The role of psychological distance in knowledge acquisition and absorptive capacity

A quantitative study investigating Nordic firms targeting the elderly population

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Abstract

An aging population is becoming an increasingly growing global phenomenon, and 2050 is said to be a historical breaking point where 65+ will outnumber those between 0-5 years old. However, previous research has failed to provide sufficient explanations for consumer behavior for this particular segment, and a large incidence have been found to share the belief that technology fails to be adapted to meet their needs properly.

An overlooked aspect of knowledge management was found and a research gap was thus identified addressing the role of cognition when assessing and interpreting customer needs. The purpose has been to develop a deeper understanding of certain aspects of how companies within this industry acquire and assimilate knowledge, and how product developers perceive the role of cognition in these processes. In order to shed light on these dimensions of knowledge management, a research question has been formulated as follows:

*How does psychological distance affect knowledge acquisition, absorptive capacity and relationship quality?*

A quantitative study was carried out involving 45 companies operating in a variety of industries ranging from robotics, hygiene and special nutrition, to eldercare and mobility products. Altogether, 51 responses were collected and analyzed using simple- and multiple regression, and were subsequently discussed based on a developed theoretical framework.

The results found in this study have been used to identify combinations of cognitive dimensions and relationship quality for the purpose of developing a better understanding of its respective impact on knowledge acquisition and absorptive capacity. The findings culminated in a model through which to explain for these combinations of psychological distance, level of construal and relationship quality and their effect on the ability to acquire and disseminate new knowledge from elderly.

High-level information was found easier to acquire among the respondent companies, and low-level contrarily easier to absorb. Greater psychological distance in combination with low relationship quality had a positive impact of high-level construal individuals to acquire knowledge from external sources. In contrast to these findings, perceived proximity in the psychological distances and high relationship quality were jointly found to assist in knowledge dissemination processes for low-level construal individuals.
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1. Choice of subject

We as researchers are second year Master’s students, currently enrolled in the program for Business Development & Internationalization at Umeå School of Business and Economics. During our studies, an aging population has been introduced as one of the major academic trends and a growing global challenge. We believe this phenomenon comes with unique possibilities for companies to create and exploit new market opportunities, but will naturally come with challenges in understanding and translating user needs into successful innovations. As both of us have prior work experience within the field of innovation from both biotechnology and the high-tech industry, we saw this as an opportunity to broaden our knowledge base in one, for us, completely new setting. We thus have an interest in developing a deeper and holistic understanding of the knowledge acquisition process in this segment where the ability to communicate needs might be of more complex nature than in more conventional contexts.

1.1 Problem background

An aging population is a globally prevalent phenomenon, but marks of its consequences are significantly evident in developed countries (Chand and Tung, 2014, p. 409). By 2050, for the first time in history, a population in excess of 65 years of age are expected to outnumber children under five. This has significant implications not only for governments but also businesses, as the aging population is creating a very powerful new consumer class (Cohen, 2014). According to Euromonitor, the aging population’s global spending power is expected to reach $15tn by 2020 (Foy, 2014). Furthermore, the spending power of the 18 to 39 year olds, the group more frequently targeted by companies, is seen inferior to the spending power of the elderly (Cohen, 2014). This reveals a clear indication that an aging population not only implies societal challenges but bears growing business opportunities on which firms can capitalize.

Despite the huge potential, previous research seems to be lacking explanations for consumer behavior of the aging population (Moschis, 2012, p. 57). According to Lee and Coughlin (2015, p. 747), industry has failed to realize the potential benefits of the aging population due to lack of proper assessment of their needs. Furthermore, according to a Silversurfer survey, nearly 60 per cent of the respondents aged 50 or over view that technology is not being adapted to meet their needs (Foy, 2014). Thus, it does not come as a surprise that the adoption rates for many technological systems designed to aid the elderly to cope with their challenges have been low (Lee and Coughlin, 2015, p. 747). The authors continue that it appears the older adults’ adoption of technology is a complex issue affected by a multitude of factors, rather than merely price and performance (Lee and Coughlin, 2015, p. 747).

As a result of changes in the population age, new needs will manifest within these segments and cause shifts in overall demand patterns as a consequence of which structural changes will emerge within and across industries (Chand and Tung, 2014, p. 423). Chand and Tung (2014, p. 411) further present serving and developing products for an aging population as a way through which to partially manage slowing economic growth, as shifting focus on this segment implies strong growth and different product usage.
The issues in regards to serving the needs of an aging population have been addressed by Swedish policy makers. The Swedish government reveals the monetary incidence of “elderly politics?” in 2013 to reach 3.6% of GDP (Reinfeldt, 2013, p. 9), with 2.1 million pension takers (1.8 million Swedish citizens) and SEK16239 in average full pension payment (Pensionsmyndigheten, 2015). Thus, the necessity to serve the fundamental needs of this part of the population has been acknowledged on governmental level in Sweden and a detailed outline for how to cope with changing demographics has been developed. In a proposition from the Swedish government, three main principles were established for elderly politics; It is to be democratically regulated, it should be solidarily financed through the means of taxes, and finally demand, not purchasing power, should regulate availability (Persson and Wallström, 1998, p. 1). This framework implies market opportunities on which to capitalize by the industry, and for which the government is obliged to provide capital in order to meet the demand for products and services.

In order to enhance the ways in which the aging population are addressed, firms need to understand this segment better. Kohlbacher et al. (2015, p. 74) found it surprising how little research has been conducted on this contemporary matter. They continue by asking “where is the opportunity without the customer” (Kohlbacher et al., 2015, p. 74), which further implies the need to strengthen our understanding of the aging population in order to serve their needs and tap into this market.

Scholars in the field of new product development have noted that customer involvement is the core method of strengthening customer influence in the new product development process (Callahan and Lasry, 2004; Enkel et al, 2005). The level of customer influence may be high or low, depending on the extent to which customers are given power to influence the outcome of the new product development process (Dahiyat and Al-Zu’bi, 2012, p. 181). At the other end of this spectrum is the extent to which companies are able to absorb and acquire knowledge from their customer base, be it directly or indirectly through their buyers. This opens up questions regarding organizational capabilities, and we hold the belief that psychological distance may play a far greater role in knowledge acquisition and subsequently the innovation process than has previously been addressed in academic literature.

1.2 Theoretical background

In order for firms to identify how demand patterns and opportunities for innovation change as a result of an aging population, there is a need for internal resources to be reallocated to gain knowledge of how to generate new solutions (Kohlbacher et al., 2015, p. 78). New combinations of knowledge and resources yield knowledge creation, and acquisition thereof serves as the key with which to open novel market opportunities (Cohen and Levinthal, 1990; Kogut and Zander, 1992), and strengthen the individual firm’s ability to exploit them (Yli-Renko et al., 2001, p. 587). However, the history of the individual firm, in combination with the type and magnitude of the accumulated knowledge acquired, dictates how unique sets of capabilities develop with which to cope with the attributes characterizing a certain industry (Lane and Lubatkin, 1998, p. 462). The types of knowledge that firms acquire are twofold in nature; easily communicated explicit knowledge, and experienced tacit knowledge that is harder to fully articulate (Liao and Barnes, 2015, p. 1264; Lane and Lubatkin, 1998, p. 462).
Knowledge acquisition has its fundamental rationale in companies realizing knowledge deficiencies, and the consequent active search for effective solutions to overcome the said deficiencies (Dahiyat and Al-Zu’bi, 2012, p. 180). Davenport (2005), further explains that once such deficiencies or knowledge gaps are identified, adjustments in the network through which firms link their organization with external experts or lead users could be beneficial. Liao et al. (2010, p. 21) explained knowledge acquisition to be serving as the first step within a wider range of activities in the process of accepting external knowledge, and subsequently transforming it into representative material that can be internalized. Knowledge acquisition systems should thus be adopted by SMEs in order to gain an understanding of how to exploit existing knowledge, create new banks of knowledge that serves changing customer needs, and effectively allocate strategic resources (Liao and Barnes, 2015, p. 1270). As previously mentioned, demand patterns will change as a result of an aging population, hence knowledge acquisition and firms’ ability to acknowledge and internalize these changes are considered a central element playing a key role in better understanding of that market. Consequently, it will serve as an essential part of the framework for this study.

Liao and Barnes (2015, p. 1263) explain that in order for knowledge acquisition to fulfill its purpose, an inherent reciprocity between the involved parties must exist, and thus a certain level of trust must be established. Results from a study conducted by Choi et al. (2008) revealed trust to serve as a significant social enabler and found a positive link to knowledge sharing between parties. Liao and Barnes (2015, p. 1264 & 1269) further found that high-quality inter-organizational relationships assist in facilitating access to knowledge and information and thus positively affects knowledge acquisition. In order to unlock the potential to serve the needs of an aging population, it is believed that relationship quality plays a key role in establishing trust, and thus is an important aspect in understanding innovation potential. Therefore, this will be subjected to further review later in this study.

One of the critical components of innovative capabilities is the ability to exploit external knowledge (Cohen and Levinthal, 1990, p. 128), and once acquired and internally interpreted, the knowledge must quickly be integrated and disseminated into each constituent part (Liao et al., 2010, p. 21). This ability was further refined by Cohen and Levinthal (1990) as absorptive capacity, which has been found to serve as a mediator in knowledge acquisition and innovation capability as its constituent elements include knowledge exchange in interaction processes between a focal firm and its external environment (Dahiyat and Al-Zu’bi, 2012, p. 183). Furthermore, although Dahiyat and Al-Zu’bi (2012, pp. 195-196) found that customer involvement is of major importance in product development processes, and thus should be an inherent part of knowledge acquisition systems, absorptive capacity has a central role in accessing and unlocking its very potential. This has further been proven by EscrIBano et al. (2009, p. 96), who found that firms with higher levels of absorptive capacity are more efficient in managing external knowledge flows to stimulate innovative outcomes.

Cohen and Levinthal (1990, p. 131-132) further recognized the individual absorptive capacity as an important antecedent of organizational absorptive capacity. However, this has not been thoroughly researched at the individual level, and its impact on organizational absorptive capacity has been recognized as a research gap (Volberda et al., 2010, p. 944). This was further approved in the review by Martinkenaite et al. (2016, p. 703) who stated the role of individuals in organizational absorptive capacity to be under-
researched. In order to understand how knowledge is perceived during interactive activities between representatives of the focal firm and its external environment, absorptive capacity plays a central role. Therefore this concept is asserted to be highly relevant for the literature review. However, there will be no distinction between individual and firm’s absorptive capacity, as we assess them to be highly intertwined.

Holmqvist et al. (2015, p. 1432) partly addressed this individual cognitive dimension by focusing on how different levels of psychological distance affect value-creation in service development processes for contexts in which interacting parties are part in each other’s practices. Based on construal-level theory, Holmqvist et al. (2015, p. 1432) measured the degree to which psychological distance influences how customers construe information and details about certain situations. Such details are of incidental or peripheral nature and thus not essential for the overall understanding of an event, but central in order for a deep understanding to be retained and decontextualized (Trope and Liberman, 2010, p. 453). However, the study conducted by Holmqvist et al. (2015) sheds light on how psychological distance affects customers’ perceptions of the services provided, and not for the purpose of firms to enhance their understanding of the customer being subjected to service interaction. We agree with Holmqvist et al. (2015, p. 1442) that psychological distance, and thereby the sense of closeness, is an inherent part of all social interaction and thus critical in understanding the external environment, hence it will be part of the literature review for this study.

Holmqvist et al. (2015, p. 1438) present social connectivity as the inherent strength found within the established social ties required for resources to be successfully exchanged between parties. In their research, they found lower levels of social connectivity to imply a greater psychological distance between interacting units, and thus serve as a barrier to jointly create value. It thus appears natural that the relative relational strength between interacting parties is an important determinant by which the psychological distance, and thus the ability to experience a sense of closeness, is directed. Consequently, relationships and their quality between parties at different parts of the value chain come to play an important role in the extent to which interacting parties are able to fully relate to each other.

Relationship quality refers to the overall evaluation of inter-organizational relationships that arises from a range of different exchanges between interacting parties (Lages et al., 2005, p. 1041) and, if positive, has been suggested to lead to long-term benefits for firms. (Leonidou et al., 2014, p. 21). In the process of serving the needs of an elderly population, one must acknowledge not only the population in itself, but that interaction with the said segment often involves intermediary actors through which demand assessments are made. Relationship quality is believed to be a critical component in the knowledge acquisition process due to its inherent ability to lower knowledge sharing barriers, and will thus serve as a part of the forthcoming theoretical framework.

The necessity to investigate individual dimensions of such nature within the field of knowledge management has been recognized but is yet to be explicitly clarified. The overall academic focus has been placed on the extent to which external knowledge impacts product innovation, and a collective conclusion has been reached that the mere existence of such acquisition does generate new insights or opportunities for innovation (Liao and Marsillac, 2015, p. 5437). In contrast, the external knowledge base should be supplemented by developed internal capabilities through which to recognize and assess
this knowledge, disseminate it and finally promote renewal of the knowledge-based resources (Liao and Marsillac, 2015, p. 5437).

1.3 Problematization

Absorptive capacity has been found to serve as a mediator in knowledge acquisition, and significant relationships between accumulation of knowledge, greater organizational absorptive capacity and innovation capability have been proven (Dahiyat and Al-Zu’bi, 2012, p. 183; Liao et al., 2010, pp. 26-27). However, Liao et al. (2010, p. 27) could not give proof of significance in the pathway between knowledge acquisition and innovation capability, but rather support the role of industry as a mediator to each respective construct. As previously mentioned, absorptive capacity relies on individual capabilities to absorb externally sourced information, and once acquired, quick and effective dissemination through the organization is critical (Liao et al., 2010, p. 21). However, in terms of an elderly population facing changing needs and demands, pure observation or interaction might be insufficient. Kohlbacher et al. (2015, p. 78) agree with this aspect and argue that in order to generate appropriate market intelligence, employees must possess right empathic abilities and customer orientation toward the elderly. Consequently, the psychological distance, or the perceived distance of an experience (interactions and emotions) from a person’s direct experience (Holmqvist et al., 2015, p. 1432), separating the interacting parties in this context, is believed to hold valuable information in the role of relationship quality, absorptive capacity and knowledge acquisition respectively.

This particular phenomenon reveals an overlooked dimension of contemporary business studies and a research gap to which we intend to aim our attention.

1.4 Research question

How does psychological distance affect knowledge acquisition, absorptive capacity and relationship quality?

1.5 Purpose of the study

In order to answer the research question outlined for this study, we intend to shed light on a series of aspects necessary to gain insights about the target phenomenon, hence a set of purposes have been developed.

With regard to the increasingly growing incidence of the older population, and how this demographic change alters demand as a result of different physical or mental preconditions, knowledge and how such is acquired appears to serve as the main engine driving successful innovation. Furthermore, previous research has proven the importance of relationship quality and its facilitating role for information exchange in interactive processes. The ability for contemporary companies to fully understand and relate to other frames of references is thus believed to hold the key with which to uncover critical dimensions of this very generation, and in turn sustain a competitive advantage.

Consequently, the purpose of this study is to measure and describe the effects of psychological distance and its constituent elements on knowledge acquisition and absorptive capacity. It thus involves gaining a deeper understanding of how elderly users
and customers are related, based on not only cognitive dimensions but how developers understand and interpret the surrounding environment. Furthermore, the purpose is to elucidate if, and to what extent, companies have processes for acquiring and sharing knowledge about elderly customers. Finally, the intention is to shed light on the interplay between relationship quality and psychological distance, how they impact each other, and the extent to which they fluctuate with changes in certain distances.

1.6 Delimitations

Ghauri and Grønhaug (2005, p. 56) present research conduction to generally cope with restraints derived from available time, financial viability and personal skill sets. For the purpose of establishing an understanding of the preconditions based on which this study is to be carried out, a series of practical and financial constraints has to be declared for. A thesis at Master level is by definition constrained by the inherent rules and regulations by which such has been developed. The time frame allocated for its conduction is one academic semester (approximately 4 months), and the financial budget is exclusively dependent on each respective student’s financial capacity. As argued in previous section, the accumulated academic knowledge and pre-understanding of the topic at hand are both yet to be fully developed but considered sufficient for fulfilling the purpose of answering the research question.

This study is further limited to measuring opinions of product developers employed by companies operating in the elderly market. As a consequence, it does not take into account the internal corporate culture and how elements thereof foster creativity among employees nor the extent to which they differ between companies and industries.

1.7 Thesis disposition

Equivalent to the table of content provided in the beginning of the paper, the objective of this section is to outline a consecutive overview of the thesis chapters. In contrast, the disposition provides a succinct declaration of each respective constituents along with the underlying thinking process by which the sectional order has been justified.

The first thesis chapter acquaints the reader with the research topic and addresses overarching central themes. In order to establish a comprehensive overview, demographic changes toward an increasing global magnitude of elderly is introduced and explained for in a problem background, after which relevant previous research is compiled in a theoretical background section. Collectively these aim to provide sufficient contextual understanding of the inherent problematics related to understanding customer needs, in order to logically guide the reader toward the research question. The chapter is concluded by outlining the overall thesis purpose and the induced boundaries within which the research is carried out, with the purpose of enabling the reader to logically follow the research process.

The two subsequent chapters shed light on the fundamental process of developing the theoretical framework and further on issues related to theoretical- and practical methodology. The theoretical chapter provides detailed explanations of knowledge acquisition, absorptive capacity, relationship quality and psychological distance respectively, after which constructs are developed and hypotheses conclusively deduced. The methodological chapter is initially of self-reflective nature and provides
philosophical discussions addressing ontological and epistemological stances in relation to contextual elements in the research environment. Based on these stances, the tools and instruments with which to collect and analyze data are explained for and appropriately selected in order to obtain credible results. Instead of separating theoretical and practical methodology into two distinct chapters, these have been merged for the purpose of enhancing the logical flow in between them.

After having established the foundation of the thesis, a chapter has been assigned to deal exclusively with empiricism. This part aims to present and outline empirical results based on which the authors can make statistical inferences and further analyze and discuss the findings in relation to the theoretical framework.

In the final part, conclusions are made based on the inferences drawn in the empirical section, after which recommendations future research are made for and a presentation of theoretical contributions is provided. Furthermore, a separate section is dedicated to establishing quality criteria with regard to result validity and overall reliability of the study. Finally, in order to be transparent and thus eliminate the doubt of potential ethical misconduct, the overarching considerations and working procedures are explained for. Conclusively, the purpose of this chapter is to provide the information needed for making an evaluation of the overall credibility.
2. Theoretical framework

The aim of the following chapter is to provide a detailed overview of literature and studies conducted within the field of knowledge management and psychological distance. The theoretical framework starts with an overview of the overarching field of knowledge management. The subsequent sections deal with explaining the theoretical concepts in the consecutive order of knowledge acquisition, absorptive capacity, relationship quality and psychological distance.

2.1 Knowledge management

The emergence of knowledge management was explained by Jantunen (2005, pp. 336-337) as a major academic theme as a result of a changed focus within the innovation paradigm and a transition from a discovery-based to learning-based society. This is further reinforced by Brahma and Mishra (2015, p. 43) who declare knowledge and knowledge management practices to have gained prominence as key determinants by which firms’ abilities to gain competitive advantage are directed. However, in order to fully understand knowledge and the sources from which it can be obtained, a clear definition must be provided. Lee and Yang (2000, p. 783) defined knowledge as “an observer’s distinction of “objects” through which he brings forth from the background of experience a coherent and self-consistent set of coordinated actions”. This definition will serve as the foundation for how knowledge and the nature thereof will effectively be interpreted throughout this study.

2.1.1 Tacit versus explicit knowledge

Nonaka et al. (2000, p. 5) present knowledge to be of two distinct natures (dichotomies): tacit and explicit knowledge. These specific attributes characterizing the knowledge type in turn is a determinant of the approach with which such can be acquired (Liao and Barnes, 2015, p. 1259). Nath (2015, p. 13) defines tacit knowledge as “deeply rooted in each individual’s actions and experiences, as well as in his/her ideals, values, and emotions”, which in turn, due to its subjective and experimental nature, in itself is complex to formalize (Nonaka et al., 2000, p. 5). These factors collectively limit the degree to which it can be fully explicited, effectively transferred and transacted (Nonaka et al., 2000, p. 5; Lee and Yang, 2000, p. 784) and due to its inherent complexity difficult to replicate, hence serving as a critical element for establishing a competitive advantage (Liao and Barnes, 2015, p. 1259). Explicit knowledge has in contrast been described as objective and of rational nature, thus to be easily explicited and artificially captured in physical manuals, scientific formulas, data and equivalent forms of communicative material (Nonaka et al., 2000, p. 5; Lee and Yang, 2000, p. 784).

2.1.2 Paradigm shift: Knowledge as an essential resource

As a result of a shift in focus from economic resources in production to knowledge, organizations for whom the objectives revolve around sustainable growth must continuously explore, exploit and enhance resources based on knowledge (Brahma and Mishra, 2015, p. 46). This lead to the development of the term knowledge assets (resources), used for the purpose of supporting effective storing, sharing and reusing the acquired knowledge. The concept of knowledge assets was subsequently developed and categorized by Nonaka and Takeuchi (1995) into four; tacit experimental, tacit routine,
explicit systematic and explicit conceptual respectively. Ownership of knowledge assets was, by Teece (2000, p. 52), seen as the source from which to gain a competitive advantage, as it is a determinant of the ability to create value through combinations of knowledge and complementary resources. These dimensions have been considered as important advancements in knowledge management literature, but will however not be further scrutinized throughout this study.

2.1.3 The role of Knowledge management

The concepts of knowledge and innovation are argued by Murovec and Prodan (2009, p. 859) to be highly intertwined, as innovation has its roots in application of new knowledge, while application of new knowledge equivalently generates innovation. The increasingly complex nature of innovation puts pressure on organizations to obtain knowledge from a diverse set of fields in order for innovation activity to reach a desired output (Murovec and Prodan, 2009, p. 859). However, Jensen et al. (2007, p. 168) state that knowledge management faces major challenges in making the dichotomies work jointly in promoting knowledge creation and in turn innovation.

Knowledge management thus concerns the process of harnessing intellectual- and social capital for the fundamental purpose of improving the internal learning capabilities, and serves as the primary source from which organizational innovative potential derives (Swan et al., 1999, p. 264). Knowledge consists of individual pieces of data and information connected to each part of network relations, and is thus retrieved in organizational patterns instead of its constituent components (Lee and Yang, 2000, p. 783). The objectives underpinning the concept of knowledge management are two-fold, and derive from enhancement of either exploitation (the process of capturing, transferring and deploying existing knowledge) or exploration (the process in which knowledge is effectively shared, synthesized and subsequently created) (Levinthal and March, 1993, in Swan et al., 1999, p. 264). Following these objectives, it should be encapsulated in both internal and external activities, and serve as the link with which to connect the two.

Spender (2003, in Brahma and Mishra, 2015, p. 45) advances these thoughts and acknowledges organization per se as a knowledge field, constituted by fragmented and inherently limited bodies of knowledge which collectively, through dynamic synthesis, build its inventory of knowledge.

The final step within the scope of knowledge management derives from the process in which knowledge is created. The organizational capabilities with which to handle knowledge creation were categorized by Kusunoki et al. (1992, in Nonaka et al., 2000, p. 6) into knowledge base (i), knowledge frames (ii) and knowledge dynamics (iii) respectively. The first mentioned refers to distinctive individual knowledge units, which by nature are encapsulated in specialized groups of workers, technologies and processes with which to process data and patents (Nonaka et al., 2000, p. 6). They further explain knowledge frames to serve the purpose of capturing the linkages of such units with their respective priorities. For clarification, such frames could allow for a deeper understanding of internal resource allocation patterns with each functional group, and as a result of which knowledge is created in that particular setting. The category of knowledge dynamics is concerned with the dynamism of the interactional nature between the organizational knowledge base and the frames identifying organizational patterns; communication and cross-sectional coordination (Nonaka et al., 2000, p. 6).
2.1.4 Knowledge management: Network interaction

Kogut and Zander (1992, p. 631) describe that firms develop a common understanding through repeated intense interaction, through which knowledge subsequently is created and transferred. However, firms, for whom the primary focus relies on developing networks and internal architectures through which to transfer only explicit knowledge, will limit the capacity for innovative contributions (Swan et al., 1999, p. 270). Due to the immediate transferability of such knowledge, it can assist in developing basic capabilities, but does not allow for unique skills to be nurtured (Lane and Lubatkin, 1998, p. 462). On the other hand, the level of tacitness has been proven to generate increased costs of transferring the knowledge and thus inhibit effective dissemination within the organizational units (Kogut and Zander, 1993, p. 637). This implies an increased pressure on firms to develop channels with sufficient capacity to effectively translate and communicate tacit knowledge.

