

Fahim Anwar and Finn Alvestad

# Impact of technology acquisition strategy on innovation performance

Master's thesis in International Business and Marketing

Supervisor: Bella B. Nujen

Co-supervisor: Hans Arthur Solli-Sæther

June 2021



Fahim Anwar and Finn Alvestad

# **Impact of technology acquisition strategy on innovation performance**

Master's thesis in International Business and Marketing  
Supervisor: Bella B. Nujen  
Co-supervisor: Hans Arthur Solli-Sæther  
June 2021

Norwegian University of Science and Technology  
Faculty of Economics and Management  
Department of International Business



## Mandatory statement

Each student is responsible for complying with rules and regulations that relate to examinations and to academic work in general. The purpose of the mandatory statement is to make students aware of their responsibility and the consequences of cheating. **Failure to complete the statement does not excuse students from their responsibility.**

Please complete the mandatory statement by placing a mark **in each box** for statements 1-6 below.

1.	<b>I/we hereby declare that my/our paper/assignment is my/our own work, and that I/we have not used other sources or received other help than is mentioned in the paper/assignment.</b>	<input checked="" type="checkbox"/>
2.	<b>I/we hereby declare that this paper</b> <ol style="list-style-type: none"> <li>1. Has not been used in any other exam at another department/university/university college</li> <li>2. Is not referring to the work of others without acknowledgement</li> <li>3. Is not referring to my/our previous work without acknowledgement</li> <li>4. Has acknowledged all sources of literature in the text and in the list of references</li> <li>5. Is not a copy, duplicate or transcript of other work</li> </ol>	Mark each box: 1. <input checked="" type="checkbox"/> 2. <input checked="" type="checkbox"/> 3. <input checked="" type="checkbox"/> 4. <input checked="" type="checkbox"/> 5. <input checked="" type="checkbox"/>
3.	<b>I am/we are aware that any breach of the above will be considered as cheating, and may result in annulment of the examination and exclusion from all universities and university colleges in Norway for up to one year, according to the <a href="#">Act relating to Norwegian Universities and University Colleges, section 4-7 and 4-8</a> and Examination regulations at NTNU.</b>	<input checked="" type="checkbox"/>
4.	<b>I am/we are aware that all papers/assignments may be checked for plagiarism by a software assisted plagiarism check.</b>	<input checked="" type="checkbox"/>
5.	<b>I am/we are aware that The Norwegian University of Science and Technology (NTNU) will handle all cases of suspected cheating according to prevailing guidelines.</b>	<input checked="" type="checkbox"/>
6.	<b>I/we are aware of the University's rules and regulations for using sources.</b>	<input checked="" type="checkbox"/>

# Publication agreement

ECTS credits: 30

Supervisors: **Bella B. Nujen and Hans Arthur Solli-Sæther**

## Agreement on electronic publication of master thesis

Author(s) have copyright to the thesis, including the exclusive right to publish the document (The Copyright Act §2).

All thesis fulfilling the requirements will be registered and published in Brage with the approval of the author(s).

I/we hereby give NTNU the right to, free of charge, make the thesis available for electronic publication: yes no

Is there an [agreement of confidentiality](#)? yes no

(A supplementary confidentiality agreement must be filled in)

Date: 18.06.2021

## **Acknowledgement**

The finalization of this thesis completes our master's degree in International Business and Marketing at the Norwegian University of Science (NTNU) in Ålesund. As graduates we would first like to thank the organization and staff. We are sincerely grateful to all the people in different functions that have made our graduation possible.

Furthermore, we would like to thank our two fantastic supervisors, Bella B. Nujen and Hans Arthur Solli-Sæther, for their support, constant guidance, constructive feedback and encouragement throughout the entire process. Their directions and supervision have been priceless for us.

We would also like to thank the contact person at the focal firm, for introducing us to 11 relevant respondents, and thereby giving us access to a large amount of new and valuable information. We really appreciate that all the 11 respondents have taken the time out of their busy schedules to help us out. Every single one of them shared valuable insights that consequently formed our thesis. Their knowledge and experience have been of great significance.

Last, we would like to express our gratitude towards our friends and family, especially Nausheen Tabassum Rafa and Emilie Sætre Øvrebø, for great support throughout the entire process. Your patience and encouragement have truly been remarkable.

We hope you enjoy the read!

Finn Alvestad and Fahim Anwar

Ålesund, 18<sup>th</sup> June 2021

## **Abstract**

**Purpose** – The purpose of this study is to investigate how a technology acquisition strategy impacts the innovation performance of a firm. By distinguishing the gains from an acquisition into similar and complementary, we aim to explore how this distinction affects the combination of the acquired knowledge base into the focal firm's existing knowledge base, which further impacts the innovation outcome. At the same time, we examine how the same distinction influences the choice between task and human integration, and consequently impact the firm's innovation performance.

