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"Exploring the impact of culture"

Technology transfer to five African countries

- A study at Soil & More International -

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Student:	Mr. R.L. Janssen (Robert Lee) S0179000
Principal:	Mr. A. Van den Bos, Managing Partner Soil and More International B.V.
Supervision: *1st UT-supervisor* *2nd UT-supervisor*	University of Twente Mr. D.K. Kensah Dr. S.J. De Boer

Preface

In order to graduate for my study MSc. Business Administration at the University of Twente, I have written this master thesis. I would like to take the opportunity to thank a few people who were of great importance during the process of writing my thesis.

First of all, I would like to show sincere gratitude to my tutor Mr. David Kensah who took the time and effort to guide me throughout the process. He came up with valuable advice and feedback to better structure my thesis. Special gratitude also goes to my second supervisor Dr. Sirp-Jan de Boer for offering his advice and support.

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Management summary

The increasing globalization of economic activities has made cross-border transactions an important activity for companies. As competition among companies intensifies, the role of an effective cross-border transfer of organizational knowledge also becomes a crucial part of business activity. According to Szulanski (1996), knowledge transfer occurs where organizations try to recreate and maintain complex, causally ambiguous set of routines in a new setting. This process is complicated for international technology transfer in the sense that technological knowledge draws on both tangible and intangible inputs (Pavitt, 1987; Dosi & Grazzi, 2010). Since technological knowledge transfer is complex, an understanding of this process is not only crucial for the success of commercial activity, but also critical for successful transfer of any organizational knowledge across national and cultural boundaries (Javidan et al., 2005).

The transfer of technology is not just a movement of idle machinery and equipment from one place to another. It also include the transfer and adoption of technique, know-how and information. It involves the acquisition, development, and utilizations of technical knowledge by a company other than in which this knowledge originated. Technology refers to the class of knowledge about specific product or production technique and often accompanied by the technical skills necessary to use a product or production technique. However, as technology can include both tangible and intangible attributes, technology transfer is difficult to achieve, primarily due to the communication of intangible attributes. Bhagat & Kedia (1988) argued that besides the nature of technology, cultural differences is a major barrier that can hinder technology transfer.

Culture is reflected in values, norms, and practices. A person's particular cultural context, acts as a standard for perceiving, judging and evaluating experiences. The degree to which norms and values between two individuals from separate nations differ can be explained as "cultural distance". Cultural distance has been noted by Williams et al. (1988) as a major obstacle in cross-cultural business relations. According to Kogut & Singh (1988), perceived cultural distance influences managerial decisions to enter certain foreign markets based on the national cultures. To comprehend the impact that cultural distance has on cross-border transfer of technology, the purpose of this thesis is to examine how perceived cultural distance is managed by a Dutch commercial organization. I examine how the company manages this distance and seeks to transfer technology to five African countries through the purposeful use of communication. The five African countries selected for this research are: Botswana, Ethiopia, Mauritius, Mozambique and Tanzania. The aim is to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can Soil & More address these barriers?*

Since individuals and organizations are part of their societies, and culture manifests itself through individuals, it is plausible to expect them to reflect their national culture in their thinking, practices, values and therefore also in the transfer of technology. The five dimensions of Hofstede (1980) were used to describe differences between societies: power distance, collectivism vs. individualism, femininity vs. masculinity, uncertainty avoidance, and long- vs. short-term orientation.

In collectivist cultures, individuals recognize their interdependent roles and obligations to the group, while in individualistic cultures individuals prefer self-sufficiency and to be independent. Power distance refers to the degree of equality and inequality and the extent to which less powerful members expect and accept unequal power and wealth distribution within a society. Masculinity referrers to the way in which people are motivated towards different types of goal, either concerned with the quality of life (feminine) or money and recognition (masculinity). Uncertainty avoidance reflects the degree to which cultures have a

willingness to take risks associated with new methods and procedures. Long-term orientation reflects the extent to which a society pursue instant benefits or long-term commitment.

Structured interviews were conducted with the management and employees of the case company. In total seven individuals were interviewed at the case company. Although, seven interviews is a very small sample and the conclusions not being able to be generalized, the results might give a good indication of how perceived cultural distance is managed by a Dutch commercial organization. In order to prevent bias in the results, the gained data were compared with an independent control group, represented by country specialists of the NL EVD International (formally known as the EVD or in Dutch "Economische Voorlichtingsdienst") and is a partner to businesses and public-sector organizations. In total six individuals were interviewed at the NL EVD International.

The coupled data from the case company and control group indicated that in practice masculinity tend to be perceived as less influential to technology transfer than the other four cultural dimensions. The coupled data also indicated that gender tend to be negatively related to individualism. Women tend to perceive that individualism is a smaller barrier to technology transfer than men do. The data also indicated that experience tend to be negatively related to masculinity. This implies that when someone is more experienced, he perceives that masculinity is less of a barrier to technology transfer. The figures also revealed that experience tend to be positively related to power distance. This implies that as someone is more experienced, he or she perceives power distance as a greater barrier to technology transfer.

Research on articles and books indicated that people in individualistic cultures tend to emphasize explicit knowledge and knowledge independent of its context, whereas those in collectivistic cultures emphasize tacit knowledge and prefer systemic or contextually relevant knowledge. When transferring knowledge between nations with a differing power distance dimension, knowledge rejection could emerge. Uncertainty avoidance influences the degree to which cultures want to take this risk. Long-term orientation reflects the degree to which culture recognize the future value of new technology. This information was combined with the cultural dimensions of each of the five selected African countries and resulted in a list of possible barriers with technology transfer as summarized in table 5.1 and explained in the next paragraph.

Mauritius is high in power distance and individualism and therefore more comfortable in transferring and receiving knowledge that can be easily codified and stands independent of the organizational context. Differences in power distance between Soil & More and Mauritius might be the greatest barrier during technology transfer, this because the data from the case study indicated that the more experienced someone becomes the more he perceives that power distance influences the transfer process. Mauritius has a high score on uncertainty avoidance which might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any inconveniences and unstructured situations. A high score on long-term orientation means that people in Mauritius value long-term commitment and respect for tradition, thereby supporting a strong work ethic where today's work will result in long-term rewards. Botswana, Ethiopia, Mozambique and Tanzania will be further referred to as "Botswana". They need face-to-face contact to exchange knowledge because people depend on context more than do individualists who are quite satisfied with written communications. Botswana is high in power distance. Differences in power distance between Soil & More and Botswana might be the greatest barrier during technology transfer, this because the data from the case study indicated that the more experienced someone becomes the more he perceives that power distance influences the transfer process. A higher than average score on uncertainty avoidance might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any

inconveniences and unstructured situations. From a financial and organizational perspective, Botswana scores very low on long-term orientation which implies that this culture is likely to emphasize on short-term gains and are also less likely to recognize the future value of new knowledge.

In order to address the cultural barrier, the researcher observed that four methods can be used to improve the transfer of technology to the five African countries: communication, franchise handbook, training and creating cultural awareness. The first three methods are already used at Soil & More but have to be improved, while creating cultural awareness is still lacking at Soil & More. Creating cultural awareness is the method that has to be applied first, because it improves the effectiveness of the other three methods. For instance, greater cultural awareness will improve the second method "communication" and reduce misinterpretations because both parties better understand each other. Cultural awareness also has positive impact on the third method, local training courses. Since the instructor knows how to communicate with local workers, he can lower the cultural barriers and effectively transfer his knowledge. The fourth method is to use a franchise handbook. Franchise handbooks with all the rules and regulations of the company enables the receiver to better intervene when problems occur, without the sending party having to be present at the local facility.

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Chapter 1 Introduction

According to Szulanski (1996), knowledge transfer is where organizations try to recreate and maintain complex, causally ambiguous set of routines in a new setting. This process is complicated in international technology transfer in the sense that technological knowledge draws on both tangible and intangible inputs (Pavitt, 1987; Dosi & Grazzi, 2010). Since knowledge transfer is complex, an understanding of this process is not only increasingly crucial for the success of the company, but also critical for the transfer of any organizational knowledge across national and cultural boundaries (Javidan et al. 2005). While the transfer of tangible artifacts maybe straightforward, intangible attributes of technological knowledge requires codification to ensure the efficiency of transfer, but transfer itself may be impeded by cultural attributes, due to the impact of communication barriers (Bhagat et al., 2002). Differences in values and beliefs shared between home and host countries, the perceived cultural difference, has been acknowledged to influence managerial decisions to enter certain foreign markets based on the national cultures (Kogut & Singh, 1988).

Knowledge is essential for economic progress and international technology transfer is well noted as very important for economic development (Hedlund et al., 1993). Both the acquisition and diffusion of technology foster productive growth in the developed and developing countries (Hoekman et al., 2005). However there are inherent characteristics of knowledge, such as has been described in terms of its tacit and explicit properties, which makes it difficult for its transfer (Polanyi, 1958; Nonaka & Takeuchi, 1995; Boisot, 1998). This is a reflection of the fact that knowledge as a commodity can be characterized along three dimensions. These dimensions according to Boisot (1998) comprise of (i) abstraction - the degree to which information is concrete and specific versus generalizable; (ii) codification - the extent to which information is actually written down in forms of readable by others; (iii) diffusion - the extent to which the information is circulated throughout the society. Technological knowledge refers to a class of knowledge about a specific product or production technique and often includes the technical skills necessary to use a product or production technique (Erdilek & Rapoport, 1985; Dosi & Grazzi, 2010). Research in technology dynamics informs us that technology can be seen as a human-constructed means for achieving a particular end (Dosi & Grazzi, 2010). Technology transfer therefore conveys the movement of knowledge for the use of a product or production technique. To Derakhshani (1983), technology transfer between companies involves the acquisition, development, and utilizations of technological knowledge by a company other than that in which this knowledge originated.

It is clear that the current conception of knowledge and technology are related in the sense that they underpin the continuum of procedures by which organizations do things; organizational routines (Nelson & Winter, 1982). As the combination of activities must reflect the pragmatic nature and operating conditions, knowledge can manifest as both technological knowledge and knowledge in the general sense (Pavitt, 1987). However, knowledge by itself does not constitute technology because the replication and imitation of knowledge for a given productive process (intangible technological knowledge) is not easy or cheap (Winter & Szulanski, 2001). Therefore, it can be argued that the transfer of knowledge is not the same as the transfer for technology, due to the pragmatic nature of intangible technological knowledge and that technology draws on both tangible and intangible inputs (Pavitt, 1987; Dosi & Grazzi, 2010). In that sense international technology transfer has been referred to as an active process that requires: "the transmission of both physical products and knowledge across borders, between institutions or within the same institution" (van Egmond, 2001).

As technology can include both tangible and intangible attributes, technology transfer is difficult to achieve, primarily due to the communication of intangible attributes. The selection and packaging of intangible attributes has long been acknowledged as essential to the transfer process (Shannon, 1948). This is because it enables organizations to transmit knowledge that has permanence through codification (Davenport et al., 1998). It allows the sender to transfer to the receiver what to do and how to do it (Zack, 1999). However, there are constraining factors that affect international knowledge transfer. Lin & Berg (2001) revealed that the following variables influence the implementation process: the nature of the technology (standardization, maturity), international experience of the sender and recipient, and cultural differences between home and host country. However, different types of technology were not mentioned by Lin & Berg, although this is a very important aspect in cross-border technology transfer. This was reflected by the findings of Bhagat & Kedia (1988) who argued that besides the nature of the technology, cultural differences between the sender and the receiver are the major barrier in communications that can hinder technology transfer. However, cultural differences do not per se create problems; rather it is the way the cultural differences are managed that causes problems. According to Gamble & Blackwell (2001), most social groups are ethnocentric, which mean they consider their own culture superior to all others. Gamble & Blackwell (2001) state that everyone is raised in a particular cultural context and it is perfectly natural for them to use their own culture as the standard for perceiving, judging and evaluating experiences, therefore erecting a barrier to a successful transfer of technology.

Culture is reflected in values, norms, and practices. The degree to which norms and values between two firms from separate nations differ has been noted by Williams et al. (1988) as a major obstacle in cross-cultural business relations. Cultural distance is the difference in values and beliefs shared between home and host countries. Recognizing cultural differences is the necessary first step to anticipating potential threats and opportunities for foreign modes of entry in international business. According to Kogut & Singh (1988), perceived cultural distance influences managerial decisions to enter certain foreign markets based on the national cultures. This is anchored on the notion that the flow of information is impeded by differences in national culture (Johanson et al., 1977). Therefore the transfer of technology as the organization of tangible and intangible knowledge is impeded by cultural attributes, due to the impact of communication barriers (Bhagat et al., 2002).

The impact of cultural distance in cross-border transfer of technology is very interesting to study, since this process influences the success of international companies. Overcoming cultural distance, if managed properly, reduces risks and avoids misinterpretations and misunderstandings. Cultural distance is therefore an important aspect to bear in mind when transferring technology across borders. The case company selected five African countries (Botswana, Ethiopia, Mauritius, Mozambique and Tanzania) with favorable business opportunities to set up a partner network. To comprehend the impact that cultural distance has on cross-border transfer of technology to five African countries at a Dutch commercial organization, the purpose of this thesis is to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can the case company address these barriers?* The aim is to develop a theoretical framework, which combines aspects of technology transfer and perceived cultural distance and the results of the case study. An in-depth case study was found to be the best suitable research strategy to gather company specific data. The results of this study will be company specific but they can still provide good insight about cultural barriers influencing technology transfer and add empirical data to existing literature.

The practical relevance of this research is that it gives insight in the influence that cultural distance can have as a major barrier in the technology transfer process and how the cultural barrier can be addressed, thereby enlarging the chance of success for the case company.

Chapter 2 Literature review

The theories that are suitable for this research are linked together to obtain a useful theoretical framework that will be used as a basis for the data collection.

2.1 Technology

According to Litter (1988), technology can be defined as practical knowledge of how to do and make things. It may be embodied not only in products and processes, but also in the form of techniques. Cohen (2004) describes in his book "the transfer process of technology to developing countries" that technology can be categorized into four main forms as follows:

- technology, as general theoretical and practical understanding of how to do things (know-how or information);
- technology as objects (goods or tools);
- technology as installed techniques of productions (processes); and
- technology as the personal know-how and abilities of workers (skills).

Green & Morphet (1977, as cited by Cohen 2004) define technology as the systematic knowledge of technique. This technique, as the interactions of person/tool/machine/object, defines a way of doing a particular task. This statement is somehow reflected by Burgelman & Maidique (1988, as cited by Cohen 2004), who define technology as a combination of people, materials, cognitive and physical processes, plant, equipment and tools.

Bhagat & Kedia (1988) focused on cultural constraints influencing the transfer of technology across the border. There are three different kinds of technologies which are presented in the table below. Each explanation is followed by an example of technology. These different types explain that technology can be transferred through products, process or people.

Table 2.1: Different types of technology (Bhagat & Kedia, 1988)

Type of technology	Explanation
Process-embodied	Patent rights or blueprints of the actual scientific process and engineering details. The technology resides in the process itself.
Product-embodied	Patent rights of a physical product, or the physical product itself. The technology resides in the patent rights or product itself.
Person-embodied	Person-embodied technology literally means "knowledge about the technology residing in the person". Creating continuous dialogue between the "sender" and "receiver" pertaining to the intrinsic nature, diffusion, and utilization of certain scientific forms that are hard to articulate in the form of either process or product.

