 6.
30 Norway is number 16-17 out of 74 countries in the IDV index, and China is number 56-61.

expected to have a private opinion, something that mirrors the negative correlation between the two dimensions.

In more collectivist societies, management is management of groups. The relationship between employer and employee tend to take on a more moral link where protection is offered in return for loyalty, something that corresponds to the 'benevolent autocrat' relationship mentioned in high-PDI countries. A consequence of managing groups instead of individuals is that incentives and bonuses must also be given to the group as a whole, as all the employees must be treated as 'in-group' members in exchange for their loyalty. When it comes to communicating style, speaking directly to employees about their performance might lead to what can be considered *loss of face.31* Face (*mianzi*, 面子) is an especially important concept in Chinese culture, and to save *mianzi* is essential to upholding prestige and dignity in interpersonal relationships in the in-group (Buckley & Tan, 2006; Hofstede & Hofstede, 2005), thus speaking directly can undermine face-saving and cause shame. This makes face-to-face feedback less efficient in low-IDV cultures, and more indirect ways of communicating are generally preferred. When it comes to hiring, relatives or other in-group members of the employer or employees will be given preference. This reflects an aspect of learning in low-IDV societies, where the adaption of skills and virtues necessary to be an acceptable group member, to fit in, is more important than learning for the sake of wanting to learn.

31 A Hong Kong social scientist, David Yau-Fai Ho, has explained that 'face is lost when the individual, either through his action or that of people closely related to him, fails to meet essential requirements placed upon him by virtue of the social position he occupies' (Hofstede & Hofstede, 2005, p. 89).

6.2.3 Masculinity vs. femininity

The name of this dimension is coined at gender roles in society. Men are supposed to be assertive, tough, competitive and concerned with achievements outside the home, while women are supposed to be more concerned with more tender roles, such as taking care of the home, the children and people in general. Of course, there are variations of what can be termed masculine and feminine values, actions and professions in different cultures, but it is in this dimension where the scores by far were the most consistent in being gender specific. However, a masculine society can be understood as:

> A society… [where] emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with quality of life.
> (Hofstede & Hofstede, 2005, p. 120)

In contrast, a society can be termed as feminine when:

> … [E]motional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life.
> (Ibid.)

Masculinity Index (MAS) Values	
Norway	8
China	66

TABLE 6.3: IDV Values for Norway and China
Source: Based on Hofstede and Hofstede (2005)

As the table indicates, there are considerable differences between Norway and China also with regard to this dimension, with a high score indicating a masculine society and a low score indicating a feminine society.32 Another way of understanding this dimension is to think of masculine societies as more dramatically divided between the sexes, and feminine societies as more fluid, thus having a more blurry schism between gender roles.

Therefore, in highly masculine societies, the management style should be more on accord with the mentioned assertive masculine values, with more aggressive and decisive leaders. These values also affects employees in the appreciation of resolving conflicts by a 'good fight' where the strongest and most deserving part wins. On all levels, results are stressed and employees are rewarded on a basis of equity according to performance. This often leads to what a feminine society perhaps would label as a 'workaholic' environment, as career ambitions for men is compulsory and earning more money is valued more than leisure time. Women, on the other hand, have a lower share of professional jobs, and to pursue a career is optional.

As for firms and organizations in the opposite feminine societies, management is driven more by intuition and attempts to attempts to achieve consensus. Therefore, conflict situations are resolved more by negotiation and compromise. This makes the reward system less fierce and more based on equality, while the general preference for more leisure time over more money is the general opinion with the employees. In feminine countries there is a higher degree of participation in professional jobs for women, and to pursuit a career is optional for both men and women.

32 In this dimension China ranked as number 11-13, while Norway ranked as number 73 out of 74 countries included in the MAS index. Slovakia got the highest score (110) and Sweden got the lowest (5).

6.2.4 Uncertainty avoidance

This dimension relays how a culture handles the ambiguous and unpredictable. All societies face some degree of uncertainty in terms of nature, behaviour of its members and what the future brings. This cause of anxiety, and even though anxiety is a personal feeling it is often partly shared by others in similar situations, and it can therefore be argued that the causes of anxiety and how anxiety is dealt with by the individual members of a given society is learned and culturally dependent. As the degree of how strongly this is experienced in a culture is at the core of this dimension, uncertainty avoidance can be understood as 'the extent to which the members of a culture feel threatened by ambiguous or unknown situations' (Hofstede & Hofstede, 2005, p. 167).

Uncertainty Avoidance Index (UAI) Values	
Norway	50
China	30

TABLE 6.4: IDV Values for Norway and China
Source: Based on Hofstede and Hofstede (2005)

As we can see, the difference between Norway and China in this dimension is smaller than in the previous three.33 A high score in this index indicates a high degree of uncertainty avoidance and a low score indicates a low uncertainty avoidance, and

33 Norway ranks as number 57 in the UAI, with China at number 68-69 (out of 74 countries). Greece has the highest score (112) and Singapore has the lowest (8).

although the difference is not big, it can be expected that Norwegians in general are slightly more anxious than Chinese. I will now explain what implications a high and low level of uncertainty avoidance have for a working environment to illustrate the relative differences between Norway and China, although it should be noted, as in the previous dimensions, that the depicted societies below are extreme and are not identical to the actual societies found in Norway and China.

In high-UAI societies, there are many formal and informal laws, rules and regulations to control the behaviour of its members and provide relief from anxiety and ambiguity in the daily life, even if these often are not followed and are inefficient. Hard workers are plentiful high-UAI countries, as being busy offers a way to ventilate or divert anxiety, and this also offers financial security in form of higher salary – time is money. Not only does financial security count in high-UAI societies, however, as employees are motivated by security and belonging offered by long-term stays or careers in one company, employees stay longer with a company and change jobs less frequently than in low-UAI countries. In addition, there is a need for precise formalizations in organizations, and also a strong belief that experts or specialists should perform operations or solve technical solutions. Managers in high-UAI countries are more concerned with handling daily operations than strategic planning, because these activities are less unstructured and ambiguous. Because of the same reasons, organizations in high-UAI countries are good at implementing new processes and have less innovation.