**Design/methodology/approach** – We have conducted a qualitative single case study to generate in-depth knowledge about a major acquisition within the maritime industry in Northern Europe. Semi-structured interviews with eleven managers in various management positions was applied to collect appropriate data. The respondents had previous affiliations in both acquiring and acquired firm.

**Findings** – From the interview's several important factors and processes related to the post-acquisition integration process were revealed. The distinction between similarities and complementarities regarding knowledge, products and systems proved to be significantly important. Furthermore, we identified several important factors for enhancing the important element of knowledge transfer in acquisitions. Also, we have created a sequential model visualizing the process for combining knowledge bases. Our findings indicates that the 'route' chosen by the acquiring firm in the initial stages of the integration process is critical for the innovation outcome.

**Research implications/limitations** – The main contribution to the existing literature is the model we have created to provide a visualization of how a firm can combine the acquired and the existing knowledge base during the post-acquisition integration phase. Furthermore, we have highlighted the importance of rivalry among the acquired and the acquired firm in regards of absorptive capacity. Based on the numerous articles we have reviewed in the existing literature; we have not found any discussion mentioning this important aspect. The research method we have applied restricts the generalizability of our findings.

Keywords: M&A, technological acquisition, integration, knowledge transfer, innovation



# Table of Contents

Acknowledgement .....	3
Abstract.....	4
List of figures.....	7
List of tables.....	7
Chapter 1.0: Introduction .....	8
1.1 Background.....	8
1.2 Research objective and question.....	10
Chapter 2.0: Theoretical Background.....	12
2.1 Integration process and innovation .....	12
2.2 Innovation potential in acquisitions.....	15
2.3 Knowledge transfer.....	19
2.4 Innovation performance.....	25
Chapter 3.0: Research Methodology.....	29
3.1 Research design .....	29
3.2 Research approach .....	31
3.3 Research method.....	31
3.3.1 Choice of research method.....	32
3.3.2 Case selection.....	34
3.4 Data collection.....	35
3.4.1 Primary data collection: Interviews .....	36
3.4.2 Secondary data .....	40
3.5 Data analysis .....	41
3.5.1 Data preparation.....	41
3.5.2 Coding.....	42
3.5.3 Data reduction.....	43
3.6 Quality criteria.....	44
3.6.1 Credibility .....	44
3.6.2 Transferability.....	45
3.6.3 Dependability.....	46
3.7 Research ethics .....	47
Chapter 4.0: Description of the case .....	49
Chapter 5.0: Findings.....	51
5.1 Technological Acquisition .....	51
5.1.1 Delta's similar and overlapped gains from the acquisition.....	51

5.1.2 Delta's complementary gains from the acquisition .....	52
5.1.3 Summary .....	53
5.2 <i>Combining knowledge bases</i> .....	54
5.2.1 Articulation and direction of knowledge transfer .....	54
5.2.2 Different factors affecting 'combining knowledge bases' in the acquisition .....	54
5.2.3 Different activities for combining knowledge bases .....	57
5.2.4 Summary .....	59
5.3 <i>Innovation performance</i> .....	59
5.3.1 Measurement of innovation performance in Delta .....	60
5.3.2 Factors facilitating the increased rate of innovation .....	60
5.3.3 Factors influencing the decreased rate of innovation .....	60
5.3.4 Difference in approaches toward innovation .....	61
5.3.5 Summary .....	62
Chapter 6.0: Analysis and Discussion .....	63
6.1 <i>Technological acquisition</i> .....	63
6.1.1 Similarities and overlapping between Alpha and Beta impacting the acquisition..	63
6.1.2 Complementarities between Alpha and Beta impacting the acquisition .....	66
6.2 <i>Combining knowledge bases</i> .....	68
6.2.1 Articulation of knowledge and direction of knowledge transfer .....	68
6.2.2 Different factors affecting 'combining knowledge bases' in the acquisition .....	69
6.2.3 The different activities for combining knowledge bases .....	73
6.3 <i>Innovation performance</i> .....	79
6.3.1 Measurement of innovation performance .....	79
6.3.2 The rate of innovation .....	80
6.3.3 Difference in approaches towards innovation.....	81
6.3.4 Summary .....	83
Chapter 7.0: Conclusion, Implications and Further Research .....	85
7.1 <i>Conclusion</i> .....	85
7.2 <i>Theoretical contribution and managerial implications</i> .....	85
7.3 <i>Limitations and further research</i> .....	88
List of references.....	90
Appendix.....	99

## **List of figures**

Figure 1: Structure of the thesis .....	11
Figure 2: Impact of human and task integration of performance outcome. Extracted from Birkinshaw et al. (2000).....	15
Figure 3: Conceptual framework .....	28
Figure 4: Screenshot showing an example of the focused coding using NVivo .....	43
Figure 5: Graphical representation of the similar and complementary gains for Delta from the technological acquisition .....	53
Figure 6: Process for combining knowledge bases at Delta .....	73
Figure 7: Summary of the research.....	84