If the previous definitions of technology are observed and compared with each other, it can be argued that the definitions have similarities that are characteristics of technology. Technology is not only the physical equipment or tools themselves as one might think, but it seems that technology is also the know-how and the ability of workers to use the equipment or tools within a (production) process. Technology consists of the know-how, skills, tools, techniques and activities used to transform an organization's inputs into outputs (Cohen, 2004). But, know-how is similar to "knowledge", because when equipment or tools are transferred, the knowledge to use them also has to be transferred. Simply commercializing (selling) and transferring technology and handing over instruction manuals doesn't mean the technology is transferred and implemented properly. This means that knowledge and technology are indissolubly connected. It can be argued that knowledge transfer is essential for the performance of technology transfer. This has been observed and, according to Cohin & Levinthal (1990), knowledge is an essential part of expectation formation in the sense that it determines an organizations ability to accurately predict the nature of technology. At the same time, complexity is reflected in the different types of technology, which in turn can

influence the transfer process of technology. Given the requirement to have a skilled person present the transfer of process-embodied and person-embodied technologies, the transfer of these types of technology are usually more difficult to achieve across nations than product-embodied technologies.

2.2 Technology transfer

To Derakhshani (1983), technology transfer between companies involves the acquisition, development, and utilizations of technological knowledge by a company other than that in which this knowledge originated. This definition is very comparable to the definition given by van Egmond (2001): "the transmission of both physical products and knowledge across borders, between institutions or within the same institution". Traditionally, technology transfer was conceptualized as the transfer of tangible objects, but today also often involves information (e.g., a computer software program or a new idea) with little tangible properties (as cited by Li-Hua, 2005).

According to Dijkhuizen (2006) the mode by which the technology is transferred is of great importance for the success of the technology transfer process. The most well-known transfer modes are:

- Process package deals (turn-key projects, technical assistance, licensing etc.)
- Project package deals (foreign direct investment, joint-venture and subsidiaries)
- Direct sale (direct transfer or the product or service to the ultimate user)
- Alliances and co-operation
- Contracting and agreements

Lall et al. (1994) contends that successful transfer of technology to a developing country is not by simply providing equipment and operating instructions, patents, designs or blueprints, because it does not ensure that the technology is properly used. The fact that a technical manual is written does not mean that its contents are or will be read. If it is read, it does not mean the author's words were understood. If they were understood, it does not follow that knowledge has been transferred until that knowledge has been applied by the recipient. It can be argued that the efficient transfer of technology is affected by the mode of transfer and type of technology transferred. Success, however, depends on the adequate understanding of that technology by the recipient. Adequate understanding of the technology can be ensured by providing training to local workers. The training activities are of crucial importance, in the sense that technology transfer involves learning and learning can be improved by appropriate training methods.

2.3 Knowledge transfer

The complexity of knowledge types required for the successful use of a technology imply that knowledge transfer has to occur simultaneous to technology transfer. The different types of knowledge are illustrated in table 2.2, with explanations of how they might affect technology transfer. This is based on the classification by Garud and Nayyar (1994) who describe "knowledge" along three different dimensions: Simple versus Complex, Explicit versus Tacit, and Independent versus Systemic. These three dimensions of knowledge result in eight different combinations of knowledge types (2^3). These dimensions are very important because the position of knowledge along each of the three dimensions affects the amount of information required to describe it and the amount of effort needed to transfer it (Bhagat et al., 2002). For example, in comparison with tacit knowledge, explicit knowledge might behave differently when it is transferred to another country. The dimensions of knowledge are important, because the dimensions influence the transfer process of technology. If knowledge isn't transferred and adopted properly, technology can't be implemented properly.

Table 2.2: Different types of knowledge (Garud & Nayyar, 1994)

Type of knowledge	Explanation
Simple	Simple knowledge can be captured with little information and is relatively easy to transfer.
Complex	Complex knowledge evokes more causal uncertainties, and therefore the amount of factual information required to completely and accurately transfer is greater than with simple knowledge.
Explicit	Explicit knowledge can be codified (documented) in a form that can be distributed to others without requiring interpersonal interaction. Examples are: data, procedures, software, documents and products. According to Cyert & March (1992) explicit knowledge can be transferred when the sending organization informs the recipient organization about its record-keeping rules, which specify which records are to be kept and how records are to be maintained.
Tacit	Tacit knowledge is highly personal and difficult to formalize. Tacit knowledge is usually either localized within the brain of an individual or embedded in the group interactions within a department or business unit like expertise and know-how. This type of knowledge is not easily codified and depends on human intuition, but it is often considered the most valuable, complex and culturally determined.
Systemic (embedded)	Systemic knowledge must be described in relation to a body of knowledge existing in the transferring organization and is embedded in the organizational context. Meyer & Rowan (1977) use the term "embedded" knowledge. The term explains how many knowledge elements and related sub-networks will need to be transferred, absorbed, adapted and adopted by the recipient to allow the knowledge to be applied by the recipient.
Independent (not embedded)	Independent knowledge can be described by itself and is not embedded in the organizational context because less knowledge elements and related sub-networks are needed to be transferred and adapted by the recipient, which makes it easier to transfer.

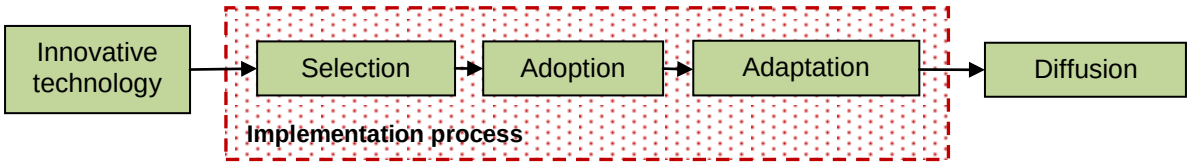
2.4 Implementation: transfer through training

Szulanski (2001) has defined "successful implementation of technology" as the incorporation or routine use of a technology on an ongoing basis in an organization, which means that the knowledge to use the technology is acquired and used by the recipient. Meyer and Rowan (1977) define "effectiveness of technology implementation" as the degree to which a recipient obtains ownership of, commitment to, and satisfaction with the transferred technology. According to Bhagat et al. (2002), "effectiveness of technology implementation" can be defined as the degree to which the receiver of the technology adapts, restructures and "memorizes" the technical information and successfully applies and implements the technology in practice.

Implementation of technologies refers to the process of selection, adoption and adaptation of technologies (Bongenaar & Szirmai, 1999) as can be seen in figure 2.1 on the next page. Selection implies the search for information and the process of weighing the technology against existing technologies. When it meets the requirements, it will be chosen and adopted. Adoption is the acceptation of a new technology in a society or organization. The adaptation process is part of that acceptation. Without adaptation there would be little acceptation, and no acceptation would imply failure of the technology implementation. An innovation can only become self-sustaining when it is widely accepted (Bongenaar & Szirmai, 1999). The last stage shows "diffusion", which explains at what rate new ideas and technologies spread through cultures. Diffusion of innovation, or sometimes cited as "technology transfer" indicates the process by which an product or service and its use and application is communicated through certain channels over time among members of a social system (Rogers, 1964). Since diffusion is mainly concerned with the rate of adoption of a

certain technology (the scale on which it is implemented), the process in the dotted box is relevant to successful transfer of technology.

Figure 2.1 The process of implementation and diffusion (Bongenaar & Szirmai, 1999)



It is clear that technology transfer relies on knowledge transfer for the successful implementation of technology. For many new technologies, additional knowledge must be transferred to enable use--not just technical knowledge but also social knowledge about who knows what, in order to facilitate good technology use after the implementation process (Attewell, 1992). This has been observed by looking at the influence that certain factors, such as the lack of skills, insufficient training, insufficient resources and inadequate communication, negatively affect technology transfer (Dhanarajan, 2001; Pajo & Wallace, 2001). These authors acknowledge that knowledge to use and implement a given technology has to be transferred through training local workers. The training activities are of crucial importance, in the sense that technology transfer involves learning and learning can be improved by appropriate training methods.

Lasserre (1982) suggested, after investigating 33 cases of technology transfer between companies with differing cultures and values, that every technology transfer needed a specific kind of training activity. Lasserre (1982) developed a theory which implies that the focus of the training effort should be adjusted to the nature of the technology to be transferred, which is shown in figure 2.2. Therefore he distinguished four different methods of training: applicative, duplicative, imitative and innovative. These four different methods with their specific explanation can be found in table 2.3 on the next page. The transfer of the most important method doesn't preclude that other approaches are not going to be needed. It can be the case that all four are needed, although their degree of importance varies.

Figure 2.2 relationships type of appropriate training and type of technology to be transferred (Lasserre, 1982)

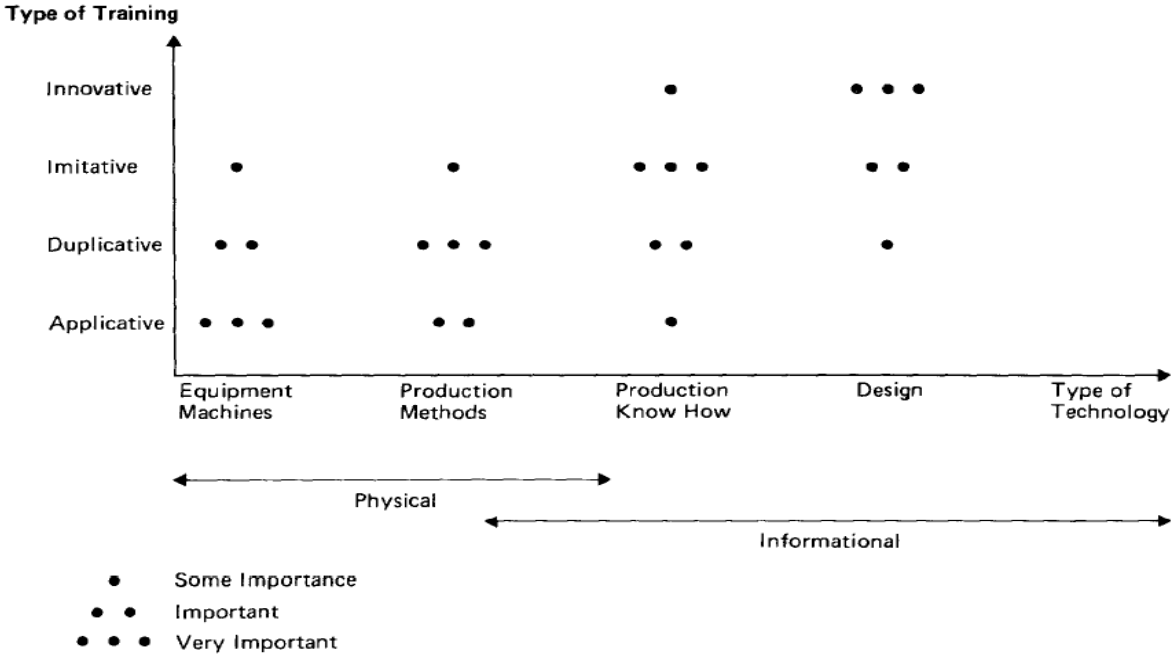


Table 2.3: A typology of training activities for technology transfer (Lasserre, 1982)

Objective of training	Appropriate method
To be able to follow and apply a well specified set of instructions. *(Machine operator learning a particular sequence of operations)*	*Applicative* Learn and apply the rules and procedures. This can be done by demonstrations and programmed instructions.
To be able to interpret general principles in order to apply them to particular operations. *(Foreman has to control workshop)*	*Duplicative* Type of training most frequent in academic and vocational institutes. Trainee has to learn the basic principle and to observe their applicability through exercises.
To be able to understand and replicate the specific hidden characteristics and ill-defined tasks of a job. *(Cook wants to learn from the chef)*	*Imitative* Coaching method by pairing individual, spend time with the trainee to find hidden characteristics of the job.
To be able to develop new methods of work or new products. *(Project engineer, product designer)*	*Innovative* Teaming methods, both the transferor and the transferee work together to innovate.

2.5 Culture

Culture is reflected in values, norms, and practices, which according to Geertz's (1973, p. 89) is: *"An historically transmitted pattern of meaning embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men [and women] communicate, perpetuate, and develop their knowledge about and attitudes toward life."*

In terms of communities organizing to solve problems in the long-term, Ed Schein defines culture as: *"A set of basic assumptions – shared solutions to universal problems of external adaptation (how to survive) and internal integration (how to stay together) – which have evolved over time and are handed down from one generation to the next."*

According to Schneider & Barsoux (2003), while problems are considered universal in that every group needs to resolve them, the solutions are considered to be unique to that particular group. They are manifested in the way people behave, and in what they believe and value.

The decision to transfer technology to another country is influenced by cultural distance, which is defined as the difference in values and beliefs shared between home and host countries (Williams et al., 1988). The degree to which these values and beliefs between two separate nations differ has been noted by Williams et al. (1988) as a major obstacle in cross-cultural business relations. Recognizing cultural differences is the necessary first step to anticipating potential threats and opportunities for business encounters. Accordingly, Kogut & Singh (1988) observed that perceived cultural distance influences managerial decisions to enter certain foreign markets based on the national cultures. Similarity in cultures of the sending and receiving companies are believed to favour transfer of intangible properties (Castro & Neira, 2005).

Currently there are several well-known studies that have attempted to profile the cultures of a nation through the use of a comprehensive survey: Trompenaars (1993), Hofstede (1980), Schwartz (1994) and House et al. (2004). All four studies posses particular strengths, however the most important advantage of Hofstede's (1980) study is that it is wide-spread in the management vocabulary and it has results for two African countries (and the Netherlands) that are investigated in this research, enabling better comparison between countries.

Cultural dimensions of Hofstede

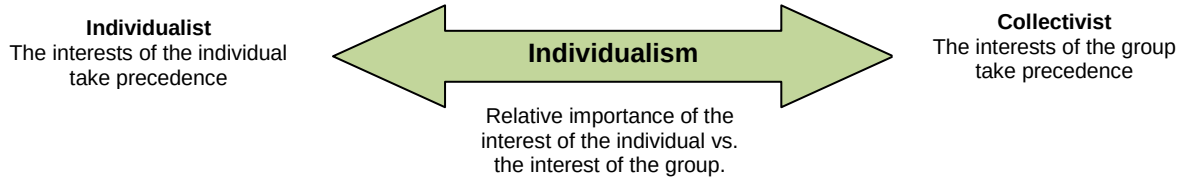
Although culture is generally defined at a societal level, culture impacts on individual behaviour. Culture can be seen to mediate between societal culture and specific individual personality (Hofstede, 1991). The most well-known and widely used theoretical framework to define cultural differences between countries is the theory developed by Hofstede (1980). Hofstede (1980) defined culture as "collective mental programming". Collective mental programming can be explained as the part of our conditioning that we share with other members of our nation, region, or group but not with members of other nations, regions, or groups. The differences between societies in their collective mental programming can be projected on a set of so-called dimensions. Based on research obtained from 53 countries and regions, Hofstede (1984, 1991) summarized five dimensions to describe differences between societies: power distance, collectivism vs. individualism, femininity vs. masculinity, uncertainty avoidance, and long- vs. short-term orientation. Triandis (1995) and Early & Gibson (1998) have pointed out that the individualism-collectivism dimension of cultural variation is the major distinguishing characteristic in the way that the various societies of the world analyze social behavior and process and transfer information.

Hofstede's (1980, 1984) initial conceptualization was a one-dimensional view of human values, with individualism and collectivism at the opposite ends of a continuum. Nations and cultures were defined as residing at one or the other of those extremes or somewhere between the two. According to Hofstede (1980, 1984) individualism–collectivism (I–C) reflects the degree to which the identity of members of a particular culture are shaped by either personal choices or by the group to which they belong. The basic tenets of cultural dimensions, individualism and collectivism, have helped illuminate and explain differences among cultures under the assumption that people in the same culture are largely homogeneous (Lee & Choi, 2005). Individualism and collectivism, strongly influence ways of thinking, is the most important cultural dimension to describe differences. It influences how members of a culture process, interpret, and make use of a body of information and knowledge.