On the other hand, in low-UAI societies managers occupy themselves more with strategic aspects of businesses. In general, there is more tolerance for ambiguity and chaos and there are fewer formal laws and rules to regulate behaviour of employees,

although the ones that do exist often are highly followed. Hard work is provided when needed in low-UAI countries, but time is a framework for orientation instead of being equated to money. There is also a higher degree of turnover, and short-term employment is more usual. A more general education is ordinary in low-UAI countries, as employees believe common sense can help solve problems, not only specialists. Cultures with weak uncertainty avoidance are good at innovating, but as they are not as good at implementation, this does often not lead to new products or services.

6.2.5 Long-term vs. short-term orientation

This fifth and last dimension was discovered through the development and use of the Chinese Value Survey (CVS), and is the result of the fourth dimension in the CVS not being the equivalent to the fourth dimension from the IBM questionnaire (uncertainty avoidance). Rather, long-term vs. short-term orientation is based on Confucian values. The general differences between the two opposites in this dimension are based on norms. In short-term oriented cultures, quick results, spending money, respect for traditions, personal stability, social status and 'face' are important, while slow results from persistence, saving, adapting to changing circumstances, willingness to subordinate and shame are important norms in long-term oriented societies. This dimension is defined as:

> …[L]ong-term orientation (LTO) stands for the fostering of virtues oriented toward future rewards – in particular perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present – in particular, respect for tradition, preservation of "face", and fulfilling social obligations.
> (Hofstede & Hofstede 2005, p. 210)

Long –Term Orientation Index (LTO) Values	
Norway	44
China	118

TABLE 6.5: IDV Values for Norway and China
Source: Based on Hofstede and Hofstede (2005)

As this dimension is based on Confucian values, it may not come as a surprise that, in general, Asian countries score high in this dimension. This is underlined by the LTO values presented in table 6.5, where China scores significantly higher than Norway,34 making Chinese considerably more long-term oriented than Norwegians.

In high-LTO countries the main work values include learning, honesty, adapting to new circumstances, and self-discipline through hard work. Managers are given more time and resources to make their contribution to the organization. Even though funds are available because of savings, investments are used as a means of slowly building up market positions. So, instead of pursuing immediate results, there is a more long-term orientation with regard to profit as well. In doing this, personal networks of acquaintances can be utilized for success, something a widely known concept in Chinese culture called *guanxi* (关系) can help illustrate. *Guanxi* can best be described as a fundamental web of interpersonal connections that makes up an inseparable part of business, and connects the family sphere to the business sphere (Buckley & Tan, 2006;

34 China tops the table, ranking number one at 118, while Norway ranks number 44. The lowest score calculated is for Pakistan at 0 (out of 39 countries).

Hofstede & Hofstede, 2005). The accumulated capital of *guanxi* with suppliers, customers and business partners is not something that would easily be traded off for short-term profit, but rather be used for long-term results.

In low-LTO societies, the work values of importance are freedom, rights, achievement and thinking for one self. As there is a small saving rate, investments are often made in mutual funds, and as bottom line numbers are the lifelines of managers, there are higher demands for immediate results. Low-LTO societies have a clearer division between the family and business spheres, and as there are rewards for abilities personal loyalties vary with business need.

6.3 Critique of Hofstede's national culture research

After giving an introduction of culture and the five cultural dimensions in this section, it is shortly time to elaborate on the research design and method chosen in this thesis. First, however, I will briefly address some of the critique aimed at Hofstede's cross-cultural research, to demonstrate that it is not without controversy he has published his theories.

In an article by McSweeney (2002), he lounges at parts of the management disciplines for the criteria they display in accepting evidence that is not nearly good enough. By this he refers to the quanta of data and accuses Hofstede for being manipulative with statistics. In his opinion, the cultural analysis made by Hofstede claims more than it can justify, and he believes Hofstede has an agenda to 'prove' his beliefs. Further, McSweeney argues that nations are not anywhere near as uniform as Hofstede believes.

Another critical article written by Ailon (2008), he tries to tear apart Hofstede's logic in previous publications by deconstructing the assumptions made and the logic displayed in his theories. There are also several reminders in the article about conflicting theory and methodology, as he tries to awaken critical reading of Hofstede's research.

7 Research design and method

As mentioned in the introduction of this thesis, my main goal of writing on this topic is to shed light on the cultural aspects of technology transfer. After living in China for two and a half years, I have with my own eyes witnessed and experienced many of the difficulties that can arise in cross-cultural interaction, and I also have first and second-hand experience with ways cultural and communicative difficulties and misunderstandings can affect Western companies doing business in China. Thus, after being introduced to knowledge and technology transfer literature through the ESST master programme I was surprised by how cultural differences to a large part had been neglected in theory on international technology and knowledge transfer. Therefore, I decided to write a thesis that could confirm the hypothesis that a transfer process is not only dependent on technology and knowledge transfer strategies, but also on how cultural differences affect the process, and in doing this perhaps be able to provide a thesis that can help fill a gap in the literature.

In this section, I will first clarify how the theoretical framework for looking at this phenomenon was constructed, then I will explain why a qualitative study have been chosen and how I chose sources for empirical data, and how I proceeded in gathering it. Finally, I will discuss strengths and limitations of the research design and method and ethical aspects of conducting case studies.

7.1 Theoretical framework

Technology transfer is a phenomenon that can be studied from several different aspects. The main reason why I have chosen to view technology transfer as a knowledge transfer process is because, as I see it, transfer of knowledge and building up a local knowledge base is the decisive factor for successfully establishing of new manufacturing sites abroad. Originally, I was going to let the intra-organizational knowledge transfer interaction be the main emphasis of my thesis to demonstrate the effect cultural aspects have on technology transfer. However, as I started reading more relevant literature on the topic and spoke to informants during data collection, I increasingly became conscious about cultural aspects affecting technology transfer not only internally in the firm, but also externally in interaction with the local network of suppliers, customers and authorities. Thus, I expanded the theoretical framework to include more external factors as well. As there is no 'recipe' for looking at technology transfer, and it might not be possible to find any universal transfer indicators (Amesse & Cohendet, 2001, p. 653), I have gathered theory from the core literature on knowledge and technology transfer, covering key internal and external aspects of the phenomenon, and supplemented it with relevant literature mentioned in the core literature, or often also suggested by my supervisor or fellow students.