## **List of tables**

Table 1: Overview of the interviews.....	39
Table 2: Display of different factors affecting the unification of the knowledge bases .....	112

# Chapter 1.0: Introduction

## 1.1 Background

Mergers and Acquisition (M&A) are becoming a more popular strategy for multinational corporations (MNCs) (Birkinshaw, Bresman, & Nobel, 2010). One of the main motives for cross-border transactions is the acquisition of innovative capabilities (Bauer, Matzler, & Wolf, 2016). A key reason for acquisitions has often been to gain access to new knowledge and competences to stay competitive. Accordingly, M&A offer firms the opportunity to keep up with globalization in addition to rapidly entering new markets (Hitt, Franklin, & Zhu, 2006), which is especially relevant for international technology companies (Birkinshaw et al., 2010). M&A can be a way to broaden the firm's knowledge base (Björkman, Stahl, & Vaara, 2007). Through an acquisition, the acquiring firm has some either similar or complementary gains. However, how these similar or complementary gains affect M&A outcomes, is hard to find explicitly in the existing literature.

It is argued that to achieve the innovation potential in an acquisition there needs to be a certain level of knowledge transfer. Knowledge transfer can be defined as “a process that covers several stages starting from identifying the knowledge to the process of transferring the knowledge to its final utilization by the receiving unit” (Minbaeva, Pedersen, Björkman, Fey, & Park, 2014, p. 587). However, what many acquiring firms have discovered is that the transfer and the utilization of knowledge through acquisition can be a challenging task. That this process is dependent on a successful integration as the integration process influences the innovation outcome of the acquisition (Cloudt, Hagedoorn, & Van Kranenburg, 2006).

Birkinshaw, Bresman, and Håkanson (2000) developed a model that distinguishes the integration process between task and human. Task integration is defined as the identification and realization of operational synergies while human integration, also often referred to as sociocultural integration in the literature, refers to the activities aimed at socializing and fostering the participation of the employees in the new entity (Birkinshaw et al., 2000). Bauer et al. (2016) concluded that human integration is negatively related to innovation outcome. This is because the tacit knowledge lies within the employees' mind. This is also supported by Sarala, Junni, Cooper, and Tarba (2016) who explained that human integration disrupts organizational structures and culture in a way that well-established routines get destroyed. Thus, it is argued that firms with the intention to innovate should start with task integration to

ensure knowledge transfer and innovation in the acquisition (Bauer et al., 2016). The argument put forward by Bauer et al. (2016) contradicts the findings of Birkinshaw et al. (2000) who stated that a low level of human integration will limit the effectiveness of task integration leading to acquisition failure. If the task integration process is pursued before human integration has begun, there is a high likelihood of acquisition problems, because the individuals on each side do not know each other (Birkinshaw et al., 2000). From this point of view, it seems to be beneficial to give equal importance to both human and task integration. Since most of the empirical research is quantitative and it is difficult to measure human integration as it is a complex and sensitive process, there is limited knowledge about the key success factors in M&A integration (Rottig, Schappert, & Starkman, 2017).

Another key factor, termed absorptive capacity, has been mentioned in the literature in relation to knowledge transfer in M&A context. Björkman et al. (2007) argue that acquisitions having a high level of potential absorptive capacity would have a higher level of realized capability transfer. Absorptive capacity is defined as a firm's capability to value new external information, assimilate and apply the external knowledge to benefit the acquiring firm (Cohen & Levinthal, 1990). Due to different levels of absorptive capacity, firms facing similar competitive landscapes may experience different post-acquisition outcomes. Puranam and Srikanth (2007) argued that in technology acquisitions, acquiring firms can leverage the acquired knowledge when acquirers use the target firm's existing knowledge as an input to their own innovation processes. Therefore, investigating how absorptive capacity impact the M&A deserves further exploration.

Also, when heightening knowledge transfer and innovation performance within the context of M&A, inconclusive results have been observed in the literature. For instance, Colombo and Rabbiosi (2014) found a strong negative direct link between technological similarity and post-acquisition innovation performance whereas Grimpe and Hussinger (2014) acknowledged that acquiring resources that are complementary to the firm, can drive innovation performance. Thus, it is not very clearly stated how much influence the acquired knowledge has on the firm's innovation performance. Majority of the studies regarding measurement of the innovation performance in technological acquisition (TA) are quantitative and therefore very often fails to explain the underlying reasons of the effect.

The above backdrop indicates that there is a need for a better understanding of how exactly a technological acquisition can improve the innovation performance in the merged entity. The next section presents the aim of our thesis and how our work is structured throughout the thesis.