However, as communication of tacit knowledge needs to involve a degree of shared meaning system between the involved parties in order for it to be understood, effective sharing and exchange of such knowledge is difficult to attain if the innovation process is interactive (Swan et al., 1999, p. 270). As the concept of knowledge involves information-based beliefs, it is dependent on the individual capacity of the subject in hold of such beliefs to understand them, which in turn is affected by judgement, behavior and attitude developed through interaction with people (Berger and Luckmann, 1967, in Lee and Yang, 2000, p. 783). As interactive innovation is not exclusively bound to one context but rather to disparate social communities within which different systems of meaning have manifested, latent knowledge must be possessed by individuals internally in order to interpret and make sense of such differences (Weick, 1990 in Swan et al., 1999, p. 270).

Summarily, within the field of knowledge management and generation, previous research has identified and emphasized a variety of dimensions ranging from acquisition, dedicated resources and fusion, to knowledge networking (Staples et al., 2001, p. 7). However, within these sets of activities, knowledge acquisition serves as the first step in accepting and transforming external knowledge for subsequent internalization thereof (Liao et al., 2010, p. 21).

For the purpose of answering the stated research question, the process of acquiring and absorbing knowledge will be the primary emphasis of this particular study.

2.2 Knowledge acquisition

Resource intensive search is an important constituent of the innovation process utilized in order to detect new commercially exploitable knowledge, which requires to collaborate and attain knowledge from actors external to the focal firm (Laursen and Salter, 2006, p. 867). In the field of innovation studies, Liao and Barnes (2015, p. 1259) explain for knowledge acquisition from sources external to the focal firm to be an emerging academic trend. The concept is presented by He et al. (2013, p. 608) as the first step in the knowledge management process. Its inherent meaning is of multi-faceted nature and has in previous research been described using a variety of definitions and explanations. Waterman (1985, p. 392) articulates knowledge acquisition as:
“the process of extracting, structuring and organizing knowledge from several sources, usually human domain experts, so it can be used in a program” Waterman (1986, p. 392).

The formulation of this definition is perceived to put excessive emphasis on the specific parties from whom knowledge can effectively be retained, and thus partly neglects the general social interaction as a means of obtaining new information. He et al. (2013, p. 608) takes a different stance and emphasize other elements of the concept by defining knowledge acquisition as:

“the process of accessing and absorbing knowledge through direct or indirect contact or interaction with a knowledge source” He et al. (2013, p. 608).

Liao and Barnes (2015, p. 1259) argue this particular definition to more properly address the social dimension of knowledge acquisition and for it to be understood as a dynamic collection of interactive practices involving participants with diverse sets of knowledge. The relative level of accuracy in this definition is thus assessed higher and more representative for contemporary academic literature, hence it will be employed throughout the course of this thesis.

2.2.1 The role of external knowledge acquisition

Knowledge is characterized by intangible attributes such as rarity, imperfect imitability and substitutability, upon which sustainable competitive advantages are built, hence an inherent need prevails for firms to continuously explore and exploit new knowledge (Liao and Barnes, 2015, p. 1259). Consequently, to develop an understanding of how knowledge acquisition assists in incorporating external knowledge and further facilitating the innovation process is of major importance (Liao and Barnes, 2015, p. 1258). However, the extent to which inter-organizational acquisition endeavors are carried out in a successful manner is restricted by a series of elements, among which existence of knowledge, ability to identify and assess value during repeated interaction, and general willingness to share information constitute major determinants (Yli-Renko et al., 2001, p. 589).

Huber (1991, pp. 91-100) outlines five distinct processes derived from which knowledge acquisition processes has developed; congenital learning, experiential learning, vicarious learning, grafting, and searching respectively. These processes derive from internal knowledge, acquired prior to and/or during the establishment of an organization through either mimetic behavior or recruitment/M&A of key personnel. The ability to recognize changes in the external environment is a result of the extent to which knowledge-processing routines are orchestrated (Jantunen, 2005, p. 337). Summarily, Jantunen (2005, p. 340) denote such capabilities to consist of a set of processes and mechanisms with which to collect information for subsequent translation into knowledge by utilizing internal- or external sources. Collectively, the procedures built by organizational experience and reconciliation serve to support technological innovation (Liao et al., 2010, p. 21). Consequently, in order to utilize, and thus exploit the full advantage of, externally generated knowledge, firms must internalize it and subsequently translate it into products and processes through internal structures and instruments developed for information acquisition (Jantunen, 2005, p. 337).

Knowledge sourced and acquired externally will enhance not only the ability to exploit existing knowledge, but serve as an engine through which to spur advancement of the
internal knowledge base (Liao and Barnes, 2015, p. 1259). With regards to product development, knowledge acquisition enhances relation-specific knowledge, reduces the cycles within which products are developed, and positively impacts the general willingness to develop new products (Yli-Renko et al., 2001, p. 593). As new product development requires coordination of the knowledge base, and thus call for integration of specialized knowledge combinations derived from various areas, relationship-based knowledge acquisition fosters such activities (Cohen and Levinthal, 1990, pp. 148-150). However, in order for effective external knowledge acquisition to establish, engagement in extensive communicational activities with essential customers in the environment within which firms operate is required (Dahiyat and Al-Zu’bi, 2012, p. 181).

Gold et al. (2001, p. 190) present two key aspects of knowledge acquisition to be (i) the improved use of the already existing, and (ii) more effective acquisition of new respectively. They refer to benchmarking and collaboration to constitute two fundamental pillars in the process of acquiring external knowledge. Benchmarking is a process through which outstanding organizational practices are identified, and occurs by assessing the current state of a focused process in order find gaps through which knowledge can be captured (Gold et al., 2001, p. 190). Based on Leonard (1995, in Gold et al., 2001, p. 190) collaboration is argued to be used as a which through which to create knowledge due to its ability to bring individuals with different cognitive styles, backgrounds, and experiences together.

### 2.2.2 Acquisition through relationship building

Interactional activities allow firms to access and combine new with existing knowledge (Yli-Renko et al., 2001, p. 589) and through development of network ties facilitate and maintain external flows (Dahiyat and Al-Zu’bi, 2012, p. 181). Yli-Renko et al. (2001, p. 589) further denote the possibility of relationship building to manifest a context within which such flows can be effectively be applied and exploited. Building on this point, Grant (1996, in He et al., 2013, p. 608) argue the difference between firms’ ability to effectively manage these acquisition processes to hold a key explanation to relative variances in organizational performance.

Research conducted by Ring and Van de Ven (1994) show that as the degree to which interacting parties develop a sense of comfort with each other’s respective competencies, social interaction develop in dyadic relationships. Yli-Renko et al. (2001, p. 590) further reinforce these findings and show that parallel to such manifestation, information intensity, frequency and breadth collectively experience greater growth. The degree to which enhancements can effectively be received by the internal knowledge base is thus a function of the focal firm’s ability to source and acquire external knowledge (Stuart, 2000; Lee et al., 2001, in Dahiyat and Al-Zu’bi, p. 180).

Establishment of cooperative arrangements, through which to involve customers, can thus assist in expanding the internal knowledge base by seeking assistance in decoding inherent information complexities and unfamiliar knowledge (Dahiyat and Al-Zu’bi, p. 180). However, the extent to which external knowledge can be acquired is regulated by the embedded incidence of social capital in the established relationships (Yli-Renko et al., 2001, p. 588). Dyer and Nobeoka (2000) found that this particular process fosters the development of both dynamic learning capabilities and client-specific capabilities, which was later confirmed by Ethiraj et al. (2005, pp. 27-28). The incidence and degree to which the nature of acquired knowledge varies holds a possibility to enhance innovativeness (He
et al., 2013, p. 609), hence innovative firms must leverage such internal capabilities in order to match this capital with changing environmental conditions (Liao and Barnes, 2015, p. 1259).

### 2.2.3 Knowledge sharing through social interaction

The concept of knowledge sharing primarily involves horizontal integration, for which the width of the knowledge base determines the degree to which diverse knowledge interfaces can establish between and among functional units (Zhou et al., 2012, p. 1092). Zhou et al. (2012, p. 1092) further present that individual members can, through increased social interaction and the exchange of disparate knowledge, acknowledge each other’s work-related know-how in order to gain an understanding of the ways in which it can be synthesized and incorporated to serve common goals.

Social interaction thus serves as the main channel through which tacit knowledge is transformed into explicit (Jantunen, 2005, p. 340). But due to the abstract nature of tacit knowledge, systematic processes are hard to use for the purpose of sharing, hence more interactive dialogue between individuals should be promoted in contrast to exclusively rely on distributing and receiving information (DeSouza, 2003, in Nath, 2015, pp. 13-14). This ought to not only stimulate and facilitate knowledge acquisition, but in turn initiate the development of capabilities with which to recognize and evaluate key customer knowledge (Yli-Renko et al., 2001, p. 590). DeSouza (2003) further found empirical evidence to support informal communication to serve as a means through which to increase sharing of tacit knowledge, and thus it should be encouraged through deliberately coordinated interactions (Nath, 2015, pp. 13-14). However, as a result of increased levels of tacitness in acquired knowledge, and a higher dependency of innovation on external social networks, the knowledge acquisition process becomes increasingly interconnected and thus socially complex (Liao and Barnes, 2015, p. 1259).

Consequently, the organizational- and individual ability to learn must be subjected to specific focus. In order for firms to fully understand the fundamental value of external knowledge and subsequently be able to successfully translate and implement the ideas and concepts of others, they must build and develop competencies for the purpose of decoding and understanding such ideas (Grunfeld, 2003, in Murovec and Prodan, 2009, p. 859). Absorption is concerned with the process of internalizing (exploiting) external knowledge in order to enhance and improve innovative performance (Zhang et al., 2010, p. 76). The concept of absorptive capacity serves as the link with which to bridge the gap between internal product development capabilities and the external base of information (Murovec and Prodan, 2009, p. 859).

### 2.3 Absorptive capacity

The concept of absorptive capacity was originally introduced in macroeconomics, where it referred to an economy’s ability to absorb and utilize externally located information and resources (Adler, 1965, p. 1; Murovec and Prodan, 2009, p. 860). Nearly three decades later, absorptive capacity started gaining wide popularity in management sciences (Lane et al, 2006; Zahra and George, 2002) after the term was introduced in a firm’s perspective by Cohen and Levinthal in their seminal work Absorptive Capacity: A New Perspective on Learning and Innovation (1990). Cohen and Levinthal (1990, p. 128) suggested that the firm’s level of prior related knowledge holds a crucial role in the ability
to exploit external knowledge. The prior related knowledge refers to the abilities to recognize, assimilate and apply new knowledge, and these abilities would collectively constitute what they call the absorptive capacity. This definition has remained popular to this date. Cohen and Levinthal (1990, p. 136) proposed that in order for firms to understand and value new knowledge, they need to possess prior related knowledge. Therefore, absorptive capacity is path-dependent and thus of cumulative nature in the sense that the related prior knowledge facilitates the acquisition of new related knowledge (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998, p. 463; Todorova and Durisin, 2007, p. 783; Zahra and George, 2002). Absorptive capacity has been subjected to wide academic interest due to its potential value in linking the three concepts of organizational knowledge, learning and performance (Martinkenaite and Breunig, 2016, p. 700) and it has been widely recognized in literature to be of central value for the development of enhanced innovation capabilities (Dahiyat and Al Zu’bi, 2012, p. 183).

One of the earlier scholars studying absorptive capacity was Keller (1996), who referred to human capital as absorptive capacity, and skill formation being of crucial importance in benefiting from new goods and technologies. However, Camison and Forés (2010, p. 708) argue that Lane and Lubatkin (1998) were the first scholars building on the original work of Cohen and Levinthal (1990). Lane and Lubatkin (1998) termed their construct relative absorptive capacity, which referred to organization’s ability to absorb knowledge from other organizations rather than from a sector, as per the original suggestion by Cohen and Levinthal (1990). A widely recognized reconceptualization was made by Zahra and George (2002), who proposed absorptive capacity as a dynamic organizational capability that consists of a set of organizational routines and strategic processes that facilitate the firm’s acquisition, assimilation, transformation and application of new knowledge. (Camison & Forés, 2010, p. 708; Todorova & Durisin, 2007, p. 780) This new construct expanded the original three-dimensional construct of Cohen and Levinthal (1990) by adding a fourth dimension. These four dimensions were further divided into two groups: potential absorptive capacity and realized absorptive capacity (Camison & Forés, 2010, p. 708; Todorova & Durisin, 2007, p. 774; Zahra & George, 2002, p 185).

Todorova and Durisin (2007) criticized the reconceptualization as it omitted some important parts from the original work by Cohen and Levinthal (1990), and suggested the reintroduction of “recognizing the value” to replace “transformation” suggested by Zahra and George (2002). Todorova and Durisin (2007) questioned Zahra and George’s (2002) assumption that knowledge assimilation and knowledge transformation were two sequential processes in absorptive capacity. Instead, Todorova and Durisin (2007) viewed absorptive capacity as the capacity to value, acquire, assimilate, and exploit external knowledge, where transformation was seen as an alternative process for assimilation, depending on whether the external knowledge fitted the firm’s cognitive schemas (Camison and Forés, 2010, p.709). However, the reconceptualization made by Zahra and George (2002) has been accepted and utilized by researchers in recent studies (cf. Jansen et al., 2005, p. 1000; Jiménez-Barrinuevo et al., 2011, p. 195; Minbaeva et al., 2014, p. 41; Roberts, 2015, p. 2430), recognizing the co-existence of, and the distinction between, potential absorptive capacity and realized absorptive capacity.

### 2.3.1 Measuring absorptive capacity

Absorptive capacity has been gaining wide interest from scholars in the past two decades, and multiple theoretical and empirical studies have been conducted in order to explain organizational absorptive capacity. It has been subjected to attention at a wide range of
levels, including individual (Cohen and Levinthal, 1990), clusters (Giuliani and Bell, 2005), dyad (Lane and Lubatkin, 1998), organization (Cohen and Levinthal, 1990), national (Criscuolo and Narula, 2008), micro-macro level interactions (Martinkenaite and Breunig, 2016), and firm’s internal social structures (Tortoriello, 2015). Scholars have largely adopted the view of absorptive capacity as a dynamic capability that enhances firm’s innovation process (Camison and Forés, 2010, p. 707; Liao and Marsillac, 2015, p. 5438; Patterson and Ambrosini, 2015, p. 77; Todorova and Durisin, 2007, p. 783; Volberda et al., 2010). Furthermore, there appears to be a consensus that absorptive capacity is a multidimensional construct (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998; Murovec and Prodan, 2009, p. 860; Todorova and Durisin, 2007; Sun and Anderson, 2010).

Lane et al. (2006) identified that most of the studies follow the original research line of Cohen and Levinthal (1990) by viewing firm’s R&D activities as an indicator of absorptive capacity and thus use it as a proxy to measure absorptive capacity (Camison and Forés, 2010, p. 708; Flatten et al, 2011, p. 99). Similar proxies have been used as well, such as patents (Zhang et al., 2007), internal capabilities (Caloghirou et al., 2004), and number of scientific publications (Mangematin and Nesta, 1999). Numerous scholars (e.g. Camison and Forés, 2010, p. 708; Flatten et al., 2011, p. 98; Volberda et al., 2010, p. 937; Zahra and George, 2002, p. 199) have expressed critique toward the use of unidimensional proxies, as they, while being easily accessible, fail to address the rich, complex structure of absorptive capacity. According to Camison and Forés (2010, p. 708) there have been some authors (e.g. Jansen et al., 2005; Lane et al., 2001; Liao et al., 2007; Tu et al., 2006) addressing the multidimensional nature of absorptive capacity by developing and utilizing multi-item instruments that attempt to capture its nature better. These instruments have covered aspects such as organizational structure and culture, management practices, methods of compensation, dominant logic, and information management systems (Camison and Forés, 2010, p. 708).

One important dimension of absorptive capacity is the role of individuals, which has been recognized since the early days of the research on the subject. Cohen and Levinthal (1990) suggested that organizational absorptive capacity is fundamentally the function of firm’s employee’s intensity of learning effort as well as their cognitive abilities. This learning is cumulative, and the employee’s ability to recognize, assimilate and exploit new knowledge is dictated by the level of prior related knowledge and relevant past experiences. Importantly, Martinkenaite and Breunig (2016, p. 701) note that employees may not produce similar outcomes in their learning efforts due to the diverse cognitive abilities they possess. Despite the apparent importance, the role of individuals has received only limited attention in absorptive capacity research. Martinkenaite and Breunig (2016, p. 701) argue that many researchers have neglected to address this complexity and proceeded to view absorptive capacity as an “algorithmic matching process” (term from Lane et al., 2006, p. 854) that can easily be improved to enhance firm’s learning capabilities. The main concern has been to understand the pattern how absorptive capacity develops as an organizational capability, despite the early recognition that it begins at the individual level (Martinkenaite and Breunig, 2016, p. 701), and that individuals hold a crucial role in knowledge utilization and exploitation. (Minbaeva et al., 2014, p. 41)

Martinkenaite and Breunig (2016, p. 702) suggest the insufficient attention paid to the multilevel nature of absorptive capacity to be a result of a general lack of recognition to
the nature of knowledge and the axiological differences distinguishing tacit and explicit knowledge. They justify this line of argumentation with knowledge and information being used interchangeably in absorptive capacity literature. Minbaeva et al. (2014) furthered the research on the role of individuals in organizational absorptive capacity by proving that employee’s ability and motivation play an important role in organizational knowledge transfer. Employee’s ability therein refers to employee’s potential and ability, i.e. overall ability, educational level and job-related in relation to competitors. Furthermore, Tortoriello (2015, p. 587) confirmed that external knowledge’s impact on the innovativeness of individuals depends on the individual’s position within the firm’s social structure. However, to our best knowledge, the gap in the role of individuals in organizational absorptive capacity still largely remains.

Absorptive capacity is still considered under-researched (Murovec and Prodan, 2009, p. 859), and the highly differentiated nature of it seems to be the hallmark of the field (Volberda et al, 2010, p. 940). The field still seems to be lacking consensus how to measure absorptive capacity (Camison and Forés, 2010, p. 708; Escribano et al., 2009, p. 99; Minbaeva et al., 2014, p. 38) and even about the phases composing the construct (Jiménez-Barrinuevo et al., 2011, p. 191). We follow the example of numerous researchers (Jansen et al., 2005; Jiménez-Barrinuevo et al., 2011; Leal-Rodríguez et al., 2014; Minbaeva et al., 2014; Roberts, 2015) and build our study on the reconceptualization made by Zahra and George (2002). We aim to further the research by investigating the role of individuals by following the suggestion made by Volberda et al. (2010, p. 944) that future researchers should include the characteristics of individual cognition as an influencing factor of absorptive capacity in their research. Nooteboom et al. (2007) paved the road in their study on cognitive distance and absorptive capacity, finding that an optimal cognitive distance between firms exists to maximize absorptive capacity. Furthermore, we appreciate the notion made by Martinkenaite and Breunig (2016) that the nature of knowledge is also of importance in the context of organizational absorptive capacity.

2.4 Relationship quality

Research on relationships in the business context has been identified to originate from the service marketing field, where it was primarily dealing with consumer perspective (Holmlund, 2008, p. 32; Payan et al., 2010, p. 543). Research on the importance of good inter-organizational relationships is said (Leonidou et al., 2014, p. 21; Payan et al., 2010, p. 542) to have begun over 50 years ago when Wroe Alderson published his book *Dynamic Marketing Behaviour* (1965), and the field has been expanding since (Payan et al., 2010, p. 543). To this date, the field has developed substantially as scholars have followed different research streams by including e.g. inter-organizational governance (Heide, 1994), buyer-seller relations (Dwyer et al., 1987), and channel relationships (Anderson and Narus, 1990) in their studies of inter-organizational relationships (Payan et al., 2010, p. 542). Of these research lines, numerous scholars (e.g. Leonidou et al., 2014; Lages et al., 2005; Liao and Barnes, 2015; Tsai and Ghoshal 1998; Yli-Renko et al., 2001) have focused on relationship quality.

As stated in the section 1.3, relationship quality refers to the overall evaluation of inter-organizational relationship that arises from a range of different exchanges between interacting parties (Lages et al. 2005, p. 1041) and may lead to long-term benefits (Leonidou et al., 2014, p. 21). Relationship quality is seen as an inherent part of inter-
organizational arrangements, which reflects the “health” of the relationship (Lahiri and Kedia, 2011, p. 12). Relationship quality has been identified to dictate the strength and continuity of inter-firm relationships, which, in turn, have been positively associated with inter-organizational financial performance, reliability of supply, lower production costs, enhanced marketing efficiency, and customer orientation (Payan et al., 2010, p. 542). Studies have also shown the positive effect of relationship quality on knowledge acquisition (Liao and Barnes, 2015), which is likely to stem from the intensity of buyer-supplier social interaction involved in the process (Yli-Renko et al., 2001).

Similarly to other recognized qualities, such as product or service quality, relationship quality has been identified to be a multidimensional construct consisting of a number of variables (Lages et al., 2005, 1041; Leonidou et al., 2014, p. 21; Obadia and Vida, 2011, p. 471). According to Dant et al. (2013, p. 283), the concept of relationship quality has consistently been including trust and at least one other relational construct, of which the most frequently studied ones have been commitment and satisfaction (Palmatier et al., 2010, p. 139). This finding is supported by the literature review conducted by Payan et al. (2010). However, the operationalization of relationship quality in a way that includes trust in the construct has been subject to criticism (Ndubisi, 2007, p. 830), as some scholars argue trust to be an antecedent to relationship quality rather than part of the construct itself (Barnes et al., 2015, p. 30; Ndubisi, 2007, p. 830). Despite the three decades of research, the field still lacks consensus regarding the factors constructing relationship quality (Holmlund, 2008, p. 35; Lahiri and Kedia, 2011, p. 13; Skarmeas et al., 2008, p. 181).

However, a definition deemed particularly valuable to our study is as follows: the relationship quality is the extent to which “two parties develop common goals, norms, and reciprocal expectations regarding the goodwill trustworthiness of the exchange partner” (Yli-Renko et al., 2001, p. 591). Therefore, we view it as a means with which to facilitate exchange of information. This view is supported by Liao and Barnes (2015, p. 1261); as a result of common goals and expectations, partnering firms have a reduced need to monitor each other. This enhanced quality of inter-firm interactions can motivate firms to strengthen their knowledge sharing mechanisms and develop knowledge acquisition capabilities (Liao and Barnes, 2015, p. 1261). Thus it appears to be rather intuitive that relationship quality has an important role in knowledge acquisition from sources external to the firm.

### 2.4.1 Relationship quality and knowledge acquisition

According to Ahamed and Skallerud (2013, p. 285), strong relationship quality cannot be achieved without a good communication climate. The importance of communication in relationship quality has been identified in several studies (Lages et al., 2005; Leonidou et al., 2014). On the other hand, Liao and Barnes (2015) confirmed the mediating role of knowledge acquisition between relationship quality and product innovation flexibility, further highlighting the link between communication and relationship quality. Liao and Barnes (2015, p. 1270) concluded that supplier relationship affects product innovation flexibility through external knowledge acquisition. Successful knowledge acquisition requires reciprocity between the partnering firms, and the interactive orientation must be emphasized in order to facilitate knowledge capturing, sharing and applying (Moreira, 2009, p 97).
However, it needs to be noted that the study by Yli-Renko et al. (2001) obtained conflicting results: their data showed that relationship quality had a negative effect on knowledge acquisition. As a possible explanation, authors suggested that “overembeddedness” in relationships may insulate small firms from the external world, or that the reduced need of monitoring as a result of high trust simultaneously hampers the levels of knowledge acquired (Yli-Renko et al., 2001, p. 607). This is important to keep in mind. Liao and Barnes (2015) argue that a certain level of trust has to be present in business partnerships, and the positive relationship enhances mutual understanding and information exchange. Furthermore, trust and reward play an important role as enablers in knowledge sharing (Choi et al., 2008, p. 742). Therefore, we take the stance that relationship quality plays an important role in knowledge acquisition from sources external to the firm. We also acknowledge the findings of Yli-Renko et al. (2001): if a scale exists from no trust to “overembeddedness”, we believe there is something in between that explains the positive effect of relationship quality on knowledge acquisition. However, in this study we do not intend to define this middle ground, but merely acknowledge its possible existence when analyzing the results.