Using Hofstede's cross-cultural research as the framework for incorporating the cultural aspects to technology transfer theory was decided after discussions with a post doc employee at the Centre for Technology, Innovation and Culture at the University of Oslo. This framework was found befitting as it is the most developed guideline of looking at the relative differences between national cultures in existing cross-cultural theory, and can easily be applied to indicate the relative positions of Norway and China by looking at the dimension value indexes. The cultural framework has contributed by giving me a

more theoretical perspective on what factors to look for and expect when collecting data, and provided a means for theorize the experiences expressed by the data collection.

However, as already pointed out, cultures are relative and there are variations within countries. Thus, a qualitative analysis does not always correspond to the research by Hofstede, and this is especially something to consider for my thesis, since I am not looking directly at national values, but rather on personal views of national values expressed implicitly through certain members of firms. As organizational values are developed later in life and are more related to more superficial practices (Hofstede & Hofstede, 2005, p. 284), this might cause confusion between national and organizational values. Due to time and geographical limitations, however, looking more in depth on how cross-cultural employees in organizations affect the organizational cultures in the firms use is for other academics to research. Therefore, I have decided to presume that the employees in the firms that serve as sources for my empirical data have values that in large part correspond to the national values indexes of the country they are from, and I use this as a platform to look at how technology transfer is affected by cultural differences.

7.2 Designing the thesis and choosing method

In my thesis, I have decided to take a qualitatively perspective on how cultural aspects affect technology transfer. Choice of research design should be decided by the research question, and as my research question ('how') is explanatory and focused on a set of

contemporary events, a case study is a good strategy to pursue (Yin, 2009). Further, in this thesis I look at technology transfer *processes*, and in doing so it is often required to perform a qualitative analysis, as quantitative data, as input-output numbers, are insufficient to properly evaluate and analyse a transfer process (Autio & Laamanen, 1995). Especially cultural influence is difficult to quantify, and a cultural phenomena can best be given attention by conducting case studies (Ragin, 1994, ch. 4). A qualitative case study can be defined as:

> …[A]n empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.
> (Yin, 2009, p. 18)

As the phenomenon of Norwegian firms establishing manufacturing sites in China is a highly contemporary one, and the context of cultural differences affecting the technology transfer involved is not clearly evident, it is reasonable to conduct a qualitative analysis.

In the thesis, a multiple-case design is used, and when conducting a multiple-case design each cases should be selected so that it either predicts similar results or contrasting results for anticipatable reasons (Yin, 2009). Already early on in the design process I decided to look at Norwegian firms' manufacturing sites in China. This is because primary activities are more central in a firm's strategy and more vital for its competitive advantage (Porter, 1985),35 and I expected firms that offshore primary activities to provide more support and backup in terms of resources and time than firms moving

35 See Porter (1985) for classifications primary activities and support activities.

support activities abroad, something that might reduce practical difficulties associated with the technology transfer process in itself.

For this reason I have been in contact with several Norwegian firms with manufacturing sites located in China. Many turned me down, but after searching for firms a long time I came over an industrial park owned by Norwegian in Ningbo, China, called Nordic Industrial Park (NIP).36 Here, the primarily Nordic firms that want to establish themselves in China can receive help for both practical and cultural problems that potentially can affect the technology transfer process. In order to decrease the number of cultural variables in the thesis, I only tried to get NIP's Norwegian customers to assist me in providing empirical data, although I wanted the cases for my thesis to still be relatively inexperienced in their Chinese operations, so that any cultural problems hopefully had yet to be properly solved.

After getting approval from the General Manager of NIP to interview him, I also managed to get the top leaders in four Norwegian firms located in NIP to participate as interview objects and sources of empirical data. As these firms operate in different industries, have different maturity in terms of the technology they use and have different complexity in their operations I would expect them to provide contrasting results in the analysis. However, if I should find similarities in their experiences of opening up manufacturing sites in China, it could well be possible that the empirical data can shed light on cultural difficulties associated with the technology transfer process.

36 For more information on NIP, see the empirical section.

After the initial contact had been made with the Norwegian firms, and the Norwegian top managers in each firm had agreed to contribute to the thesis by being interviewed, I started working on the interview guide (appendix A), and the same interview guide was used in all four in-depth interviews. Here, it should be noted that prior to interviewing the Norwegian top leaders in the firms, I had conducted two exploratory in-depth interviews with the CEO of NIP, and the CFO of NIP and CEO of NIP Service, in addition to the GM of the Norwegian-Chinese Chamber of Commerce (NCCC), and a managing partner in a consultant agency that works with helping firms adjust to cross-cultural working environments. The information provided by these informants was helpful to form the interview guide for the top leaders for the manufacturing firms, and in addition to my own experiences from China, this has also let me have reflexivity toward the information provided by the cases. As it showed, however, two of the firms have been considered as not being far enough along the establishment phase of setting up the site and have no or very little manufacturing in China, and as a result they have been rejected as cases in this thesis. Therefore, I have ended up with having two cases in this thesis, namely Marine Aluminium and Mascot Power Supplies.

7.3 Validation and reliability

In a case study as well as in other designs of research, the quality of the design is essential, and to ensure the quality of the empirical research tests of validity and reliability in the case study can be used. There are four relevant tests that can be used for quality assurance, three regarding validity, and one regarding reliability (Yin, 2009).

To increase the first, *construct validity*, I will use multiple sources of evidence. As I am conducting a two-case study, I believe that this should ensure the validity of my findings. It can be argued that I should have interviewed several people in each of the firms, as the empirical data collected from each of the firms perhaps is rather one sided and the data provided by them will not be verified from other sources. It can also be argued that I should have used Chinese employees as sources to bring a Chinese perspective on the cultural aspects into the thesis.

Although I believe that both objections are good, I must add that I have tried to interview the two Chinese production supervisors, and that both interviews was not fruitful in providing usable empirical data, and the idea and already collected data was abandoned on an early stage. This can perhaps be studied as an example of cultural differences in it self, and as there in all the cases only is one Norwegian expatriate working at each of the manufacturing sites, I ended up with only one source of empirical data from each of the firms, although data found on the internet supplemented this. The two rejected cases have also provided useful data in that they have increased my understanding of the two selected cases. Therefore, I believe, as mentioned above, that it is sufficient validation if the two interviews show a pattern for cultural difficulties. Further, I have transcribed all the interviews and sent them to the informants for approval, something that in several cases have led to clarification and elaboration on topics brought up in the interviews.