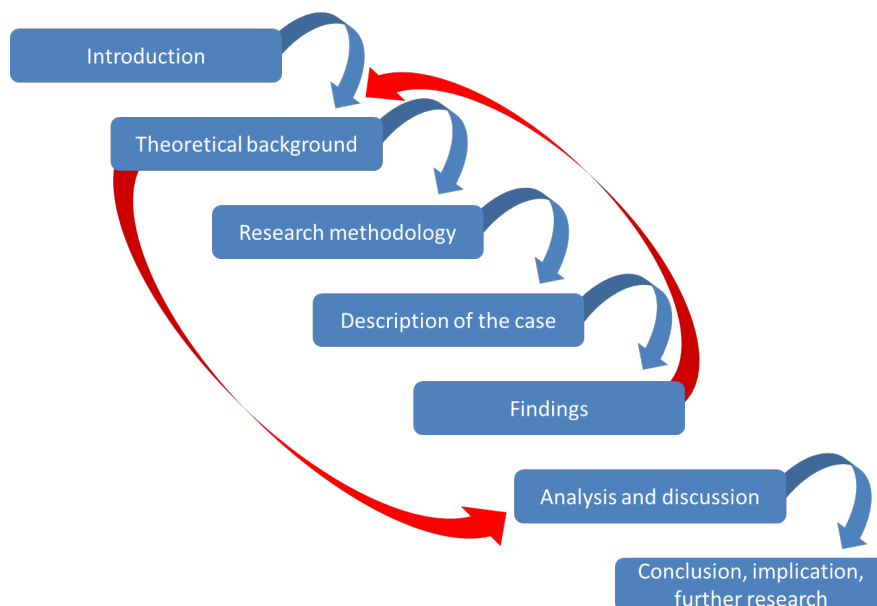
## **1.2 Research objective and question**

The objective of this study is to find out how a technology acquisition, and the transfer of technology and knowledge influences the post-acquisition innovative performance of firms. A cross border acquisition where one multinational corporation (MNC) acquires another MNC operating within the same industry represents our context. Cross border acquisitions and MNCs acquisitions strategies and experiences are highly relevant to the international business (IB) field. When one technological firm acquires another, it gets access to the acquired firm's knowledge base. Although firms involved in technological acquisitions expect to enhance their innovation performance, the existing literature shows that is necessarily not the case in reality. It is not a straight-forward process. The acquired knowledge should act as the source of innovation and create value, which is why transfer of knowledge has been emphasized in the literature (Birkinshaw et al., 2010). In this regard, the distinction between similarity and complementarity by Makri, Hitt, and Lane (2010) between acquiring and acquired firm's products, systems and knowledge need to be considered since we believe this distinction affects the knowledge transfer. Although we have found in the literature that similarities and complementarities have negative and positive effect on innovation performance respectively (Colombo & Rabbiosi, 2014; Grimpe & Hussinger, 2014), it was not specified exactly how the impact occurs. We argue that since innovation is driven by knowledge, it is important to investigate how similarities and complementarities influence knowledge transfer and subsequently impact innovation performance. To exploit the knowledge potential through successful knowledge transfer, some important mechanisms need to be in place (Bresman, Birkinshaw, & Nobel, 1999). There are limited discoveries in the existing literature describing the entire process from knowledge identification to the ultimate goal of knowledge assimilation. We aim to create a more holistic understanding of how similar and complementary gains from acquisition affect the combination of knowledge bases that in turn, influences innovation. Thus, we formulated the following research question to address these gaps:

***“How does a technology acquisition strategy impact innovation performance?”***

### 1.3 Structure of the thesis

To conduct the research and write this thesis, we followed the process as illustrated below in figure 1. We started with an initial background search, followed by an extensive review of relevant literature. Based on that we developed our conceptual model. After that we made decisions regarding the methodology and collected data. After gathering relevant findings, we went back to the literature review to connect our findings with the literature. Based on this, we present our analysis and a discussion where we include our thoughts and arguments. Finally, we draw the conclusion, present theoretical and managerial implications along with the further research scope and mention the limitations of the study.



*Figure 1: Structure of the thesis*

Chapter 1 contains background and context of the thesis. Furthermore, we give justifications for our study, and how it will contribute to gaps in the existing literature. Lastly, the research objective and question are presented. The rest of the thesis is organized in the following way. Chapter 2: A broad literature review followed by creating a theoretical framework. Chapter 3: Research methodology, here we give a justification of all our methodological choices. Chapter 4: A generic description of the acquiring firm referred to as ‘Alpha’ and the acquired firm ‘Beta’. The merged entity will be referred to as ‘Delta’ throughout the thesis. Chapter 5: An objective presentation of our findings. Chapter 6: Analysis and discussion regarding our findings and their fit with existing theory. Chapter 7: Conclusion, implications and limitations of the study.