Following the stance that relationship quality holds a degree of importance, it is useful to take a look at the factors impeding it. Leonidou et al. (2006) studied the effect of distance of relationship quality and partially confirmed the inhibiting role of (greater) distance in exporter-importer relationships (2006, p. 582). Their construct of distance comprised distant social relations, unawareness of organizational structure, and unfamiliarity with working methods, organizational culture and business environment (Leonidou et al., 2006, p. 580). However, despite the seemingly logical link between psychological distance and relationship quality, the field lacks research in this context to our best knowledge. The link between knowledge acquisition and relationship quality has been established (Liao and Barnes, 2015). We aim to strengthen the research by investigating the link between psychological distance and relationship quality, and how this interplay affects firms’ absorptive capacity and knowledge acquisition.

### 2.5 Construal-level theory and Psychological Distance

Construal-level theory states that abstract representations, or levels of abstract mental construal, are formed within people’s minds in relation to an object and its prevalent psychological proximity (Liberman et al., 2007, p. 143). It describes the influential mechanism of psychological distance on cognition (Trope and Liberman, 2010, p. 440), and suggest a relationship between the level at which information is construed and the psychological distance separating the object subjected to different levels of construal (Holmqvist et al., 2015, p. 1433). This contends that higher levels of construal are used in order to create a mental representation of an object when the psychological distance from that particular object increases (Trope and Liberman, 2010, p. 441).

Although what is not present cannot be experienced, future predictions and imaginative speculations thereof can be mentally constructed, which by nature is distinct from direct experience (Trope and Liberman, 2010, p. 440). Such predictions represent psychologically distant objects and serve the purpose of transcending the immediate situation or environment in which one is (Trope and Liberman, 2010, p. 440). The inherent function of construal levels thus revolves around expansion of the individual mental horizon or regulatory scope, hence constituting the central tenet of Construal-level theory (Kalkstein et al., 2016, p. 2).
2.5.1 Low- and High-level construal

Holmqvist et al. (2015, p. 1433) describe a situation to be highly detailed and contextualized when presented at lower levels of construal and for these details to be of incidental or peripheral nature, and thus not essential for developing an understanding of the situation at hand. The context specific local particularities of the object/target subjected to focus, thus leads low-level construals to bind the mental horizons to this immediate environment (Kalkstein et al., 2016, p. 2). In contrast, situations in which information is presented at a higher level of construal, contextual elements are extracted as a result of which central features characterizing the event can effectively be understood and retained (Holmqvist et al., 2015, p. 1433). Higher-level construal is thus more simple and coherent (Trope and Liberman, 2000, p. 877), but such understanding occurs at a relatively abstract level, in which the peripheral and incidental features are foregone as a result of the information representation being decontextualized (Trope and Liberman, 2010, p. 453). By expanding the mental horizon, high-level construals also allow for separation between the focused target and the egocentric here-and-now, as the primary attention revolves around extraction of attributes that can be generalized across contexts that fluctuate across psychological distance (Kalkstein et al., 2016, p. 2). Summarily, low-level thought considers proximal targets while in contrast high-levels suffers from less bias in direct connection to its specific proximity, and thus extend the thoughts to include both proximal and distal targets; psychological distance and the level of construal are thus cognitively related (Kalkstein et al., 2016, p. 2).

Trope and Liberman (2010, p. 442) argue this to hold also for a reverse direction of influence, in which the effect of construal level on distance is the same, i.e. the generality of high-levels naturally encourages the mind to focus on distal instantiations of objects. They further state that by understanding and forming concepts of more abstract nature allows individuals to mentally transcend events that have recently been experienced across time, space and hypothetical examples.

2.5.2 Psychological distances

Psychological distance per definition is of egocentric nature and rooted in the individual subjective experience of the relative perceived distance between an object and the reference point of the self, here and now (Trope and Liberman, 2010, p. 440). Consequently, its inherent concern is the extent to which an object can, through distance dimensions of temporal, spatial, social distance and hypotheticality, be removed from that particular reference point (Trope and Liberman, 2010, p. 440). These dimensions are clarified and referred to by Holmqvist et al. (2015, p. 1438) as “social (who is interacting and how), spatial (where the interactions take place), temporal (when interactions will take place), or hypothetical distance (will the interactions take place)”. These comprised dimensions constitute subcomponents of one sole metric of egocentric distance, namely psychological distance (Trope and Liberman, 2010, p. 440), and are of critical value as alterations within any of these egocentric distances will influence cognition in an equivalent manner (Holmqvist et al., 2015, p. 1433). Activation of any dimension of distance in isolation will thus automatically affect the relative proximity of another (Holmqvist et al., 2015, pp. 1432-1433).

Nootboom (2009, in Bertrand et al., 2013, p. 752) states that the cognitive distance captures the relative extent to which differences exist in cognitive construction between
people based on the way the surrounding world is perceived, interpreted and understood. Understanding these dimensions and the ways in which the perceived distance change as a result of such changes is essential as it constitutes the psychological reality (Van Boven et al., 2010, p. 872). Furthermore, individual cognitive competencies emerge as a result of interpersonal interaction (Curseu et al., 2014, p. 1), hence affected by the relative psychological distance.

Situations in which psychological distance is small, the direct individual experience is subjected to impact due to the spatial and temporal proximity; such events occur here and now (Holmqvist et al., 2015, p. 1434). Information represented at lower levels of construal thus enables the observer to extract and utilize concrete rich details bound to its specific context, while in contrast more spatially and temporally distant events removes the availability of such detail as it is removed from the direct experience (Trope et al., 2007, p. 84). The implication of this particular link between psychological distance and the level of construal is thus that information represented at a high level of construal increases the perceived psychological distance (Holmqvist et al., 2015, p. 1434).

Events, in which the relative level of temporal, spatial, social or hypothetical distance is high ought to be represented in more abstract terms (Trope et al., 2007, p. 84). Further, as the level of abstraction increases, the envisioned psychological distance would increase as a function of this movement (Trope and Liberman, 2010, p. 440), which allows for one to focus on the desirability of specific alternatives and the underlying reasons justifying such desire (Hamilton, 2015, p. 117). High psychological distance is thus the result of an event occurring in the future to which the individual reference point is not closely related, or is experienced by people less like oneself (Trope et al., 2007, p. 84). The bidirectional nature of this relationship serves as the fundamental premise of construal-level theory (Trope and Liberman, 2010, p. 444) and implies on the one hand higher-level construals to allow for consideration of targets that are more distant, while those very targets in turn have a tendency to attract higher-level construals (Kalkstein et al., 2016, p. 2). For a contrasting scenario, in which psychological distance is low, the thinking process is concretized which allows the mind to put emphasis on details, feasibility of available options and the ways in which they can effectively be used (Hamilton, 2015, p. 117).

Ledgerwood et al. (2010, p. 39) state that greater psychological distance leads to an increase in apathy as a result of lower susceptibility to incidental social influence. However, while this is true, they argue the distance to make people switch attention to central context specific details and thus to neglect features of irrelevant character, which in turn produces evaluative consistency in terms of changing contextual information.

Stephan et al. (2011, p. 401) argue that for cases in which the level of construal varies between the self and the target at hand, higher levels activates humanism and benevolence, which in turn is positively associated with empathy and helping. However, if this process is not reciprocal, i.e. only varies with the target, lower level of construal implies a closer connection to the self (Stephan et al., 2011, p. 401).

### 2.5.3 Cognitive distance

A fifth dimension, referred by Nooteboom (2007, p. 1081) as cognitive distance, has been acknowledged to be concerned with a wide scope of mental activity. He argues this activity to include perception, sense making, emotions and equivalent value judgements based on which the world is subjectively constructed. Subjective interpretation of the
world is a result of different experiences collectively shaping each dimension, which creates the notion of cognitive distance between people (Nooteboom, 2007, p. 1081). Consequently, in order for people to fully align motives in between each other, one must share basic perceptions and the ways in which to make sense of events. Based on Weick (1979, 1995) and Smircich (1983), Nooteboom (2007, p. 1081) argues for the necessity of developing certain systems for interpretation, shared meanings and focus, and for them to be built upon such basic perception.

2.5.4 The effect of changes in psychological distances
Changes across all dimensions of psychological distance collectively increase the degree to which the level of abstraction is mentally represented of a certain object or event (Ledgerwood, 2010, p. 34). Trope and Liberman (2010, p. 440) argued that although outcomes mediated by construal have an immediate effect on prediction, evaluation and action in relation to them, so should alternations in psychological distance. Previous research has found evidence proving the impact of high-level information (self-beliefs, theories and general trends) to increase on prediction as a result of changes in both spatial and temporal distances while simultaneously experience a decrease in impact of low level (Trope and Liberman, 2010, p. 451). Stephan et al. (2011, p. 400) found changes in temporal distance of future social interaction to cause a decrease in perceived familiarity of a social target and further for it to share less familiar characteristics relative to the self. Further, they found evidence for a relationship between high-level abstract construal of a social target and lower individual familiarity which implies less resources allocated to that specific target. This research addressed a previously unrecognized area of psychological factors and the degree to which perceived social closeness can be deliberately promoted or restricted (Stephan et al., 2011, p. 400).

Trope and Liberman (2010, p. 446) argue that while psychologically distant perspectives enhance the individual ability to extract the contextual gestalt, it contrarily detriments the equivalent ability to recognize missing low-level attributes characterizing the coherent whole. However, Kalkstein et al. (2016, p. 6) found results with which to conclude that social learning is superior to direct experience as the spatial distance between the self and the source of information is greater than learning based on own experience. This means that high-level learning is more likely to occur as a result of a psychologically distant model, in contrast to one closer to the self (Kalkstein et al., 2016, p. 7). The underlying reason is explained as when the behavior of a distant model is observed, the level at which the observer construes the same action is higher, hence the behavior will be learned and internalized at a higher level.

Holmqvist et al. (2015) investigated the role of psychological distance in the value creation process, and found evidence for a positive relation between reduction in psychological distance and facilitation of value creation if framed at the right level of customer construal. They describe psychological distance to be fluctuant and manifested within a variety of spheres which can involve the service provider, the customer or both in a joint sphere. Consequently, a service provider can deliberately alter certain distances in order to prevent them from serving as a barrier for interaction, and thus increase value creation (Holmqvist et al., 2015, pp. 1435-1436).

Trope and Liberman (2010, p. 451) argue in line with construal-level theory that an increase in temporal distance can increase optimism as a function of that change, provided high-level construals anticipate the probability of desired outcomes to be relatively high.
However, the level of optimism is contrarily argued to experience a relative decrease with an increase in temporal distance, when low-level construals imply the very same likelihood of a desired outcome (Trope and Liberman, 2010, p. 451).

Kolb (2008, in Holmqvist et al., 2015, p. 1435) proposed that alteration of the psychological distance may assist in facilitating value co-creation between individuals engaging in interactive activities by fostering a higher degree of social connectedness. Intuitively, as stated in section 1.3, this follows a lower degree of social connectivity to be equivalently comparable to a greater social distance. The perceived psychological distance separating the interacting parties will thus influence the ways in which the interaction itself is being construed, hence services must be altered to fit this level of construal (Holmqvist et al., 2015, p. 1435).

Nootbooom (2007, p. 1081) explains for an increase in cognitive distance to be positively related to interactive learning, as the different knowledge and perspectives separating the parties stimulate and bridge the gaps in between them. To a certain point, this reveals novel opportunities to combine complementary resources, but when distance reaches a certain level it inhibits mutual understanding from developing (Nootbooom, 2007, p. 1081). Finally they argue too close of a distance, i.e. extensive familiarity with that of the counterpart, to remove the innovative sphere in collaborative activities.

2.6 Theoretical model and Hypothesis development

For the purpose of developing a coherent framework and a model with which to measure the effect of psychological distance on knowledge acquisition, absorptive capacity and relationship quality, the linkages between each separate construct must be validated. It must further be assured that each respective measurement is anchored in and clearly linked to one construct. Ping (2004, p. 125) outline a six-step order through which models are tested, involving the following: construct definition (i), outlining of the relationship between constructs (ii), development of construct measurements (iii), data gathering (iv), measurement validation (v) and model validation (vi).

Following the presented order, the first three steps will be cover in the following section in order to develop a valid model with which to answer the stated research question.

2.6.1 Construct definition

For the purpose of defining constructs for each respective concept, previous definitions will be brought forward. These authors have, based on the results found, been widely cited in academic journals which is assessed to reinforce that the constructs have been validated and the assumption of them correctly representing their intended measurement.

2.6.2 Knowledge acquisition

A multi-item scale for defining knowledge acquisition has been developed through review of literature within the field of knowledge management. Liao et al. (2010, p. 24) describe knowledge acquisition to be based on two primary means, i.e. to identify and acquire completely new knowledge (i), and use existing knowledge in order to create new knowledge through collaborative activities between firms and individuals (ii). This study
brings forward 9 items developed by Gold et al. (2001), out of which two has been slightly modified, which can be found in Appendix 1.

2.6.3 Absorptive capacity
The concept of absorptive capacity is, due to its inherent tacitness and complex construct, rather difficult to measure (Liao et al., 2010, p. 21). Consequently, it has been essential to use validated scales from which low factor loading items have been removed. We follow the acknowledged reconceptualization made by Zahra and George (2002), and later developed and validated by Flatten et al. (2011), which divides absorptive capacity into four respective dimensions: (1) Acquisition; (2) Assimilation; (3) Transformation; and (4) Exploitation. However, as knowledge acquisition is measured using a separate construct exclusively developed for that concept, the first and fourth dimension will not be used in order to avoid overlap. This study uses 7 items, and for a detailed outline see Appendix 1.

2.6.4 Relationship quality
In this study, we follow the definition made by Yli-Renko et al. (2001), that relationship quality is the extent to which “two parties develop common goals, norms, and reciprocal expectations regarding the goodwill trustworthiness of the exchange partner” (Yli-Renko et al., 2001, p. 591). This study employs, with slight modifications, 2 items developed by Liao and Barnes (2015) and 3 items developed by Yli-Renko et al. (2001), with which to measure relationship quality (see Appendix 1).

2.6.5 Construal level and psychological distance
The level of construal is, based on the review provided in section 2.5, defined by the extent to which objects or events are construed at high- or low levels, and thus if construal is linked to highly detailed and contextualized features (i) or retention of central features (ii). Based on Trope and Liberman (2010), the construct for psychological distance is defined by its four constituent means, spatial, social, temporal and hypothetical distance, and is concerned with the perception of an object relative to the self as a function of changes in each respective dimension. This study employs 8 items initially developed by Bar-Anan et al. (2006), which have been slightly modified and are presented in Appendix 1.

2.6.6 Construct relationships
Closer psychological distance ought to imply lower-level construals to better extract contextual details deeply anchored in an event, and should thus serve to direct the focus of knowledge acquisition activities toward rather specific targets. In line with this argumentation it becomes intuitive that lower-level construals should, with less difficulty, exploit and apply existing knowledge in that specific setting provided high relationship quality. Contrarily, greater psychological distance should lead higher level construals to retain central features of an event and thus lead to more intense efforts to acquire new knowledge and develop an understanding of the broader picture without targeting a particular problem. The influence of relationship quality consequently ought to be weaker. As the greater distance should enhance the individual ability to extract contextual gestalts (i.e. to understand the big picture), it might give rise to an inability to identify problem details at hand, and thus have a detrimental effect on exploitation of existing
knowledge. On the other hand it ought, due to this potential inability, spur creativity and prove to have the complete opposite effect.

As greater psychological distance diminishes the ability to construe peripheral or incidental features, it should lead to easier knowledge transformation but less accurate assimilation. Closer psychological distance would on the other hand increase the level of tacitness, and thereby lead to increased complexity in transformation but with more accurate assimilation.

By nature, relationship quality ought to fluctuate with the intensity of interaction and the consistency of positive outcomes thereof. The relationship between psychological distance and relationship quality should thus be bidirectional, in which lower perceived quality would imply temporarily greater psychological distance and *vice versa.*
2.7 Hypotheses

Guided by the research question, and based on the construct relationships stated in section 2.6.6, six hypotheses have been developed.

**H1:** Closer psychological distance has a positive effect on acquisition of detailed and/or specific knowledge.

**H2:** Closer psychological distance and high relationship quality have a positive effect on the ability of low-level construal individuals to exploit and apply existing knowledge for a specific need.

**H3:** Greater psychological distance and lower relationship quality have a positive effect on high-level construal individuals to acquire knowledge about the organized whole.

**H4:** Greater psychological distance has a negative effect on the ability for high-level construal individuals to exploit and apply existing knowledge for a specific need.

**H5:** Closer psychological distance has a positive effect on perceived relationship quality.

**H6:** Greater psychological distance has a negative effect on perceived relationship quality.

2.8 Theoretical model

![Conceptual model developed by Authors](image)

*Figure 1: Conceptual model developed by Authors*
3. Methodology

The following chapter provides a detailed declaration of the methodological foundation based on which this study is conducted. The philosophical stances, and thus the held assumptions of reality, are clarified and outlined for the purpose of providing a logical connection to the following subsequent choices: Research approach, research design, research strategy, operationalization and data analysis. The methodological choices has been evaluated based on each respective ability to effectively assist in answering the stated research question of this study.

3.1 Philosophical approach

The philosophical approach underpinning and justifying a set of held assumptions of what is right or wrong in science has been widely debated, and advocates of different dichotomies have emerged over time. The nature of the social world is approached by, and subjected to, sets of implicit or explicit assumptions concerning the ways in which it may or may not be investigated (Burrell and Morgan, 1979, p. 1). Morgan and Smircich (1980, p. 491) argue that research method cannot, due to the its embodied assumptions of the nature of social phenomena and the ways in which knowledge can be obtained within its structure, be presented in the abstract. This has further been reinforced by Hirschman (1985, p. 225) who base the argumentation on the inevitable subjection to influence from attitudes and human values due to science being the result of human creation. The fundamental philosophical stances has thus been divided into two distinct approaches, each rooted in sets of interrelated assumptions; ontology (essence of a phenomenon) and epistemology (the grounds of knowledge) respectively (Morgan and Smircich, 1980, p. 491; Burrell and Morgan, 1979, p. 1-2).

In order to fully recognize the potential of each set of assumptions and the ways in which results can be generated, Long et al. (2000, p. 195) recommend social science researchers to thoroughly reflect upon the own ontological and epistemological stances.

3.1.1 Ontological assumptions

The discipline of social ontology is described to concern itself with what exists (Kivinen and Piirainen, 2004, p. 231) and thus the underlying assumptions about social reality and the nature characterizing its inherent attributes (Long et al., 2000, p. 190). It refers to a typology for reflecting on the fundamental views of human beings and the extent to which reality is perceived as either objective to these individuals, or subjective and socially/cognitively constructed between them (Morgan and Smircich, 1980, p. 492; Long et al., 2000, p. 190). Bryman and Bell (2011, p. 21) explain for the position of objectivism to imply a view of social phenomena as a source from which external facts are presented, which by nature are independent and thus not susceptible to individual influence. This paradigm derives from a pro-natural science philosophy for which the world is perceived as a solid network where its constituent parts are in precise connection to each other (Long et al., 2000, p. 191-192).

In contrast, the position of subjectivism holds the core assumption of reality as a mere projection of human imagination (Morgan and Smircich, 1980, p. 492). This position implies a belief held about the world to be consisting of multiple, and all equally valid, human realities, in which understanding of the individual historical-contextual characteristics is critical (Long et al., 2000, p. 191).
However, these particular stances are not mutually exclusive, but rather two extremes of a larger continuum of thought. Morgan and Smircich (1980, pp. 492-493) explain that advocates of each tend to incorporate perspectives from adjacent positions, and present a range of alternatives in between each polarized position for which the transition must be gradual.

3.1.2 Epistemological assumptions

Epistemological assumptions are concerned, from a knowledge basis perspective, with the ways in which one can attain an understanding of the surrounding world (Burrell and Morgan, 1979, p. 1), and how transmission of such knowledge effectively can occur (Long et al., 2000, p. 190). The epistemological philosophy is thus an extension of the ontological positions outlined in the previous paragraph. Morgan and Smircich (1980, p. 493) describe the fundamental assumptions held about the world and its mere existence to inherently reflect differences about the grounds in which knowledge can be created. They further argue that as the ontological assumptions pass gradually along the continuum of subjective/objective, the nature of accepted knowledge changes in accordance. Long et al. (2000, p. 190) describe, based on the two extremes, knowledge to be either perceived as highly subjective and thus a result of individual experience, or in contrast, of objective nature and theoretically accessible to all.

The assumptions derived from that of the objectivist, and thus the view of the world to be perceived as an interconnected solid network, calls for an epistemological position that alleviates the necessity of studying the constituent elements of that structure and the nature of their relationships (Morgan and Smircich, 1980, p. 493). This is referred to by Burrell and Morgan (1979, p. 5) as a positivist view, for which the main emphasis revolves around seeking to empirically analyze, explain and predict social world phenomena through regularities and causality. The epistemological positivism thus encourages an objective form of knowledge that imitates natural science (Bryman and Bell, 2011, p. 15) and by which the nature of laws within such phenomena can be measure as social “facts” (Morgan and Smircich, 1980, p. 493).

As a step toward a more subjective position, in between the polarized positions, critical realism serves as the middle ground. Kivinen and Piirainen (2004, p. 232) explain, based on Bhaskar (1975), that knowledge must adhere and conform to the concrete structures of the positivist world. However, critical realists recognize a distinction exist separating the objects subjected to focus and the terms used to describe it, thus reality should be understood to consist of certain levels irreducible to one another (Bryman and Bell, 2011, p. 17; Kivinen and Piirainen, 2004, p. 232).

The epistemological position, for which the roots are anchored in the assumptions of social reality to be rather subjective and socially constructed, encourages a different fundamental point of view with regard to how knowledge is created. This position was initially addressed as contextualism (Gadalla and Cooper, 1978, p. 350), subsequently translated into “anti-positivism” (Burrell and Morgan, 1979, p. 5), and later referred to by Bryman and Bell (2011, p. 16) as interpretivism, which poses that people and the institutions in which they take action are by nature fundamentally different from the law-like relations found in natural sciences. In contrast to the positivist view of social reality the standpoint of the observer is rejected, and the world can only, due to its essentially
relativistic perception thereof, be understood from the point of view of the individuals within it (Burrell and Morgan, 1979, p. 5).

Saunders et al. (2009, p. 116) present interpretivism to stem from the two philosophical branches of symbolic interactionism and phenomenology respectively. Long et al. (2000, p. 193) present the prior mentioned to view knowledge to derive from symbolic relationships and its inherent meanings, manifested as a result of social actions and interactions rather than social behavior. Consequently, as such meaning is to be found in the social action, they argue the inability to measure or observe such social reality as law-like behavior.

The latter refers to how individuals effectively make sense of the surrounding world (Bryman and Bell, 2011, p. 18), which is a more extreme subjective stance, and one for which Long et al. (2000, p. 194) state that:

“knowledge is constituted as discovery of the methods humans use to create or arrive at a subjective consensus on social meanings”.

3.1.3 Axiology

Creswell (2013, p. 20) presents axiology to be concerned with the extent to which values influence research and the potential effects thereof. Individual values are a key element by which human action is directed, and due to a general inability to separate oneself from the values held, the axiological assumptions impact and characterize academic research (Heron, 1996, p. 286; Creswell, 2013, p. 20). Consequently, the following sections aim to explain for the extent to which personal values may have influenced the choices made throughout the study and the potential impact of forthcoming chapters. The subsequent section further aims, based on the methodological discussion, to outline and reflect upon the philosophical stances taken for this thesis.