The work of Hofstede has been criticized on a number of points. It seems that the research has been culturally bound. The research team of Hofstede was composed of Europeans and Americans. The questions they asked and their analysis of the answers may have been shaped by their own cultural biases, resulting in confirming Western stereotypes (McSweeney, 2002). Another point of critic is the fact that the work of Hofstede is now beginning to look dated, since the study was undertaken between 1967 and 1973. Cultures slowly evolve. What was a reasonable characterization in the 1960s and 1970s may not be so today. In order not to rely too heavily on the figures presented by the work of Hofstede, information from the NL EVD International and literature on each culture were used in combination with the work of Hofstede.

Individualism/Collectivism

Figure 2.3 Individualism/collectivism (Adapted from Griffin & Pustay, 1996)



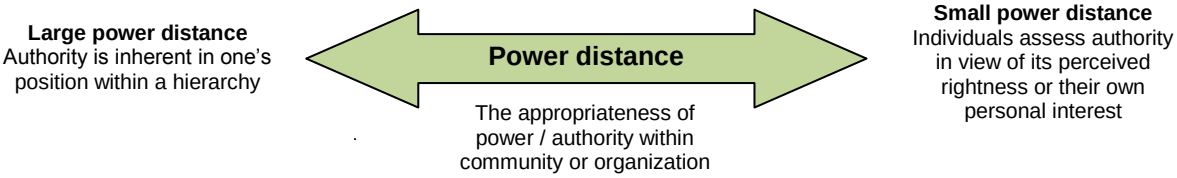
The major differences between individualistic and collectivistic values are shown above in figure 2.3. In collectivistic value orientation, people's major concern is their in-group. According to Triandis (1988) an in-group can be defined as a group of people who share

common interests and have a concern for each other's welfare, and whose members may include family, distant relatives, co-workers, and members of religious groups to which an individual belongs. People value the welfare of the group higher than the welfare of the individual (Rafferty & Tapsell, 2001). The in-group is expected to look after an individual in exchange for loyalty. Triandis (1996) stated that individuals are very loyal to each other and resources are shared within the family. If a person has got a job, the rest of the family members who are unemployed get support (Hofstede, 2001). Collectivist cultures regulate behaviour through shame or loss of "face". Reciprocity, obligation, duty security, tradition, dependence, harmony, obedience to authority, and equilibrium are valued in collectivistic cultures (Triandis, 1989).

In individualistic cultures, individuals prefer self-sufficiency, management is done at the individual level, and tasks prevail over relationships. People are supposed to take care of themselves and remain emotionally independent from the group. The individuals decide and take actions by themselves instead of with others (Marcus and Kitayama, 1991). It is also important for a person in this culture to advance more than others and to succeed in different kind of ways. Self-interest is the dominant motivation. Independence, creativity, self-reliance, solitude, and self-actualization are valued in individualistic cultures (Triandis, 1989).

Power distance

Figure 2.4 Power distance (Adapted from Griffin & Pustay, 1996)



As can be seen above in figure 2.4, power distance refers to the degree of equality and inequality and the extent to which less powerful members expect and accept unequal power and wealth distribution within a society. As can be seen in the figure above, cultures with large power distance emphasize vertical relationships and differentiate persons from one another according to rank and create a strict social hierarchy. Supervisors expect respect and obedience. High power distance societies tend to have centralized political power and establish tall hierarchies in organizations with large difference in salaries and status. Cultures with small power distance emphasize horizontal relationships and stress the equality of all persons and create a flat social hierarchy (Koerner & Ascan, 2003).

Uncertainty avoidance

Figure 2.5 Uncertainty avoidance (Adapted from Griffin & Pustay, 1996)

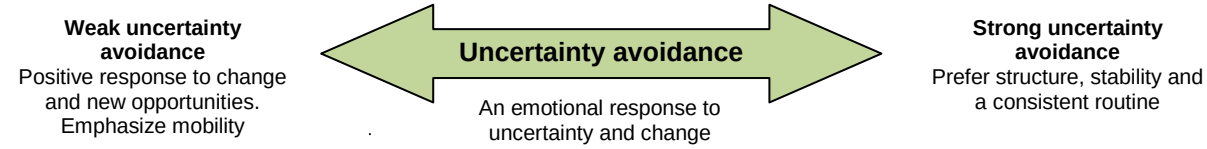
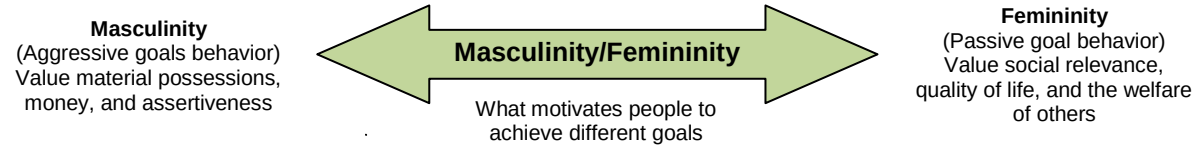


Figure 2.5 illustrates how uncertainty avoidance can be explained. Uncertainty avoidance reflects the degree to which the members of a society feel threatened by ambiguity and are rule-oriented. According to Shore & Venkatachalam (1996) cultures characterized by weak uncertainty avoidance have a somewhat greater willingness to take risks associated with new methods and procedures. These cultures, for example, may be more willing to try new technology before it has been proven in other organizations. These cultures dislike written or

unwritten rules. Shore & Venkatachalam (1996) also stated that when cultures are characterized by strong uncertainty avoidance, the introduction of new technology will raise the anxiety level of its host implementers, top managers and end-users. They will show concern over the uncertainty of new methods and procedures associated with the new application and will be particularly resistant to the abandonment of systems with which they are familiar and feel secure. There is a great emotional need for rules, either written or unwritten. Employees in strong uncertainty avoidance cultures, tend to stay with their organizations for a long time. In contrast, those from weak uncertainty avoidance cultures are much more mobile. Organizational changes in strong uncertainty avoidance cultures are likely to receive strong resistance from employees, which make transfer of change difficult to administer.

Masculinity/Femininity

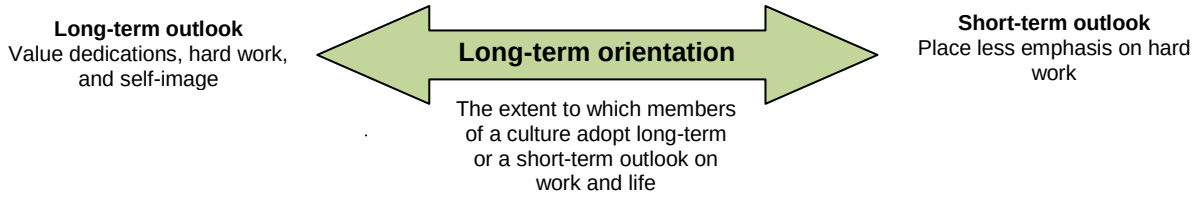
Figure 2.6 Masculinity/Femininity (Adapted from Griffin & Pustay, 1996)



As can be seen in figure 2.6 the dimension of masculinity/femininity reflects the degree to which the social gender roles are clearly distinct. In masculine cultures, males are expected to be assertive, tough and focused on material success, and females are expected to be tender and focused on quality of life. Griffin and Pustay (1996) labeled it "aggressive goal behavior", because it referrers to the way in which people are motivated towards different types of goal. Traditional masculine goals include: earnings, recognition, advancement, valuing material possessions, assertiveness and money. In feminine cultures, both gender roles overlap. Both men and women are expected to be modest, tender, and concerned with quality of life. Traditional feminine goals include: good relations with supervisors, peers, and subordinated; good living and working conditions; and employment security (Hofstede, 1980).

Long- vs. short-term orientation

Figure 2.7 Long- vs. short-term orientation (Adapted from Griffin & Pustay, 1996)



The dimension of long term-orientation, as illustrated in figure 2.7, reflects the extent to which a society exhibits a pragmatic future oriented perspective rather than a conventional historic or short term point of view. Cultures scoring low tend to be conventional and traditional, and pursue instant benefits and satisfaction in work related aspects. Cultures scoring high have a thrift for investment and a long-term orientation both financially and psychologically. These cultures also value long-term commitment towards organizations and career.

2.6 Perceived cultural distance and technology transfer

The decision to transfer technology to another country is influenced by cultural distance (Williams et al., 1988). The cultural dimensions as deduced by Hofstede are used here to

examine how person-related variables would react in case of technology transfer to foreign countries. Kogut & Singh (1988) observed that perceived cultural distance influences managerial decisions to enter certain foreign markets based on the national cultures. Person-related variables such as age, gender, work experience, language, education, religion, socio-economic status and race have an impact on the perceived cultural distance when considering to enter foreign markets or transfer technology (Watson & Lippitt, 1957; Glick, 2002; Gill, 1998).

In order to investigate whether these person-related variables influence the perceived cultural distance, the variables age, gender and (foreign) experience are collected from the respondents of the case company. This gives the researcher the opportunity to investigate whether age, gender and (foreign) experience are related to the perceived influence of the cultural dimensions of Hofstede on technology transfer at the case company.

2.7 Perceived cultural distance and knowledge transfer

It is clear that technology transfer relies on knowledge transfer for the successful implementation of technology. For many new technologies, additional knowledge must be transferred to enable use--not just technical knowledge but also social knowledge about who knows what, in order to facilitate good technology use after the implementation process (Attewell, 1992; Moreland, 1999). Besides the fact that perceived cultural distance influences managerial decisions to enter certain foreign markets based on the national cultures, cultural distance as itself influences the knowledge transfer process. This because the transfer of technology, as the organization of tangible and intangible knowledge, is impeded by cultural attributes, due to the impact of communication barriers (Bhagat et al., 2002). The five cultural dimensions of Hofstede are used to argue how they influence the knowledge transfer to foreign countries.

Individualism/Collectivism influencing knowledge transfer

As cited by Bhagat et al. (2002), when it comes to receiving and transferring knowledge, individualists look for information in its contextual form, and they emphasize the significance of information in written and codified form and are more likely to accept such information (Kagitcibasi, 1997; Triandis, 1990, 1995, 1998). People in collectivist cultures are less likely than individualists to emphasize the significance of information that is written and codified and are more likely than individualists to disregard such information. Individualistic cultures are more likely than collectivistic cultures to run the risk of a "not-invented-here" syndrome because knowledge and ideas that are developed in a different context will be valued less due to the emphasis on individual initiative and personal achievement. Collectivistic cultures need face-to-face contact because people depend on context more than do individualists who are quite satisfied with written communications.

Table 2.4 on the next page illustrates the relative emphases of the three dimensions of knowledge in individualist and collectivist societies. As cited by Bhagat et al. (2002) table 2.4 shows that while people in individualistic and collectivistic cultures do not differ in terms of their preferences for handling either simple or complex types of knowledge, people in individualistic cultures emphasize explicit knowledge, whereas those in collectivistic cultures emphasize tacit information and knowledge. People in individualistic cultures prefer knowledge independent of its context, whereas those in collectivistic cultures prefer systemic or contextually relevant knowledge.

Table 2.4 *Relative emphasis of different facets of knowledge (Bhagat et al. (2002)*

Dimensions of knowledge	Individualist cultures	Collectivist cultures
Simple versus Complex	No distinct preferences for either handling simple or complex knowledge	
Tacit versus Explicit	Explicit	Tacit
Independent versus systemic	Independent	Systemic

Power distance influencing knowledge transfer

Bhagat et al. (2002) stated that when the dimension of power distance is superimposed upon the more fundamental dimension of individualism-collectivism, one gets a better sense of how information and knowledge may be selectively transferred and processed by members of societies that differ along these dimensions. This can be explained as communication flows differently when the society is vertical (primarily from the top to the bottom) than when it is horizontal (communication flows both ways-from top to bottom and from bottom to top). When transferring knowledge between nations with a differing power distance dimension, knowledge rejection could emerge. Knowledge rejection reflects the tendency to selectively ignore information that might cause important structural as well as programmatic changes in the recipient organization, due to the fear of violating the rules of the hierarchy (Bhagat & Kedia, 1988).

Uncertainty avoidance influencing knowledge transfer

Uncertainty avoidance refers to the degree to which people in the culture prefer structured over unstructured situations. In other words, do people feel threatened by ambiguous situations and have they created beliefs and institutions that try to avoid these? According to Pauleen (2007) this feeling is expressed through nervous stress, and avoidance or even punishment of risk-taking and the need for security, predictability, and written and unwritten rules. Uncertainty avoiding cultures are expected to have more institutionalized rules for transferring knowledge compared to uncertainty embracing cultures because explicit rules have to be created to maintain security and predictability. An associated aspect is the tendency of organizations to focus on explicit instead of tacit knowledge in the knowledge transfer routines.

Masculinity/femininity influencing knowledge transfer

Dominant values in societies characterized by femininity are caring for others and the quality of life. In these countries, great importance is placed on a friendly atmosphere, consensus and cooperation through interpersonal and interdependent relationships. In masculine cultures, the willingness to transfer knowledge is more frequently equated with status, promotion and power than in feminine cultures (Hinds & Pfeffer, 2003, as cited by Pauleen, 2007). An intolerance for mistakes and need for help will discourage the transfer of knowledge throughout the organization. Feminine cultures are more likely to view knowledge transfer as a people-to-people process and value cooperation through interpersonal relationships than masculine cultures, because masculine cultures have a greater tendency to lack personal ties.

Long-term orientation influencing knowledge transfer

This dimension reflects the extent to which people's reference time frame is focused on achieving either long-term goals or the more immediate short-term goals. Pauleen (2007) described that countries with a long-term orientation adhere to the values of long-term commitment and respect for tradition, thereby supporting a strong work ethic where today's work will result in long-term rewards. On the other hand, countries that have a short-term orientation do not embrace long-term devotion to forward thinking values. As a result, commitment will not form a barrier to change, thereby increasing the speed of change. Transferring knowledge requires effort and time for documenting expertise and for being involved in social interactions. According to Pauleen (2007) organizations in long-term

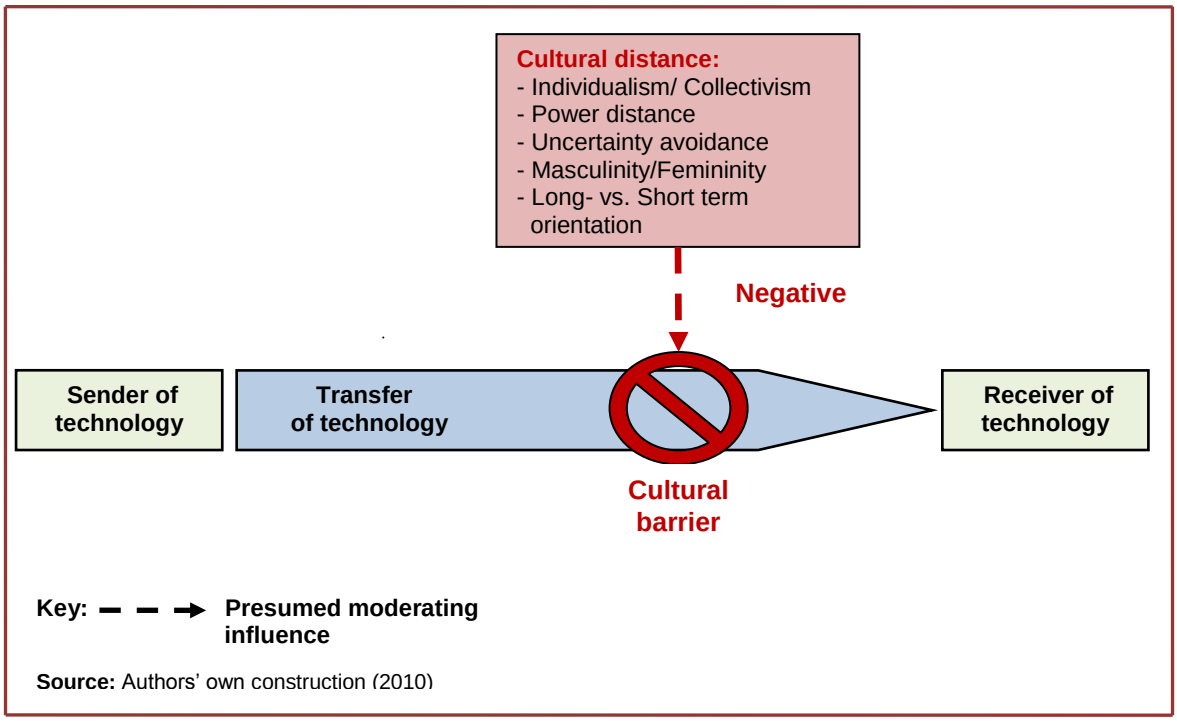
oriented cultures are expected to provide more time and meeting places for documenting expertise and being involved in social interactions than short-time oriented cultures since the advantages of knowledge management are acknowledged by their emphasis on thinking ahead. Long-term cultures are also more likely to recognize the future value of new knowledge, thereby assisting the absorption of knowledge.