## **Chapter 2.0: Theoretical Background**

This thesis draws on peer-review articles derived from different fields of IB, where the main fields being M&A, innovation, and knowledge transfer. While the first field represents the core topic in this research, the remaining subfields have been acknowledged as important to include when investigating M&As. In this chapter, we provide an overview of relevant literature within these fields and stress their relevance to our research. To summarize the covered articles that we have applied in our literature review, we have created a literature review matrix, which is attached in appendix 1. The matrix is a visualization of how the articles are related to the different concepts.

### **2.1 Integration process and innovation**

There is a large number of scholarly contributions focusing on the post-acquisition processes in M&A. Integration is defined as the degree of interaction and coordination between the firms involved in the M&A (Larsson & Finkelstein, 1999, p. 6). Despite becoming a more popular strategy in IB, the success rate of acquisitions is low. The low success-rate can be an indication that the post-acquisition integration strategies fail to address the complexities of an integration process (Verbeke, 2010). Extant research has shown that a high degree of integration is required in high-technology M&A to be able to utilize the potential synergy effects sufficiently. However, high levels of integration often entail loss of autonomy, which can be detrimental in terms of post-acquisition performance (Rossi, Yedidia Tarba, & Raviv, 2013). The dilemma of autonomy and synergy utilization in M&As are likely to emerge in high-technology and knowledge-intensive industries since combining knowledge between acquiring and acquired firms often involve obtaining and transferring tacit and socially complex knowledge-based resources (Ranft & Lord, 2002). Puranam and Srikanth (2007) analyzed the way acquirers leverage technology acquisitions and found two ways of exploiting the acquired technology. The first argument put forward is that when acquirers use the acquired firm's existing knowledge as an input to their own innovation processes, primarily they are leveraging what the acquired firm "knows". The second argument is that when acquirers rely on the acquired firm as an independent source of ongoing innovation, primarily they are leveraging what the acquired firm "does". Furthermore, the same authors claim that post-merger integration helps acquirers leverage what the acquired firm "knows" by promoting coordination between acquirer and acquired firm but hinders their ability to leverage what the acquired firm "does"



because of the disruptive effects on the acquired firm caused by a reduction in autonomy (Puranam & Srikanth, 2007, pp. 806-807).

Birkinshaw et al. (2000) developed a model that divides the integration process into task integration and human integration, and their effect on performance outcome. Human integration, which is often referred to as sociocultural integration in the literature (e.g., Sarala et al. (2016)), refers to the activities aimed at socializing and fostering participation among employees in the new shared entity. Birkinshaw et al. (2000) study scrutinized management integration in knowledge intensive acquisitions. Because of the high levels of complexities and special characteristics of M&As in high-technology sectors, the authors noticed that integration of human resources might be more successful when carried out in a slow and cautious manner. The authors defined task integration as the identification and realization of operational synergies. Task integration focuses on resource sharing and transferring of capabilities. This is a model that several other researchers have supported and further developed. Task integration can further be divided into production, marketing and system integration. In their study of European cross-border M&As, Bauer et al. (2016, p. 5) divided production integration into two items (1) production and (2) supply sources. Marketing integration consists of distribution channels, sales/after-sales services and marketing programs. System integration is composed of strategic planning systems, financial and budgeting systems, and management information systems. One of Birkinshaw et al. (2000, p. 419) most important findings was that the relationship between task integration and acquisition success is mediated by the level of human integration already in place. Lower levels of human integration will impede the effectiveness of task integration, and consequently yield acquisition failure. Even though the authors made a conceptual distinction between the two, they are not independent of one other. The order of execution is significant. If firms initiate the task integration process before the human integration has begun, Birkinshaw et al. (2000) argues that acquisition problems are likely to arise because the employees of acquiring and acquired firms do not know each other in the context of differences in firm culture, operational routines etc. Scientists and engineers often possess a high level of tacit knowledge. Therefore, management of such employees requires high levels of trust and confidence.

The complexity of these relationships consequently results in a time-consuming integration process (Birkinshaw et al., 2000). Sarala and Vaara (2010) found that task integration has a positive impact on knowledge sharing. Bauer et al. (2016) supports the distinction between

task and human integration made by Birkinshaw et al. (2000) in the post-acquisition integration phase. They argue that the distinction helps explain why many previous researchers have come to inconclusive findings when studying integration in M&A and innovation. Without the distinction between task and human integration, the complexity of the integration process can become perplexing. Their findings showed that when thought upon as isolated processes, human integration is negatively related to innovation outcome, while task integration is positively related to innovation outcome. Bauer et al. (2016, p. 83) further argue that a certain degree of task integration is necessary for resource- and capability-sharing in order to make use of the proposed synergies in terms of innovation and technology development. Firms with the intention to innovate should therefore start with task integration to ensure knowledge sharing and innovation in the acquisition. It is clear that there are not a right or wrong way to approach the integration process. In M&A every case differs in dimension and context. Thus, the amount of information that needs to be distributed differs in each specific case. However, to successfully communicate throughout the integration process, the information needs to be communicated efficiently, honestly and precisely (Birkinshaw et al., 2000). Regardless of the distinctiveness of acquisitions, Birkinshaw et al. (2000) defined three alternative routes when assessing how to achieve successful acquisitions through (human and task) integration. The alternative routes are presented in figure 2 below. The model is distinct from our conceptual framework as our outcome focuses on innovation performance. However, it visualizes the firm's options of how to approach task and human integration, which is a critical part of our study. We expect that the route chosen by the focal firm will have a significant impact on the process of combining the acquired knowledge which might lead to the innovation outcome. In their discussion Birkinshaw et al. (2000) pointed towards alternative A as the theoretically optimal route. However, risk-averse management ended up choosing alternative C since alternative B proved to be significantly more costly. Alternative C possesses a higher degree of caution and can be effective since the employees on both sides keep some level of autonomy (Birkinshaw et al., 2000).