In line with the stated research question, the purpose of this study is to investigate how levels of psychological distance influence the individual ability to cognitively relate to a counterpart, and thus to measure how the absorptive capacity varies as a function of this ability. This is a clear reflection of the shared academic backgrounds and collective interest in gaining a deeper understanding of how to better accommodate an elderly population and in the end stimulate innovation with which to meet changing demands. The axiological assumptions with regard to preconceptions of how this effectively ought to be addressed, and the synthesized framework with which to measure its impact, have thus had strong impact on the choices made. Consequently, the extent to which this study is believed to generate theoretical contribution is a result of discussions held, and the underlying values influencing the direction thereof. These particular values will thus naturally affect the forthcoming sample selection and evaluation of its degree of suitability for this study. However, the available sampling options will be carefully evaluated in order to minimize the impact of personal values and thus to increase the degree to which it can be considered representative for its purpose.

3.2 Research paradigm

Figure 2 outlined below presents the four constituent paradigms of social theory developed by Burrell and Morgan (1979), for which the aim is to depict and explain for the interplay between the ontological and epistemological dimensions of reality. Burrell
and Morgan (1979, p. 23) explain for the paradigm intention to alleviate common denominators in perspectives between groups of theorists in order to approach social theory framed by shared problematics. The paradigm matrix thus provides a holistic map with which to identify shared commonalities and differentiating elements between various researchers, and the underlying assumptions adopted (Burrell and Morgan, 1979, p. 24). Each respective paradigm is divided classified as follows; Subjectivism, Objectivism, Radical change and Regulation.

![Figure 2: Four paradigms for the analysis of social theory](source: Burrell and Morgan (1979, p. 22))

The sociology of regulation refers to the purpose of business research as to understand and provide for non-judgmental explanations of organizational phenomena, after which potential suggestions on future improvements can be declared (Bryman and Bell, 2011, p. 24). In significant contrast to this dimension, the fundamental pillar of sociology of radical change revolves around identifying explanations for such change along with the structural conflicts and contradictions by which society is perceived to be characterized (Burrell and Morgan, 1979, p. 16). The functionalist paradigm, located in the bottom right corner, is problem-oriented, regulatory and objective in nature as it seeks to meet organizational problematics within its very structure with rational explanations and recommendations with which to solve it (Saunders et al., 2009, p. 120). The interpretive paradigm is subjective and aims, contrarily to observation of action, focus on individual consciousness and frames of references in which explanations to social phenomena is believed to be found (Burrell and Morgan, 1979, p. 28). On the upper left side of the matrix, the radical humanist is concerned with meanings of social phenomena and sees change as the main driver for research, thus perceives an organization and its inherent constituents as socially arranged but from which its individuals must be separated (Bryman and Bell, 2011, p. 24). The quadrants final paradigm, i.e. that of the radical structuralist, is objective in nature and concerned with organizational hierarchies, structural patterns and the extent to which such internal relations give rise to dysfunctionalities (Saunders et al., 2009, p. 121). Analysis of power relationships and patterns of conflict thus constitute the foundation based on which research ought to be approached.
3.3 Philosophical stances

Contextualizing the previous explanation for critical realism is necessary in order to clarify the ontological view held of the social world. It was stated that “a distinction exist separating the objects subjected to focus and the terms used to describe it” (See section 3.1.1). Saunders et al. (2009, p. 119) explained for this position to view the world and its mere existence as independent of human thoughts or knowledge, but is subject to interpretation through social conditioning.

Changes in perceived or actual psychological distances between individuals imply an equivalent effect on cognition. The brain is set up by concrete networks of law-like relationships which per nature are unsusceptible to human influence. However, the conscious mind is subsequently used in order to make sense of the event, hence it is external to the social world. The ontological assumptions are thereby intuitively revealed, and the stance of a critical realist will consequently be adhered to.

Knowledge is not viewed in absolute and/or static terms, but bound to its specific context and the elements characterizing a rather distinct environment. It is thus seen as deeply relational and the result of dynamic processes, making it stand in direct relation to human action. Our epistemological assumptions thus support knowledge to reside in the very nature of human interaction and in order to for it to be attained, one must understand its inherent complexities.

However, as the intention is not to investigate in rich detail specific individual cognition, but rather to generate a general understanding of the ways in which elements of psychological distance can affect absorptive capacity, the complexity of the philosophical position increases.

With regard to section 3.2 and the research paradigm, the epistemological stance is thus found to be mainly of objective nature but in between that of the functionalist and interpretivist. Long et al. (2000, p. 192) present an epistemological paradigm derived from the semi-objectivist position in which the social world is defined as an adaptive and reactive “open organism”. This position is explained to imply predominance of causal relationships and thus a view of the world to operate pursuant to natural laws, although such network connections are parts of an evolving social process. Consequently, as the organismic paradigm puts emphasis on multi-directional interactions to occur continuously, the most general causal patterns can only be subjected to identification, hence not thought to be a static social essence (Long et al., 2000, p. 192).

This philosophical orientation allows us to treat knowledge as a result of a complex dynamic process, but as an integral part of a defined structure, hence the “open organism” will be adopted for this particular study.

3.4 Research approach

The research approach of a study depends on the extent to which theories are defined in the beginning of the research project. Accordingly, there are two opposite approaches: deductive and inductive. The former refers to an approach fundamentally anchored in the intention to explain for causality between variables within a social phenomenon (Saunders et al., 2009, p.125). The accumulated incidence of research conducted within the studied field collectively serves as the platform from which to deduce hypotheses.
which in a subsequent phase will be subjected to empirical scrutiny (Bryman & Bell, 2011, p.11). A deductive approach thus is adopted when the research begins with a set of defined premises and an aim to produce a conclusion, which will be true if the premises are (Ketokivi and Mantere, 2010, p. 330; Saunders et al., 2012, p. 143). An inductive stance is explained by Bryman and Bell (2011, p. 13) to have a reversed connection between theory creation and observation, as a result of which theory is perceived as the mere outcome of a studied social phenomenon. Induction is presented by Saunders et al. (2009, p. 126) to possess an inherent ability to uncover specific dimension of reality that with a pre-set of defined variables might not be possible. In other words, a deductive stance implies data to be collected for the purpose of testing hypotheses or propositions in relation to an existing theory, whereas an inductive approach aims to build new theory (Saunders et al., 2012, p. 144). Furthermore, as highlighted by Lukka and Kasanen (1995, p. 71), the outcome of reasoning in inductive studies is never true with certainty, whereas deductive approach preserves that possibility, given that the defined premises are true.

Additionally, there is a third research approach; abduction. It is described by Patel and Robinson (2011, p. 23) to be concerned with a combination of inductive and deductive elements, which effectively implies hypothetical patterns to be formulated for individual cases which are subsequently used to explain them. It involves two distinct steps, where the first is of inductive nature and the second derived from that of deduction, based on which existing hypotheses or theory can be expanded in order to attain a more general level (Patel and Robinson, 2011, p. 23). This effectively means being able to move between theory and observation. Abduction is distinct from both deduction and induction, and it is seen as the weakest reasoning form due to its inherent fallacy of affirming the consequent (Ketokivi and Mantere, 2010, p. 330). It is however commonly used in research practice (Ketokivi and Mantere, 2010, p. 330)

Extensive research has been conducted in the past within the fields of knowledge acquisition, absorptive capacity, relationship quality and psychological/cognitive distance, however not fully combined. The theoretical foundation has consequently been assessed sufficient in order to explain for causality between the constructs, and thus for the purpose of answering the stated research question. Conclusively, the adopted research approach is derived from that of a deductive.

### 3.5 Research design

The research design is described as the general plan for how the research questions will be answered, outlining the data collection techniques and methods of analysis to process the collected data (Saunders et al., 2012, p. 160). The first methodological decision to be made is the choice between quantitative and qualitative methods, or a combination thereof.

The adopted research strategies within the field of business administration generally adheres to that of quantitative (numeric) or qualitative (non-numeric) respectively (Saunders et al., 2009, p. 152) The traditional (and simple) way of distinguishing quantitative and qualitative research is the type of data: numeric data, i.e. numbers, is associated with quantitative research, whereas non-numeric data, i.e. words, symbols or images, is associated with qualitative research. However, qualitative research is not bound to be conducted in absence of numeric values (Bryman and Bell, 2011, p.386). This simple type of distinction between the two research methods is narrow and problematic
(Saunders et al. 2012, p. 161), as a variety of different assumptions about the nature of knowledge and the phenomena at hand is inevitably underlying the choice of research method (Long et al., 2000, p. 190; Morgan and Smircich, 1980, p. 491). As quantitative methods draw principally from natural sciences, the use of them in the context of social sciences implies that researchers attempt to “freeze” the social world into a concrete structure where the influence of humans is reduced (Morgan and Smircich, 1980, p. 498). This approach holds a presumption that the social world can be measured objectively by studying the law-like relationships between different elements that have been abstracted from their context. However, such a view on social sciences is not free of problems, as was pointed out by Lukka and Kasanen (1995), who refer to a notion made by MacIntyre (1990) about the difficulty of generalization in social sciences. In order to make meaningful predictions for the future populations they would have to remain unchanged, which goes against our independence to make our own choices – our freedom of being unpredictable.

The field seems, based on (Long et al, 2000, p. 191), to be polarized by the contrasting views whether methods from natural sciences can be utilized in social sciences, or is a more qualitative approach needed that incorporates the scientist’s understanding of the world that is shaped by personal experiences. Long et al. (2000, p. 195) argued that scholars have promoted the use of qualitative approach in theory generation, whereas quantitative approach is more fruitful in theory testing. They further argue it to be problematic to use either of those approaches for both as qualitative approach has its strengths in validity and quantitative in reliability, while both methods fall short of the strength of the other.

The research design that is often coupled with deductive approach is quantitative. (Saunders et al, 2012, p. 146) However, as discussed earlier, the choice of research design is not simple. When we as researchers identify our epistemological stance to be critical realist, which is leaning slightly toward the objective end of the continuum, we believe that the world exists independently of human influence but interpreting it requires understanding of the social context. This is a challenging mix for designing research. However, it is also our belief that the evolution process of the social world is characterized by causal relationships, and we want to hypothesize and test some of the relationships therein in order to increase our understanding of the world. The intuition and common sense of us as researchers, both of which are argued by Long et al. (2000, p. 195) to serve as good indicators of the appropriateness of research method, are therefore suggesting carrying out a quantitative study. This would help to benefit from and build on the past research to increase the reliability and the ability to generalize the results of our study. However, we acknowledge the inherent issues with generalizing in social sciences: it is possible, but not to the same (strong) extent as in e.g. natural sciences (MacIntyre, 1990 in Lukka and Kasanen, 1995, p. 73), as there is no reasoning or observation guaranteeing the studied social phenomenon still exists in the future (Lukka and Kasanen, 1995, p. 74).

Furthermore, the choice of quantitative research method also suggests the nature of our research design. The study of causal relationships between different variables, i.e. investigating a problem in order to explain for causality, is known as explanatory research (Saunders et al., 2012, p. 172). As this corresponds with the fundamental aim and intention of this study, the nature of the research design derives from that of an explanatory.
3.6 Research strategy

The choice for research strategy is made similarly to that of the research design: it is heavily influenced by the research questions and objectives. Saunders et al., (2012, p. 173) list some of the possible research strategies as follows: Experiment; Survey; Archival Research; Case Study; Ethnography; Action Research; Grounded Theory; and Narrative Inquiry. A similar discussion could be had about research strategies as has arisen about research designs: no strategy should be seen superior or inferior to others per se, as they are so largely dependent on a multitude of issues, such as the philosophical stances and the research context.

In principal, quantitative research associates with experimental and survey research strategies (Saunders et al., 2012, p. 163). Experimental research strategy has its roots in natural sciences, where it was initially utilized in laboratory experiments. It aims to test that if something happens to an independent variable, what is the probability it will cause an effect in the dependent variable (Hakim, 2000, in Saunders et al., 2012, p. 164). It has been argued to be the most rigorous of scientific research methods (Saunders et al., 2012, p. 174). Lab experiments and surveys are further presented by Morgan and Smircich (1980, p. 492) to adhere to the extreme objectivist end of the scientific approach continuum.

A survey strategy is commonly used in management and business research when the aim is answer “what”, “who”, “where”, and “how”-type of questions (Saunders et al., 2012, p. 176).
Survey strategy may utilize structured observation, structured interviews, or questionnaires, out of which questionnaires permit the collection of standardized data from large populations, which can then be analyzed using various statistical methods (Saunders et al., 2012, p. 176-178). This is advocated as a very economical way of collecting large amounts of data, as opposed to e.g. interviews, which explains its popularity in management- and business research. However, the survey strategy is not free of problems, as the number of questions that can be included in the questionnaire is limited, and as is the human capacity to understand them in the right way. Saunders et al. (2009, p. 372) puts emphasis on the necessity to secure that respondents decode the asked questions in the way it was initially intended. Questionnaires thus need to be designed carefully, and it is desirable to test their functionality with a smaller sample prior to distribution in large scale.

The research strategy that has been evaluated as most appropriate for the purpose of answering the stated research question derives from that of a survey, and data is to be collected through questionnaires. This will be further presented in section 3.13.

3.7 Literature search and source criticism

3.7.1 Systematic review

Guided by the stated research question, branches to the field of knowledge management have been subjected to scrutiny. Knowledge acquisition, absorptive capacity, along with relationship quality and psychological distance thus collectively served as the fundamental platform from which literature was reviewed. The primary objective has been to secure a high level of trustworthiness in the reviewed material, hence peer
reviewed articles published from high impact journals have been exclusively selected. In order to access such tertiary literature sources, electronic databases such as EBSCO Business Source Premier, JSTOR and Emerald have been used.

The primary focus of the literature review has been to minimize the extent to which bias may have influenced the material by previous researchers. Bryman and Bell (2011, p. 94) present systematic reviews, due to its adoption of explicit procedures, to suffer from a lower degree of research bias and thus serve as a cornerstone in evidence-based research. Consequently, the design of the review adheres to that of a systematic, and the literature found within each respective field have offered a good overview of the covered topics and thus have set the direction of this study.

3.7.2 Search words

Keywords used for this study have involved “Knowledge management”, “Knowledge acquisition”, “Absorptive capacity”, “Relationship quality” and “Psychological distance”. The process of searching for relevant literature has followed what Saunders et al. (2009, p. 83-84) refer to as Boolean logic, where search strings (the stated search words) have been combined or searched for in isolation in order to widen the sources from which to access literature.

3.8 Pre-understanding

An inability to make sense of the world without having established a level of pre-understanding thereof serves as an intuitive but fundamental assumption of the scientific philosophy (Gilje and Grimen, 2007, p. 179). The degree to which such can be developed is a function of individual experiences, which by nature is different with individual background, but directs the ways in which interactions are interpreted (Gilje and Grimen, 2007, p. 183). With a collective educational background amounting to twelve years of university studies in the field of business administration, it is believed a rather high degree of pre-understanding has been developed prior to conducting this study.

The role and importance of knowledge acquisition and absorptive capacity in contemporary corporations have been extensively encountered during studies on innovation management and business development. Although this has allowed for contextualization of each respective theoretical concept, and thus for them to be contrasted with companies operating in the elderly market, it is important to emphasize the continuous learning curve. The pre-understanding will merely serve as a way to rationalize choices and discussions in order to reach conclusions of the direction in which to proceed. Contrarily, the concept of psychological distance has been recently encountered, and the level of pre-understanding is thus rather limited. However, the procedure of creating the theoretical framework of this study is believed to provide sufficient academic material for gaining a proper grasp of the concept at hand.

Conclusively, our pre-gained academic knowledge is believed to have given a sufficient perspective of the concerned field in order to effectively carry out this study.
3.9 Time horizon
Research can follow two primary designs with which to indicate the point in time at which to collect data, and the incidence of cases from which data is to be collected; Cross-sectional and Longitudinal. Bryman and Bell (2011, pp. 53-54) present a cross-sectional design to entail a large number of cases, each studied at one particular point in time, for the purpose of establishing a sufficient body of quantifiable data in order to draw inferences of potential patterns between variables. In contrast, a longitudinal study retrieve its strengths in its capacity to utilize the benefits of time in order to observe development and change of certain phenomena provided uninfluenced by the researcher (Saunders et al., 2009, p. 155).

As the main objective with this study is to measure, explain for, and subsequently generalize the relationship between psychological distance and elements of knowledge acquisition, there is no intention of gaining an understanding how such factors vary over time for each individual sample. The adopted approach is thus cross-sectional as it allows to build an extensive body of quantitative data by which a larger population sample can be represented. Additionally this particular approach enables direct cause-and-effect comparison of variables derived from the same point in time, thus reflecting a legitimate snapshot of the phenomenon at hand.

3.10 Methodological Summary

Table 1: Summary of Methodological assumptions and choices

<table>
<thead>
<tr>
<th>Critical Realism:</th>
<th>Social world seen as a concrete network, from which the mind is separated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Organism:</td>
<td>Creation of law-like generalizations is an evolving social process</td>
</tr>
<tr>
<td>Deductive:</td>
<td>Literature serve as the foundation based on which hypotheses are stated</td>
</tr>
<tr>
<td>Quantitative:</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>Explanatory:</td>
<td>Intention to explain causality between specific variables</td>
</tr>
</tbody>
</table>

3.11 Data collection Methods

3.11.1 Secondary data
Secondary data per definition is concerned with data for which the collection process has been carried out by others, for a purpose different than the research question at hand (Stewart, 1984 in Cowton, 1998, p. 424). It includes both quantitative and qualitative data, ranging from raw unprocessed data to compilations of selected data (Saunders et al., 2009, p. 258). The types of secondary data thus include governmental and regulatory bodies, press material, company reports or academic articles (Cowton, 1998, pp. 424-42). As mentioned in section 3.7.1, the systematic review carried out is, in its entirety, comprised by data of secondary nature.
3.11.2 Primary data

Data of primary nature is new and specifically linked to the conducted research (Saunders et al., 2009, p. 256). Cowton (1998, pp. 428-429) explains for secondary data to imply loss of control over the data generation process, and despite manipulation thereof, it may inadequately address the research at hand as the generation of data served a different theoretical concern. He further intuitively describes for the inability to utilize such data if it is yet to be collected. As stated in the introductory chapter (see section 1.3), no research has been found addressing the impact of psychological distance on absorptive capacity and knowledge acquisition. Consequently, this study will exclusively rely on collection of primary data for subsequent analysis.

3.11.3 Sampling method

In order to for data to be effectively collected from a sample that is representative for the target population, and for which the result subsequently can be generalized, an appropriate sampling method is considered of essential value. The sampling techniques by which to locate and filter a target sample is divided in two specific categories, probability- and nonprobability sampling respectively. For the purpose of drawing statistical inferences about a specific sample derived from a target population, probability sampling is most frequently employed in survey-based research strategies (Saunders et al., 2009, p. 214). This implies a selection process based on randomness for which each specific population unit has a non-zero probability of being selected (Bryman and Bell, 2011, p. 176). Nonprobability sampling is contrarily concerned with a range of techniques of exploratory nature through which to select a suitable sample (Saunders et al., 2009, p. 233). In line with the nature of this study, and an intention to draw statistical inferences on quantitative data, probability sampling has been employed.

3.11.4 Sampling frame

Due to unavailability of existing sampling frames with which to identify and randomly select representative samples developing products with an elder population as main target segment, such has been compiled using lists from trade shows and exhibition fairs. This choice is a recommended step by Saunders et al. (2009, p. 214) who argue that in case availability of such lists is limited, one would have to assemble an own compilation thereof. However, the objective has been to minimize the risk of inadequacy, and thus for the sampling frame not to be inaccurate and non-representative. Consequently, exhibition fairs within the Nordic region have be subjected to scrutiny in order to screen a list of suitable companies for the purpose of this research. The target sample is product- and service development teams in companies addressing an aging population, with an already developed portfolio of existing products with which to serve the market of interest.

As the challenges of serving changing demand patterns is believed to be mediated by the psychological distance separating the product developer from the end user, we propose it to apply independently of market. However, in order to minimize the risk of fundamental bias in the sampling process, companies have been acknowledged and listed based on the industry in which they operate.

3.11.5 Types of sampling

Systematic sampling derives from the family of probability based techniques and involves applying regular intervals in the sample frame in order to attain proper selection (Saunders
et al., 2009, p. 226). This technique suggests selection of units directly from the used sample frame (Bryman and Bell, 2011, p. 180). In order to secure a high degree of representativeness in the collected data, such method would be appropriate for the nature of this study. However, due to the rather limited magnitude of companies operating on markets addressing an elderly population, conducting random samples is assessed to exclude a significant part of the available samples.

Purposive, sometime referred to as judgmental, sampling, enables the researcher to select cases based on individual judgement in a way through which to best answer the stated research question (Saunders et al., 2009, p. 237). It can be treated as a random sampling process through which sampling occurs within a segment holding the most desirable information (Guarte and Barrios, 2006, p. 277). This technique excludes less informative segments by assigning them zero inclusion probability, and can thus be referred to as purposive random sampling (Guarte and Barrios, 2006, p. 278). It is thus not part of conventional probability or nonprobability sampling techniques, but rather a hybrid. Based on Jeager (1984), McDaniel and Gates (2010, p. 424) argue such non-probability sampling, provided careful and thorough data collection, to be of reasonably representative nature. Purposive sampling is traditionally associated with qualitative research, but has due to internet recruitment become a popular technique for large sample quantitative studies (Barratt et al., 2015, p. 5). Additionally, Bryman and Bell (2012, p. 288) address the concept of homogenous sampling for which focus revolves around specific sub-groups characterized by similar features.

As the objective is to gain an understanding of how psychological distance impacts product- and service developers’ ability to fully understand the needs of the users, the aim is to find a sample with shared characteristics in terms of profession. Consequently, a homogenous purposive sampling has been assessed suitable and thus employed for data collection. However, Barratt et al. (2015, pp. 5-6) state that inferential statistics drawn upon purposive sampling cannot be subject to generalization outside of the sample itself. Due to the abstract and subjective nature of psychological/cognitive distance perception, individuals are still seen to behave in a way that can be explained through such dimensions irrespective of industrial features. The issue of non-generalizability is thus seen to have been reduced.

### 3.11.6 Sample size

Bryman and Bell (2011, p. 189) argue that the relative extent to which a target population is heterogeneous serves as a key determinant directing the required sample size. A greater population heterogeneity thus implies more variation which in turn calls for a larger sample size. The group of companies to which attention is given are rather homogenous, and the respondents collectively share a large set of similar characteristics, hence a comparatively smaller sample size is assessed sufficient. However, the collected data must provide a certain level of confidence, and a margin of error that allows the researcher to undertake analysis at a sufficient level of detail (Saunders et al., 2009, p. 220). In order for research to be conducted and for the results to be subsequently published, the willingness of the target sample to respond is essential and thus gives rise to a situation of total dependency on the respondents (Baruch, 1999, p. 421). As the entire population of companies cannot be approached for this study, it is considered essential to theoretically identify a sample size that is representative for the population.
The required sample size can be effectively calculated based on either chosen confidence level or margin of error, for which the latter is not negatively influenced if the population size is much larger than the desired sample size (Moore et al., 2011, p. 343). Based on the constructed sampling frame, the total population size consists of 127 companies.

Malhotra (2011) demonstrate a statistical method with which to determine a required sample size based on an assigned confidence level, where \( n \) represents the sample size and \( N \) the population size respectively. Furthermore, \( Z \) demonstrates the standard error which is effectively determined by the critical value of \( Z \), which with a confidence level of 95% corresponds to a value of 1.96.

\[
n = \frac{2500 \times N \times Z^2}{[25 \times (N - 1)] + [2500 \times Z^2]}
\]

Source: Malhotra, 2011

Based on a population size of 127 companies, this calculation gives a required sample size of 95 respondents. The central limit theorem states that if the studied sample size reaches a certain incidence, distribution of its sample mean will approach normal distribution (Moore et al., 2011, p. 21). Saunders et al. (2009, p. 243) further builds on this concept, and argue 30 to be sufficient for the purpose of conducting proper statistical analyses. Although aiming for 95, based on the size of the target population, a sample of >30 is assessed sufficient in order to be representative.