2.8 Research framework

To comprehend the impact that cultural distance has on cross-border transfer of technology, the purpose of this thesis is to examine how perceived cultural distance is managed by a Dutch commercial organization, seeking to transfer technology to five African countries, through the purposeful use of communication. The preceding literature study is used to develop the research framework which combines aspects of technology transfer and perceived cultural distance to conduct a case study. The aim is to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can Soil & More address these barriers?*

The framework presented in figure 2.8 shows how cultural distance affect cross-border related technology transfer. When a certain company wants to sell or commercialize its technology, the technology has to be transferred to new business partners in exchange for royalty payments. The technology transfer process is obstructed by a cultural barrier. This barrier arises in the technology transfer process, due to "cultural distance". This means that the differences between the cultural patterns of the societies in which the organizations are located, exert strong negative moderating influences. These cultural differences can be found along the five cultural dimensions of Hofstede, which greatly influence the way different cultures communicate.

Figure 2.8 A model of technology transfer in a cross-border context



Source: Authors' own construction (2010)

Chapter 3 Methodology

This section describes the research approach. It explains and describes how to carry out the research and what research methods are used. The researcher has to keep the following question in mind: Where to find the information? What or whom would help me explain the main problem? How to prevent biased opinions and make independent comparisons?

3.1 Research purpose and approach

The aim is to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can Soil & More address these barriers?* The five African countries selected for this research are: Botswana, Ethiopia, Mauritius, Mozambique and Tanzania. The nature of this research project is qualitative, since a broader and deeper understanding of cultural distance influencing technology transfer is needed. This means that the problem of culture affecting technology transfer is solved using existing tools and instruments from different research fields. Since the aim of this research is to study perceived cultural distance which is highly based on the interview respondents' attitudes and perceptions, it is easier to demonstrate the findings in both qualitative and quantitative data to strengthen the derived conclusions.

3.2 Case description format

Since the aim is to examine how perceived cultural distance is managed by a Dutch commercial organization, an in-depth case study was found to be the best suitable research strategy. Eriksson & Wiedersheim-Paul (2001) point out that a case study involves investigating one entity but many variables in order to get an in-depth picture. The case study method is useful when the purpose is to study a certain process and to identify the factors which influence this particular process (Bell, 2000). Robson (2002) defines "case study" as a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context. This strategy requires the researcher to triangulate multiple sources of data. According to Saunders et al. (2003), triangulation refers to the use of different data collection techniques within one study in order to ensure that the data are telling you what you think they are telling you. The data that were used in this research are: articles, internet and interviews with individuals of the case company and independent organization.

The most trustworthy conclusions can be derived from double-blind randomized controlled trials with a representative sample. The weakest findings are those from case-studies (Hopkins, 1998a). Taking a good sample is an important issue. Results can only be generalized when the sample is selected randomly with a low proportion of dropouts. In case of Soil & More, which has 7 employees, the results can't be generalized to other companies but it does give a good view of how cultural difference influence the transfer of Soil & More technology. The results can therefore be seen as a basis for further research at other companies.

3.3 Data collection tactics

In this research, both primary and secondary data were collected. The secondary data for this case study has been collected from the Internet, articles and documentation from the case company. These secondary data were used to get a good understanding of both the research problem and the case company. According to Davidson & Patel (2003), qualitative verbal analysis is often used to gain better understanding of the research problem. Therefore, the primary data for this research are collected through personal interviews with the seven selected employees of the case company and the control group. All

the information gathered from the primary and secondary data was used to give an answer to the main research problem. Recommendations will be given with regard to how Soil & More can prevent possible problems and how the company can efficiently manage the transfer process of technology to new partners located in differing cultural and geographical settings.

The seven selected employees of Soil & More have different functional levels thereby increasing the validity of the research. However, interviewing only people from Soil & More might lead to bias in the results, because employees and managers at Soil & More might view cultural differences, after many years of experience, as a smaller problem during technology transfer than other people might. In order to prevent bias, the data of Soil & More has to be compared with data given by an non-commercial independent (control) group.

The control group is represented by country specialists of the NL EVD International (formally known as the EVD or in Dutch "Economische Voorlichtingsdienst"). In foreign countries this agency is known as the Agency for International Business and Cooperation and is a partner to businesses and public-sector organizations. They aim to help Dutch entrepreneurs to achieve success in their international operations, by providing information about foreign markets, cultural differences, governments, rules and laws, trade and industry. The control group is independent, non-commercial and the country specialists have sufficient experience with cultural differences in each of the five selected African countries. Because Soil & More already has licensing agreements in five other countries (Brazil, Egypt, India, Mexico and South-Africa), three other country specialists from the NL EVD International are selected, who have one of the five other countries in their portfolio. Selecting country specialists with different expertise levels, and experience with other non-African cultures increases the validity of the research. The interview guide, which was used for the case company and the control group, can be found in appendix III on page 50.

3.4 Data analysis method

The interviews with the management and employees are the most important source of information from the case company. Although seven interviews held with the employees of Soil & More is a very small sample and the conclusions not able to be generalized, they can still provide good insight about experiences and possible difficulties with technology transfer. The results will be compared with scores given by an independent control group represented by six country specialists of the NL EVD International. This is done in order to prevent bias in the results given by the case company. The comparison also provides information about possible relationships between the three variables age, experience and gender and the perception of the influence of each cultural dimension on technology transfer. The aim is to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can Soil & More address these barriers?*

The gathered data are examined by the researcher to see if the data show any possible relationships with the three selected variables. The relationships might give an answer whether the perception on the influence of each cultural dimension is age, experience or gender related. The strength of relationships between two variables can also be calculated with a correlation coefficient. The Pearson correlation coefficient is the main correlation function in Office Excel and often used to find either negatively or positively linear correlations between variables. However, for instance: (1) data don't have to be distributed normally, (2) don't have to be linear, although a very obvious relationship between the variables can be observed. It could also be the case that one outlier is strong enough to either lower or strengthen the correlation, which influences the relationship between the variables and therefore the conclusions someone is making. Another point of interest is that the correlation coefficient can indicate the strength of a linear relationship between two variables, but its value generally does not completely characterize their relationship. Establishing a correlation between two variables is not a sufficient condition to establish a

causal relationship (in either direction). Causes underlying the correlation may be indirect or unknown. In the end, the correlation coefficient can't replace the individual examination of the data. The data and possible relations in this research are very suitable to be presented in the form of a case description, which will be done in chapter 4.

3.5 Validity

Validity represents what should have been investigated is investigated. Internal validity concerns to whether the researcher has captured the phenomena to study or something else (Merriam, 1994). External validity concerns to the extent the achieved result is valid outside the experimental situation (Bryman, 1997). To improve the internal validity, seven employees of Soil & More with different functional levels where selected for this study. The results where compared with the findings from a independent control group represented by country specialist of the NL EVD International, to conform any insights within Soil & More. External validity is difficult in single case studies. The aim of this research is not to make any generalizations, but to get a deeper insight in the effect of perceived cultural distance on technology transfer to Africa and add empirical data to existing literature.

Chapter 4 Findings from case study

This chapter presents the empirical data gathered from the structured interviews held with the case company and the independent control group, and an analysis of the national cultures of the selected five African countries and technology at the case company are given.

4.1 National cultures the Netherlands and African countries

Cultural distance is the difference in values and beliefs shared between home and host countries. Since the aim is to get a deeper understanding of cultural distance and its impact on technology transfer to the five African countries, the cultural dimensions of these five countries are examined. For this paragraph Mr. Mansour and Ms. Bouman of the NL EVD International were interviewed to provide more information about the five African countries selected for this research. Scores for each cultural dimension for The Netherlands, Ethiopia and Tanzania can be found in appendix I.

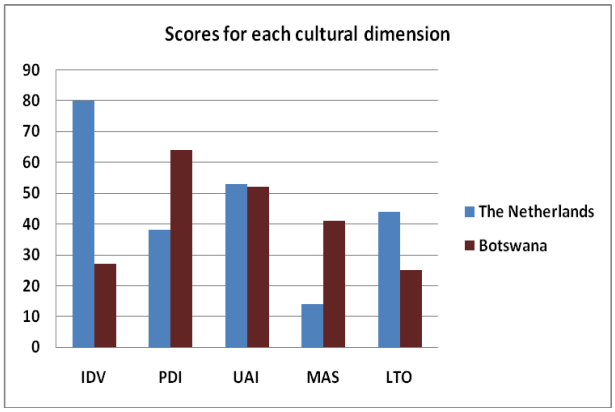
National culture the Netherlands
Hofstede (1980) reported that the Netherlands had a score of 80 on individualism, which is ranked the fourth highest individualism score in the world. The high individualism score indicates that the Netherlands is a society that has loose interpersonal relationship and more individualistic attitudes. Individuals in the Dutch culture are more self-reliant and look out for themselves and close family members. Privacy is considered as cultural norm, and individual pride and mutual respect is highly evaluated and appreciated. The list in appendix I also shows that the Netherlands had a score of 38 on power distance. The relatively low score indicates that the Dutch people emphasize equality of power and wealth, decentralization of decision making process, and close relationship between subordinates and supervisors. The Netherlands had a 53 on uncertainty avoidance, compared to 64 as a world average. A moderate UAI score may indicate a cultural tenancy to minimize or reduce the level of uncertainty by enacting rules and regulations. A low score of 14 was observed on the masculinity dimension, which indicates a low level of differentiation and discrimination between genders. The Netherlands also had an average score on long-term orientation, which indicates individuals tend to concern more about long-term benefits, both financially and psychologically.

National culture of the five African countries
African culture is collectivist in nature (Dia, 1991). The group has more importance than the individual and group success is more valued than individual success. The majority of Africans, despite their linguistic and cultural differences, live in a society where the key structures are the extended family, clans, villages, or tribes. These structures extend to their deceased ancestors. Each person also belongs to a religious group; atheism is virtually non-existent in Africa (Littrell & Baguma, 2004). Smith, Peterson and Schwartz (2000) found African cultures to depend for guidance upon reliance on superiors and rules, and that these traits are associated with collectivism, hierarchy, power distance and masculinity. Most of the nations of Africa are especially high on these cultural dimensions.

"Ubuntu", which means "humanness" and is unique to Africa, is a multidimensional concept which represents the core values of African ontology; respect for any human being, for human dignity and for human life, obedience, solidarity, caring, interdependence and hospitality (Asente, Miike, Yin, 2007). So despite Africa's cultural diversity, threads of underlying affinity run through the beliefs, customs and practices of various African societies. Ubuntu is the philosophy which reflects the African heritage, traditions and culture.

National culture of Botswana

Figure 4.1 Scores for The Netherlands/ Botswana

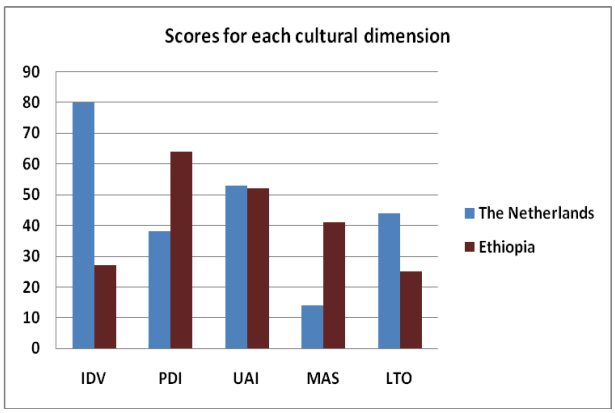


Although there were no figures available for the cultural dimensions of Hofstede (1980) for Botswana, an analysis on the national culture could be made with the help Ms. Bouman of the NL EVD International. The scores for Botswana in figure 4.1 are estimates of the scores based on the interview held with Ms. Bouman. Findings from Harvey, Carter and Mudimu (2000), state that Botswana is culturally similar to Uganda and Zimbabwe and have been distinguished as collectivists (Littrell & Baguma, 2004). This statement is similar to the findings of anthropologist Isaac Schapera (1953; 1967). Based on his work, the culture of Botswana should be expected to be similar to that of the other Bantu peoples of the neighbouring Zambia, which are collectivist. This statement was further strengthened by Ms. Bouman, who also stated that Botswana is culturally quite similar to Zambia and Uganda. She stated that in the Botswana collectivism and both achievement and status consciousness are highly valued. People in Botswana believe everyone should take responsibility for fellow members of their group to maintain a harmonious and close interdependence. However, a high level of inequality of wealth and power is accepted, indicating that Botswana scores high on power distance. According to Ms. Bouman, Bostwana falls in the group "East Africa" described by Hofstede, which includes Ethiopia, Tanzania, Kenya and Zambia. As can be seen in appendix 1 and figure 4.1, East Africa had a score of 27 on individualism and a high score of 64 on power distance.

Providing more evidence of high power distance, Ms. Bouman told that leaders are seen to possess genuine authority ("teacher") but are expected by their subordinates to use it only sparingly and in a humane and considerate way. The mentioned statements are supported by an empirical study conducted in Botswana by Jones et al. (1995), in which public sector managers reported that they perceive effective leaders primarily as those who provide clear direction and targets, accompanied by a paternal and supportive management style. Botswana had an approximate score of 50 on uncertainty avoidance (figure 4.1). Such countries have a high need for security, concern for doing things correctly and great respect for experts. Long career commitment and organizational structure are also highly valued. Botswana scores below average on masculinity, which means they embrace feminine values such as looking after one another, and being polite and modest in behavior. A low score was observed on the long-term dimension, which indicates that people in Botswana tend to pursue instant benefits and satisfaction and are conventional and traditional.