In the second test, *internal validity*, it is important to do establish a causal relationship. To do this, I have used constructed a theoretical framework to build explanations for the topic of my thesis, and looked for patterns in the empirical data verify it. The third test,

external validity, implies generalization of the results to some broader theory. As I have constructed the analytical framework used in this thesis and research on how cultural aspects influence a technology transfer processes is little developed, I do not expect the findings in this thesis to be generalized and used as a set framework in other studies of the topic. However, I do hope my thesis can contribute to shed light on the gaps in the literature, and be used as a small step on the way to developing a framework for doing research on the topic.

The final test, *validity*, involves demonstrating how the thesis was constructed and conducted so that it can be replicated with the same results. By providing rich descriptions of the theoretical framework used in this thesis, and in this section explain how I have proceeded in developing it, the theoretical procedures are in place for replication of the study. By explaining how and where I gathered the empirical data and presenting the interview guide as an appendix, the empirical procedures of the study are in place for replication, and the reliability of the thesis should be strengthened.

After presenting and justifying research design and method used in this thesis, I will in the next section present the cases and analyse the empirical findings to see if this corresponds to the theory introduced.

8 Empirical findings and analysis

In this section, I will introduce the sources for empirical data, while at the same time present my findings with regard to technology transfer. By doing this I hope to find out if the cross-cultural perspective from section 6 can bring any contributions to the innovation-oriented approach to technology transfer in the analysis section. First, I will present the context of which the two cases conduct their Chinese operations in, namely Nordic Industrial Park, and elaborate on the services they offer their customers. Then, I will briefly introduce the Chinese endeavours of the Marine Aluminium and Mascot Power Supplies, before moving on to the empirical analysis of this thesis. There, I will discuss in depth what the findings involve and link them up with the theory explained earlier in the thesis. As a framework to look at this topic of this thesis is non-existent, I will in the analysis section review theory introduced in the technology transfer sections 3, 4 and 5, and discuss what cultural implications the national value scores from the different dimension indexes have for technology transfer in the context of the two Norwegian firms.

As mentioned, there are cultural variations not only between nations, but also within and between organizations, especially when a firm employs people from different nations they cannot assume common values with its employees (Hofstede & Hofstede, 2005, p. 286), but organizational culture is only considered implicitly in this thesis by the national values possessed by the employees of an organization. However, using the scores from the mentioned indexes might provide good explanations for findings in the empirical section. In addition to analyse the cultural differences' implications for the

transfer, I will address some of the practical implications of transferring technology to China from Norway.

8.1 The context – Nordic Industrial Park

The proximity to the greater Shanghai (上海) area and the ocean makes Ningbo (宁波), with its urban population close to 2,5 million, a central and practical location for business activities in China, both for domestic as well as foreign-related firms. After its formal establishment in Ningbo in 2002, the history of the Norwegian owned Nordic Industrial Park (NIP) started when they became fully operational on the 1st of January 2004.

One of the main assets of the eight expatriates and almost 70 Chinese working for NIP is their accumulated experience from running and facilitating for businesses in China and their know-how with the Chinese culture and system. In addition to renting out property, they also offer services including company registration, recruitment of personnel, financial/accounting, ICT-services, legal assistance and more general consultant services to their (for the most part) Nordic customers. With their main goal being to provide assistance to small and medium sized businesses (SMB) for an easy entry to China, they now have an still increasing number of around 50 firms located in the industry park, most of which from different industries, operating in different markets and with different strategic motivations for establishing themselves in NIP.

After helping many firms register in China over the years, the NIP can make sure all legal documents, official permissions and registrations are in place by the time their customers arrive NIP, and as this process might be difficult to manoeuvre in for inexperienced firms, most of their customers choose to buy this service from NIP. And after arrival at NIP, the customers receive a consultation on how to cope with the cultural challenges associated with operating and doing business in China, or what NIP themselves refer to as 'Chinese factors'.

These 'Chinese factors' has a lot to do with communication style. This does not necessarily have anything to do with linguistic challenges, rather, NIP stress the importance of not putting too much emphasis on English proficiency. As an NIP informant told me during an interview, at arrival in China a Norwegian leader should see him or herself as being blind, deaf and mute, at that the Chinese management team will serve as his/her eyes, ears and mouth. In NIP's opinion, it is important to balance the management team between recruiting people with good language skills and recruiting people with good professional skills, so that key personnel can fill all of these different roles accordingly. NIP work hard at creating employees that act as 'cultural hybrids', where an imprinted 'western' mind-sett makes the employees capable of efficiently communicating with both Norwegians and Chinese. The consultant service NIP offer is in other words also highly focused on cultural factors, and the services NIP provide to their customers and the vision they have for their industrial park all imply that it is not easy for SMBs without any previous encounters from China to establish them selves there, for both practical and cultural reasons.

It might be expected that NIP customers experience a smoother transition phase when establishing production in China than other firms. The services NIP offer can perhaps help decrease the effect of cultural differences between Norway and China would have on technology transfer for their costumers, and although it is beyond the scope of this thesis, it can be expected that firms establishing themselves without assistance in China would encounter more difficulties due to lack of experience with operating on Chinese soil. As mentioned in section 7, I believe that any findings of cultural difficulties affecting NIP customers' technology transfer processes would be more valid than if the firms established a manufacturing site in China on their own.

8.2 Marine Aluminium

In December 2008, Marine Aluminium (MA) moved in to NIP, in order to be closer to their markets in Asia and to enjoy the spoils of low-cost labour. Already in April 2009 they started production at their new manufacturing site, and their goal is for the Ningbo branch to become the largest manufacturer of helicopter landing pads (helipads) in Asia, offering a large variety of products that are welded into components in NIP and shipped out to their customers. Today, MA's Ningbo plant employ 20 people, where the General Manager (GM), who has been there since the establishment in NIP, is the only Norwegian, whereas the rest are Chinese.

After recruitment of key personnel was done through NIP's recruitment service, the GM developed a mutual understanding with them of what was needed from future employees and they started handling the recruitment process them selves. Since the

technologies used in MA's production processes are mature37, new employees should be able to obtain necessary skills through training. Even if they lack the required level of detailed knowledge, newly hired employees usually have the general level of knowledge needed for training and practicing on how to perform the work tasks. Since beginning in NIP, MA has fired five employees lacking the required skills for the job. The most important qualities with applicants when recruiting are a right attitude in terms of being on time, being loyal and trustworthy are seen as. As a result of this, MA has in their search for right people to fill positions increasingly started to hire people their current employees know from before and recommend.