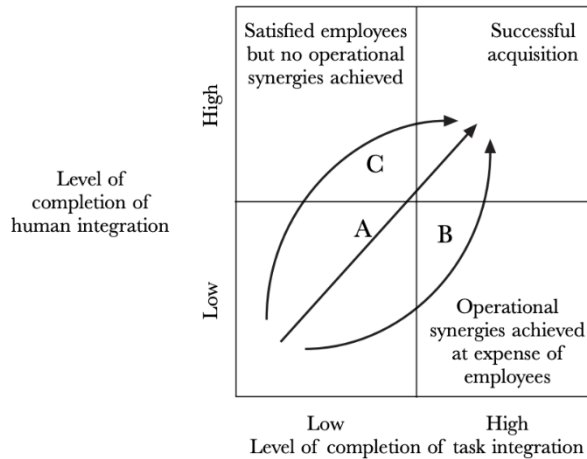


Figure 2: Impact of human and task integration of performance outcome. Extracted from Birkinshaw et al. (2000)

## 2.2 Innovation potential in acquisitions

There can be different motives behind going for M&As. As we are focusing on technology acquisitions in this study, we will first try to define the motives behind TA. It is important to understand the motive behind a TA as it is becoming a frequent phenomenon in high-tech industries, before focusing on the outcome of such acquisitions. According to Ahuja and Katila (2001), acquisitions which provide technological inputs to the acquirer are regarded as technological acquisitions. Existing literature on M&As highlights technological ‘know-how’ and the development of technological capabilities as a critical driver for TAs (Ahuja & Katila, 2001). When firms engage in TAs, it implies that the acquiring firms intend to create innovation by absorbing the knowledge of the acquired firm and gain sustainable competitive advantage (Jo, Park, & Kang, 2016). Accordingly, the need to obtain new technical skills and technological knowledge are drivers behind the acquisitions in high tech industries (Rossi et al., 2013). Cai, Liu, Deng, and Cao (2014) suggested that one of the advantageous strategies for increasing technological knowledge is external technology acquisition which can include purchasing technology/ patents, licensing, and technology-based alliances. New technologies gained from TA can lead to improved profitability of firms if the new technologies are transformed into actual innovations (Meglio, 2009). For instance, the invention process of the firm gets accelerated by external technology acquisition (Wang, Cao, Zhou, & Ning, 2013).

According to Ahuja and Katila (2001), one way of viewing the TA is the absorption and unification of the acquired firm’s knowledge base into the acquiring firm’s knowledge base.

Relatedness between the knowledge bases is a critical dimension when it comes about unifying the two knowledge bases (Ahuja & Katila, 2001). Park and Ghauri (2011) also identified that business relatedness is a significant factor affecting technology acquisition. In the way of organizing research, unrelated technologies often require a radical change which can easily be counterproductive (Cloudt et al., 2006). Ahuja and Katila (2001) found that acquiring firms having moderate levels of relatedness yields better innovation output compared to acquiring firms with high levels of related and unrelated knowledge bases. The authors found a non-linear impact on innovation output in terms of the relatedness of the knowledge bases of acquiring and acquired firms. Innovation output will increase up to some optimum level for having relatedness between knowledge bases and then it will start to decrease as relatedness increases (Ahuja & Katila, 2001; Cloudt et al., 2006). Cassiman, Colombo, Gerrone, and Veugelers (2005) created distinction between technology-relatedness and knowledge-relatedness. Technology which is already operational can be referred as technology-relatedness, and technology which has future development potential due to the prevailing knowledge in both acquiring and target firms, can be referred as knowledge-relatedness (Cassiman et al., 2005). The authors argued that when technologies are similar, it can lead to increased scale and scope in production whereas when the knowledge is similar, the scale and scope in research and development (R&D) is more likely to be triggered. Hagedoorn and Duysters (2002) differentiated between market relatedness and technology-relatedness in M&A. They explained that marketed relatedness improves the innovative potential of M&As performance in terms of economies of scale and scope as firms can expand operation into related activities. However, in case of technologically related M&As, there is a substantial possibility of duplication in the existing technological capabilities and the effect is only marginally significant (Hagedoorn & Duysters, 2002).