National culture of Ethiopia

Figure 4.2 Scores for The Netherlands/ Ethiopia



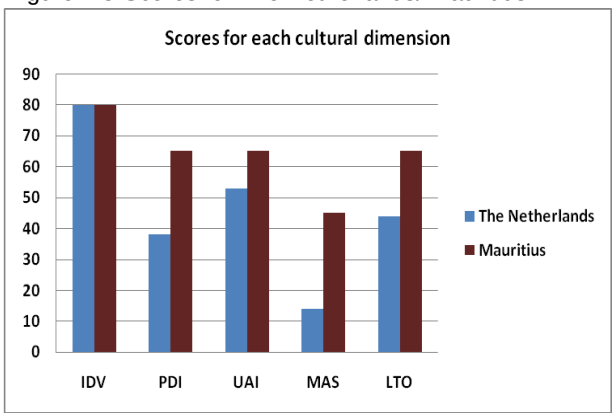
Hofstede (1980) made an analyses for East Africa, which includes Ethiopia, Tanzania, Kenya and Zambia. The scores for Ethiopia on each cultural dimension are presented in figure 4.2. Figure 4.2 shows that Ethiopia had a score of 27 on individualism. This low individualism score implies that the value of collectivist and loyalty is tightly held. Individuals in Ethiopia culture tend to look after members of a group, family, extended family or organizations, and at the same

time everyone takes responsibilities for one's fellow members in the group. Collectivistic societies believe everyone should take responsibility for fellow members of their group to maintain a harmonious interdependence, and the interpersonal relationships are collective and close. In Ethiopia, one's identity is based on group membership and collective views are considered better than individual opinion. Similarly, in Ethiopia membership of group protects individuals in exchange for their loyalty to the group (Kamoche & Debrah, 2004). Figure 4.2 shows that Ethiopia had a high score of 64 on power distance. This high score of power distance for Ethiopia shows a high level of inequality of power and wealth within the society, and also a high level of centralization of decision making. It is acceptable that Ethiopians should be dependent on the privileged and powerful (Kamoche & Debrah, 2004). In this culture, respect to and following orders from the authority (usually the elder) are the cultural norms, a lot of vertical differentiation is demanded to justify and maintain status and image. Due to these aspects, voices from lower hierarchies tend to be ignored.

According to Mr. Mansour of the NL EVD International mutual respect is essential in doing business with Ethiopians. Mr. Mansour told that respect to and following orders from the authority (boss) are the cultural norms, employees dare not to take decisions if the boss is not present. Subordinates expect to be told what to do and the ideal boss is a benevolent autocrat (good farther). Organizational structure and concern for doing this correctly are very important, which is reflected in a high score for uncertainty avoidance as can be seen in figure 4.2. Mr. Mansour also stated that Ethiopian people are also very proud and because of that, addressing them on errors must be done with great care. Putting them on pressure isn't good for a fruitful relationship. Furthermore, Mr. Mansour indicated that Ethiopians are more interested in short term results than the results that are gained in the long term. The term "short-term orientation" is used for this observation, which means that Ethiopians have a greater focus on the present and a more immediate gratification of need, such as spending to support current needs. This was supported by a low score of 25 on the long-term orientation dimension as can be seen in figure 4.2. Ethiopia is also a feminine culture, which means both gender roles overlap.

National culture of Mauritius

Figure 4.3 Scores for The Netherlands/ Mauritius



Although there were no figures available for the cultural dimensions of Hofstede (1980) for Mauritius, an analysis on the national culture could be made with the help Mr. Mansour of the NL EVD International. The scores for Mauritius in figure 4.3 are estimates of the scores based on the interview held with Mr. Mansour. According to Mr. Mansour, it is very interesting to notice that people from Mauritius are very proud of their Island. In the book *"Managing Human Resources in Africa"* written by Kamoche and Debrah (2004), an interesting analysis is presented, written by Ramgutty-Wong (2004), about HRM in Mauritius. According Ramgutty-Wong (2004), Mauritius is poised to serve as an example of economic success amidst cultural diversity and structural constraints of size and geographical isolation.

With a population of 1.2 million and a history related to the slave era and subsequently to the wave of Indian immigration, Mauritius is not only densely populated but also has a variety of different cultures, which are unequally represented. The main ethnic divisions are Hindus and Muslims, which account for 65% of the population (respectively 48% and 17%), followed by Creole (30%), Sino-Mauritians (3%) and Franco-Mauritians (2%) (Ramgutty-Wong, 2004). Mr. Mansour stated that although the figures indicate that the majority of the population is

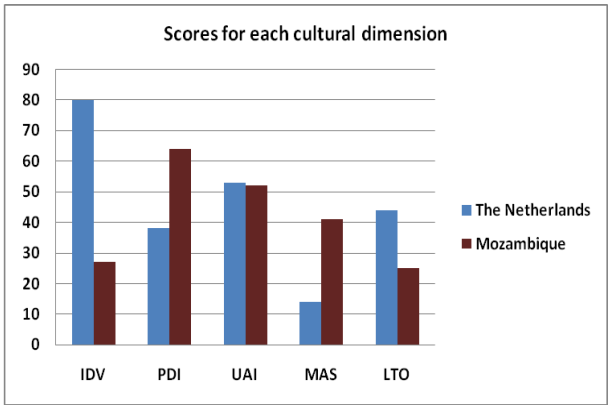
Indo-Mauritian, many other cultures have blended, with most individuals likely having at least two cultural backgrounds.

Ramgutty-Wong (2004) made use of a study on two samples of university students, to define the Mauritian national culture. The study revealed that the country is moderately high on power distance and high on individualism. This could be explained by the disparate psyches of the different ethnic groups present on the island, but also by a strong element of common experience of slavery in its various forms. High power distance is therefore to be expected in a former colony with only a recent history of independence, where status consciousness is probably near the world record, resulting today in an evident achievement culture.

Mr. Mansour indicated that unlike many developing countries, Mauritius scores low on collectivism, which possibly correlates with the noted achievement orientation, but high on power distance due to a high status and achievement culture. He stated that Mauritius scores high on uncertainty avoidance, because the population is still conditioned by the French and British bureaucratic system, and so finds reassurance in structure, rules, standardization and stability. Mauritius scores medium on masculinity and high on long-term orientation. A medium score on masculinity indicates Mauritius scores higher than the other four African countries and tend to embrace masculine values like earnings, recognition, status and material success. Mauritius scores high on long-term orientation. A high score on long-term orientation indicates individuals tend to concern more about long-term benefits, both financially and psychologically and value long-term commitment towards organizations and career. According to Eriksen (1997), Although a vast number of people originating from different continents, Mauritian culture can actually be described as quite uniform in the sense that they share basic values, that there is considerable linguistic uniformity and recruitment to the labour market is increasingly based on individual skills (Eriksen, 1997).

National culture of Mozambique

Figure 4.4 Scores for The Netherlands/ Mozambique

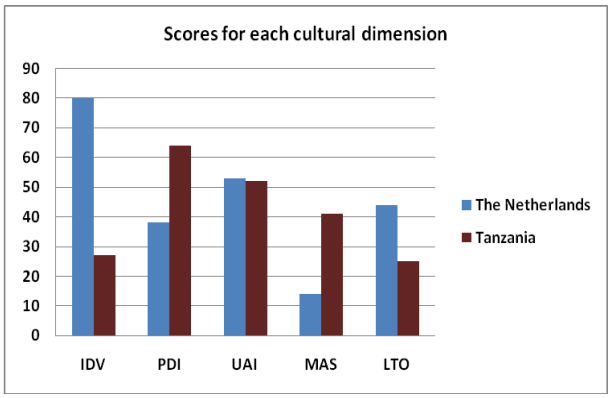


Although there were no figures available for the cultural dimensions of Hofstede (1980) for Mozambique, an analysis on the national culture could be made with the help of Ms. Bouman of the NL EVD International. The scores for Mozambique in figure 4.4 are estimates of the scores based on the interview held with Ms. Bouman. According to Ms. Bouman, the Mozambique culture is focused on relationships rather than being task oriented like Dutch culture. She stated that in the Mozambique community interaction, collectivism and status consciousness are strongly valued. Collectivistic societies, like the Mozambique society, believe everyone should take responsibility for fellow members of their group to maintain a harmonious interdependence, and the interpersonal relationships are collective and close. However, a high level of inequality of wealth and power is accepted. Referring back to the term "Ubuntu", she indicated that this philosophy is also present in Mozambique. It is the collective consciousness of the people of Mozambique. According to Ms. Bouman, it involves being sympathetic, caring, sensitive to the needs of others, being respectful, patient and kind. Mozambique is a feminine culture, meaning that they have a greater ambiguity in what is expected of each gender. Both men and women are equally concerned with the quality of life. Like Botswana and Ethiopia, Mozambique scored relatively low on long-term orientation, which means individuals tend to focus on instant benefits and satisfaction.

Using the so-called mental image, Mozambique could perhaps be characterized by the 'pyramidal organization', built on loyalty, hierarchy and implicit order and found in societies that score high on power distance and medium on uncertainty avoidance (Kouwenhoven, 2003). This high score of power distance for Mozambique shows a high level of inequality of power and wealth within the society, and also a high level of centralization of decision making (Kouwenhoven, 2003).

National culture of Tanzania

Figure 4.5 Scores for The Netherlands/ Tanzania



Hofstede (1980) made an analyses for East Africa, which includes Ethiopia, Tanzania, Kenya and Zambia. The scores for Tanzania on each cultural dimension are presented in figure 4.5. Figure 4.5 shows that Tanzania had a score of 27 on individualism. This low individualism score implies that the value of collectivist and loyalty is tightly held. Individuals in Tanzania culture tend to look after members of a group, family, extended family or organizations, and at the same time everyone takes responsibilities for one's fellow members in the group. Collectivism societies believe everyone should take responsibility for fellow members of their group to maintain a harmonious interdependence, and the interpersonal relationships are collective and close. Tanzania had a high score of 64 on power distance as can be seen in figure 4.5. This high score of power distance for Tanzania shows a high level of inequality of power and wealth within the society, and also a high level of centralization of decision making. In this culture, respect to and following orders from the authority (usually the elder) are the cultural norms, and voice from lower hierarchies tends to be ignored. Employees in countries that rank high on power distance, such as Tanzania, are more likely to prefer an autocratic leadership style and some paternalism because they are more comfortable with a clear distinction between managers and subordinates rather than with a blurring of decision-making responsibility (Bangert, Dokter and Valdez, 2005). Tanzania scored on average on uncertainty avoidance. According to Bangert et al., 2005), this creates a rule-oriented society that institutes laws, rules, regulations and controls in order to reduce the amount of uncertainty. Such countries have a high need for security, concern for doing things correctly and great respect for experts. As can be seen in figure 4.5, Tanzania scores below average on the cultural dimension of masculinity. This low score means they embrace feminine values such as looking after one another, and being polite and modest in behavior.

According to Mr. Mansour there are a lot of clans in Tanzania, which results in a real "clan-culture". Individuals in Tanzania culture tend to look after members of a group, family, extended family or organizations. There is a considerable dependence of subordinates on bosses, and a preference for clearly demarcated hierarchy. He stated that a person in a high-level position treats those at lower levels with dignity, but the differences in rank are always clear. According to Mr. Mansour, delegating decision making implies incompetence because the rank of a high-status person requires him to make decisions himself. The emotional distance between hierarchies will tend to be relatively large. That means that subordinates will rarely approach and contradict their bosses. He stated that people in such a culture tend to accept the power and authority of their superiors simply on the basis of the superior's position in the hierarchy and to respect the superior's right to that power.

Conclusion

Table 4.1 on the next page shows how each country scores on the five cultural dimensions. The blue colour indicates that the cultural dimension of a certain country is comparable to the

Netherlands. The Netherlands had a high score on individualism, while it scored very low on power distance. In sharp contrast, Botswana, Ethiopia, Mozambique and Tanzania scored low on individualism but very high on power distance. Mauritius, which has more Western cultural influences than the other four African countries, has both high scores on power distance and individualism. All counties except Mauritius had a comparable score on uncertainty avoidance and masculinity, which indicates these countries are rule-oriented and embrace feminine values. Botswana, Ethiopia, Mozambique and Tanzania all scored low on long term orientation, while Mauritius scored high. Mauritius had just one dimension with a comparable score, while the other four countries had two dimensions with a comparable score to the Netherlands. Finally, an interesting thing to notice is that Botswana, Ethiopia, Mozambique and Tanzania all have comparable scores on each of the five cultural dimensions, and comparable results with the study of Kouwenhoven (2003): IDV: *low*, PDI: *high*, UAI: *medium*, MAS: *low*, LTO: *low*.

Table 4.1: Results on the five cultural dimensions for the Netherlands and the five African countries

Country	IDV	PDI	UAI	MAS	LTO
The Netherlands	*High*	*Low*	*Medium*	*Low*	*Medium*
Botswana	Low	High	*Medium*	*Low*	Low
Ethiopia	Low	High	*Medium*	*Low*	Low
Mauritius	*High*	High	High	Medium	High
Mozambique	Low	High	*Medium*	*Low*	Low
Tanzania	Low	High	*Medium*	*Low*	Low

4.2 Soil & More: current practices and processes

Since knowledge transfer is complex, an understanding of this process is not only increasingly crucial for the success of the company, but also critical for transferring any organizational knowledge across national and cultural boundaries (Javidan et al., 2005). Knowledge transfer is essential for the performance of technology transfer, in the sense that it has to occur simultaneous to technology transfer. This implies that it is of importance to examine the different types of knowledge and technology at Soil & More in order to select possible barriers that can occur during the transfer of technology to one of the selected African countries. These dimensions of knowledge are very important because the position of knowledge along each of the three dimensions, as described earlier on page 11, affects the amount of information required to describe it and the amount of effort needed to transfer it (Bhagat et al., 2002). In the same sense, the complexity of technology is reflected in the different types of technology, which in turn can influence the transfer process of technology, as described earlier on page 9.

Technology to be implemented

(1) Windrow-turning machinery and chippers

Windrow composting is a simple and versatile method where organic matter is built into large piles. Open windrow piles have to be aerated, which means that the piles have to be turned by a machine to replenish the oxygen supply. Reducing the size of organic waste, helps to speed up the decomposing process, which is done by chipping machines. Both the chippers and windrow-turning machinery are *product-embodied technologies*.

(2) TopTex cover

Not all compost is produced in open windrow piles. In some cases, the composting piles are lined up and are covered with a TopTex cover, which is made of a highly robust, ultraviolet resistant and permeable (breathable) fabric. Being waterproof and windproof, TopTex reduces the effect of the elements, regulates the temperature, helps to hold the needed moisture in the pile and keeps the odor of decaying organic material locked inside. This TopTex system is a *product-embodied technology*.

(3) Biodynamic compost Inoculant

A specially developed inoculant is added to the composting piles, which are provided by Soil & More. This is a "compost enzymatic activator", which contains cultured bacteria, fungi and enzyme strains, designed to speed the composting process of organic waste material and significantly improve the quality of the finished compost. This biodynamic compost inoculant is a *product-embodied technology*.

(4) Compost measure equipment

The compost piles have to be monitored continuously during the composting process. Temperature must be monitored using approved temperature monitoring devices. CO_2 as well as the O_2 levels in de compost piles must be monitored using an approved CO_2 and O_2 monitoring device. These measurement equipment are *product-embodied technology*.

(5) Monitoring and management system

The advanced windrow monitoring and management system reduces the number of turns required to less than half of the number needed using other composting methodologies. This saves time and fuel, and almost doubles the capacity of the compost turner and tractors. The online management system allows an easy to use, web-based solution to continuously monitor and audit the composting process and product quality. It is *process-embodied* because it is connected with Soil & More in the Netherlands and it involves a continuous monitor system.

(6) Composting process itself

All types of technology mentioned above are parts of the total composting process, which is the art, technique and ability to produce high-quality compost that is free of any weeds or contaminations, has the right components with the right size and complies with all standards that are set by Soil & More. Because the composting process is a very complex process and needs a lot of experience to master, especially with the help of specialists, the technology can be defined as both *person-embodied* as well as *process-embodied*.