### 3.11.7 Non-responses

The questionnaire was sent out to 127 companies, out of which 12 chose to decline participating due to ethical reasons and lack of available time. Out of the 115 companies, 51 responses were successfully received corresponding to an effective response rate of 44.3%. However, 45 responses could be confirmed and traced to e-mail correspondence, which implies 6 questionnaires to potentially have been redistributed internally. In that case the company response rate amounts to 39%, but the total number of suitable participants cannot be estimated. This could imply a certain degree of bias in the results, but in reference to the homogeneity in many answers provided it is assessed unlikely. As the distribution between company size and age proved rather balanced, is it thus reasonable to assume that in case bias is prevalent it would derive from that of gender. The 64 companies from which no responses could be collected, were sent 2 reminders, which might indicate either lack of interest or available time to allocate for such purpose.

The amount of respondents potentially suitable for participation is likely to be in excess of the 51, as it is reasonable to assume that at least larger companies have assigned developer positions for more than one employee. There is thus a risk for most of the answers provided to reflect the opinion of management, unless the individuals with whom e-mail contact was initiated specifically assigned an appropriate employee to participate. Due to the ethical guidelines underlying this study, full anonymity was promised, hence each individual company cannot in retrospect be contacted for clarification of this issue. It is conclusively believed that the non-response rate did not have a significant impact on the results as the tendencies were rather similar with company size, age and gender spread across a variety of industries.
3.12 Operationalization

In relation to reviewed academic literature within the fields of knowledge acquisition, absorptive capacity, relationship quality and psychological distance, a gap was identified based on which a research question was developed. Based on literature within the mentioned fields, a theoretical framework was designed in order to provide lenses through which to answer the stated research question. Constructs were carefully defined to include specific elements characterizing each concept, and the ways in which they interrelate were declared for. Data was collected from a sample of 45 companies operating with an elderly population as the target segment, and product developers from each respective organization were effectively selected. The theoretical framework served as the platform with which the collected data was analyzed to uncover correlation between them, and later reflected upon in a discussion section. Question items were primarily utilized from previously validated research in order to secure a high factor loading in relation to the developed constructs, and modified in accordance with the fields of study. Questions related to knowledge acquisition and absorptive capacity were designed in more general terms with regard to firm behavior, while psychological distance and relationship quality targeted the individual perception of the self in relation to others.

3.13 Questionnaire

The questionnaire has been developed for the purpose of distributing it using the internet and for the respondents to complete it independently of the distributor. Such questionnaire is referred to by Bryman and Bell (2001, p. 231) as self-completion questionnaire. Saunders et al. (2009, p. 368), based on Dillman (2007), outline three separate types of data for which questionnaires are appropriate for collecting; opinions, behavior (past, present, future) and attribute (characteristics) respectively. As the aim of this study is to gain an understanding of how individuals perceive their ability to understand other objects, and how that in turn affects organizational knowledge acquisition, the first two data types has been employed for designing questions.

For the purpose of securing question validity and representativeness, multi-item scales have been designed in direct relation to the developed constructs outlined in section 2.6. The employed type of questions is what Kent (2007, p. 155) refer to as fixed choice, through which the respondent is provided a range of alternatives that he or she is instructed to choose from. However, due to the rather abstract nature of psychological distance, absorptive capacity and relationship quality, the primary objective has been to articulate the questions in a way that makes the respondent understand them in the intended fashion. If the questions designed for the survey contain vocabulary with which the respondent is not fully acquainted, it might result in him or her not properly understanding its full meaning (Brace, 2008, p. 14). To mitigate this particular problem, a pilot test of the questionnaire has been distributed among peer Master students in order to secure reliability and suitability of the questions. Saunders et al. (2009, p. 394), based on Fink (2003b), argue this to serve as an essential step to secure that respondents followed the outlined instructions correctly and fully understood the ways in which the questions were intended to be answered. Following Kent (2007, p. 163), the questionnaire has been sequenced in a way that allows the respondent to first be introduced to the topic at hand in a simple manner, after which it logically flows into each respective topic.
The questionnaire has been designed using categorical and ordinal questions in order to acknowledge gender and age of the respondent, the size of the company he or she works for, and further the degree to which he or she agrees with the statements. As the data will be analyzed using computer software, each specific question has been coded in ordinal manner using a 7-point Likert-scale (1 = lowest, 7 = highest) in order to measure how strongly the respondent agrees with a certain statement. This measurement scale is the most commonly employed psychological measure with which respondents assess and evaluate psychological traits (Wakita et al., 2012, p. 534). As Oaster (1989, in Wakita et al., 2012, p. 534) found a 7-point Likert-scale to display highest statistical reliability in terms of testing-retesting, the choice of scale has been assessed appropriate for this study. In order to understand the phenomenon at hand, such measurement scale is further believed to provide the respondent enough scope to fully reflect on the given answers, and thus reduce potential bias.

The first section of the questionnaire is concerned with the constructs corresponding to the level of construal and psychological distance, after which the subsequent parts are consecutively address knowledge acquisition, absorptive capacity and relationship quality respectively.

3.14 Dependent and independent variables

As outlined in section 3.5, explanatory studies are testing the relationships between variables: whether a change in variable X causes an effect on variable Y. There can be dependent, independent and extraneous variables (Saunders et al., 2009, p. 367). Dependent variables are changing as a response to changes in other variables, therefore being the “effect”, whereas independent variables are causing the change in dependent variables, being the “cause”. Some examples of independent variables could be e.g. price, number of shops, or money spent on advertising, and they can be used in prediction of e.g. market share or sales, that, thus, are the dependent variables in this example (McDaniel and Gates, 2010, p. 566). Furthermore, extraneous variables may be used to provide alternative explanations for the changes in dependent variables (Saunders et al., 2009, p. 367), but as the name suggests, they are not the actual interest of the study. Such variables can be of qualitative nature (e.g. organizational culture) and thus not suitable for the quantitative nature of this thesis.

In this study, the initial attempt is to research the impact of psychological distance on knowledge acquisition, absorptive capacity and relationship quality. Therefore, we study the effect of changes in one variable (that is, psychological distance) on the named three other variables. As such, psychological distance is treated as the independent variable and the other three as dependent variables of our study. Moreover, we also intend to perform multiple regression analyses where relationship quality is utilized as an independent variable together with psychological distance, to reveal their combined effect on knowledge acquisition and absorptive capacity. Furthermore, we deploy different construal levels (low, neutral, and high) as selection variables in some regression analyses. This allows us to learn more of the impact of the level of construal on the relationship of the independent and dependent variables, in both simple- and multiple regression analyses.
3.15 Data Analysis Methods

3.15.1 Descriptive statistics

Employment of descriptive statistics allows for descriptions and comparisons to be made numerically, and are concerned with explaining central tendency and the dispersion of data (Saunders et al., 2009, p. 444). Measurements such as mean, median and standard deviation have been calculated in order to uncover the response distribution, after which each respective item has been summated and averaged to demonstrate the value of its derived construct. Along these measurements, kurtosis and skewness values have been measured in order to clarify the extent of normality in the distribution. Furthermore, scatter plots has been used for the purpose of identifying the relative spread of each respective data point based on which correlation tests have been conducted. Finally, frequency tables and histograms have been used in order to display and compare the relative frequency of answers in relation to the categorical variables of age, gender and company size respectively. Cross-tabulation is presented by Kent (2007, p. 366) to be used for presentation of relationships between categorical variables, hence it has been employed in the analysis.

3.15.2 Statistics

In order to estimate the potential relationships between two variables in the scatter plots, bivariate analyses has been carried out. Bryman and Bell (2011, p. 346) explain for bivariate analysis to focus on two variables at each point in time for the purpose of uncovering the ways in which they might be related. This implies a search for correlation evidence giving support for that alternations in one variable coincides with a corresponding change in another (McDaniel and Gates, 2010, p. 580). Pearson’s correlation is a statistical measurement with which to assess the relative strength of linear connections between two variables (Shiu et al., 2009, p. 554). The coefficient takes on a value in the range of -1,00 to 1,00, in between which the value of 0 indicates no degree
of interconnection and thus perfect independence of each other (Bryman & Bell, 2011, p. 347). A negative value by nature implies negative correlation, i.e. a relationship between an increase in variable Y and a corresponding decrease in variable X (Shiu et al., 2009, p. 554). In order to measure the effect of psychological distance on each separate construct, a simple linear regression analysis has been carried out and with using least-squares equation R-square to measure the degree of variation caused by the dependent variable. Correlation is thus related to regression, and by squaring this correlation coefficient (R-square) one can observe the proximity of each separate value relative to a hypothetical line (Kent, 2007, p. 363). The values assumable by this statistic ranges between 0-1 and demonstrates the relative variation percentage found in the dependent variable that can effectively be explained by the variability of the other (McDaniel and Gates, 2010, p. 598-599). However, as adding further variables into this equation inevitably increases R-square, this might not reveal the entire truth and the analysis has thus been further extended.

3.15.3 Multivariate analysis procedures

Zikmund et al. (2009, p. 564-565) present multiple regression as a statistical measure through which to regress multiple variables in relation to one dependent variable. In contrast to fitting a straight line to the observed values along a vertical and horizontal axis, the multiple regression model allows to expand the dimensions and fit the observations onto such space (McDaniel and Gates, 2010, p. 598). This analysis instrument is by nature assessed appropriate as three constructs have been developed, each of which assigned to represent dependent variables. As mentioned in section 2.6.5, constructs representing psychological distance and level of construal have been developed as an independent variable and selection variable (categorical), i.e. two to whom influence cannot be subjected by those of others. Shiu et al. (2009, p. 564) present the formula with which to calculate straight line regression to derive from $Y = \beta_0 + \beta_1X_1 + \ldots + \beta_nX_n + \varepsilon$. They explain for the dependent variable to be represented by $Y$, the intercept symbolized by the value $\beta_0$, $\beta_n$ to indicate the slope of the regression line, and finally $X_n$ to constitute the independent variable. Epsilon, $\varepsilon$, accounts for the accumulated residuals in the data points and thus designates the overall error for prediction. Squared multiple correlation R-square (adjusted R-square) has been used in the multiple regression model in order to adjust for how correlation changes with additional independent variables in the equation, which does not assume that each independent variable explains the variation in that of the dependent.

Furthermore, in order to infer the degree to which the linear measures are statistically significant, i.e. what Moore et al. (2011, p. 176) explain as when the observed effect rarely occurs by chance, T-tests have been used with a 95% confidence interval and P-value (alpha-level, $\alpha$) of 0.05. The P-value is an indicator for the probability of the observed statistic to display a value equal to or more extreme than what has actually been observed (Moore et al., 2011, p. 356), which in this case corresponds to 5% of the times with 95% confidence. For inferences on multiple regression, the same P-value and confidence interval have been used, but an ANOVA F-tests have been employed and presented from ANOVA tables. However, following the argumentation by McDaniel and Gates (2010, p. 598), the output and interpretation thereof is not different from that of bivariate regression. Finally, in order to secure the level of consistency in the employed measurements, Cronbach’s alpha coefficient has been used, which Kent (2007, pp. 142-143) describe as a measure with which to assess the internal reliability of multi-item scales to its respective construct. Haele and Twycross (2015, p. 67) explain for this
measurement to be the most common for determining an instrument’s internal consistency, and provides an acceptable reliability score if demonstrating a value of <0.7.

3.15.4 Procedure of testing psychological distance on relationship quality

In order to assess and measure the interplay between relationship quality and psychological distance, and thus if perceived relationship quality is positively related to a closer cognitive distance between individuals, association tests has been used to uncover and display such relationship. The items have been summated and averaged, subjected to Pearson’s correlation test, and finally been tested using simple and multiple linear regression by combining the categorical level of construal in a selection variable.

3.15.5 Procedure of testing psychological distance on absorptive capacity

With regards to the discussion held of tacit vs. explicit knowledge (see section 2.1.1) and the complexities in disseminating and articulating such experience, tests has been done to examine if, and to what extent, closer psychological distance has a positive effect on absorptive capacity. The test aims to uncover if the individual ability to relate to another object is mediated by the perceived psychological/cognitive distance separating the self from that particular object. The procedures have been carried out using the same instruments as mentioned in the previous section.

3.15.6 Procedure of testing psychological distance on knowledge acquisition

The relationship between these constructs might not fully uncover the underlying mechanisms through which knowledge acquisition systems are shaped and manifested. However, it holds the possibility to reveal potential explanations for a relationship between individual level of construal and how firms explore and exploit external knowledge. This relationship will be tested with the same procedures as outlined in the two previous sections.

Finally, due to the bidirectional nature of relationship quality and psychological distance, these have been tested as independent variables on knowledge acquisition and absorptive capacity, using construal level as selection variable.

3.16 Statistical assumptions

Hair et al. (2010, p. 71-72) present the importance of acknowledging underlying statistical assumptions before pursuing regression analysis. Osborne et al. (2001, in Osborne and Waters, 2001, p. 1) found a rather low incidence of articles having tested the assumptions held of the statistical instruments based on which conclusions are drawn. As this particular process adds transparency to the subsequent empirical section, it is considered essential with regards to reliability and validity. In order to avoid the extent to which the results are subjected to Type I or Type II error, or for the level of significance to be misjudged in the analysis, the underlying statistical assumptions made must be outlined and explained for. Building on the work by Osborne and Waters (2001), four common assumptions will be declared for and how to effectively deal with its implications.
Variables used in regression analysis are assumed to be normally distributed, but in case of non-normality such assumption can lead to a distorted picture of revealed relationships and misleading significance tests (Osborne and Waters, 2001, p. 1). Such non-normality can be derived from kurtosis or distribution skewness. Consequently, normality tests have been carried out on the collected data in order to secure its distribution.

The second assumption is concerned with linearity, which derives from standard multiple regression and for it not to reveal accurate relationships between measured variables unless such fully demonstrate linearity (Osborne and Waters, 2001, p. 1-2). In case of non-linearity, they argue for the regressed results to reveal underestimated relationships between the variables. This is further extended to assume little or a low degree of multicollinearity, which by Hair et al. (1998, p. 157) is referred to as a situation in which correlation between independent variables causes a relative decrease of the unique variance demonstrated by each independent variable in isolation. They further argue that such event would increase the prediction percentage as a result of multicollinearity. In order to secure linearity and thus detect potential non-linear patterns, residuals in the scatterplots can be analyzed and subjected to data cleaning.

The third assumption refers to the assumptions of no errors. Many variables in social science are inherently prone to measurement error due to its difficulty to be accurately measured (Osborne and Waters, 2001, p. 2). As previously stated, this has been partially mitigated by careful development of the used constructs for which measurement validation already has been tested, and low factor loaded elements excluded (see section 2.6).

The final assumption is concerned with homoscedasticity, i.e. that the variance of errors in the dataset is identical throughout all levels of the independent variable (Osborne and Waters, 2001, p. 4). Nolan and Heinzen (2008, p. 441) present visual examination of scatter plots as a mean with which to identify homoscedasticity, where data points should appear around the horizontal line (value = 0) due to variances being equal.

For a more detailed demonstration of how these assumptions were challenged and effectively dealt with, see section 4.1.

### 3.17 Outliers

For the purpose of improving the statistical significance measures, the incidence of outliers in the data have been identified, mapped out and to a certain extent removed. Moore et al. (2011, p. 17) explain for outliers to be important deviations from the overall distributional pattern. Due to the mathematical formulas by which a majority of the employed descriptive statistics (mean, standard distribution and variance) are calculated, such measures are by nature sensitive to outliers which naturally may have a detrimental effect on the statistical significance. Moore et al. (2011, p. 111) present the incidence of large regression residuals to be vast when outliers are found in the y-direction of a scatterplot. Additionally, extreme values located in the x direction of a scatterplot do generally have an influential effect on the least-square regression line, if exclusion thereof would notably alter the result of a calculation (Moore et al., 2011, p. 111). Due to the underlying assumption of normality, in cases where such extreme values evidently prevail, elimination thereof will balance the dispersion of the data points in order to meet the requirements pursuant to this assumption. In order to establish such balance,
interquartile range (IQR) calculations have been made. This concept is defined by Kent (2007, p. 315) as the distributional scope between the 25th and 75th percentile (Quartile 1 and 3), which encompasses the difference corresponding to 50% of observations derived in the middle. The IQR result is multiplied by 1,5 after which this value is subtracted from the first quartile (Q1) and added to the third quartile (Q3), revealing prevalence of outliers in the area below Q1-(1,5 * IQR) and above Q3+(1,5 * IQR) (Baron, 2013, p. 222). However, due to the nature of Likert-scales, such incidence was rather low after having summated the constructs.

3.18 Access

As mentioned across previous sections, the group of selected respondents qualify in accordance with the outlined selection criteria, and thus the overall aim has been to reach out to product- and service developers. Due to an initially nonexistent official sampling frame, the issue of access has played an essential role in order to attain a sufficient response rate among the rather low incidence of companies operating in the market addressing elderly needs. Bryman and Bell (2011, pp. 427-428) argue organizational access to be an initially formal and complex process, and provide for a series of tactical moves through which to increase the probability of reaching the target individual(s). One of the described tactics is to suggest meetings with each respective respondent to clarify the general intent of the study, which serves as a means through which to reduce the barriers. Due to geographical dispersion of company locations and the financial constraints of thesis authors, this was not possible. Hence, as described in section 3.18, the identified companies were approached with a thorough email describing the intention of the research. In cases where the circumstances (such as a holistic contact list online) allowed for specific targets to be contacted, individuals in managing positions were selected due to their influence on the organization. When such was not possible, emails were sent through standardized online contact forms in order for it to be forwarded by gatekeepers to appropriate teams.
4. Empirical findings and quantitative analysis

This chapter outlines and provides an explanation for the empirical findings of this study. The first section outlines the procedure of testing the statistical assumptions and the verification process of the measured constructs. Demographics of the target respondents are presented followed by a table declaring for Cronbach’s alpha values of each respective construct, after which the two subsequent sections deal with descriptive statistics and the performed regression analyses.

4.1 How statistical assumptions were met

Assumption of no error:
Prior to drawing inferential statistics, verification of each respective scale was completed by performed factor analysis tests. This was done in order to secure the extent to which each item loaded to its corresponding domain (construct) to ensure its inherent validity. A vast majority of the items revealed a factor loading of >0.8, and was thus kept in its initial condition. However, two items brought forward from previous studies in knowledge acquisition and absorptive capacity had to be removed as values of 0.408 and 0.485 were respectively shown.

Assumption of normality:
In order to meet the underlying assumption of normality, the distribution of the datasets were investigated using histograms. Psychological distance, absorptive capacity and relationship quality were found to violate this assumption and proved negative skewness. This was effectively remedied by taking the 10th logarithm and adjust it for the negative skewness by adding 1 + the maximum spread value and subtract it from the total value of each respective construct.

Assumption of linearity:
The datasets were depicted in scatter plots in order to detect significant residuals relative the fitted regression line. Before summatign each item into its respective domain, the Likert-scale is by nature an interval scale and thus linear by definition. However, when summated into total values the nature of the scale changes pursuant to this merge, and revealed a minor prevalence of outliers. These were removed in accordance to the procedure described in section 3.16.

Assumptions of homoscedasticity:
In order to determine the extent to which homoscedasticity was potentially prevalent in the data set, the SPSS test for VIT-value measurement was performed. It consistently revealed a value close to 0, which implies value to be found close to the horizontal line and thus no indication of apparent homoscedasticity.
4.2 Cronbach’s alpha

Table 3: Cronbach's alpha

<table>
<thead>
<tr>
<th>Construct:</th>
<th>Cronbach's alpha:</th>
<th>No. of items:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological distance</td>
<td>0,763</td>
<td>8</td>
</tr>
<tr>
<td>Knowledge acquisition</td>
<td>0,799</td>
<td>9</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>0,776</td>
<td>7</td>
</tr>
<tr>
<td>Relationship quality</td>
<td>0,725</td>
<td>5</td>
</tr>
</tbody>
</table>

As explained for in sections 3.15.1 and 4.1, the responses of each respective item were summated in order to run factor analysis tests, after which they collectively were summarized into a value representing its corresponding construct. A Cronbach’s alpha test was subsequently run for which coefficient demonstrated values between 0,725-0,799, which positively correspond to the >0,7 level presented by Haele and Twycross (2015, p. 67) as presented in section 3.15.3. It can thus be confirmed that the internal consistency between the items and its respective domain is strong enough to be considered reliably measuring what was initially intended.

4.3 Descriptive statistics

As described in section 3.13, the questionnaire involved three categorical variables derived from that of gender, age and company size respectively.

4.3.1 Gender

Figure 3 above depicts the distribution of gender out of the 51 respondents, which as illustrated shows 68,63% to derive from male respondents and 31,37% from female respondents. As illustrated, this figure mirrors a larger proportion of male managers but
the distribution accurately represent the individuals with whom contact has been made and it thus assessed appropriate for the purpose of depicting the industry. However, much of innovation in these industries involve rather advanced programming, a field that so far seems to be overrepresented by male workers. The explanation for the uneven distribution might thus be derived from the industry itself and the amount of available qualified workers in each.

4.3.2 Age

![Figure 4: Age distribution](image)

In order to attain deeper insights into the general characteristics of the respondents, the age distribution was subjected to scrutiny. As illustrated in the histogram in figure 4, a clear majority of the respondents fall into the scope 35-54 years old, whereas a more balanced distribution can be observed between those of 25-35 and >54. Contrarily, the lower age category reveals a rather insignificant number, for which a potential explanation can be found in the extent of academic merits required for product development jobs. As the questionnaire was sent out to individuals in managing positions, the incidence of respondents older than 54 years of age is assumed to be a mere reflection of the practical method. It is reasonable to believe that managers generally are assigned senior positions within this particular age span after having acquired substantial experience in the field of product development. Altogether, figure 7 displays a vast majority of middle-age workers, which can reflect a market in which the complexity of product innovation calls for more experienced developers.
4.3.3 Company size

As can be seen in figure 5 above, the distribution of respondents per company size seems rather evenly distributed, with 37.3 % (19) of the responses being recorded from companies with less than 10 employees, 35.3 % (18) from companies with 10-50 employees, and the remaining 27.5 % (14) from large companies with over 50 employees. By making reasonable judgements from the public information available on the websites of the companies that agreed to participate, it seemed the companies with less than 10 employees were mostly operating in high-tech industries, whereas the middle sized firms with 10-50 employees seemed mostly to be operating within specialized niche markets. The larger firms were part of large global conglomerates active in a variety of product fields.

4.3.4 Level of construal

We placed two carefully designed questions in the beginning of the questionnaire with the aim to reveal the level at which individuals construe informational details. The respondents were asked to reflect on how he or she would construe information about their typical users’ physical abilities and personalities. Those respondents whose preferences were found to be directed toward small, individualistic details in favor of the general “big picture” of their user group were considered low-level construals, that is, they are construing their observations of their surroundings at the low level. The incidence of low-level construals was 23, or 45 %, of the respondents. In turn, the respondents who rather construed their worlds from top-down, large-to-small, were deemed high-level construals. 16 (31 %) of the respondents were classified as high-level construals. Finally, respondents who could not identify themselves on either side were classified as neutrals, which as a term may be slightly misleading as it might rather reflect that they adjust depending on situation. However, 12 (or 24 %) of the respondents were categorized as neutrals.
4.3.5 Psychological distance

Similar to the level of construal, questionnaire items were developed based on previous research for the purpose of measuring the psychological distance of our respondents. After summing the Likert-scale items and calculating the means, the respondents were categorized into having either high or low psychological distance based on the mean of their answers in relation to the respective items. Respondents with a mean higher than 4 were categorized high, and below 4 as low. If the mean was found to be exactly 4, the respondents would be deemed neutral. Conclusively, 40, or 78 %, of the respondents were high, 10 (20 %) were low, and 1 (2 %) was neutral.
4.3.6 Social distance

In order to gain a deeper understanding of psychological distance, it is helpful to separate the construct into the individual dimensions of psychological distance, as outlined in section 2.5.2. Figure 8 below illustrates the distribution of the respondents’ perceptions regarding social distance, which was measured by questions 6 and 7 in the questionnaire. The values underneath corresponds to the interval within which the incidence of responses were to be found. 42 (or 82 %) of the respondents showed clear agreement regarding the impact of social distance with the means of their responses to the said two questions being 4.8 or above, whereas 6 (11.8 %) of the respondents did not agree with the impact of social distance being significant.