Money and status are pointed out as the most important motivating factors for the employees. For instance, the MA employees seem to like the creative pay system with a base salary complemented by bonuses related to performance, absence, and compensation for travel expenses. However, as most conflict situations at the work place derive out of reward and prestige issues economic factors can also be a disturbing factor. The GM of MA is firm about inviting all the workers to official celebrations and also arranges gatherings for employees and their families twice a year, something that is well received. This is viewed as a platform for creating and showing mutual respect, as this kind of interaction between co-workers is not so usual in China.

Starting as a welder in MA 27 years ago, the GM is familiar with all aspects of the technologies used and knowledge needed to perform the different operations at the manufacturing site. In the beginning, the GM personally trained all the newly hired employees, followed by practical training where the newly hired employees tried and

37 MA's first helipad delivery was in 1974.

failed on their own. Due to practical difficulties like time limitations and communicational difficulties (language problems), however, trained employees have taken over as continuators of firm competences and handle the training of new employees, although the GM still contributes if needed. When implementing complex processes, specialist transferors are sent from the back office to provide assistance with instructions, routines and HSE-regulations and so on, and these implementations have been evaluated as successful.

New designs for helipads are sent from the R&D department located in Norway to the manufacturing site in Ningbo, where the GM works as an 'intermediate' between a project leader in charge of the project located in Norway and the production supervisor in Ningbo. After going through the blueprints with the production supervisor, quality checks supervision in a more hands-on manner still have to be conducted frequently in the production process to ensure that the helipads fulfil expected standards, due to the skilled but relatively inexperienced MA employees. However, if something is unclear about the work operation, the Chinese employees will not necessarily bother to ask for assistance of clarifications, this can also be a cause for repeated mistakes because the routines are not yet fully implemented and the workers work fast and hard.

Concerning business networks, the GM also believes there is more socializing with suppliers, customers and authorities than previously experienced in Norway. In order to show respect, it is important to 'wine and dine' them and get to know each other, while the meetings with them often can be experienced as filled with hard negotiations. However, when doing business, customers and suppliers often request that blueprints and drawings are handed out, something that in some occasions have caused suspicions

of violated intellectual property rights (IPR). Another factor to consider is problems finding suppliers with internationally approved certifications and documentation.

8.3 Mascot Power Supplies

After registering and establishing the firm in the autumn of 2007, Mascot moved in and started up their facilities in NIP in the beginning of 2009. The firm is a manufacturer of power supplies and battery chargers, both custom and standard made. Their main motivation for establishing manufacturing in NIP was cost saving, and so far the firm has been producing semi products, although their plans for NIP is to get finished products (both standard and custom made) into their production line sometime in 2011. As of today, there are 17 employees working at their site, whereas one Norwegian GM and while Chinese fill the rest of the positions.

After filling the first couple of key positions through NIP's recruitment service, they have hired all the remaining employees on their own. On two separate trips, key management personnel (they all speak English) have been sent to production sites in Europe for training and to see how the production operations worked at experienced and well-functioning sites. Afterwards, there has also been also a lot follow-up communication over mail and telephone as a supplement. When the production management has reached a satisfactory level, Mascot started recruiting production workers. Normally a production worker receives is trained by the production managers for one month before entering full work. Additional recruitment to vacant positions is usually announced locally, but if the requirements for a position are high they might increase the range of

the search. Mascot's production operations in NIP are not so complicated, and the firm can use on existing routines after being in the industry for a long time. There have also been specialist engineers from Norway visiting the manufacturing site to review routines, adapt instructions and so on. Nevertheless, problems do occur, and after starting up in NIP, Mascot has fired two people because of showing incompetence at work.

According to Mascot, their employees are eager to learn, but because they have big respect for superiors they have some troubles opening up and being creative. To cure this, the GM and the management emphasise communication, meetings and talking openly with the employees. Satisfied and happy employees are seen as a key to the firm doing well, and by giving the employees respect they hope this will be reciprocated. However, the GM states that the most important factor for satisfied employees is salary, and as NIP's customers in general have a higher level of salaries than their local counterparts they hope this can contribute to the well being of their employees as well.

One of the reasons Mascot have experienced some difficulties is because they outsource a great number of the components used in their products. As they cannot approve of suppliers locally, they have to give potential suppliers specifications for a component they want produced, and when they receive the component, they have to send it to the R&D department located in Norway to approve both the component and supplier there. Sometimes this process can drag on, by the Norwegian R&D department disapproving the component or sending out new specifications, and then the whole process has to be repeated. As the already approved suppliers regularly mark the shipments wrong, send out wrong products or other things, this require extensive quality controls, and take up

resources locally in Ningbo. Most of Mascot's customers are based in the USA and Europe, so there is little contact with them directly from the manufacturing site in Ningbo.

8.4 Discussion of findings in the empirical data

After presenting the findings of the data collection for the thesis, it is time to analyse them in the proposed framework of combining an innovation-oriented approach to technology transfer with Hofstede's cultural dimensions. In table 9.1, a summary of the national value scores of Norway and China is provided.

National Values										
Dimension Index	**PDI**		**IDV**		**MAS**		**UAI**		**LTO**	
	Score	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**
Norway	31	67-68	69	16-17	8	73	50	57	44	13-14
China	80	12-14	20	56-61	66	11-13	30	68-69	118	1

PDI – Power Distance Index **UAI – Uncertainty Avoidance Index**
IDV – Individualism Index **LTO – Long-Term Orientation Index**
MAS – Masculinity Index

TABLE 8.1: All Dimension Values and Ranks for Norway and China38
Source: Based on Hofstede and Hofstede (2005)

8.4.1 Organizational knowledge creation – culturally revisited

38 All the cultural dimensions have 74 countries included in their indexes, except from the LTO index where 39 countries are included.