Knowledge needed to implement technology

Providing training and support to the local partners and employees is needed to ensure that the quality of the compost is of the highest standard, that they take the right measurements, apply the inoculants properly and that the composting process itself is done in the right way. Currently, knowledge about the Soil & More technology is transferred through a more applicative training of local employees. They are taught how they should use the windrow-retuning machinery, measurement equipment and the inoculants.

The following types of knowledge needed for technology transfer are described from a training perspective, therefore transferable knowledge is made tacit (personal training). However, several types of knowledge can also be transferred in a explicit way if a culture prefers this type of knowledge transfer. Knowledge that can also be made explicit are indicated with "(explicit)".

(1) Windrow-turning machinery and chippers

Using machinery such as windrow-turners and chippers requires training, especially the windrow-turner, in order to safely and efficiently aerate the windrow piles. Knowledge to operate a windrow-turner and chipper is simple. Because the company producing the windrow-turners and chippers provide training to use the equipment, the knowledge can be defined as tacit. (explicit if knowledge provided by manuals).
Knowledge: *simple – tacit (explicit) – independent*.

(2) TopTex cover

Because the technology behind the TopTex cover is quite sophisticated, using the TopTex covers requires some training. The cover can be removed and placed on the piles by hand or

with a mobile winder. Both operating this mobile winder as placing the cover by hand are easy, defining it as simple knowledge. The knowledge can also be defined as tacit and independent because personal training has to ensure that the cover is used in the right way. (explicit if knowledge provided by manuals).
Knowledge: *simple – tacit (explicit) – independent*.

(3) Biodynamic Compost Inoculant
Inoculants are simple to use but it needs practice and training. The amount of input material has to be calculated in order to apply the right amount of inoculant to the compost piles. Because the knowledge of applying Inoculants is not embedded within an organization, the knowledge can be defined as independent. (explicit if knowledge provided by manuals).
Knowledge: *simple – tacit (explicit) – independent*.

(4) Compost measurement equipment
Test instruments are needed to monitor the composting process. Both temperature, CO_2 and O_2 levels have to be monitored every day during the entire composting process. Wrong measurements during the process can result in entire windrow piles to be disqualified as Soil & More certified compost. Taking measurements is of great importance. The knowledge to correctly use the instruments can be seen simple and tacit in the case when every step is thoroughly explained by a specialist. (explicit if knowledge provided by manuals).
Knowledge: *simple – tacit (explicit) – independent*.

(5) Monitoring and management system
The advanced windrow monitoring and management system reduces the number of turns required to less than half of the number needed using other composting methodologies. This saves time and fuel, and almost doubles the capacity of the compost turner and tractors. The online management system allows an easy to use, web-based solution to continuously monitor and audit the composting process and product quality. The knowledge can be seen as simple, explicit and independent because the system come with personal training for correct use and the knowledge can be described by itself. (explicit if knowledge provided by manuals). Knowledge: *simple – tacit (explicit) – independent*.

(6) Composting process itself
The composting process itself is complex and takes training and support in order deliver compost that is of a high-quality standard throughout the year. Support has to be given in the first stage to explain what selection criteria are important in the selection of a good composting site, what sources of input materials can be used, how the input materials have to be handled, how to monitor the composting process and how to eventually distribute the compost. Making the right mix of input materials is also a complex knowledge, which requires extra support, because not every combination of input materials produces the compost that meets the quality standards. Especially in the first stage of start-up, this knowledge is highly personal and difficult to formalize. Purely relying on sending formalized documents might cause flaws and low quality. The whole composting process itself is a sort-of systemic knowledge, because a lot of elements are involved in the transfer process that are embedded in the transferring organization. Knowledge: *complex – tacit – systemic*.

Four out of six selected technologies that have to be transferred are so-called product-embodied technologies, and are relatively easy to be transferred. The monitoring and management system is a process-embodied technology, while the composting process itself is a combination of a process- and person-embodied technology. Both process- and person-embodied technologies are harder to transfer because more specific knowledge has to be transferred. The table is presented in appendix II.

Connecting knowledge dimensions and cultural emphasis

If the table from appendix II is combined with table 2.4 on page 16 (*Relative emphasis of different facets of knowledge)*, table 4.2 below shows the transfer process of technology to the five selected countries. Botswana, Ethiopia, Mozambique and Tanzania will in this paragraph be further referred to as "Botswana". The knowledge about the first five technologies is relatively easy to implement in Botswana, because the knowledge is tacit and to a larger extent simple to understand. Mauritius emphasizes explicit knowledge above tacit knowledge. The first five technologies can be made explicit by providing manuals and instructions. The last technology is harder to transfer to both Botswana and Mauritius because the knowledge is complex, tacit and systemic. Especially the complexity makes the transfer harder than for the other five technologies. However, transferring it to Botswana might pose lesser problems because the knowledge is both tacit and systemic, which is emphasized by Botswana people. Mauritius, which is a low-context cultures, prefers explicit (written) and independent knowledge, therefore the transfer of the last technology can pose some problems.

Table 4.2: Dimensions of knowledge at Soil & More and effects of transfer to the selected countries.

Technology	Knowledge dimension to use technology			Transfer process
	Simple/ Complex	Explicit/Tacit	Systemic/ Independent	
(1)	Simple	Tacit (Explicit)	Independent	Relatively easy to transfer to Botswana. Relatively easy to Mauritius if knowledge made explicit.
(2)	Simple	Tacit (Explicit)	Independent	Relatively easy to transfer to Botswana. Relatively easy to Mauritius if knowledge made explicit.
(3)	Simple	Tacit (Explicit)	Independent	Relatively easy to transfer to Botswana. Relatively easy to Mauritius if knowledge made explicit.
(4)	Simple	Tacit (Explicit)	Independent	Relatively easy to transfer to Botswana. Relatively easy to Mauritius if knowledge made explicit.
(5)	Simple	Tacit (Explicit)	Independent	Relatively easy to transfer to Botswana Relatively easy to Mauritius if knowledge made explicit.
(6)	Complex	Tacit	Systemic	Harder to transfer to both Mauritius and Botswana.

Conclusion

The knowledge about the first five technologies is relatively easy to implement in Botswana, Ethiopia, Mozambique and Tanzania. Mauritius emphasizes explicit knowledge above tacit knowledge, which has to be reflected in the transfer process. The first five technologies can be made explicit by providing manuals and instructions, thereby improving the transfer process to Mauritius which is also relatively easy due to the simplicity of the knowledge. The last technology is harder to transfer to all five countries because the knowledge is complex, tacit and systemic. Especially the complexity makes the transfer harder than for the other five technologies.

4.3 Soil & More

4.3.1 Case description

Soils in many developing countries have become depleted due to extensive use of ammonium-based fertilizers. Farmers face decreasing yield which they try to compensate by using even more intensive farming methods. Soil & More International B.V. holds a key to tackle this vicious cycle. Soil & More International B.V., founded in 2007, developed a more advanced Controlled Microbial Composting (CMC) technology that not only produces high-quality compost in less than half of the time needed in other composting methods, but also

helps to avoid methane emissions. The CMC technology is UNFCCC[1] approved. Soil & More is the first company in the world that has developed a technology that generates verified carbon credits from organic composting. The amount of carbon emissions (CO_2) reduced/avoided at production facilities of Soil & More can be sold as carbon credits, generating an extra income stream for the compost producer (Soil & More, 2009). This advanced technology not only helps to tackle the problem of soil depletion but also reduces methane emissions that are harmful to the environment.

Soil & More International B.V. wants to commercialize its technology through licensing the technology to local partners. This enables Soil & More to generate revenue from its innovation and expand its network quickly without having to spend huge amounts of money on direct investments in the selected countries. Currently (January 2010) Soil & More has licensing agreements in Brazil, India, Egypt, Mexico and South-Africa, while further negotiations are made with potential parties in several other countries.

4.3.2 Gathered data

The interview guide, which was used for the case company and the control group, can be found in appendix III on page 50. Results on each of the three variables can be found in table 4.3. These results will be used to see whether age, gender or experience are related to the perceived influence of each cultural dimension on technology transfer.

Table 4.3: Overview scores Soil & More

Interviewee	Age	Gender	Years of foreign business exp.
Mr. Van den Bos	40-49	M	12
Mr. Bandel	30-39	M	8
Ms. Bogatzki	20-29	F	6
Mr. Baars	50-59	M	16
Ms. Sikirica	20-29	F	2
Ms. Luske	20-29	F	2
Mr. Van der Kamp	20-29	M	3

During the interview, the employees of Soil & More were asked which of the five cultural dimensions might influence technology transfer the most. They were all familiar with the cultural dimensions of Hofstede and where asked, using a 5-point Likert scale, how they would rate the importance of each cultural dimension based on their experience. The following question was asked for each dimension: "……has a strong influence on the transfer process of technology from the Netherlands to foreign countries". 1 stands for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, while 5 stands for strongly agree. The results given by each interviewee at Soil & More on the perceived influence of the five cultural dimension can be found in table 4.4. The data in table 4.4 will be further analyzed in the next paragraph.

Table 4.4: Results on the scores for the cultural dimensions, Soil & More

Interviewee	Individualism	Power distance	Uncertainty avoidance	Masculinity	Long term-orientation
Mr. Van den Bos	5	5	4	3	5
Mr. Bandel	4	5	4	3	4
Ms. Bogatzki	4	4	4	3	4
Mr. Baars	4	5	3	2	5
Ms. Sikirica	3	4	4	4	4
Ms. Luske	3	4	4	4	4
Mr. Van der Kamp	4	3	4	3	4
Total average score	***(3,9)***	***(4,3)***	***(3,9)***	***(3,1)***	***(4,3)***

[1] (United Nations Framework Convention on Climate Change)

4.3.3 Analysis of the data

The data and possible relationships in this research are very suitable to be presented in the form of a case description. In this paragraph, the scores given by the employees of Soil & More are reviewed. The scores are combined with experiences from the transfer processes in the five countries Soil & More already has a licensing agreement. The scores on the cultural dimensions of the five countries they already have a licensing agreement can be found in appendix I on page 48.

Individualism was given a relatively high score. Brazil, Egypt, India and Mexico al had low scores on individualism, indicating that these countries embrace collectivistic values. According to Mr. Van den Bos, the family and extended family are very important in these countries and people tend to work together more often than in our Western society. In South-Africa, which scores high on individualism, the foremen had to tell several employees the same thing because employees shared their knowledge less than if they would cooperate and work together. Working together improves knowledge sharing and therefore the transfer process.

Power distance had a high score compared to the other dimensions. All five countries had a high score on power distance and this greatly influenced the transfer process. For instance, in Brazil. sending written manuals and guidelines posed some problems because the local foreman selected information from the manuals and guidelines that he thought were important, selectively ignoring specific measuring instructions and thereby obstructing the certification process. Another example is Egypt. According to Mr. Bandel, the technology transfer process in Egypt took a lot of extra time and effort. Mr. Bandel and Mr. Baars had to travel to Egypt for several times during the initial stages of setting-up the composting site and the transfer process of the Soil & More technology. Because the Egypt facility is still medium-sized compared to the facility in South-Africa, all communication is handled by the facility manager. There seems to be no delegation of tasks whatsoever.

Uncertainty avoidance and long-term orientation were also important according to the employees of Soil & More. Brazil, Egypt and Mexico all had high scores on uncertainty avoidance, which was evidenced the time and effort it took to convince the partners in these countries to use the Soil & More technology. However, once convinced of the value of the new technology, the partner assisted the knowledge transfer process by providing more time for social interaction between Mr. Baars and the employees that had to be trained (long-term orientation). Masculinity had a lower score and the employees of Soil & More couldn't mention examples that reflected the influence of masculinity. Even in Mexico, which has a high score on masculinity, this dimension didn't seem to obstruct the transfer process of technology.

The gathered data are examined by the researcher to see if the data show any possible relationships with the three selected variables. The relationships might give an answer whether the perception on the influence of each cultural dimension is age, experience or gender related. If the variables and data from table 4.3 and 4.4 are combined a few possible relationships can be seen. It is interesting to notice that at Soil & More power distance, uncertainty avoidance, masculinity and long term-orientation are to a certain extent related with age and experience. Gender tend to be negatively related with individualism. Men at Soil & More rated individualism either a score of 4 or 5 with a mean of 4,25, while women at Soil & More rated individualism a score of 3 or 4 with a mean of 3,3. This implies that women tend to perceive that individualism is a smaller barrier to technology transfer, while men perceive individualism to be a greater barrier to technology transfer. Gender also tend to be positively related to masculinity. Men at Soil & More rated masculinity either a score of 2 or 3 with a mean of 2,75, while women at Soil & More rated masculinity a score of 3 or 4 with a mean of 3,7. This implies that women tend to perceive masculinity as a greater barrier to technology transfer, while men perceive masculinity to be a smaller barrier to technology

transfer. Both age and experience tend to be positively related with power distance. This implies that when someone is older and more experienced, he observes that power distance becomes a greater barrier to technology transfer. For instance, Mr. Van den Bos, Mr. Bandel and Mr. Baars all have at least 8 years in international experience (with Mr. Baars having 16 years of experience) and all three men perceived power distance to be very influential. On the other hand, Ms. Sikirica, Ms. Luske and Mr. Van der Kamp all have less than 3 years of experience and all perceived power distance to be moderately influential. There tend to be a negative relation between the variables age and experience and masculinity. Mr. Van den Bos, Mr. Bandel, Mr. Baars and Ms. Bogatzki all having at least 6 years of international experience all gave masculinity a score of 2 or 3, while Ms. Sikirica and Ms. Luske gave masculinity a score of 4. These data tend to indicate that the older and more experienced one becomes, the less likely he perceives that masculinity is a barrier to technology transfer. Long term-orientation tend to be positively related with age and experience. Both Mr. Van den Bos and Mr. Baars perceived long term-orientation as very influential to technology transfer, while the other five interviewees perceived long-term orientation as slightly less influential to technology transfer. Therefore the data indicated that the older and more experienced one becomes, the greater he perceives that long term-orientation becomes a barrier to technology transfer.

4.4 NL EVD International

4.4.1 Case description NL EVD International

NL Agency is a department of the Dutch Ministry of Economic Affairs that implements government policy for sustainability, innovation, and international business and cooperation. NL EVD International (formally known as the EVD or in Dutch "Economische Voorlichtingsdienst"), part of NL Agency, is a partner to businesses and public-sector organizations. They aim to help Dutch entrepreneurs to achieve success in their international operations, by providing information about foreign markets, cultural differences, governments, rules and laws, trade and industry. Therefore, the NL EVD International is a very reliable control group in the sense that it is independent, non-commercial and has a lot of expertise on cultural differences and technology transfer.

4.4.2 Gathered data

The interview guide, which was used for the case company and the control group, can be found in appendix III on page 50. Results on each of the three variables can be found in table 4.5. These results will be used to see whether age, gender or experience are related to the perceived influence of each cultural dimension on technology transfer.

Table 4.5: Overview scores of the NL EVD International

Interviewee	Age	Gender	Years of foreign business exp.
Ms. Brussee	30-39	F	5
Mr. Van Delsen	40-50	M	9
Ms. Vriens	20-29	F	4
Mr. Triezenberg	40-49	M	9
Mr. Abader	40-49	M	12
Ms. Bouman	30-39	F	10

During the interview, the country specialists of the NL EVD International were asked which of the five cultural dimensions might influence technology transfer the most. They were all familiar with the cultural dimensions of Hofstede and where asked, using a 5-point Likert scale, how they would rate the importance of each cultural dimension based on their experience. The same interview setup was used as with the employees of Soil & More. The results given by each interviewee at the EVD on the perceived influence of the five cultural dimension can be found in table 4.6. The data in table 4.6 will be further analyzed in the next paragraph.