4.3.7 Spatial distance

The dimension of spatial distance was measured by questions 3 and 4 in the questionnaire. The results show that 27 of the respondents (53 %) perceived the impact of spatial distance to be significant with means of the answers at 5 or higher, as shown in the figure 9 below. However, 29.4 % (15) of the respondents indicated only moderate impact, with means between 4 and 5. The remaining 9 of the respondents (17.6 %) did not perceive the impact of spatial distance to be a significant determinant in terms of how customers effectively can be understood.
4.3.8 Temporal distance

Temporal distance was measured using question 5 in the questionnaire. As there was only one question designed to measure temporal distance, the value output was in integers (meaning 1, 2, 3, … instead of decimals) that fall within the horizontal category intervals shown in figure 10 below. As the results indicate, 56.9% (or 29) of the respondents agreed that temporal distance has an impact on them. 29.4% (15) of the respondents showed disagreement with the statement, and 13.7% (7) did not either agree nor disagree about the impact.
4.3.9 Hypothetical distance

Hypothetical distance was measured by question 8 in the questionnaire. Similarly as with temporal distance, the result integers herein fall within the horizontal category interval ranges in the figure 11 below. The results show that 35 (or 68,8 %) of the respondents agree with the statement regarding the impact of hypothetical distance on them. 6 (11,8 %) of the respondents disagree, and 10 (19,6 %) did not either agree or disagree with the statement.

![Hypothetical distance](image)

Figure 11: Hypothetical distance

4.4 Mean comparison and Cross-tabulations

The means and standard deviations for the constructs are illustrated in table 4 below in order to investigate how the general responses differed in between each construct. The highest mean was obtained by absorptive capacity with a value of 5.45, whereas the lowest was 5.11 for knowledge acquisition. The mean value displays 5.18 for psychological distance, and for relationship quality 5.26. As shown, all of the standard deviations for the constructs were below 1, with the highest deviation shown for psychological distance at 0.81.

<table>
<thead>
<tr>
<th>Construct:</th>
<th>Mean:</th>
<th>Standard deviation:</th>
<th>n:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological distance</td>
<td>5.18</td>
<td>0.81</td>
<td>51</td>
</tr>
<tr>
<td>Knowledge acquisition</td>
<td>5.11</td>
<td>0.70</td>
<td>51</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>5.45</td>
<td>0.69</td>
<td>51</td>
</tr>
<tr>
<td>Relationship quality</td>
<td>5.26</td>
<td>0.74</td>
<td>51</td>
</tr>
</tbody>
</table>
As the constructs seem to have a mean value not significantly different from each other, it is purposeful to scrutinize the findings for further insights, hence the mean values have been sorted by construal levels, age, company size, or gender. Table 5 below shows the means of each respective construct, categorized by the level of construal of the respondents. The differences remain rather small, but have become more visible. It appears that neutral-level respondents were scoring distinctively compared to low- and high-level construals, whereas the differences between the latter two remained very small. Neutral-level construals showed the highest means for psychological distance (5.51), knowledge acquisition (5.43) and absorptive capacity (5.58), and the lowest mean for relationship quality (4.90). For low- and high-level construals, the means for all constructs were within 0.12 decimals, and with absorptive capacity as low as 0.01 decimal.

Table 5: Cross-tabulation, construal level

<table>
<thead>
<tr>
<th>Construal level</th>
<th>Low</th>
<th>High</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td></td>
</tr>
<tr>
<td>Psychological distance</td>
<td>5.14</td>
<td>5.04</td>
<td>5.51</td>
</tr>
<tr>
<td>Knowledge acquisition</td>
<td>4.95</td>
<td>5.05</td>
<td>5.43</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>5.42</td>
<td>5.41</td>
<td>5.58</td>
</tr>
<tr>
<td>Relationship quality</td>
<td>5.30</td>
<td>5.42</td>
<td>4.90</td>
</tr>
</tbody>
</table>

Below, table 6 shows the means sorted by different age groups, revealing somewhat larger differences than when sorted by level of construal. The age group “under 25” should not be considered herein due to N = 1. Interestingly, respondents of the age group over 54 scored highest means of all constructs, and the lowest of the herein considered age groups 25-34 scored lowest means. The smallest deviation is seen in psychological distance, with the means lying between 0.40 decimals. Knowledge acquisition and absorptive capacity both had the mean variance within 0.69 decimals.
Table 6: Cross-tabulation, age

<table>
<thead>
<tr>
<th></th>
<th>Under 25 (N=1)</th>
<th>25-34</th>
<th>35-54</th>
<th>Over 54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Distance</td>
<td>5.17</td>
<td>5.01</td>
<td>5.11</td>
<td>5.41</td>
</tr>
<tr>
<td>Knowledge Acquisition</td>
<td>5.78</td>
<td>4.64</td>
<td>5.20</td>
<td>5.33</td>
</tr>
<tr>
<td>Absorptive Capacity</td>
<td>5.00</td>
<td>5.05</td>
<td>5.50</td>
<td>5.74</td>
</tr>
<tr>
<td>Relationship Quality</td>
<td>6.60</td>
<td>4.83</td>
<td>5.34</td>
<td>5.41</td>
</tr>
</tbody>
</table>

The mean comparison between company sizes also reveals somewhat considerable variance. Respondent from companies with less than 10 employees had the lowest means for psychological distance (4.96) and knowledge acquisition (4.91), whereas the respondents from companies with 10-50 employees scored highest (5.46 and 5.38, in respective order). Interestingly, the highest mean for absorptive capacity (5.68) was found with the smallest companies, and the lowest (5.24) in companies with more than 50 employees. Conversely, the latter achieved the highest mean for relationship quality (5.41) and the middle sized companies had the lowest (5.08).

Table 7: Cross-tabulation, company size

<table>
<thead>
<tr>
<th></th>
<th>Less than 10</th>
<th>10-50</th>
<th>More than 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Distance</td>
<td>4.96</td>
<td>5.46</td>
<td>5.11</td>
</tr>
<tr>
<td>Knowledge Acquisition</td>
<td>4.91</td>
<td>5.38</td>
<td>5.02</td>
</tr>
<tr>
<td>Absorptive Capacity</td>
<td>5.68</td>
<td>5.38</td>
<td>5.24</td>
</tr>
<tr>
<td>Relationship Quality</td>
<td>5.32</td>
<td>5.08</td>
<td>5.41</td>
</tr>
</tbody>
</table>

Finally, the means comparison between females and males shows similar tendencies for knowledge acquisition and absorptive capacity, but slight differences for psychological distance and relationship quality. Females scored the highest means in psychological distance (5.38), absorptive capacity (5.49), and relationship quality (5.51), whereas males had the highest mean score for knowledge acquisition (5.13).
Table 8: Cross-tabulation, gender

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>Psychological distance</td>
<td>5.38</td>
<td>5.09</td>
<td></td>
</tr>
<tr>
<td>Knowledge acquisition</td>
<td>5.06</td>
<td>5.13</td>
<td></td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>5.49</td>
<td>5.44</td>
<td></td>
</tr>
<tr>
<td>Relationship quality</td>
<td>5.51</td>
<td>5.14</td>
<td></td>
</tr>
</tbody>
</table>

4.5 Pearson’s correlation

As described in section 3.15.2, Pearson’s correlation reveals how strongly the constructs are correlated, with values ranging between -1.00 and 1.00 that respectively indicate either negative or positive relationship, with a value of 0 showing no correlation at all. As can be seen from table 9 below, all of the dependent variable constructs are significant and positively correlated with over 99.9% confidence (P = <0.01). The strongest positive correlation is found between knowledge acquisition and absorptive capacity, at 0.597, whereas the lowest is between absorptive capacity and relationship quality, at 0.390. None of these correlations are very strong, in fact moderate at best, but nevertheless proved significant. Psychological distance, the independent variable, has been found to only correlate significantly (P = <0.01) with knowledge acquisition, showing a positive correlation of 0.464. Interestingly, no significant correlation is demonstrated between the constructs of either psychological distance and absorptive capacity nor relationship quality.
Table 9: Pearson’s correlation

<table>
<thead>
<tr>
<th>Constructs</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological Distance (1)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Acquisition (2)</td>
<td>.464 **</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absorptive Capacity (3)</td>
<td>.093</td>
<td>.597 **</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Relationship Quality (4)</td>
<td>-.009</td>
<td>.375 **</td>
<td>.390 **</td>
<td>1</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)

The lack of correlation between psychological distance and two of the other main constructs gives an interesting starting point for further analysis, which will commence in the next section.

4.6 Regressions

In order to be able to answer the outlined research question, simple- and multiple regression analyses were performed on the data to fathom the underlying relationships between the four constructs. First, a simple linear regression analysis was run for perceived psychological distance and its effect on knowledge acquisition. The results show that the model is significant with an F-value of 10.484 and P-value of <0.05. However, the R-square shows the model only to predict 17.6% of the variation in the dependent variable. Consequently, it cannot be excluded that this happened by mere chance regardless of its significance. Furthermore, the B-value displays a value of -.182, which indicates a small negative effect on the dependent variable. The B-value shows how much a one unit change in the independent variable impacts the dependent variable (Saunders et al., 2009, p. 463): in this case, when psychological distance increases by one, knowledge acquisition decreases by 18.2%, as indicated by the negative B-value. In turn, a decrease in psychological distance would lead to an increase in knowledge acquisition.

Table 10: Simple regression 1.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.756</td>
<td>.021</td>
<td>36.900</td>
</tr>
<tr>
<td></td>
<td>Psychological_distance</td>
<td>-.182</td>
<td>.056</td>
<td>-.420</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Knowledge_acquisition

The regression analyses for psychological distance’s effect on absorptive capacity and relationship quality gave F-values of 1.843 and 0.001, and P-values of 0.181 and 0.971
respectively, thus demonstrating no statistical significance. Psychological distance when measured against relationship quality hence do not correspond to what was previously believed, as is discussed further in section 5.6.2. As a result of this, the tables have been omitted from the section.

After the simple regression analyses were performed, a series of multiple regression analyses were conducted in order to test the combined effect of the two independent variables psychological distance and relationship quality, on knowledge acquisition and absorptive capacity. As explained for in section 3.15.3, such statistical analysis instrument allows for regression of multiple variables in relation to one dependent variable. This was done for the purpose of increasing our understanding of the extent to which relationship quality can be considered as an amplifier between psychological distance and the dependent variables knowledge acquisition and absorptive capacity. The two performed multiple regression analyses yielded significant results. Initially, knowledge acquisition was tested as the dependent variable, employing psychological distance and relationship quality as predictors. The analysis resulted in an F-value indicator of 10,489, and proved significant at p<0.0001. Furthermore, the adjusted R-square value of 0.275 suggests that such effect can be expected in 27.5% of cases. The B-values show a mild negative effect for both of the independent variables, with psychological distance having a slightly higher impact at negative 18.2% change in the dependent variable.

**Table 11: Multiple regression 1.**

<table>
<thead>
<tr>
<th>Coefficientsa</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Unstandardized Coefficients</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.831</td>
</tr>
<tr>
<td>Relationship_quality</td>
<td>-.167</td>
</tr>
<tr>
<td>Psychological_distance</td>
<td>-.182</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Knowledge Acquisition

As the second multiple regression analysis, absorptive capacity was tested as the dependent variable in a setting identical to the previous test. With an F-value of 4,799, and P-value of 0.013, results were significant, albeit slightly less so than attained using knowledge acquisition. In a similar manner, adjusted R-square demonstrated 0.132, proposing the model’s prediction value to be valid for 13.2% of the cases, raising concerns for the role of chance in the relationship between the constructs. The B-values seen in the table below indicate a stronger positive effect for relationship quality (36.4%).

**Table 12: Multiple regression 2.**

<table>
<thead>
<tr>
<th>Coefficientsa</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Unstandardized Coefficients</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.161</td>
</tr>
<tr>
<td>Relationship_quality</td>
<td>.364</td>
</tr>
<tr>
<td>Psychological_distance</td>
<td>.100</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Absorptive_capacity
4.6.1 Simple regression by construal level

After having performed the previously presented regression analyses, the aim was to deepen our understanding of the model and thus uncover new dimensions. A series of analyses were run on the relationship between each respective construct and the levels of construal. At first, the effect of psychological distance on knowledge acquisition was tested, using data from the respondents categorized as low-level construals, i.e. interpreting the surrounding environment through contextual detail. The regression analysis showed F-value of 11.369 and P-value of 0.005, suggesting the results are significant. Furthermore, adjusted R-square of 0.409 gives prediction value for 40.9% of the cases. The B-value of -0.297 indicates a moderate negative effect of the relationship between variables: for every unit increase in psychological distance, knowledge acquisition decreases by 29.7% for low-level construals and vice versa.

Table 13: Simple regression 2.

<table>
<thead>
<tr>
<th>Coefficients$^{a,b}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Psychological_distance</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Knowledge_acquisition
b. Selecting only cases for which construal_level = low

Secondly, an identical test was performed with a subset of respondents who were found to be classified as high-level construals, i.e. individuals for whom interpretation of the world initially occurs at a less context-bound level. However, as the analysis yielded a low F-value (1.658) and was not significant at the 5% level, we decided to omit the table from this section. The same test was further performed with the data from respondents for whom the level of construal was classified as neutral. The results were not statistically significant in this case either, and thus will not be discussed further in this section.

The subsequent analysis involved absorptive capacity and was performed in a manner equivalent to that of knowledge acquisition. In the first analysis data was included from the subset of respondents that were identified as low-level construals. The results show an F-value of 8.349 with >95% confidence (p-value 0.012). The adjusted R-square of 0.329 explains the model to be a valid predictor in 32.9% of the cases. The unstandardized coefficients (B-value) demonstrate 0.326, suggesting a positive (increasing) effect of 32.6% on the dependent variable absorptive capacity.

Table 14: Simple regression 3.

<table>
<thead>
<tr>
<th>Coefficients$^{a,b}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Psychological_distance</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Absorptive_capacity
b. Selecting only cases for which construal_level = low
The same test was further performed including respondents with high- and neutral levels of construal. However, the results were statistically insignificant (p-values 0,974 and 0,314): thus the result tables are not included in this section. Finally, the influence of construal level on the effect of psychological distance was tested on relationship quality. These tests gave results with p-values of 0,500 (low-level construal); 0,651 (high-level construal); and 0,304 (neutral-level construal). As these are not statistically significant either, they were not included in this section.

4.6.2 Multiple regression by construal level

Similar to what was performed earlier, the combined effect of psychological distance and relationship quality was tested on the dependent variable, using construal levels as a selection variable. First the test was performed using knowledge acquisition as the dependent variable, and measured against data collected from low-level construals exclusively. The test showed an F-value of 5,282 at the p-value of 0,021, thus suggesting statistical significance at p<0,05 when the constructs are combined. The adjusted R-square proposes a prediction value of 36,3 % of the cases. This implies that in slightly more than a third of the instances, the model can be used to predict the outcome effect on knowledge acquisition. The individual values however differ in significance when measured independently. The B-values indicate a 29,6% negative effect of psychological distance and a very low positive effect (1,5%) of relationship quality in isolation, when combined with a selection variable of low-level construals. The negative relationship can thus tell that for every -0,3 decrease in the value of psychological distance (or an increase in the actual distance) has a positive effect on knowledge acquisition. Interpreting the results using the dependent variable as the starting point, the results reveal that for every unit increase in knowledge acquisition, the value of psychological distance declines with 29,6%.

Table 15: Multiple regression 3.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>.787</td>
<td>.107</td>
<td>7,308</td>
</tr>
<tr>
<td></td>
<td>Psychological_distance</td>
<td>-.290</td>
<td>.093</td>
<td>-.667</td>
</tr>
<tr>
<td></td>
<td>Relationship_quality</td>
<td>.015</td>
<td>.241</td>
<td>.013</td>
</tr>
</tbody>
</table>

Table 15: Multiple regression 3.

A subsequent analysis was performed measuring the impact of high-level construals. The F-value was very high, 17,460, with significance at a p-value of <0,001. This indicates that a combination of the constructs show strong significance, but in isolation psychological distance is weaker. When measured independently, this construct demonstrates a slightly insignificant value of 0,165. However, when combined the adjusted R-square demonstrated a relatively high value of 0,599, suggesting predictability for approximately 60 % of the cases. This effectively means that by combining these constructs the results can, with strong significance, predict 60% of the change that occurred in knowledge acquisition. The B-values indicate a weak negative relationship between the constructs, with relationship quality having a stronger negative effect at 26,6 % and psychological distance a weaker negative effect at 7,6 %. Provided that information
is interpreted at higher levels, unbound to its contextual uniqueness, negative values of psychological distance and relationship quality yields an increase in knowledge acquisition.

*Table 16: Multiple regression 4.*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.819</td>
<td>.025</td>
<td></td>
<td>32.276</td>
</tr>
<tr>
<td>Psychological_distance</td>
<td>-0.076</td>
<td>.053</td>
<td>-1.195</td>
<td>-1.441</td>
</tr>
<tr>
<td>Relationship_quality</td>
<td>-0.266</td>
<td>.048</td>
<td>-5.754</td>
<td>-5.559</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Knowledge_acquisition  
b. Selecting only cases for which construal_level = high

When tested, there was no significance (p = 0.995) for neutral-level construals and were thus not included in this section.

We proceeded to perform a multiple regression analysis with absorptive capacity as the dependent and psychological distance and relationship quality as the independent variables, similarly testing the differences between different levels of construal. The first test with low-level construals was significant at <0.001 level with an F-value of 12.205. Unstandardized Coefficients (the B-value) show a positive relationship at levels of 0.378 and 0.744, with an adjusted R-square value demonstrating predictability in 59.9% of the cases. Contrarily to knowledge acquisition, these results indicate that for every unit increase in absorptive capacity, both relationship quality and psychological distance moves in accordance. This means that the perceived distances become closer in relation to the measured object provided that the level of construal is kept low.

*Table 17: Multiple regression 5.*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>.045</td>
<td>.102</td>
<td></td>
<td>-4.37</td>
</tr>
<tr>
<td>Psychological_distance</td>
<td>.378</td>
<td>.089</td>
<td>.709</td>
<td>4.264</td>
</tr>
<tr>
<td>Relationship_quality</td>
<td>.744</td>
<td>.230</td>
<td>.577</td>
<td>3.333</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Absorptive_capacity  
b. Selecting only cases for which construal_level = low

The same test was subsequently performed on high-level construals and proved not significant at 5% alpha-level, albeit close (p = 0.086). Similarly, neutral-level construals did not yield significant results (p = 0.445), as a result of which the tables for these two were excluded from this section.
5. Empirical Analysis and Discussion

The purpose of this chapter is to analyze and discuss the empirical data set in order to answer the stated research question. The first section treats each respective construct in isolation and provides a detailed scrutiny of the results in relation to the theoretical framework. The two subsequent sections deal with analysis and discussion of the performed simple- and multiple regression tests.

5.1 Construal level

When asked to construct an image of a typical elderly user, i.e. someone about whom the respondents had a clear picture, the vast majority mentally related to personality characteristics unique to that very individual. As explained by Kalkstein et al. (2016, p. 2), the tendency of low-level construals to exclusively emphasize context specific local particularities inevitably make them anchor their mental horizon in the immediate and specific environment. The strong propensity to pay attention to subtleties thus indicates cohesiveness among the companies when confronted with an object to which they have very distinct previous experience. The outcome thus seems to follow the theoretical line of reasoning rather accurately. Trope and Liberman (2010, p. 442) argue that using abstract details to form and develop an understanding of concepts allows individuals to more easily transcend recently experienced mental images across time and space.

Contrarily, when the respondents were asked to mentally depict the physical traits of a typical elderly user, the respondents were equally prone to construe information on higher levels. In this case, the results demonstrate a proclivity to think of the elderly population in rather general terms characterized by highly similar features. As explained by Kalkstein et al. (2016, p. 2), high-level construals can better extend the thoughts to reduce the meaning of distance and thus suffer from less bias in relation to the distinct environment.

However, theory does not claim this mental level of construal to be either permanent nor exclusively bound to any particular ways, but rather provide a spectrum within which individuals show tendencies of how the immediate environment is interpreted as a function of how its details are related to one another. The respondents thus evidently seem to switch focus when presented a scenario in which the projected object is not directly linked to memorable behavioral traits, which might have led them into thinking in more general terms.

5.2 Psychological distance

When investigating the role of psychological distance, one must isolate each specific dimension of the construct in order to develop a deeper understanding of what effects are perceived to have the strongest impact. Following the distributional charts provided in sections 4.3.6 – 4.3.9, each individual distance will be analyzed to measure its relative importance.

5.2.1 Spatial distance

For the questions developed in connection to Spatial distance, as can be seen in figure 9, a vast majority of the respondents shared the belief that their ability to relate to customers is strongly affected by the physical distance to the self. Equivalently strong results were
subsequently demonstrated for the perceived ability to understand customer problems if they were present in the immediate vicinity of the respondent. The spatial distance thus seems to play a central role.

This could reflect an end-user group for whom the nature of every-day needs are different to an extent where it is not part of the frame of references for those of the employees, and thus understanding their needs would require physical presence. Consequently, there might be a need for more detailed qualitative aspects and observation in order to fully develop an understanding of the problems the companies seek to address. It is reasonable to believe that this could further be a reflection of the overall level of construal among the employees, and thus of a need to be acquainted with the rigorous details of the users, which can effectively be extracted only when present in a social setting. As was argued by Trope et al. (2007, p. 84), events that occur in more spatially and temporally distant settings remove this availability of detail by separating it from the direct experience.

The reason for these attitudes may also be found in the level of perceived abstraction in relation to an object that is represented at a greater psychological distance. Following the arguments provided by Trope et al. (2007, p. 84), such distal events should imply a higher level of abstraction, and as a result of such, the psychological distance should increase accordingly (Trope and Liberman, 2010, p. 440).

5.2.2 Temporal distance

Following the distribution of figure 10, the questions for Temporal distance demonstrated rather polarized results with a rather even distribution of individuals agreeing on themselves being either strongly impacted or almost insensitive to this time parameter. The reason for these findings might not be easily understood as it might be a mere reflection of individual memory and the effectiveness of the processes in which such can be stored and retrieved. However, the explanation can potentially be derived from the industry in which the companies operate. The end-user needs might be more or less intricate, and the required level of complexity in the products thus easier or harder to relate to in retrospect.

Stephan et al. (2011, p. 400) gave evidence for temporally distant interaction to attenuate the extent to which individuals feel familiar with a social object, and simultaneously the perceived familiarity to the characteristics thereof. However, the impact of temporal distance might possibly find its explanation in a change in construal level. The negative impact on familiarity might cause some individuals to unconsciously start retrieving and construing higher levels of information, while those for whom attention is still directed to lower levels might suffer from decreasing familiarity as time passes. Therefore, the degree of sensitivity toward this parameter differs between individuals who might otherwise share personal characteristics.

5.2.3 Social distance

Concerning the impact of Social distance, the opinions were fairly strong and coherent among the respondents. Figure 8 shows that being cognitively similar to the counterpart with whom to interact appears to be essential for developing a true understanding of the user needs. It was said to strongly affect not only the ability to understand the prevalent contextual problematics, but to increase the sense of empathy and willingness to help.
At a first glance, these results are not surprising and seem to an extent in fact self-evident. However, while the perceived impact is really positive, it opposes previous theoretical reasoning and displays a potential problem in interactive learning. As Nooteboom (2007, p. 1081) explained, greater cognitive distance can be positively related to interactive learning, as these cognitive differences create mental gaps in which learning can be effectively stimulated. It thus provides an opportunity to combine resources of complementary nature, and as this gap closes (the separating distance gets too narrow) the effect of the innovative sphere diminishes. However, in order for such gap to close, it is reasonable to assume a large extent of social interaction will be required before such state can be reached. If the level of perceived empathy can be increased by assigning developers with similar cognitive characteristics to the individual from whom knowledge is to be acquired, it ought to be encouraged. By doing so, the established relationships could be improved and thereby assist in developing a better understanding of the customer.

5.2.4 Hypothetical distance
Many respondents agreed somewhat to using imagination as a means through which to foresee how future events would unfold, but some were rather indifferent as demonstrated in figure 11. As they claimed to use previous knowledge to improve future projects, it ought to imply that the hypothetical distance is generally perceived rather close. In other words, they appear certain of how things most likely will be in the future based on what they already know. On the other hand, the neutrality of many respondents might indicate that hypotheticality is not of significant concern. A final explanation might further be found in the level of abstraction, and that the nature of the question might have caused confusion in terms of how to properly interpret it. This is however hard to properly distinguish, but it has been taken into consideration when interpreting the results.