When it comes to building up competence, it has been mentioned that the first step of setting up a new manufacturing site is to recruit the right personnel. As suggested in section 5, the level of tacit knowledge possessed by individuals is difficult to assess, and there is reason to believe that language barriers will amplify these difficulties in a recruitment process. Further, it is not only the tacit and explicit knowledge bases with the applicants that need to be considered, but also how the compatibility of the Chinese employees with that of the Norwegian company, because 'when companies go international, their planning and control systems continue to be strongly influenced by their national culture' (Hofstede & Hofstede, 2005, p. 256), and therefore it can be expected that employees need to demonstrate willingness to adapt to the 'Norwegian' environment of the work place. Perhaps for this reason, MA will often rather trust the judgement of their employees who knows what is needed to work for MA, both professionally and culturally. As the employees already are part of an in-group (low IDV), it seems likely that if they bring someone not qualified to fill a position or without the cultural adaptiveness needed, as they can end up with losing face, something they will strongly try to avoid. This corresponds to the 'cultural hybrids' NIP work so hard to create, and also the reason why Mascot often have four rounds of interviews before hiring.

With regard to organizational knowledge creation, there are several aspects potentially affected by cultural differences. As the tacit compound of knowledge contains 'mental models' in the form of individual beliefs and viewpoints, it can seem as though culturally learnt values that are part of out mental programming can influence how knowledge is interpreted. As for explicit knowledge, the transfer of codified knowledge can be impeded by language difficulties, as the need for a 'common language' not only demands

a shared context and environment to decode knowledge, but an actual oral language needs to be shared in order to create a platform for speeding up the transfer process. However, although language difficulties can contribute to cultural misperception, it should not be confused with cultural difficulties (Hofstede & Hofstede, 2005, ch. 9). In both cases, most of the management were proficient in English, something that can be expected to increase mutual understanding of knowledge through a shared context. Nevertheless, language difficulties can serve as a filter of information and knowledge needed for efficiently converting knowledge if too few people in an organization can communicate with each other.

As for commitment, the point of creating a shared context also applies here. Without this it is difficult to create a purposeful environment for the employees, as they are unable to conceptualize the new information. However, according to Hofstede's research, what constitutes a purposeful environment is not universal for all cultures. As China has a high PDI score, the manager who acts as the benevolent father can be expected to be the ideal for Chinese employees, something that contrasts an expected preference for democratic leader types by Norwegians. The democratic leader in a flatter Norwegian company structure might be able to provide more autonomy to the employees of the firm, but this is not necessarily the right strategy to pursue in China, as workers in high-PDI countries expect to be told what to do. This might prove Nonaka somewhat wrong in that autonomy increases an individual's self-motivation. Even though both MA and Mascot focused on creating a purposeful environment for its employees through respectful treatment of employees, and a shared context through socializing and communication, it was in both cases pointed out that money was the primary motivation for Chinese employees. This suggests that the benevolent father also is a generous one.

Therefore, it seems as though, while autonomy might increase the *intrinsic* motivation with individualistic Norwegian workers, Chinese workers are more dependent on *extrinsic* motivation provided by leaders giving assertive direction and stimulation in terms of prestige, privileges and economic compensation39. This is also related to the high MAS of China, where money and status can seem to be a more important motivation for performing a job than for Norwegians. It can also be expected that for a Norwegian leader to earn the loyalty of Chinese employees, it is important to treat the employees as one group (low IDV score for China) to easier create a shared context with the employees.

In converting knowledge between individuals of the organization, especially the Mascot case referred to Chinese workers as eager to learn. As both MAS (career ambitions) and LTO (learning and adapting to new circumstances among main work values) are significantly higher in China than in Norway, it could be expected that knowledge conversion in general is a welcome concept for the hardworking (high MAS) and disciplined (high PDI) Chinese employees working for Mascot. However, the motivations for converting and learning are different and have to be spurred more actively by managers and supervisors due to the high PDI score, something that corresponds to the initiatives for getting the Chinese employees to open up and be more creative through meetings and better communication can affirm. It can be expected that the DUI-mode of innovation, where socialization is central, might present some difficulties as Chinese expect to be told what to do instead of learning by themselves. In the MA case, however, it seemed as though the learning process complies with this form of learning. This is

39 Intrinsic and extrinsic motivations are defined in section 3.2.

perhaps because of the GM's attributes fulfilling, if not surpassing, the requirements as a 'transferor' of technology. When the production workers have a GM that can perform their job as good, if not, better than them, it is to be expected that they will do their uttermost to improve their skills, especially when their superior tells them to. This seems to be on accord with the statement by one of my informants that a firm should send the one who hurts the most when establishing themselves abroad.

However, there could be some pit falls that can obstruct or slow down the conversion process in Chinese culture. Because a leader decides the level of skills needed to be part of the 'in-group' at the work place (i.e. an employee, although 'in-group' also contain emotional connotations), this of course affects the motivation for and quality of knowledge conversion, as these standards might require the employees to adopt skills that necessitates performance what high-MAS Chinese consider to be 'feminine' tasks or operations, or work tasks considered by high-PDI Chinese to be below their professional status.

8.4.2 The transmitter – culturally revisited

In terms of the personalization and codification strategy, it is not difficult to agree with statement that the more knowledge is codified, the easier its absorption will be (Amesse & Cohendet, 2001; Cohen & Levinthal, 1990), and after reviewing relevant literature in section 4 it can be expected that this strategy will be widely employed in technology transfer processes, as have been confirmed by both the cases in this thesis. Use of the codification strategy when Norwegian companies open up manufacturing sites in China, however, involves some problematic aspects not considered so far in the thesis. First of

all, when transferring codified knowledge between Norway and China it is imperative that all manuals, routines, procedures, and so on, are correctly translated, so that nothing essential is left or filtered out in the process, something that can slow down the transfer process significantly and also increase transfer costs. This might be difficult if routines need adaption to the local environment in China as well, since such alterations are difficult to conduct beforehand without testing them out properly, both practically and culturally. For instance, after arriving NIP Mascot has slightly altered their routines to be more static and monotone so that multi-tasking could be avoided. This can be linked together with a high PDI where workers prefer to be told what to do, and not have to take initiative as to how to solve their job tasks.