Table 4.6: Results on the scores for the cultural dimensions, NL EVD International

Interviewee	Individualism	Power distance	Uncertainty avoidance	Masculinity	Long term-orientation
Ms. Brussee	3	4	5	4	4
Mr. Van Delsen	4	4	3	4	4
Ms. Vriens	4	4	4	5	4
Mr. Triezenberg	5	5	4	4	5
Mr. Abader	5	5	3	3	5
Ms. Bouman	4	5	3	3	4
Total score average	***(4,2)***	***(4,5)***	***(3,7)***	***(3,8)***	***(4,3)***

4.4.3 Analysis of the data

The relatively high scores for individualism, indicated that five specialists were convinced that individualism strongly influenced the transfer process. The strength to which members of a society have a strong group cohesion influences the communication process, and thereby the knowledge transfer process. Working together and paying respect for others in the group stimulates the communication process. The scores for power distance were even higher, and all six specialists were unanimously convinced that power distance had the most influence on the transfer process. In flatter organizations, where superiors and employees are almost considered equally, the flow of knowledge and information will be smoother and stimulates the communication process. The scores for uncertainty avoidance where the lowest of all five. At first, uncertainty avoidance influences how people accept change and risk. Furthermore, uncertainty avoidance is associated with structure, rules and policies. This will influence the successfulness of technology transfer, however, it doesn't instantly mean that structure, rules and policies are always a barrier to successful transfer. Time-tables, rules and policies can lead to less improvisation, which enhances transfer. It seems that the people from the NL EVD International experience these barriers as moderately influencing the transfer process. The fourth dimension masculinity had the second lowest score, with only Mr. Triezenberg giving it a higher score. He indicated that gender does influence the transfer process, because some cultures don't threat men and women equally and some cultures may expect male and female roles to be distinct, therefore limiting communication between employees. Long-term orientation had comparable scores to individualism. Loyalty, strong work ethic and commitment towards the company and job, improves the transfer process.

It is interesting to notice that at the NL EVD International power distance, uncertainty avoidance and masculinity are to a certain extent related with experience. Gender is negatively related to individualism and long term-orientation. Men at the NL EVD International rated individualism either a 4 or 5 with a mean of 4,7, while women at the NL EVD International rated individualism a 3 or 4 with a mean of 3,7. This implies that women tend to perceive that individualism is a smaller barrier to technology transfer, while men perceive individualism to be a greater barrier to technology transfer. Gender also tend to be positively related to long term-orientation. Men at the NL EVD International rated long term-orientation either a 4 or 5 with a mean of 4,7, while women at the NL EVD International rated long term-orientation a 4 with a mean of 4. This implies that women tend to perceive long term-orientation as a smaller barrier to technology transfer, while men perceive long term-orientation to be a greater barrier to technology transfer. The data indicated that experience tend to be positively related with power distance. This implies that when someone is older and more experienced, he observes that power distance becomes a greater barrier to technology transfer. Mr. Triezenberg, Mr. Abader and Ms. Bouman all having at least 9 years of international experience perceived power distance to be a very influential, while Ms. Brussee and Ms. Vriens with less international experience perceived power distance to be slightly less influential. A negative relation could be observed between the variable experience and Uncertainty avoidance. Mr. Triezenberg, Mr. Abader, Mr. van Delsen and Ms. Bouman gave uncertainty avoidance a score of 3 or 4, while Ms. Vriens and Ms. Brussee gave uncertainty avoidance a score of 4 or 5. These data tend to indicate that the older and

more experienced one becomes, the less likely he perceives that uncertainty avoidance is a barrier to technology transfer. This same negative relation can be observed between the variables experience and masculinity. The data tend to indicate that the older and more experienced one becomes, the less likely he perceives that masculinity is a barrier to technology transfer.

4.5 Comparison

In total seven individuals were interviewed at the case company. Although, seven interviews is a very small sample and the conclusions not being able to be generalized, the results might give a good indication of how perceived cultural distance is managed by a Dutch commercial organization.

Interestingly, from the two samples mentioned in paragraph 4.3.2 and 4.4.2, it seems that the dimensions of individualism, power distance, uncertainty avoidance and long-term orientation were given quite comparable scores by both Soil & More and the NL EVD International, which implies that both groups were like-minded on these four dimensions and perceive them as having a strong influence on technology transfer. Masculinity was given lower scores by the people from Soil & More. The difference is 0,80 points between the average scores for the other dimensions. An explanation could be that companies in practice perceive masculinity to have a weaker influence on technology transfer than people from the NL EVD International would expect.

If the data analyses of both the case company and the control group are compared, a few relationships found at Soil & More were supported by the findings of the NL EVD International, which might indicate that the relationships may have some strength. The data indicated that there was a relation between gender and individualism at both Soil & More and the NL EVD International. However, the negative relation between gender and individualism was stronger than the positive relation between age/experience and individualism. This implies that women tend to perceive that individualism is a smaller barrier to transfer, while men perceive individualism to be a greater barrier to technology transfer. There tend to be a negative relationship between experience and the cultural dimension of masculinity. This implies that when someone is more experienced, he or she perceives that masculinity is becoming less a barrier during the transfer of technology. A positive relationship could be observed between experience and power distance. This implies that when someone is becoming more experienced, he perceives that power distance becomes a greater barrier to technology transfer.

4.6 Conclusions and implications for the research framework

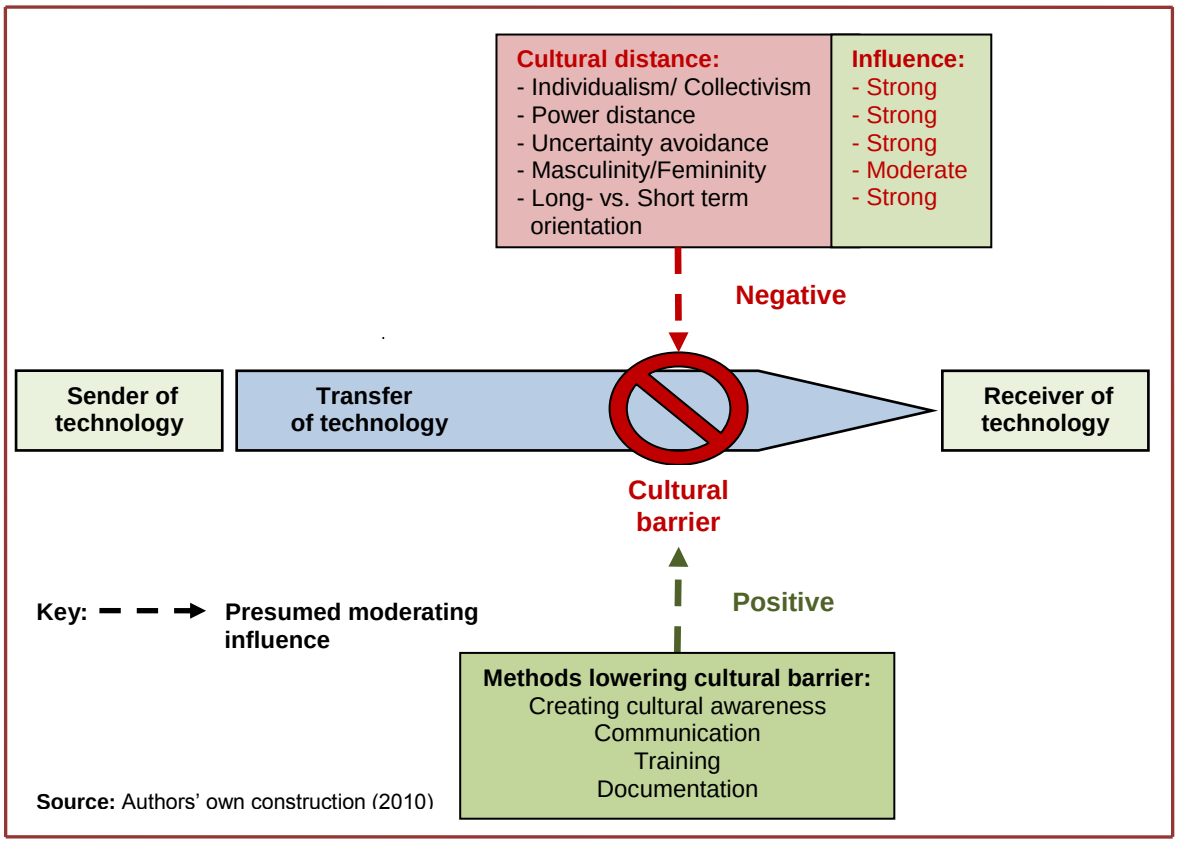
It seems that from the relations found in the data from both groups, gender tend to be negatively related with individualism. Women tend to perceive that individualism is a smaller barrier to technology transfer. Men perceive individualism to be a greater barrier to technology transfer. The data also indicated that experience tend to be negatively related to uncertainty avoidance and masculinity. This implies that when someone is more experienced, he perceives that uncertainty avoidance and masculinity are becoming less a barrier during the transfer of technology. Experience tend to be positively related to power distance. This implies that when someone is becoming more experienced, he perceives that power distance becomes a greater barrier to technology transfer.

Although the employees of Soil & More were asked if they experienced any difficulties in each of the five countries they already have a licensing agreement, it seems that Soil & More experienced these differences on masculinity as less important to technology transfer because none of the interviewees mentioned it specifically. Besides that, the respondents gave masculinity a lower score compared to the other dimensions. It seems that in practice,

masculinity has less influence on technology transfer than the other four cultural dimension of Hofstede, which is reflected in figure 4.6. The dimensions of individualism/collectivism, power distance, uncertainty avoidance and long- vs. short-term orientation are the four most important dimensions that influence technology transfer, because all four greatly influence the flow of knowledge between actors.

In order to address the cultural barrier, the researcher observed that three methods are used at Soil & More to improve the transfer of technology: communication, franchise handbook and training. These three methods are added to the framework in figure 4.6 as having a positive moderating influence on the cultural barrier. Soil & More continuously communicates with local management to check what progress has been made and what problems occurred. After signing the contract with a new partner, a franchise handbook is given to improve the technology transfer process and local workers are trained to operate the machinery and use the measurement equipment. However, besides the three methods Soil & More already uses to stimulate technology transfer and overcome cultural barriers, Soil & More also has to use a fourth method: "create cultural awareness". This is probably the most important method to address the cultural barrier, because cultural awareness can be used to further improve the effectiveness of the other three methods. Therefore, creating cultural awareness is also added to the framework in figure 4.6 as having a positive moderating influence on the cultural barrier. How Soil & More can better address the cultural barrier will be further explained in chapter 5.

Figure 4.6 A model of technology transfer in a cross-border context



Chapter 5 Addressing the barriers

The aim of this chapter is to develop an understanding of *how Soil & More can address the cultural barriers.* In order to address cultural barriers, the researcher first must know what the barriers are. By making the cultural barriers clear, it is easier to tackle the problem. The possible barriers that might arise when technology is transferred to the five selected countries are presented in table 5.1 below. After table 5.1, the cultural barriers will be further explained, after which the methods will be presented to address the cultural barriers.

Table 5.1: Possible cultural barriers with technology transfer

Mauritius	Botswana, Ethiopia, Mozambique, Tanzania
❑ Knowledge rejection due to difference in power distance. ❑ Emphasis on explicit knowledge transfer. ❑ Less emphasis on personal ties, which may hinder knowledge sharing and the transfer process.	❑ Knowledge rejection due to difference in power distance. ❑ Emphasis on tacit knowledge transfer. ❑ Short-term oriented, providing less time and effort which obstructs the transfer process. ❑ Short-term oriented, do not embrace long term devotion, less commitment which might obstruct the transfer process. ❑ Today's work has to result in immediate short-term rewards. ❑ Emphasis on face-to-face contact, however distance a problem. ❑ Less likely to recognize value of new technology faster, obstructs transfer process.

Transfer of technology to Mauritius

Mauritius is high in power distance and individualism and therefore more comfortable in transferring and receiving knowledge that can be easily codified and stands independent of the organizational context. Differences in power distance between Soil & More and Mauritius might be the greatest barrier during technology transfer, this because the more experienced someone becomes the more power distance influences the transfer process. Mauritius has a high score on uncertainty avoidance which might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any inconveniences and unstructured situations. Masculine cultures have a greater tendency to lack personal ties, therefore hindering knowledge sharing and technology transfer. Masculinity is perceived as being less important in the transfer process. The coupled data from the case company and control group indicated that masculinity was perceived to be negatively related with experience, therefore more experience might lead to less difficulties with this dimension.

People in Mauritius have to be convinced that new technologies work, which takes a lot of time. A high score on long-term orientation means that people in Mauritius value long-term commitment and respect for tradition, thereby supporting a strong work ethic where today's work will result in long-term rewards. Organizations in long-term oriented cultures are expected to provide more time and meeting places for documenting expertise and being involved in social interactions, which improves the transfer process.

Transfer of technology to Botswana, Ethiopia, Mozambique, Tanzania

Botswana, Ethiopia, Mozambique and Tanzania will be further referred to as "Botswana". The strength of the Botswana culture lies in their propensity to absorb and transmit tacit information. They need face-to-face contact to exchange knowledge because people depend on context more than do individualists who are quite satisfied with written communications. Botswana is high in power distance. Differences in power distance between Soil & More and Botswana might be the greatest barrier during technology transfer, this because the more

experienced someone becomes the more power distance influences the transfer process. People in Botswana are focused on relationships created over long periods of time that are built on frequent exchanges rather than on sporadic and discrete in time exchanges favored in more individualist societies. This is significant for knowledge sharing in that they will be much more likely to share knowledge when they have a long-term, in-group relationship established. However, from a financial and organizational perspective, Botswana scores very low on long-term orientation which implies that this culture is less likely to recognize the future value of new knowledge, thereby obstructing the absorption and transfer of new knowledge. Today's work has to result in immediate short-term rewards.

The four African countries have a feminine culture, which are more likely to view knowledge transfer as a people-to-people process and value cooperation through interpersonal relationships, thereby favouring tacit knowledge above explicit knowledge. A higher than average score on uncertainty avoidance might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any inconveniences and unstructured situations. However, masculinity is perceived to be less important in the transfer process. The coupled data from the case company and control group indicated that masculinity was perceived to be negatively related with experience, therefore more experience might lead to less difficulties with this dimension.

Methods to address cultural barrier

As was mentioned in chapter 1, cultural differences do not per se create problems; rather it is the way the cultural differences are managed that causes the problems. The cultural barriers mentioned above can be addressed by the methods that were presented in the adjusted framework in figure 4.6. The first three methods (communication, franchise handbook and training) are already used at Soil & More but have to be further improved, while creating cultural awareness is still lacking at Soil & More. Creating cultural awareness is the method that has to be applied first, because it improves the effectiveness of the other three methods. For instance, Soil & More continuously communicates with local management to check what progress has been made and what problems occurred. Greater cultural awareness will improve communication and reduce misinterpretations because both parties better understand each other. People in for instance Africa, interpret and evaluate things in different ways. What is considered an appropriate behavior in one culture is frequently inappropriate in another culture. Creating cultural awareness involves conducting workshops and sessions both at the home and host country to make both sides aware of each other's cultural practices. Continues effort in cultural awareness helps to create better understanding between Soil & More in the Netherlands and receivers in each of the five African countries, which in turn lowers the perceived cultural distance of both parties.