When there is similarity between the knowledge of acquiring and the acquired firms, the integration of the knowledge bases is more easily facilitated (Kogut & Zander, 1992). Cloudt et al. (2006) referred technological relatedness to firm-specific aspects such as technological disciplines and engineering capabilities. The authors argued that unrelated technologies can be counterproductive and too similar technological knowledge will contribute little in innovation outcome. Thus, in order to enrich the acquiring firm's knowledge base, there needs to be some degree of differentiation in the technological capabilities and firms should look for moderate relatedness between knowledge bases (Cloudt et al., 2006). Consequently, for unifying the knowledge bases in a high-tech setting, relatedness of the acquired knowledge is an important

factor (Cloudt et al., 2006). However, Cloudt et al. (2006) also indicated that if the knowledge is too similar to the already existing knowledge base, it will only generate additional costs for the firm to obtain and transfer the external knowledge which has no relevant enrichment to the existing knowledge base. In the context of cross border acquisitions, Park (2011) found that foreign firms' possession of relevant knowledge emerges as a strong factor affecting technology acquisition. This finding is in line with Cohen and Levinthal (1990) research that showed that a firm's prior related knowledge aids the organization to recognize the value of new technology, assimilate it and finally internalize it. If the firms are coming from different realms of technology, it can be resource consuming integrating the knowledge bases together (Ahuja & Katila, 2001). In a study of more than 15 industries, involving both domestic and international R&D partners, Cummings and Teng (2003) found that knowledge transfer success is associated with the extent to which the parties share similar knowledge bases.

Cassiman et al. (2005) showed that compared to the acquisitions of technology-related but dissimilar firms, the impact on innovation is much smaller for the acquisition of technologically similar firms. The same authors claimed that knowledge-relatedness would help to extract benefits for further technology development due to prevailing knowledge in both acquiring and acquired firms (Cassiman et al., 2005). Furthermore, if both firms operate in the same market as competitors prior to the acquisition, the technology gain will likely be insignificant. Thus, it will be more pronounced in terms of R&D reduction. Makri et al. (2010) revealed that when acquiring similar knowledge, the similarities are less likely to enrich invention capabilities because in such cases, instead of searching for new solutions, firms look for solutions which are close to the existing solutions. Reus (2012) argued that firms with knowledge bases which are similar but almost overlapping, will be provided with little or no new knowledge. However, the author also acknowledged that combining firms with very distinct knowledge bases is not an easy task as both firms face difficulties to comprehend and value each other's knowledge. Sears and Hoetker (2014) explained that similarities in the knowledge between the acquiring and target firm employees cause overlaps and redundancies which can lead to a more competitive and hostile environment. The authors also mentioned that if a firm acquires similar technological capabilities conflicts might arise, and consequently it can destroy the potential of the acquirer's existing capabilities.

In a similar vein, Cassiman et al. (2005) focused on firms that are active in complementary technological fields and found that acquisitions of technologically complementary entities lead

to increased R&D efficiency. The authors argued that firms that are active in complementary technological fields, when merged, can realize synergies and economies of scope in their R&D process. It was suggested that merging two technologically substitutive firms can reduce their R&D and thus rival firms gain very little from their merger (Cassiman et al., 2005). The terms similarity and complementarity have been used interchangeably in the literature for defining relatedness. However, in the context of TAs, Makri et al. (2010) has offered a distinction between technology similarity and complementarity.

Technology similarity between firms is defined as the degree to which firms focus on the same narrowly specified areas of knowledge for solving their technological problems (Makri et al., 2010). On the other hand, technological complementarity between firms is defined as the degree to which firms focus on different narrowly specified areas of knowledge that are within the broad area of knowledge shared by the firms (Makri et al., 2010). Similarly, Colombo and Rabbiosi (2014) argued that when acquiring and acquired firm's R&D operate in the same narrowly defined technological fields, they would exhibit a high degree of technological similarity. The degree of technological similarity is low when firms specialize in different, narrowly defined technological fields while operating in the same broadly defined area of R&D activities (Colombo & Rabbiosi, 2014).

Reus (2012) suggested that knowledge bases are considered complementary when the combining firms give distinct capabilities in similar fields of business. Externally acquired knowledge will be easily comprehensible and new when it is complementary to the existing knowledge (Reus, 2012). Accordingly, when embarking on a TA, firms should search for, identify, and acquire business that have scientific and technological knowledge that is complementary to their own. Findings of Makri et al. (2010) indicated that complementary scientific knowledge and complementary technological knowledge both contribute to post-acquisition performance by stimulating higher quality and more novel inventions. The authors emphasized that firms operating in the high-tech industry should acquire complementary knowledge for better invention productivity. Transferring the acquired knowledge to parent firms is important because such transfers are a major motivation for the international sourcing of knowledge as they help to augment parent firms' technological assets (Shang & Poon, 2013).