Transfer of new codified knowledge created in China can also be impeded if not translated properly. In both cases new knowledge had to be sent to a Norwegian R&D department for approval, due to non-existent local R&D departments. Therefore, firms' general display of 'inertia' in R&D internationalization can of course contribute to impede knowledge flows (Narula, 2002). However, cultural factors also play a role in firm's R&D strategies. In addition to a high PDI, China's high LTO score indicates pragmatism and adaptiveness in dealing with others through use of *guanxi*, and these two factors imply a relatively high degree of corruption in China (Hofstede & Hofstede, 2005, p. 352). The low Chinese IDV score indicates that taking care of the in-group is important and that laws and rights differ for some categories of people, even though China's low UAI score should contribute to lower corruption by having fewer laws that are being kept (Ibid.) This might be a slight contradiction in the case of the Chinese

culture, as it somewhat collides with Hofstede's theory,40 although there are strong indications for problems in China with IPR to derive from economic poverty and the fact that existing laws still have not been in use for long (Gassmann & Han, 2004).

Due to high costs, the personalization strategy is perhaps not so widely used in international technology transfer. During data collection for this thesis, one informant nevertheless told me about the Japanese firm Toshiba's establishment of a manufacturing site just outside of Hangzhou (杭州) in China. In the start-up process they sent 300 Japanese from a factory in Japan with instructions that they could leave as soon as the Chinese employees hired to fill their position in Hangzhou had reached a satisfying level. Of course, only large firms with abundant resources can pursue a personalization strategy that intense and costly. On the other hand, as discussed in section 5, ICT alone cannot be expected to replace face-to-face interaction completely. Rather, as found in the cases, use of experienced transfer teams for diffusing specialized knowledge when needed, coupled with considerable involvement of expatriates at the manufacturing site and extensive training of key personnel in the back office can be expected to be the main transfer mechanisms in utilization of this strategy, (Bruun & Bennett, 2002).

In using this strategy, there is also the possibility of transferors and expatriates experiencing 'culture shock' in China (and elsewhere), where the foreign cultural environment can be seen a negative and this can lead to hostility toward the new environment (Hofstede & Hofstede, 2005, ch. 9). Although Norwegians with a low UAI

40 China was number 79 on the 2009 Worldwide Corruption Perceptions ranking of countries, with Norway ranked at number 11 (Transparency-International, 2010).

score might be less prone to such experiences than many other national cultures, individualists often consider their mental programming as superior to collectivist thinking (Hofstede & Hofstede, 2005, p. 106). If these scenarios occur, it might be difficult for the expatriates to treat the Chinese employees according to the local societal norms and adapting to the local environment.

8.4.3 The receiver – culturally revisited

As for the integration mechanisms of knowledge mentioned earlier, the first, rules and directives, can be expected to be an efficient way of implementing organizational knowledge due to the generally low UAI score of China, indicating that Chinese (as Norwegians) are used to fewer formal laws that are highly followed. Due to other factors already discussed, however, China has a relatively high rate of corruption in its society, and this can also indicate that employees might be inclined to bypass internal rules and directives as well. There have been no indications from the empirical data that this is a problem at the work place, although a perhaps because there are more supervisors in China, and this might have a preventive effect.

The second, sequencing, is an implementation mechanism that members of cultures with high PDI and high MAS scores probably is most comfortable with. In high-PDI countries, there is a competitive advantage in terms of discipline, while there in high-MAS countries are competitive advantages with regard to mass production and efficiency (Hofstede & Hofstede, 2005, p. 345), and these are all required abilities in sequencing. This mechanism for implementing knowledge thus seems to suit Chinese

workers well. However, as the MA case showed, there are possible pit falls in terms of large quanta of flawed products if the production process is not supervised in a hands-on manner. As the third mechanism, routines, contains qualities of both the previous two mechanisms, this can also be expected to fit well with Chinese workers. Nevertheless, as mentioned in the analysis of codification, there is a possibility that routines need to be adapted to the local work culture.

Finally, group problem solving and decision-making, might match well with the innovative qualities associated with low UAI score of both Norway and China. However, even though Chinese workers like to be treated as in-group, this does not mean they are comfortable with this concept. Due to their high PDI score and low IDV score, Chinese will as mentioned earlier probably have difficulties with expressing their personal views instead of being told what to do, making this mechanism better suited for Norwegians than Chinese employees, something Mascot's lack of creative initiative by the employees illustrates. However, it can be argued that if the top manager is successful in creating a strong enough in-group at the work place, this might help lower the threshold of expressing opinions and make utilization of this mechanism more possible, and attempts of achieving this have been made in both cases in this thesis.

In the section on developing capabilities, the importance of building absorptive capabilities was discussed. Even though the theory and empirical data indicate that the possibility of Norwegian firms establishing an R&D department in China is small, capabilities still need to be formed locally at the manufacturing site. Both MA and Mascot expressed hope for establishing an R&D department in NIP, a strategy that would probably increase their local capabilities significantly and contribute to a more

dynamic production. Especially Mascot can benefit from establishing R&D department to assess suppliers on their own, although MA's project leaders sitting in Norway also seems inconvenient. However, although having a local R&D department to some extent can make up for proximity problems, the relatively high degree of corruption in China and 'inertia' of R&D internationalization will probably unnerve some firms. After looking at the suspicions MA has about sharing blueprints with customers and suppliers suggest that building open networks for innovation in China is difficult.

Even though R&D also might help the co-development of knowledge with local customers and suppliers in such networks, developing personal relationships is also important when searching for external knowledge and contacts in China. The concept of guanxi has already been defined and explained in section 6, but as it only have been associated with corruption so far in the analysis section, the entire concept has perhaps a bit undeservingly been painted black. Without doubt, using guanxi for illegal gains is wrong; however, the concept can also be used to create extensive networks that by providing a means to search for external knowledge can help increase a firm's knowledge base, and thus also absorptive capacity.

The question is whether or not Norwegians with their low LTO have the long-term perspective and patience needed to accumulate guanxi with external interpersonal connections so that they can benefit from using it, or if Norwegian expatriates stay long enough in China for this to develop. As seen from the empirical findings both the firms spend much time in dealing with suppliers and customers, but as they have only been in China for a relatively short time, it might be too early to say if they have accumulated any guanxi with their connections. Rather, the GMs 'wining and dining' with customers,

suppliers and officials in Ningbo, can perhaps be interpreted as a first step creating an 'in-group' relationship. As 'in-group' members in China receive preferential treatment, having a personal relationship with the right people can help speed things up in business life. Again, I would like to emphasise that this is not the same as to omit existing laws and regulations. During the course of writing this thesis, I have myself taken part in a meeting between a big Norwegian firm and a Chinese delegation of high-ranking officials, where they discussed the firm's possible establishment in a province in China. The meeting did not have any outcome; rather it seemed to me that everything was arranged so that the two parts could get to know each other before talking business. This can perhaps serve as reminder of the importance of personal relationships for conducting business in China, either by being part of an in-group or by accumulating guanxi in networks.