Cultural awareness also has positive impact on local training courses. Since the instructor knows how to communicate with local workers, he can better and effectively transfer his knowledge. Besides that, instead of just sending handbooks, providing training courses as itself is also a very effective way to lower cultural barriers and enhance technology transfer. By training and communicating face-to-face, the locals are trained how to set up production processes or how to intervene when technical problems occur. Quality control procedures, maintenance programs and inventory checking have to be implemented and the production personnel have been trained to the necessary disciplined effort of controlling the production process on a day-to-day basis. The six parts of the Soil & More technology described in chapter 4 have to be transferred through a different type of training. The four product-embodied technologies (machinery, cover equipment, inoculants and measurement equipment) and the monitoring and management system can be transferred through a more applicative training. In such a case the key issue of concern should be on the quality and the availability of operating manuals and that programmed devices are adapted to the local language and symbolism. The availability of a professional trainer exercising on real situations is also very important. Emphasis should also be on the more duplicative method of

training when transferring knowledge about the monitoring and management system. The trainee has to learn the basic principles and to observe their applicability in various situations through exercises. The composting process itself has to be transferred through a more imitative training. Transferring know-how becomes the central focus of this training effort. In this method of training, a trainee is attached to the trainer who plays the role of a coach. According to Lasserre (1982), the crucial element is the willingness of the coach to spend time with the trainee to help him find the particular hidden characteristics of the job. The coach has to be willing to share his experience.

Franchise handbooks with all the rules and regulations of the company can also enhance technology transfer. Buckley, Clegg & Tan (2006) have argued that the transfer of corporate norms, routines and common understandings are essential to successful knowledge absorption. Especially with local partners in countries far from the Netherlands, a franchise handbook enables the receiver to better intervene when problems occur, without the sending party having to be present at the local facility.

Chapter 6 Conclusions and recommendations

In this chapter a short review of the purpose of this research is presented, followed by the main conclusions of this research. After the conclusions, the limitations of and reflections on this research are presented.

6.1 Conclusions

The aim of this research was to develop an understanding of *the influence of cultural barriers on technology transfer to Africa, and how can Soil & More address these barriers?*

The theory revealed that the effectiveness of technology transfer is dependent on the extent to which the technological knowledge draws on tangible or intangible inputs. As technology can include both tangible and intangible attributes, technology transfer is difficult to achieve, primarily due to the communication of intangible attributes. In other words, if the knowledge is not transferred properly, the technology can't be implemented correctly, thereby abolishing the transfer process.

The knowledge about the first five technologies is relatively easy to implement in all five countries. The case study revealed that the first five technologies can be made explicit by providing manuals and instructions, thereby improving the transfer process to Mauritius which is also relatively easy due to the simplicity of the knowledge. The last technology is harder to transfer to both Botswana and Mauritius because the knowledge is complex, tacit and systemic. Especially the complexity makes the transfer harder than for the other five technologies. In case of the embodiment of the technology, the four product-embodied technologies are relatively easy to be transferred. The monitoring and management system and the composting process itself are both process- and/or person-embodied technologies, and are therefore harder to transfer because more specific knowledge has to be transferred.

The coupled data from the case company and control group indicated that in practice masculinity is perceived as less influential on technology transfer than the other four cultural dimensions. The coupled data indicated that gender tend to be negatively related with individualism. Women tend to perceive that individualism is a smaller barrier to technology transfer. Men perceive individualism to be a greater barrier to technology transfer. The data also indicated that experience was negatively related to uncertainty avoidance and masculinity. This implies that when someone is more experienced, he perceives that uncertainty avoidance and masculinity are becoming less a barrier during the transfer of technology. Experience is positively related to power distance. This implies that when someone is becoming more experienced, he perceives that power distance becomes a greater barrier to technology transfer.

Mauritius is high in power distance and individualism and therefore more comfortable in transferring and receiving knowledge that can be easily codified and stands independent of the organizational context. Differences in power distance between Soil & More and Mauritius might be the greatest barrier during technology transfer, this because the data from the case study indicated that the more experienced someone becomes the more power distance influences the transfer process. Mauritius has a high score on uncertainty avoidance which might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any inconveniences and unstructured situations. A high score on long-term orientation means that people in Mauritius value long-term commitment and respect for tradition, thereby supporting a strong work ethic where today's work will result in long-term rewards. Botswana, Ethiopia, Mozambique and Tanzania will be further referred to as "Botswana". They need face-to-face contact to exchange knowledge because people depend on context more than do individualists who are quite satisfied with written communications. Botswana is high in power distance. Differences

in power distance between Soil & More and Botswana might be the greatest barrier during technology transfer, this because the data from the case study indicated that more experienced someone becomes the more he perceives power distance influences the transfer process. A higher than average score on uncertainty avoidance might improve the technology transfer process due to more structured communication, rules/regulations and time-schedules leaving less room for any inconveniences and unstructured situations. From a financial and organizational perspective, Botswana scores very low on long-term orientation which implies that this culture is less likely to recognize the future value of new knowledge.

The coupled data from the case company and control group indicated that in practice masculinity has less influence on the effectiveness of technology transfer than the other four dimensions. Both uncertainty avoidance and masculinity tend to be negatively related to experience, therefore more experience might lead to less difficulties with these two dimensions in all five African countries.

In order to address the cultural barrier, the researcher observed that four methods can be used to improve the transfer of technology to the five African countries: communication, franchise handbook, training and creating cultural awareness. The first three methods are already used at Soil & More but have to be improved, while creating cultural awareness is still lacking at Soil & More. Creating cultural awareness is the method that has to be applied first, because it improves the effectiveness of the other three methods. Creating cultural awareness involves conducting workshops and sessions both at the home and host country to make both sides aware of each other's cultural practices. For instance, Soil & More continuously communicates with local management to check what progress has been made and what problems occurred. Greater cultural awareness will improve communication and reduce misinterpretations because both parties better understand each other. Providing training courses as itself is also a very effective way to lower cultural barriers and enhance technology transfer. By training and communicating face-to-face, the locals are trained how to set up production processes or how to intervene when technical problems occur. The third method is using a franchise handbook. Franchise handbooks with all the rules and regulations of the company can enhance technology transfer. Especially with local partners in countries far from the Netherlands, a franchise handbook enables the receiver to better intervene when problems occur, without the sending party having to be present at the local facility.

6.2 Reflection and limitations of research

Reflection

The objective of this research was to investigate how perceived cultural distance influence the transfer of technology to five African countries. Vast amounts of information could be found on cultural differences influencing either knowledge or technology transfer. However, it became clear that only some research had been done on the topic of cultural differences influencing technology transfer while most of this literature focused on implementing information technology in foreign countries. It was confusing that knowledge transfer was quite often used as a synonym for technology transfer, as if both definitions are exactly the same. It was also quite difficult to figure out how all variables in this research influenced each other, and a lot of different articles of different writers had to be used to produce a good literature review to start the research.

Using the definitions of Garud & Nayyar (1994) posed some problems to the researcher. It was very difficult to stay objective when defining the knowledge at Soil & More, despite the interviews with Aart and Miriam and the vast amount of data that were provided about the company. A question that kept popping up was: Is this knowledge complex or simple, independent or systemic, or is it tacit? The problem was later solved, because the technology

had to be transferred through training, which involves transferring tacit knowledge. The same could be said when using the definitions of Bhagat & Kedia (1988). Is this technology person-embodied or process-embodied? The interpretation of the founded information tends to be very personal, which means that another researcher could interpret the same knowledge or technology at the same company quite differently. This is a limitation of this research.

It was also hard to find reliable information about the three African cultures that had no scores for the cultural dimensions of Hofstede. To give a good comparison between countries, it is important to use the same scores and data. To gather the needed information, books and articles where used and structured interviews were held with six country specialists of the NL EVD International. All information combined provided enough input to investigate what cultural pattern suited best for the other three countries. However, if the researcher would have conducted research in each of the five African countries, this would have further improved the validity and reliability of this research.

Because this research was based on the experiences of seven employees of Soil & More and the comparison with the scores of six country specialists of the NL EVD International, the conclusion can't be generalized to other companies. Besides that, being able to measure the effectiveness of technology transfer in Africa would have had given the researcher a better foundation to make conclusions. Further research has to be conducted in the host country itself (Africa) on the influence of masculinity, but also other cultural dimensions mentioned by Trompenaars (1993), Schwartz (1994) and House et al. (2004) on the effectiveness of technology transfer.

Limitations of cultural dimensions

This research made use of Hofstede's conceptualizations of five cultural dimensions. However, it is necessary to indicate that many articles have challenged Hofstede's findings. Several major critiques on the work of Hofstede are summarized below.

At first, the representativeness of Hofstede's national sample was challenged by the fact that all respondents in his sample were from one organization (although different branches): IBM. If a sample is to narrow, it is not appropriate to assume that the sample is representative for a whole nation, making it not appropriate for cross-cultural comparison (McSweeney, 2002). It seems that the research has been culturally bound (McSweeney, 2002). The research team of Hofstede was composed of Europeans and Americans. The questions they asked and their analysis of the answers may have been shaped by their own cultural biases, resulting in confirming Western stereotypes.

The last point of critic is the fact that the work of Hofstede is now beginning to look dated, since the study was undertaken between 1967 and 1973. Cultures slowly evolve (Sneider & Barsoux, 2003). What was a reasonable characterization in the 1960s and 1970s may not be so today.

6.3 Recommendations

Creating cultural awareness in the very early stage of negotiation can bring up deeply rooted beliefs and values up to the surface before they can harm the technology transfer process to Africa. Fedor & Werther (1996, as cited by Wall & Rees, 2001) have outlined an eight stage process that can help to create culturally responsive joint-venture alliances and reduce cultural barriers. By making use of the multi-step process, decision makers can add the cultural dimension (or referred as "the fourth dimension") to the normal strategic, financial and legal considerations when creating an alliance. According to Fedor & Werther (1996, as cited by Wall & Rees, 2001), using this multi-step process should mean that deeply rooted values are brought to the surface before they damage the prospects of the alliance. Fedor & Werther tend to agree on the idea that cultural differences should be minimized. Trying to

minimize the differences means allowing more autonomy, but standardizing systems and procedures for all partners in the network. The eight stage process defined by Fedor & Werther is too broad for a company like Soil & More and some contractual agreements at the company are based on licensing the composting technology and know-how, not forming an alliance with the partner. However, identifying cultural differences, when licensing the technology to a potential partner, is still very important. Therefore the eight stage process is adjusted and three steps are left out of the process, leaving a five step process that Soil & More has to follow to avoid failures. The following five steps were derived from the book written by Wall & Rees (2001).

1) Create cultural profiles of each company, identifying the original corporate culture by defining unique sets of beliefs and methods of problem-solving.
2) Compare profiles and identify problem areas. These might reveal ambiguities and inconsistencies that should not be ignored. Both parties need to agree the degree of operational independence they are hoping to achieve.
3) To uncover divergence, consensus has to be reached on business objectives – such as desired rates of return, market shares, salaries, and growth and time targets.
4) The legal structure chosen for the alliance must take into account the desired culture.
5) Both partners have to agree on their management and staffing responsibility, and if these are consistent with the objectives of the alliance.

Fedor and Werther (1996, as cited by Wall & Rees, 2001) suggest that assessing the cultural compatibility of international alliances is critical if failure is to be avoided. Knowing the cultural match between the partners helps define the type of deal mostly likely to succeed.

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Interviews

Soil & More

Mr. Van den Bos	Managing Partner
Mr. Bandel	Managing Partner
Ms. Bogatzki	Communication and PR Manager
Mr. Baars	Compost specialist
Mr. Van der Kamp	Product development
Ms. Sikirica	Product development
Ms. Luske	Product development

EVD

Ms. Bouman	Country specialist *(Botswana, Mozambique, South Africa)*
Mr. Abader	Country specialist *(Egypt, Ethiopia, Mauritius, Tanzania)*
Mr. Triezenberg	Country specialist *(Brazil)*
Ms. Vriens	Country specialist *(Brazil)*
Ms. Brussee	Country specialist *(Mexico)*
Mr. Van Delsen	Country specialist *(India)*

Appendix I Score's for Hofstede's cultural dimensions

Hofstede's four cultural indexes for selected countries

	Cultural dimensions			
	Power distance	Uncertainty avoidance	Individualism	Masculinity
Arab countries*	80	68	38	53
Argentina	49	86	46	56
Brazil	69	76	38	49
Canada	39	48	80	52
Denmark	18	23	74	16
East Africa**	64	52	27	41
France	68	86	71	43
Germany	35	65	67	66
India	77	40	48	56
Italy	50	75	76	70
Japan	54	92	46	95
Malaysia	104	36	26	50
Mexico	81	82	30	69
Netherlands	38	53	80	14
Pakistan	55	70	14	50
South Korea	60	85	18	39
Spain	57	86	51	42
Sweden	31	29	71	5
UK	35	35	89	66
USA	40	46	91	62
World mean	57	65	43	49

*Saudi Arabia, Egypt, United Arab Emirates, Iraq, Kuwait, Lebanon and Libya
**Ethiopia, Kenya, Tanzania and Zambia
Sources: Hofstede (1980a, 1991)

Appendix II Overview technology at Soil & More

Table I: Dimensions of technology and knowledge at Soil & More

Part of Soil & More technology	Type of technology	Knowledge dimension to use technology		
		Simple/Complex	Explicit/Tacit	Systemic/ Independent
Windrow-turning machinery **(1)**	Product-embodied	Simple	Tacit *(Explicit)*	Independent
Gore-Tex cover **(2)**	Product-embodied	Simple	Tacit *(Explicit)*	Independent
Biodynamic Compost Inoculant **(3)**	Product-embodied	Simple	Tacit *(Explicit)*	Independent
Compost measure equipment **(4)**	Product-embodied	Simple	Tacit *(Explicit)*	Independent
Monitoring and management system **(5)**	Process-embodied	Simple	Tacit *(Explicit)*	Independent
Composting process itself **(6)**	Process-embodied and person-embodied	Complex	Tacit	Systemic

Appendix III Interview guides

Interview guide Soil & More

Respondents background
1. Name, age and title?
2. In what way are you involved in the technology transfer process at Soil & More?
3. Years of working experience at Soil & More and previous companies?

Cultural differences
4. Do you recognize the five cultural dimensions of Hofstede?
5. How have the cultural differences of Hofstede influenced the transfer of the technology?
6. Have the differences caused any miscommunications?
7. Have some of the differences you experienced had a stronger or weaker influence than the others?
8. Can you rate the next statement: " ***** has a strong influence on the transfer process of technology from the Netherlands to foreign countries".

1: strongly disagree
2: disagree
3: neutral
4: agree
5: strongly agree

* Individualism
* Power distance
* Uncertainty avoidance
* Masculinity
* Long term-orientation

Interview guide EVD

Respondents background
1. Name, age and title?
2. Years of working experience at EVD and previous companies?
3. Have you ever given advice to companies that wanted to implement new technologies in foreign countries?

Cultural differences
4. Do you recognize the five cultural dimensions of Hofstede?
5. How have the cultural differences of Hofstede influenced the transfer of the technology at the case companies you guided?
6. Have the differences caused any miscommunications?
7. Have some of the differences you experienced had a stronger or weaker influence than the others?
8. Can you rate the next statement: " ***** has a strong influence on the transfer process of technology from the Netherlands to foreign countries".

1: strongly disagree
2: disagree
3: neutral
4: agree
5: strongly agree

* Individualism
* Power distance
* Uncertainty avoidance
* Masculinity
* Long term-orientation