As interaction usually takes place sporadically and continuously during the development of new products, knowledge is acquired on a regular basis. In order to be one step ahead, it is reasonable to assume that certain assumptions are made about how events will unfold, based on what is already known. The research done on this particular dimension is rather scarce and yet to be fully discovered. However, a hypothetically distant object would theoretically increase the envisioned psychological distance (Trope and Liberman, 2010, p. 440) and thereby the perceived degree of abstraction. What the results demonstrate seems, contrarily, that the perception of what could be or what will be can adequately be envisioned based on the internal knowledge base and thus depicted rather concretely.

5.2.5 How do they change each other?
The strong impact of meeting end users and its inherent value in developing a deeper understanding of the user-specific situations was collectively agreed upon. By reducing the spatial distance it simultaneously seems to have an equivalent effect on the perceived social distance, and thereby on the relative cognitive state between interacting parties.

What can be observed might thus be synchronic multidimensional changes in the psychological distances for which movement in one direction has an immediate, albeit individually unique, effect on those of others. The findings consequently seem to give strength to underpin and confirm the theoretical line of reasoning by Holmqvist et al.
(2015, pp. 1432-1433), that activation of an isolated distance dimension will automatically and subliminally exert influence on the relative proximity of others.

### 5.3 Knowledge acquisition

The respondents revealed that the company processes by which knowledge is acquired are heavily influenced by the employees enrolled in such activities. Furthermore, customer feedback was agreed to serve as a platform for developing improved processes for subsequent projects. However, the results were found to be rather scattered when asked if processes existed for translating and generating knowledge based on identified customer needs. This implies some respondents to be strongly agreeing on their companies to be having somewhat formalized systems with which to interpret and create new knowledge, but some contrarily seem to have limited capability. Finally, the results show a somewhat strong confirmation for having explicit processes for exchanging and distributing knowledge throughout the organization.

Yli-Renko et al. (2001, p. 589) put emphasis on the individual- and organizational abilities to identify and properly assess value in interactive activities in order for knowledge acquisition to be successfully carried out. Such capabilities should derive from sets of developed internal mechanisms that can be used for information collection and knowledge translation (Jantunen, 2005, p. 340). Some companies might fulfill these dimensions in a satisfying manner, but the fact that others do not meet the theoretically optimal conditions may have a rather logical explanation. It would thus be a mistake to assume efforts are not initiated. Due to differences in company sizes of the target respondents, it is reasonable to believe that monetary preconditions differ pursuant to the inherent limitations of this very parameter. Lower sales revenues implies limited financial viability to allocate resources to activities for purposes of secondary priority. The essentiality of implementing such systems may be equally acknowledged but the practical restrictions might be yet to be overcome. On the other hand, the results might reflect an actual knowledge gap in how to manage and orchestrate such activities.

However, this means that some companies might fail to exploit the full advantage of externally generated knowledge due to an insufficient architecture for properly internalizing what is acquired. As stated by Liao and Barnes (2015, p. 1259), externally acquired knowledge enhances not only exploitation but assists extensively in spurring advancement of the internal knowledge base.

An interesting phenomenon was further revealed. Following the arguments by Jantunen (2005, p. 337), the ways in which knowledge-processing routines are effectively orchestrated directs the ability to fully recognize changes in the external environment. Although some respondents did agree either strongly or very strongly on having processes for acquiring knowledge about the industry, a rather extensive incidence of them held a neutral or even negative attitude. For companies lacking such market screening activities, it puts pressure on individual employee initiatives to bring every-day information into business usage, or potentially a heavy reliance on customers for information retrieval. However, it cannot be told the extent to which it is perceived sufficient for that particular industry and might thus be a fallacy.

The fact that a clear majority of the respondents agreed on having processes for exchanging knowledge with customers and business partners, along with the perceived
high relationship quality, allows to infer that the behavior stands in accordance with theory. The results support that the respondent companies use social interaction as means through which to explore new knowledge. Ring and Van de Ven (1994) and Yli-Renko et al. (2001, p. 590) pose that social interaction develops into dyadic relationships as a result of establishing a sense of mutual comfort which in turn enhances information intensity, frequency and exchange.

Although the target companies use social interaction as a means through which to explore new knowledge, an interesting observation was made with regards to the type of information gathered from different actors. The results indicate that information acquired from buyers is usually presented and construed at a high-level, whereas individual preferences are found to advocate low-level knowledge. The explanation may be found in the value chain set-up. Knowledge might be initially construed at a low level by the intermediary buyer but transferred in a high-level manner, either as a result of deliberate transformation or an inability to effectively translate the inherent tacitness. It might further be that when acquiring knowledge from buyers, the aim is directed toward more general information as complementary to what has already been sourced from the end user and thus might not require that level of detail. This will be discussed further in section 5.7 when addressing the multiple regression results.

Conclusively, what can be told is that companies trying to address the needs of an elderly population engage, however to different extents, in activities through which to both exploit existing and explore new sources of knowledge.

5.4 Absorptive capacity

5.4.1 Knowledge transferal

Based on the opinions of the respondents it can be inferred that the target companies have established routines and procedures for internal communication. Cross-departmental collaboration seems to be generally encouraged for the purpose of solving problems jointly across business units. In a fashion similar to the above stated, ideas and concepts developed by individual workers are further said to be communicated throughout the organization, and once important information is acquired externally it is effectively disseminated. The answers provided indicate that the fundamental pillars for building and sustaining parts of absorptive capacity seem to a certain extent adequately fulfilled. As Liao and Barnes (2010, p. 21) stated, the organizational absorptive capacity derives from individual capabilities to not only understand the value of acquired knowledge, but to redistribute it to relevant internal departments. This capability is thus heavily reliant on human capital and the relative individual propensity to ensure continuous dissemination. A strong consensus seems to prevail in terms of such behavior to be part of every-day activities, and thus for employees to naturally take an active role in their collaborative learning. One can thus draw the conclusion that a majority of the respondents possess strong dissemination capabilities, and hence seem to follow what is considered theoretically optimal. As they are operating in an industry where needs are not only different from the more conventional markets but also changing in the ways they can be properly addressed, internal communication seems to play a key role in maintaining a coherent understanding of customer needs.
However, a few respondents indicated that such ability may be restricted and that the communicational stream might be yet to unlock its full potential. Following the arguments by Cohen and Levinthal (1990), the intensity of learning efforts and the individual cognitive ability fundamentally dictate organizational absorptive capacity. While this seems to be true, another dimension might inhibit these abilities to develop. The geographical dispersion must thus be subjected to further attention, as the negative experiences are mainly found within companies with more than 50 employees. Larger corporations may have located departments in areas where the macro environmental preconditions are best suited for each respective business unit. This naturally implies inherent communicational complexities that might not be shared by smaller companies. Simply, cross-departmental collaboration might require larger efforts and resources than for smaller-sized firms.

5.4.2 Assimilation and Transformation

The perceived ability to apply new knowledge and successfully link existing knowledge with new insights were assessed strong among the respondents. They collectively agreed on not only translating insights gained from customer meetings into practical work, but to prepare such knowledge for future events and make it available to others. It appears reasonable to assume that these findings to some extent mirror the results found in knowledge acquisition. A strong tendency to communicate what has been observed and well-orchestrated systems with which to translate and store such observations seem to prepare organizations to better cope with challenges in understanding customers. This might also explain the strong statistical findings revealed when measuring these constructs on each other.

The behavior can be well explained by what was found by Liao and Marsillac (2015, p. 5437). They argued for the importance to supplement the external knowledge base with internal capabilities that can identify and assess knowledge, as well as channel and use it to renew knowledge-based resources. The findings can thus reveal that new insights are merged with what was previously known in order to expand and extend the base, which according to Brahma and Mishra (2015, p. 46) constitute critical drivers of sustainable growth. However, such reasoning again relies heavily on the organization’s human capital. As Cohen and Levinthal (1990) describe it, as learning by nature is cumulative, prior related knowledge and experience together dictate the employee’s ability to make such assessments.

Consequently, it ought to be sensitive to the levels at which it is initially construed and, if to be successfully disseminated and transformed into new useful knowledge, the cognitive dimension must be consistent between employees. The essentiality in the issue must change with the relative tacitness of the absorbed knowledge, which per definition is both subjective and experimental, and therefore complex to formalize (Nonaka et al., 2000, p. 5). However, this is further discussed in section 5.7.

Although the relative strength of absorptive capacity is dependent on individual capabilities, other organizational functions that foster and spur such capacity may have a role in these findings. The underlying reason for the strong results could potentially be found in the corporate culture. If cross-functional collaboration is widely encouraged from upper management and ideas/problems frequently passed on between employees, it appears reasonable to assume that such would be anchored in corporate policy. Although
the respondent companies collectively seem to have explicated systems for absorbing knowledge, a large part of the explanation could potentially be found in the sum of more qualitative parameters.

5.5 Relationship quality

By observing the answer distribution, what the perceived relationship quality between the target companies and their customers demonstrates is not only strong but appears to be something toward which resources are allocated. The relationships are generally characterized by reciprocal assistance and strong relational commitment which altogether add up to delightful connections. Contrarily, a majority of the respondents somewhat disagreed about avoiding making demands that could harm the interest of the other, and a rather negative/neutral approach was demonstrated also with the extent to which promises are kept unconditionally.

As shown in section 5.4.1, the corporate climates appear to promote intra-organizational interaction and communication, and in an equivalent manner it seems reasonable to infer such to be prevalent in the customer side as well. Ahamed and Skallerud (2013, p. 285) claim that manifestation of strong relationship quality is unattainable in absence of a good communication climate. Based on what has been found in previous sections, what can be seen thus seem to be a chain of events influencing each other and for which relationship quality serves as the very foundation for such to effectively sustain. Following Lahiri and Kedia (2011, p. 12) the relationship quality reflects the health of relational commitments and is a core part of inter-organizational arrangements. Consequently, what can be confirmed is that a clear majority of the target companies appear to fulfill the basic requirements for developing the preconditions for sound information exchange to occur.

However, as Dant et al. (2013, p. 283) proclaim, the platform on which relationship quality is built derives from three separate pillars; trust, commitment and satisfaction respectively. While the respondents agree on the existence of the two latter, the first seems yet to be attained. As stated before, when asked about the extent to which promises are kept the responses were, albeit scattered, rather leaning toward the negative side of the spectrum. Furthermore, slightly negative stances were taken in terms of making demands that could hurt the interest of the counterpart. To use this information to state that the trust level is low might however still be inaccurate or even purely incorrect. Due to the perceived satisfaction, the underlying reason ought to be found in other factors. Differences in business models naturally dictate the extent of customer involvement, thus the type of relationships and the degree of interdependence seem reasonable to receive further attention.

The ways in which the target companies operate might not involve total reliance on the counterpart as if they were involved in strategic alliances or equivalent joint venture set-ups. As the companies are run independently, the results might simply reflect conventional business behavior where the individual agenda is given main priority and the self-interests not de-emphasized in order to fully oblige the needs of the other. Consequently, this does not necessarily have to be perceived as an act of distrust but rather mutually accepted business behavior.
5.6 Measuring psychological distance on each factor

5.6.1 Psychological distance on knowledge acquisition and absorptive capacity

The results of the simple linear regression tests performed between psychological distance, knowledge acquisition and absorptive capacity respectively, demonstrated weak or no impact. Although psychological distance could explain 17.6% of the variation found in knowledge acquisition with significance p<0.001, the actual effect is still too complex to fully distinguish. The 1st hypothesis stating a positive effect of close psychological distance on knowledge acquisition can thus be rejected.

The answer for this phenomenon can likely be derived from the fact that both knowledge acquisition and absorptive capacity must be measured in relation to a particular object or a series of events. Without having established a relational sphere with an individual from whom to acquire or absorb new knowledge, it is not possible to assess the object in relation to which the psychological distance is assessed.

5.6.2 Psychological distance on relationship quality

As the perceived relationship quality increases, it is reasonable to believe that it continuously diminishes the perceived psychological distance, which in turn potentially leads to a reciprocal reinforcement of each dimension. However, none of the constructs in isolation could prove that such impact exists with even remote significance, and the results rather demonstrated a mutually neutral approach when measured individually.

A potential explanation to these finding could possibly be found in the fundamental meaning of the very concepts. Relationship quality per definition implies that an unknown degree of interaction already took place in order for a quality level to be established, which in a default setting would naturally be independent of how individuals perceive distances in between each other. An identical line of argumentation applies for psychological distance at default conditions. As explained by Trope and Liberman (2010, p. 440) psychological distance is found in the individual and subjective experience of a perceived distance separating the egocentric reference point and a specific object or event. Furthermore, as described in Holmqvist et al. (2015, p. 1432), psychological distance is by nature fluctuant and can manifest in different spheres of the social interaction with customers. Without initial contact, a relation has not been established and the perceived psychological distance would be unmeasurable as it is yet to manifest.

Once contact has been initiated, a cognitive process will inevitably start after which it can be subjected to measurement. This not only confirms the bidirectional nature of the concepts, but implies that separation of them cannot result in valuable findings in the context of knowledge acquisition and absorptive capacity. In order to properly explain the effects, they would have to be treated jointly and analyzed by performing multiple regression tests. By combining psychological distance with relationship quality and categorizing the respondents based on how information is construed, it ought to establish the right preconditions for having an impact on knowledge acquisition and absorptive capacity. Equivalently, the level of construal is, although consciously influential, by nature subliminal and cannot be separated from cognition (psychological distance), and thus they must be treated together. By doing so, it allows for a better understanding to be
gained of their interdependence, and thus for one step to be taken toward answering the outlined research question. In the forthcoming section, psychological distance, relationship quality and construal level are treated as independent variables and discussed as inseparable and intertwined concepts. We can therefore reject hypotheses 5 and 6 outlined in section 2.7, as the relationship between the said constructs in isolation could not be proved.

5.7 Combining the factors

By combining the ways in which individuals effectively construe informational details, with the perceived impact of psychological distance and the relationship quality established between individuals in an organization, interesting dimensions were revealed. The results demonstrated significantly positive effects on both knowledge acquisition and absorptive capacity. However, the level of construal appears to either inhibit or facilitate these organizational elements. Some instantiation seems to call for individuals focusing on the mere generalities of objects, while others for the exact opposite.

5.7.1 High-level construal: knowledge acquisition

It can be seen with a prediction value of 0.6 (adjusted R-square) that the relative difficulty in acquiring knowledge diminishes if information is construed at a higher level. However, such efforts appear to be strengthened by a greater perceived psychological distance in between the interacting parties in combination with an established negative relational sphere. These findings collectively give support for the 3rd hypothesis.

Yli-Renko et al. (2001, p. 589) argued that the level of success in acquiring knowledge is restricted by its mere existence, the ability to identify it and the general willingness to share it in between interacting parties. It might thus be true that the ability to identify new knowledge is easier when focusing on the larger details and adequately sufficient even though the psychological distance is greater. Ledgerwood et al. (2010, p. 39) argue that a greater psychological distance will trigger a sense of apathy as the level of susceptibility is lowered in relation to incidental social influence. This however cannot either be rejected nor confirmed. If it is true, it does not necessarily have to imply a negative element in the process of knowledge acquisition, but rather reflect a mere objective focus on what to acquire and simply neglect the personal distance to the individual from whom this is acquired. Greater psychological distance might further be associated with an inability to fully relate to the problems subjected to investigation, but as the impact of this when focusing on high-level information is rather low, it appears natural not to be vital to the process. The ways in which such knowledge is channeled might further add rationality to this line of reasoning. If acquisition endeavors occur in situations where observation serves as the main engine through which to establish a good understanding of the overall context, the value of psychological distances might be of lower importance.

The connection between negative relationship quality and knowledge acquisition appears at first surprising, but confirms what has been brought forward in previous academic papers. Research conducted by Yli-Renko et al. (2001) proved the very same relationship to be prevalent, and explained for the underlying reasons to potentially derive from a general “overembeddedness” as the relationship quality grows stronger.

Following Cohen and Levinthal (1990, pp. 148-150), relationship-based knowledge acquisition determines the extent to which coordination of the knowledge base can occur.
This can thus be confirmed in terms of acquisition activities, and the relationship per se appears to play a main role in such endeavors. Ultimately, as Liao and Barnes (2015, p. 1261) stated, inter-firm interaction can serve as a motivator for developing strong acquisition mechanisms, but the role of psychological distance might be somewhat irrelevant depending on how these are structured. However, the results collectively indicate preferences toward proximity in each respective psychological distance in order to maximize the outcome of interactive activities. How knowledge is effectively understood between individuals in the process of dissemination must therefore receive further attention.

5.7.2 Low-level construal: absorptive capacity

Contrarily, if information is construed by individuals at lower levels, i.e. small contextual details are subjected to natural emphasis, the absorptive capacity increases significantly given a close psychological distance. The adjusted R-square value of 0.599 implies an ability to predict nearly 60% of the variation in absorptive capacity using a combination of these particular constructs. The 2nd outlined hypothesis can therefore be given support.

As stated by Swan et al. (1999, p. 270), a certain degree of shared meaning systems must be manifested in order for tacit knowledge to be effectively communicated, which has inherent complexities if the innovation process is interactive. Consequently, there might be a connection between low-level construals having closer psychological distance to end users, and the ways in which these shared meaning systems can effectively develop. Although it cannot be told by the data, there might be continuously ongoing processes between individuals which, based on such subtle personal traits, improve over time alongside strengthened relational connections. This can thus potentially explain the underlying reason for why such context specific information is better absorbed if the relationship quality is perceived high. If true, it would further confirm the findings by Yli-Renko et al. (2001) and Moreira (2009, p 97), that the intensity in social interaction is likely to dictate how knowledge is absorbed, and in order to be successfully shared and applied, reciprocity is a necessity.

Holding the perceived relationship quality constant, the results revealed a situation where the exact opposite values were displayed if the level, at which information is construed, is reversed. This implies a relatively lower degree of individual absorptive capacity if an object is studied with the intention to acquire high-level information. Intuitively, this means that if high-level information is easier to acquire and low-level easier to absorb, a holistic organizational dissemination can become problematic. The relative level of tacitness in acquired knowledge thus plays a critical role when new knowledge is to be acquired and communicated between employees or partners.

This finding partially confirms what was said by Kogut and Zander (1993, p. 637), that increased tacitness inhibits effective communication and thus generates increased costs of organizational knowledge transferal. Consequently, this puts emphasis on the ability not only to understand the customers from which to retrieve new knowledge, but also a dimension of inter-employee understanding. As Holmqvist et al. (2015, p. 1435) found, psychological distances between interacting parties dictate how interaction itself is to be construed. For best effect, the internal milieu ought to receive further attention.
## 5.8 Hypotheses revisited

*Table 18: Hypotheses revisited*

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong>: Closer psychological distance has a positive effect on acquisition of detailed and/or specific knowledge.</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H2</strong>: Closer psychological distance and high relationship quality have a positive effect on the ability of low-level construal individuals to exploit and apply existing knowledge for a specific need.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H3</strong>: Greater psychological distance and low relationship quality have a positive effect on high-level construal individuals to acquire knowledge about the organized whole.</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H4</strong>: Greater psychological distance has a negative effect on the ability for high-level construal individuals to exploit and apply existing knowledge for a specific need.</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>H5</strong>: Closer psychological distance has a positive effect on perceived relationship quality.</td>
<td>Rejected</td>
</tr>
<tr>
<td><strong>H6</strong>: Greater psychological distance has a positive effect on perceived relationship quality.</td>
<td>Rejected</td>
</tr>
</tbody>
</table>
5.9 Revised model

Following the analysis, the results allow for the findings to be conceptualized into a model that is slightly different from that of the original. In relation to the conceptual model presented in chapter two, the revised model is significantly different in shape and function in order to account for the scope of combinations between psychological distance, level of construal and relationship quality.

The results of the study revealed a higher degree of complexity than initially believed, and an interdependence that the previous model failed to address. The revised model has thus been developed like an onion wherein each layer is represented by a description corresponding to the nature of the value of each concept. By fitting arrows across each side of the model, it accounts for the investigated combinations of each respective concept, and its final impact on knowledge acquisition and absorptive capacity. In order to depict the effect of each combination, positive and negative signs have been employed as indicators and attached on the side as illustrated in figure 12 below.

![Figure 12: Revised model](image)

The three inner layers represent the core of the model, and must be treated as inseparable due to the cognitive nature of psychological distance and level of construal, and the bidirectional connection with relationship quality. As demonstrated in the model, these three concepts should thus first be considered in relation to each other, after which its effect on the outer layers of knowledge acquisition and absorptive capacity can be seen. The outer peripheral layers must be treated as separate, and the effect of one is thus independent from the effect on the other, i.e. a positive effect on knowledge acquisition does not influence the effect on absorptive capacity.
The arrows fitted across each side of the layers have been developed based on the evidence found, and the line of argumentation provided in section 5.7. Following the upper arrow, high (greater) psychological distance in combination with high construal level and a lower degree of relationship quality, demonstrates a positive effect on knowledge acquisition but a negative effect on absorptive capacity. The lower arrow should logically be followed in an identical manner. This demonstrates that low (close) psychological distance combined with low-level construal and high relationship quality, collectively has a negative impact on knowledge acquisition but a positive impact on absorptive capacity.

As a result of the inability to prove significance in the relationships between more combinations of the three inner layers, the arrows cannot yet be crossed to involve of the upper and lower side combined. Consequently, the combinations of high (great) psychological distance and low construal level, and the opposite scenario, has not been outlined in the model. However, this does not exclude such combinations to potentially hold valuable insights, but has been asked to be investigated in future research as outlined in section 6.7.
6. Conclusion and recommendations

This chapter provides an answer to the stated research question and its corresponding purposes that have served to guide the choices made throughout the thesis. The chapter outlines the practical and societal relevance of the findings after which the theoretical and methodological contributions are explained for. Finally, recommendations are made for future research in the field and a separate section has been assigned to explain for the limitations encountered during the research process.

6.1 General conclusion

The overall purpose of the thesis has been to shed light on the cognitive dimension and measure its perceived impact on knowledge management processes when developing an understanding of elderly users and customers. Two out of six hypotheses could be confirmed out of which one could either be rejected nor given support. The findings resulted in a model with which to answer the stated research question:

“How does psychological distance affect knowledge acquisition, absorptive capacity and relationship quality?”.

The role of psychological distance and the levels at which individuals construe surrounding information have proved valuable in the processes of knowledge acquisition and absorptive capacity. However, due to its bidirectional nature with relationship quality and their inherent fluctuant interplay, the effects of psychological distance in isolation could not be shown to demonstrate any statistical relevance. The distances are by nature dependent on the degree to which relationships develop and the individual attention to detail when acquiring knowledge from external sources.

Greater psychological distance and moderate relationship quality jointly assist in acquiring general knowledge for which details are not bound to the incidental or peripheral nature of a social object or event. In the industry of product development for an elderly population it was proved beneficial to maintain a certain cognitive and relational distance toward the customer from whom knowledge is to be acquired. These findings can confirm previous research and, by adding cognitive variables, increase the prediction value of past models. As a result of this study, a larger part of the variance between knowledge acquisition and absorptive capacity can now be explained for.

In contrast, the role of closer psychological distance has a major part in inter-organizational dissemination processes. Provided a perceived high relationship quality and internal capabilities to interpret and understand intricate contextual details, the distances collectively assist in assimilating knowledge better between individuals within the organization. The social, temporal and spatial distances can thus increase the efficiency in cross-departmental translation of tacit knowledge which in turn can yield improved knowledge transformation. By understanding the role of psychological distance, the barriers of transferring subjective experiences to a counterpart can be reduced, provided the interacting parties construe information at a lower level. Deliberate efforts to adjust psychological distances can thus serve as a determinant for decreasing the marginal loss when disseminating knowledge between employees in an organization.
Based on the above stated answers, it is believed that the right dimensions of the social phenomenon were emphasized and thus the thesis purposes adequately fulfilled. Knowledge management processes were successfully linked to individual cognition and the ways in which they fluctuate with relationship quality. It has further been investigated how processes are designed for acquiring and disseminating knowledge among companies targeting an elderly population. Finally, the purpose was to develop a deeper understanding of how psychological distances affect the degree to which elderly customers are understood, and the role of capabilities to make sense of the surrounding environment.

However, in order to fully understand the role of psychological distance, future research is necessary for which recommendations are made in section 6.7.