9 Concluding discussion

In this thesis, I have linked the dynamic innovation-oriented approach to technology transfer together with cross-cultural research to look at how cultural differences affect technology transfer between Norway and China. As there still is no accepted framework to combine technology transfer and cultural aspects in research, this has been an attempt to demonstrate the importance of incorporating cultural variations into existing technology transfer theory. By first introducing a framework for looking at technology transfer from an innovation-oriented approach that covers many aspects of the transfer, from a micro-level to more of a macro-level and from internal to external knowledge flows, we have seen that the proposed cultural framework can contribute by predicting and explaining the outcome of the transfer based on the national values of the countries involved in the transfer. Although the two cases used as empirical sources in this thesis operate in different industries, markets and have different technologies, the findings showed many similarities between their situations. Thus, it seems as though the innovation-oriented approach and cross-cultural studies can complement each other when analysing technology transfer processes between culturally different countries.

With regard to organizational knowledge creation, we have seen that the perception of what constitutes a purposeful environment through which a shared context can be developed for converting knowledge is different between Norway and China. We have also seen that the motivations for Chinese and Norwegian workers are different in nature. I have argued for how this affects knowledge conversion, but further research is needed in order to draw conclusions.

We have seen that the codification and personalization strategy are complementary in a transfer, even across far distances such as between China and Norway. However, we have also seen that cultural differences can affect the codification strategy negatively, obviously language proficiency, or lack of it, can play a role in this, however, adapting routines to the local environment might offer problems. We have also seen that cultural factors can affect codification in affecting to firms' incentives for establishing R&D departments. I have also argued that although the personalization strategy can contribute as a transfer mechanism between Norway and China, it can also contribute with negativity and hostility if the transferors experience a culture shock.

Regarding competence building, we have seen that rules and directives, sequencing and routines seem to be well-suited integration mechanisms in China, but that group problem solving and decision-making does not seem to make Chinese comfortable. Developing capabilities are more difficult, however, something my empirical findings indicate lack of R&D department contributes to. There are nevertheless other channels for building networks in China, such as the concept of guanxi and establishing close, personal relationships, but these require time to be built, and it is questionable if Norwegians have the patience for this due to low LTO and the notion that Norwegian expatriates might not move permanently to China.

Thus, the success of technology transfer depends seems not only to depend on how technology is transferred, but where it is transferred from and to can play a role as well.

9.1 Limitations with this thesis

As mentioned, this thesis has attempted to take a step toward creating a framework to approach the topic of how cultural differences affect technology transfer. However, a weakness in my approach is that cultural differences are relative and hard to generalize. This means that, even though national values can help predict implications of transferring technology between two culturally different countries, this will never be a completely accurate framework for conducting research. Further, there are also methods for doing research on organizational cultures, and there is a possibility that this would provide a more accurate analysis. However, it was beyond the scope of this thesis to supplement with this.

Another limitation with my thesis is that the cases chosen for the empirical section have many variables that are unaccounted for, as for instance maturity of technologies, motivations for establishment in China, support from back office, industry they operate in and so on. The cases nevertheless showed similarities in the empirical findings, but these variables should anyway be taken in for consideration as potentially influencing the conclusions drawn from this thesis.

9.2 Future research

I mentioned in the introduction that a few attempt have been made on incorporating cross-cultural aspects to related topics. I nevertheless believe that the future research to be stressed the most is to continue incorporating the cultural aspect into other fields.

More research is needed before any conclusions as to exactly how and to which extent the cultural affect technology transfer. This counts for research where organizational culture is the focus as well.

Also, I believe that more case studies are needed, especially when looking into technology transfer processes, as this is the only method that can capture the cultural effects on transfer processes in a satisfying way.

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Appendix A:

Interview Guide, Person X, Position X, Firm X

Facts About the Firm:

Write facts about Firm X, and especially facts about the Firm X in NIP.

Questions:

1. Can you tell me a little about yourself and your role in firm X? How long have you been working in Ningbo?
2. How many employees do you have at your Ningbo Plant? What is the nationality rate (Norwegians and expatriates vs. Chinese)?
3. What were your firm's motivations and driving forces behind opening up production in Ningbo?
    a. How did the decision process evolve?
    b. Why in Ningbo?
    c. What is your vision and goal, with the plant?
4. How did you proceed in building up competence in Nordic Industrial Park (NIP)?
    a. Transfer of technology and knowledge. How did you ensure not to loose competence during the transfer process?
    b. Do you have, or will you have, an R&D department in NIP?

   c. Are you adapting any technology, routines or regulations to better suit the local environment?
   d. Do you use NIP's recruitment service, or do you recruit employees on your own (if mixed, how much)?
   e. How do you proceed in the recruitment process?
   f. What kind and how much training do you provide to your employees? Who conducts the training? Do you provide any cultural training?
5. Do you have any policies about what nationalities (expatriates/Chinese) and how many of each nationality your employees should have? What about language skills?
6. What have been the biggest challenges of bringing your Ningbo Plant up to the standards of other production units your firm has?
   a. Do you have the same requirement as to standards and type of production (standard vs. custom made)?
   b. How is the production efficiency compared to your other manufacturing sites?
   c. What about innovation at the Ningbo Plant?
   d. Which of the NIP services do you use?
   e. How do you find the cross-cultural cooperation in your firm to affect performance?
7. Can you describe conflict situations you have had in the workplace?
   a. Is there any common denominator in the conflicts?
   b. Have you been able to solve the conflicts?
   c. How do you proceed in solving the conflicts?
8. How has your Ningbo plant lived up to your expectations?
   a. Costs?

b. Quality of production, services and locations?

c. Efficiency?

d. What do your customers think about your NIP plant?

e. Do you have plans of expanding?

9. Is there anything you want to tell me that I have not already asked?

10. Are there any other people you believe I should interview on this matter?