### 6.2 Societal relevance

The demographic dispersion is about to reach a historically critical state in which the relative incidence of young people is not proportional to that of the elderly. This naturally implies increasing societal challenges and a harder pressure on governmental institutions to assure proper, legally stipulated, welfare provision. Younger generations thus bear the responsibility to sustain and improve the health and well-being of the elderly. However, based on the prevalent age distribution, the ratio of people for which assistance must be provided in relation to the number of available assistance providers implies heavy pressure on novel innovation.

Companies play an essential role in addressing these needs, and in order to secure a solid pipeline of innovations, knowledge acquisition processes and absorptive capacity can serve as the link with which to bridge this gap. By increasing the knowledge and understanding of elderly users and ways in which to improve the cognitive ability to relate to their functional impediments, one can increase the incentive to tap into a growing market. The results of this study can thus emphasize dimensions to which limited previous academic attention has been paid. By taking a step in this direction, a larger magnitude of firms can realize how to improve the knowledge acquisition processes to unlock latent potential and thus put pressure on the competitive environment. The monetary incidence of such movement would naturally have significant nation-wide economic implications and would ultimately allow for hospitals and elderly care-centers to improve the health of their care takers.

### 6.3 Managerial implications

The findings of this study allows firms to rethink the chain of activities in knowledge management processes. The results of the cognitive dimension allow management to gain an understanding of how to better structure teams based on their ability to recognize different levels of contextual detail in order to maximize knowledge acquisition endeavors. This further applies for how to effectively translate and assimilate what has been acquired across departments. By implementing the findings of this study it would thus allow management to attain a higher level of understanding of concepts and ideas related to absorptive capacity and its impact on product development processes. Furthermore, if systems can be adapted to effectively identify how elements in level of
construal and cognition are unique to each employee, the effect on innovation capacity could in turn potentially be rather strong.

In a similar manner, the human resource management function could utilize the results to maximize the impact of these dimensions and skill sets in recruitment processes. If these aspects can be considered when recruiting people in product development or business intelligence, it might yield strong intangible capabilities and thus a source of competitive advantage. Management ought to realize the value of relationship quality with the individuals from whom knowledge is acquired and ensure not only assignment of right individuals for the mission, but to keep a certain distance in order to avoid diminishing the innovative sphere. This does not imply a deliberate effort to cause any harm to customers for the purpose of establishing a slightly negative relational sphere, but rather an effort to remain objective when observing customer needs and evade being too personal.

In order to expand the perspective and uncover influencing dimensions to the results found, and thus properly answer the stated research question, it is assessed essential to address the contextual elements of Who, Where, When.

6.3.1 Who
As the respondent companies are operating in the market for elderly users, it appears reasonable to elaborate on the potential impact of the unconventionality of the industry itself. As previously stated, greater psychological distance along with slightly negative relationship quality increased the impact of knowledge acquisition provided information was construed at higher levels. The heterogeneous nature of the elderly population might make it necessary to keep a certain distance when observing customer needs. The actual needs of some elderly might be so far from the observer’s frame of reference that it requires him or her to maintain a certain psychological distance in order to break the information down to a translatable level and thus something understandable. For example, if an elder individual has lost the reflexes that allow this person to swallow properly, it might not be possible for a developer to fully understand the inherent complexities in this issue. Instead it might be beneficial to remain at a greater psychological distance as it allows the developer to extract and construe the overarching details of the problematics.

The fact that the statistics showed negative relationship quality to increase efforts of knowledge acquisition might not imply a negative relational sphere, but merely a necessity not to get too close to what is being studied. End-user involvement in product development processes might thus be different from other conventional industries where the exchange of information might occur at more understandable levels. The need per se might further dictate the extent to which these findings are accurate. There are naturally a large variety of problems, each of which are characterized with a certain degree of complexity. If the needs are perfectly communicable and can be effectively understood at many levels, the situation might be different.

6.3.2 Where
In order to get a better picture of how knowledge is acquired, the interplay between tenderers and acceptors in public procurement processes must be addressed. In some instances the product requirements might be declared in written form and communicated by each respective institution in a way that require companies only to match the outlined
criteria. It might therefore remove the necessity of direct customer involvement. However, this might not apply for companies outside the Nordics, and the processes might look differently in countries in North America, Asia, or the rest of Europe.

The degree of relative complexity might further make it unviable to involve some individuals in development processes, which means that information gathered most likely are sourced from employees working with them or someone responsible for purchasing. The relationship quality and psychological distance might thus serve other purposes and lose its importance when sourcing knowledge.

6.3.3 When

Taken into account the competitive market pressure of 2016, the financial situation of countries and budgetary restrictions of private firms must be taken into consideration in order to depict the phenomenon fairly. It might be possible that companies seek to address and meet problems with more general solutions in order for them to be accessible to larger groups of people. It may thus simply call for high-level information to be acquired and the cognitive dimensions might be of less value although this is contradictory to the preferences of psychological distance. However, it cannot be said with any degree of certainty that this in fact holds any truth, and will naturally differ between companies in the same industry.

6.4 Theoretical contribution

Following the argumentation outlined by Whetten (1989, p. 491), the fundamental mission of theory-development derives not simply from rewriting existing academia, but to challenge and extend the knowledge. Previous research has tried to investigate knowledge acquisition and absorptive capacity based on rather static parameters from which the individual role in many cases has been excluded. The overarching emphasis has predominantly been concerned with organizational processes rather than mere cognition. Furthermore, a majority of the studied business articles fail to fully enunciate and distinguish the Whys underlying their theoretical models, as the main focus has been put on empirical value and causality. Whetten (1989, p. 491) argue such publications to have tendencies of preluding empirically dominated discussions in contrast to those theoretically anchored.

Although the methodological purpose has been explanatory, and for psychological distance to be tested for causality, significant attention has been directed toward the Why: for what reason is this in fact happening. The model developed throughout this study can now assist in explaining and predicting a larger fraction of the variation between the studied concepts. Although previous research has been able to address critical dimension in knowledge management and the mediating effect of one on another, it has been yet to fully discover the role of individual cognition in these processes. This paper makes a theoretical contribution by proving the need of a deeper convergence between psychological theory and business administration, in order to better understand the role of the cognitive self in relation to others.
6.5 Methodological contribution

Research within the field of psychological distance has been nearly exclusively employing qualitative techniques and methods, involving focus groups in which reactions and actual behavior has been studied and documented (cf. Kalkstein, 2016; Trope & Lieberman, 2007; 2010). By following the methodological path of deduction and thus carrying out a pure quantitative study, theory developed by previous inductive researchers can be not only empirically tested, but it also allows for a conversion between the two respective fields of psychology and business management. It thus contributes methodologically by acknowledging psychological distance as part of the objectivist spectra and by statistically validating the impact of such theoretical concept on rigorous business administration theory.

6.6 Limitations

It was previously argued that the mechanisms steering changes in psychological distance ought to be independent of industry. While this is still agreed upon, the relative strength of this parameter might change in relation to the industry subjected to focus. An elder population possesses characteristics that are inherently different from other segments which in turn might result in a different value of this predictor if applied across other industries. Consequently, the choice of paying attention to a very niche industry naturally puts limitations on the study.

The methodological stances taken for this study might further have served as a limitation for developing a thorough and correct understanding of the social phenomenon. As described in the next section, more fruitful information might be found by employing different qualitative techniques to collect and interpret data. By treating individuals as part of a concrete network of uninfluential links, the results are limited to measuring the phenomenon rather statically and thus excludes how social interactions per se continuosly fluctuate and impact the value of psychological distance.

Due to the small incidence of companies operating in this industry and the sample size of N=51 from which data was successfully collected, the study is limited to draw conclusions based available respondents. Although tendencies among the participants were rather strong, this factor might have limited the reliability of the study. Finally, the fact that we as researchers have to assume that the respondents were all part of the product development departments might further put limitations on the study. However, the lack of control has been taken into consideration when interpreting the results.

6.7 Suggestions for future research

The results of this thesis can clearly show that psychological distance is an important parameter in the process of not only acquiring but assimilating knowledge from external sources. However, the inherent limitations of quantitative research do not allow for a deeper investigation of the observed phenomenon. Consequently, it calls for complementary qualitative research in order to clarify and accentuate the underlying contextual influencers. By conducting case studies, one would be able to identify and map out inhibiting elements for translating tacit knowledge into explicit based on the cognitive distance in between individuals. This further applies to the dimension of relationship quality and how individuals perceive this to change with changes in each respective
psychological distance. Future research could thus be conducted for the purpose of finding a level optimal for acquiring and disseminating knowledge.

It would further be recommended for further research to confirm the validity of the model, and tests its applicability in a wider range of industries. Furthermore, it would be interesting to investigate the cross-cultural aspect of psychological distance, and thus the role of psychological distance in situations where people with different meaning systems interact to acquire knowledge. Consequently, to test the model in relation to Hofstede’s renowned model for cultural dimensions would perhaps expand the perspective, and increase the understanding of such element in knowledge management processes.

Finally, in order to fully understand the ways in which psychological distance effectively change over time alongside relationship quality, it is suggested to make a longitudinal study within the very same industry.
7. Truth criteria and ethical considerations

The first part of the following chapter provides descriptions of quantitative truth criteria and the tools and instruments with which the quality of the research has effectively been evaluated. This part is concerned with internal/external validity, after which a discussion is held with regard to fundamental reliability, objectivity and potential bias of the study. The subsequent part deals with ethical guidelines and how they have influence the choices made throughout the course of the study.

7.1 Research quality/Truth criteria

LeCompte and Goetz (1982, p. 31) present the inherent value of scientific research to be a partially interdependent function of the individual ability to explicitly demonstrate the level of credibility in findings. They further argue the need for authenticity to be independent of research philosophy, academic discipline or the ways in which to collect and analyze scientific data.

Reliability is by nature associated with research replicability, while the concept of validity is concerned with the extent to which measurements of a phenomenon are accurately performed in quantitative studies (LeCompte and Goetz, 1982, p. 32; Haele and Twycross, 2015, p. 66). These aspects collectively constitute the platform by which research quality effectively can be assessed, and were categorized by LeCompte and Goetz (1982, pp. 31-32) into four; Internal/external reliability, and internal/external validity respectively.

7.1.1 Reliability/Replicability

External reliability is explained by LeCompte and Goetz (1982, p. 32) to revolve around the question if the same phenomena would be discovered, or constructs be generated in a similar manner, by independent researchers that are given identical or equivalent operating preconditions. In contrast, internal reliability is described to be concerned with the extent to which other researchers are able to match data to pre-given sets of generated constructs in a manner similar to that of the original researcher. Due to the nature of psychological distance, the cognitive perception of external objects is believed to remain persistently different between individuals due to variations in cultural heritage, value judgements and accumulated experience. However, the underlying cognitive mechanisms through which such perceptions are created are not believed to be bound unique to each individual, but rather shared among human beings. Hence, provided a similar contextual setting, results are believed to be similar if carried out by other researchers following the same procedures.

Leech et al. (2011, p. 115) present consistency in the evidence to be a key determinant in order for research to be replicable, as it otherwise would not be possible to conduct legitimate research. Consistency is thus concerned with the extent to which scores can be used to measure constructs across variations in its constituent items, types of instruments and the time point at which these constructs are to be measured (Leech et al., 2011, p. 115). In order to determine the reliability of measurements in quantitative studies, Haele and Twycross (2015, pp. 66-67) describe for homogeneity (i), stability (ii) and equivalence (iii) to serve as essential reliability attributes. Homogeneity, (that is, if scale
items measure one specific construct), has been confirmed by adopting scales from studies in which these were tested using Cronbach’s alpha and Kuder-Richardson coefficient respectively. Such tests have been made again in order to secure and confirm the results found in previous publications. As these scales further have been adopted in a variety of previous research publications, the result stability attribute has been assessed sufficiently strong. Finally, the equivalence criteria, i.e. what Haele and Twycross (2015, p. 67) explain for as response consistency among multiple users using qualitative assessments, is yet to be investigated as the adopted measurements derive merely from quantitative studies. However, following the argumentation by Kent (2007, p. 141), while a valid measure intuitively has to be reliable, a reliable measure may contrarily be invalid.

7.1.2 Validity

Validity is, as previously mentioned, conclusively concerned with the truth value of evidence, and usually categorized into internal and external. It merely refers to the general proximity and consistency of the connection between the initial research purpose and the empirical analysis process (Ejvegård, 2003, p. 73). Internal validity is closely associated with causality, and emphasizes the issue of the relative degree to which proven relationships between measured variables in fact holds (Bryman and Bell, 2011, p. 42). It is thus concerned with the approximated truth about inferences drawn upon empirical evidence, and if such is authentically representative of realities (LeCompte and Goetz, 1982, p. 32). External validity on the other hand addresses the issue of legitimate representativeness across a variety of contexts (LeCompte and Goetz, 1982, p. 32), i.e. the extent to which it effectively can be generalized throughout groups of individuals.

Haele and Twycross (2015) expand the issue of validity further and explain for three separate sub-dimensions through which it can be secured; content validity (i), construct validity (ii) and criterion validity (iii). In consecutive order, the categories address the accuracy of measurements in relation to its respective construct, if and to what extent the intended construct is measured, and if the employed instruments are related to others for measuring equivalent variables (Haele and Twycross, 2015, p. 66).

In order to remedy potential validity related problems, a series of measures have been taken. As demonstrated in section 3.11.6, sample size calculations have been done for the purpose of estimating required statistical power, together with which extensive discussions have been held throughout the study with regard to contextual characteristics. The initiated contact with the target respondents have been inviting and professional to avoid loss of participants, and a discursive section has been exclusively dedicated to the issue of nonresponse to show transparency and awareness.

7.1.3 Generalizability

Bryman and Bell (2011, p. 163) explain for generalization in quantitative studies to imply an ability to apply empirical results in contextual environments located outside the scope of the setting in which the original study was carried out.

As argued by Lukka and Kasanen (1995, p. 78), statistical reasoning and the underlying assumptions of the employed measurement- and analysis procedures cannot be ensured to remain true or hold in the future, and thus constitute a problem for statistical generalization. While generally agreeing with this statement, manifestation of the cognitive distance separating individuals occurs at an interpersonal level, and its
constituent parameters are thus not subjected to the influence of time. If the future conditions change it is most likely a result of changes in these distances between the target sample and the object for which products are to be developed. Furthermore, the cultural dimension must be taken into consideration. The study has been conducted collecting data from companies operating in the Nordic market, where cultural similarities might be stronger than countries located in other parts of the world. In order for the results to be successfully generalized, the limitations inherent to this aspect must thus be kept in mind and treated carefully.

Conclusively, as the course of events in terms of methodological processes and statistical procedures have been rigorously explained for, it is believed that this study can be re-tested and replicated in other geographical regions and industrial settings.

7.2 Bias

In order to reduce the sources for potential bias and thus increase the level of neutrality in the evidence, a series of steps have been taken throughout the study. Kent (2007, p. 241) present human judgement or equivalent influence in the sample selection process to constitute a critical source of systematic error, which can result in over- or under representations of specific units. As declared for in section 3.11.4, there was no pre-existing sampling frame based on which to draw random samples, hence such has been developed exclusively for the purpose of this study. However, the suitability of available sampling procedures were carefully evaluated and the relative incidence of firms operating in each specific industry was assessed and found to be rather balanced.

The identities of the target companies were further anonymized in order to secure no inferences could be drawn with regard to firm affiliation. However, as the questionnaire was initially distributed to the one responsible for each respective department, after which this individual redistributed it to the requested product developers, a certain degree of personal bias may be involved. It can thus not be confirmed who was assigned to answer the questionnaire and the degree to which this individual match the criteria for participation. Nonetheless, this step was considered inevitable and a parameter to which no control could be exerted. By distributing the questions online, the physical distance might have remedied an equivalent effect to what Kent (2007, p. 108) refer to as the “observer effect”, where people behave more rationally in the presence of an observer.

Full transparency has constituted a critical pillar in the empirical result section and the employed statistical measures have been further treated objectively. Consequently, equal confidence- and significance levels have been applied consistently to all statistical measurements.
7.3 Ethical considerations

One of the most important aspects in thesis writing are the ethical considerations, which are present in all stages of the research process (Saunders et al., 2012, p. 226). Researchers have to take measures in order to ensure no unethical practice gets conducted nor endorsed. Scholars (e.g. Bryman and Bell, 2011, p. 131-132; Denzin and Lincoln, 2003, p. 217-219; Saunders et al., 2012, p. 231) have identified several distinct ethical principles that researchers should abide to when conducting their studies: informed consent, confidentiality, truthfulness, accuracy of information, and communicating the voluntary nature of research.

When doing research on people, be it through surveys or interviews, the researchers will always have to respect those being the subjects of the research, or involved any other way in the research process. As we conducted a quantitative study, we surveyed people. This comes with a multitude of aspects that need to be considered carefully. Firstly, it was necessary to ensure our respondents were adequately informed about our study and the nature of their participation. If researchers were to deceive their subjects, it would do great harm for the research community through e.g. making the access more difficult for future researchers (Lundin, 2011, p. 153), which obviously is not desirable. Therefore, the approach we used to reach our target firms was two-phased. First, an introductory email was sent out to them which explained who we are and what the purpose of our study is, and asked about their willingness to participate in our study. The recipients were also encouraged to present us any questions if they wished to learn more about the nature of the research. A maximum of two reminder emails were sent to those who did not reply to the first one.

After receiving a positive response from the target firms, we proceeded to the phase two by sending an URL link containing the questionnaire. A message was attached to the questionnaire that explained the confidentiality of the responses and that the data cannot be traced back or disclosed to any individual respondent or organization. It was also made clear to the respondents that they were free to cancel their participation to the survey at any time of their choice, by simply moving away from the page. These undertaken measures were in line with what Saunders et al. (2012, p. 238) described as being prerequisite for reaching an informed consent.

Furthermore, the research topic of our choice and its subsequent research questions raised many thoughts which should be discussed. Conducting research on the elderly population bears much importance due to its global significance, but the perceived importance cannot undermine the human value of the research subjects. Aging in human life may come with a multitude of cognitive and physical disabilities/impairments, with potentially dramatic consequences on perceived life quality. Regardless of our personal ability to relate to such conditions, we believe the best measure for us to take is to approach the topic with uncompromised respect and remain fully objective.

Additionally, other aspects related to our research topic that has to be taken into consideration. When we aim to research the impact of psychological distance, we had to make sure psychological distance in the context of our research would not hold any negative connotations that would persuade our respondents to take one stance or another on the topic. Consequently, we had to be increasingly careful with the wording of our questionnaire items, and modify any potentially leading formulations. Moreover, after
reflecting on our constructs, we realized some of them may include aspects that some firms (under some conditions) would prefer to not disclose. Aspects as such may include customer relationships, management styles, the general functionality of the firm, or anything that could be considered sensitive information by the companies due to e.g. competitive situation in the market (Lundin, 2011, p. 153). As a result, extra attention was allocated to the wording of particular questionnaire items as well as on informing the respondents about the 100% anonymity and confidentiality of participation. It is our firm belief that no respondents were harmed during the research process, and that we are meeting the ethical requirements of the thesis work.
Reference list


Appendix 1 - Questionnaire

Umeå School of Business and Economics
Umeå University

Questionnaire – Psychological distance

Dear participant,

Thank you for participating in the survey. Please review each question carefully before answering. All of the answers will be treated with full confidentiality and cannot be traced back to any individual respondent or organization. You are free to cancel your participation at any stage of the questionnaire by simply moving away from this page. Please remember to click "Submit" at the end of the questionnaire in order for your responses to be recorded.

Kindest regards,

Tomi Paakkunainen & Patrik Ljungberg

<table>
<thead>
<tr>
<th>General information</th>
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<tbody>
<tr>
<td><strong>Age</strong></td>
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<td>25-34 [ ]</td>
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<td>35-54 [ ]</td>
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<tr>
<td>Over 54 [ ]</td>
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<tr>
<td>Prefer not to say [ ]</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
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<tr>
<td>Male [ ]</td>
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<tr>
<td>Prefer not to say [ ]</td>
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<tr>
<td><strong>Company</strong></td>
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<tr>
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<td>10-50 employees [ ]</td>
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<tr>
<td>Over 50 employees [ ]</td>
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<table>
<thead>
<tr>
<th>Psychological distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please evaluate the following statements and indicate your opinion regarding them.</td>
</tr>
</tbody>
</table>

1. Imagine your company’s product’s or service’s typical elderly user. To you, are his or her physical features... *Of very general nature* [1 2 3 4 5 6 7] *Consisting of tiny details that are important*
2. Imagine your company’s product’s or service’s typical elderly user. To you, is his or her personality...
   Focused on the big picture
   Focused on small details

3. My ability to relate to customer problems is affected by their physical distance in relation to me.
   Strongly disagree
   Strongly agree

4. Meeting and seeing our end users in person affects my ability to relate to their problems.
   Strongly disagree
   Strongly agree

5. Imagine a meeting where a customer problem was explained to you. Two weeks passes before you can effectively start working on it. This has affected your ability to relate to the customer problem.
   Strongly disagree
   Strongly agree

6. It has an effect on my ability to understand the customer need if the customer in question is similar to me or someone close to me.
   Strongly disagree
   Strongly agree

7. Interaction with someone similar to me affects my sense of empathy and willingness to help
   Strongly disagree
   Strongly agree

8. I try to foresee our end users’ future needs (and think of solutions) based on how I imagine the future to unfold.
   Strongly disagree
   Strongly agree

### Knowledge acquisition

Please evaluate the following statements and indicate your opinion regarding them.

9. Our company’s processes for acquiring knowledge about our customers is influenced by our employees.
   Strongly disagree
   Strongly agree

10. Think of your company’s typical buyer. Is the end-user information you get from them...
    Focused on small details
    Focused on the big picture

11. Our company has processes for generating knowledge from identified customer needs.
    Strongly disagree
    Strongly agree

12. Our company develops knowledge acquisition processes based on feedback from past projects.
    Strongly disagree
    Strongly agree
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Strongly disagree</th>
<th>...</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Our company has processes for distributing knowledge throughout the organization.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>14.</td>
<td>When I perceive a customer to be similar to me or someone close to me, it affects my ability to apply my previous knowledge to solve the customer need.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>15.</td>
<td>Our company has processes for exchanging knowledge with our business partners.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>16.</td>
<td>Our company has processes for acquiring knowledge about new products or services within our industry.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>17.</td>
<td>Our company has processes for exchanging knowledge between individuals within the company.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

**Absorptive capacity**

*Please rate to what extent the following statements fit the communication structure in your company.*

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Strongly disagree</th>
<th>...</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>In our company, ideas and concepts are communicated across the departments.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>19.</td>
<td>Our management emphasizes cross-departmental support to solve problems.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
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<tr>
<td>20.</td>
<td>If one of our company’s business units obtains important information, it is able to communicate this information to other relevant business units or departments.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
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<tr>
<td>21.</td>
<td>As the time passes (weeks, or say a month) between an end-user needs analysis and this moment, it has an effect on transferring that knowledge to other relevant personnel in the organization.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
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<tr>
<td>22.</td>
<td>Our employees are able to absorb new knowledge as well as to prepare it for further purposes and to make it available.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>23.</td>
<td>Our employees understand our customers and successfully link existing knowledge with new insights.</td>
<td>Strongly disagree</td>
<td>...</td>
<td>Strongly agree</td>
</tr>
<tr>
<td></td>
<td>Statement</td>
<td>Strongly disagree</td>
<td>Strongly agree</td>
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<td>24.</td>
<td>Our employees are able to apply new knowledge in their practical work.</td>
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<td>25.</td>
<td>Relationship quality</td>
<td></td>
<td></td>
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<tr>
<td>26.</td>
<td>The relationship our company has with customers is something we are</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>committed to.</td>
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<tr>
<td>27.</td>
<td>Generally, our customers are willing to provide assistance to us without</td>
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<td></td>
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<tr>
<td></td>
<td>exception.</td>
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<td>28.</td>
<td>We are delighted with our relationships with our customers.</td>
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<td>29.</td>
<td>In our relationship with customers, both sides avoid making demands</td>
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<td></td>
<td>that can seriously damage the interests of the other.</td>
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<tr>
<td>30.</td>
<td>Our customers always keep their promises to us.</td>
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</tbody>
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