Hence, to achieve the innovation potential in an acquisition there needs to be a certain level of knowledge transfer. The importance of knowledge and knowledge management has been highlighted by scholars and managers during the past decades as the view of the most critical

resource for creating sustainable competitive advantage has changed from *capital* to *knowledge* (Bresman et al., 1999). Next section will further elaborate on this matter.

### **2.3 Knowledge transfer**

Different scholars (e.g., Birkinshaw et al. (2000); Bresman et al. (1999)) have highlighted the perspective of knowledge in M&A performance. Just as for technology, one of the key reasons for acquisitions has often been to gain access to new knowledge to stay competitive. Grant (1996) argues that knowledge is the most strategically important resource available to the firm. Nonaka and Takeuchi (1995) even argue that the one sure source of lasting competitive advantage is knowledge. In the knowledge literature several major contributors divided knowledge into two components (1) explicit and (2) tacit. Haasis, Liefner, and Garg (2018) defines explicit knowledge as formalized and codified knowledge (i.e., the exchange of data, technical specifications, manuals, universal principles, patents, and engineering drawings). Tacit knowledge, on the other hand, refers to experienced-based knowledge (know-how) and includes a technical and mental component (e.g., sales skills, taste in design, creativity) (Haasis et al., 2018). Kogut and Zander (1992) incorporated both tacit “know-how” and (explicit) information or “know-what” into their definition of knowledge. The authors defined “know-how” as “the accumulated practical skill or expertise that allows one to do something smoothly and efficiently”, while referring to the more articulable dimension of knowledge when talking about “know-what”. Nonaka and Takeuchi (1995) made the same distinction between explicit and tacit knowledge. For a firm to be able to improve, adapt and succeed in rapid changing environments, the authors stated that firms need to incorporate a more holistic approach to knowledge. The authors pointed towards the success of the Japanese approach of knowledge creation, where tapping the tacit insights of individuals and making these subjective insights available, and further embedded into the entire organization, is the centerpiece of success. For the purpose of this study, we find the definition presented by Grant (1996, p. 111) of this distinction very clarifying, saying that “tacit knowledge is revealed through its application, while explicit knowledge is revealed by its communication”.

In the literature the terms ‘knowledge transfer’ and ‘knowledge sharing’ have been used interchangeably by researchers (Kumar & Ganesh, 2009). However, knowledge sharing is actually a subset of knowledge transfer (Tangaraja, Mohd Rasdi, Abu Samah, & Ismail, 2016). According to Schwartz (2006) knowledge sharing knowledge sharing is an exchange of knowledge between two individuals: one who communicates it, and one who assimilates it. On

the other hand, knowledge transfer also includes elements of cognitive understanding and the ability to apply or actually apply the knowledge.

Wang, Tong, and Koh (2004) made a distinction between managerial knowledge (e.g., management skills, marketing/sales skills, human resource management, corporate culture and value etc.) and technological knowledge (e.g., manufacturing knowledge, R&D skills and product knowledge). Danis and Shipilov (2012) used a broader description while discussing managerial and technological knowledge. In their definition managerial knowledge refers to how activities of managers are organized and coordinated. Manifestations of such knowledge would include managerial tools and philosophies, administrative routines, organizational systems, and standard operating procedures. Technical knowledge involves information, processes, and/or tools used in the development, production, and delivery of a product or service (Danis & Shipilov, 2012, p. 329). Thus, technological knowledge is less subject to the influence of cultural and environmental variations. Management knowledge, on the other hand, is more culture-bound and often highly context specific. Therefore, technological knowledge needs lower levels of adaptation in the pre-acquisitions phase. Consequently, technological knowledge can be applied instantly after the acquisition (Wang et al., 2004).

Despite the above attempt to clarify what knowledge is, the nature of knowledge can best be described as an intangible asset to the firm. Therefore, it is often quite hard to measure knowledge, or transfer of knowledge, directly (Calipha, Brock, Rosenfeld, & Dvir, 2018). Still there are several measures used in the literature for measurement of intangible assets, but also for the more quantifiable (explicit) aspect of knowledge. For intangible assets, the most frequently used method is to calculate the ratio between the firm's market value to the cost of replacing its assets. This ratio is called the Tobin's q (Calipha et al., 2018). Measuring explicit knowledge, which is more quantifiable in nature, is considered easier. Measures of explicit knowledge can be technological knowledge-based resources such as total costs of R&D, number of patents, new products brought to market, change in number of total/R&D employees and implicit knowledge, such as human capital (Calipha et al., 2018). Human capital itself can be measured based on for example level of education, prior work experience and/or the overall competence level of the firm's employees (Carmeli & Tishler, 2004).

Nonaka and Takeuchi (1995) highlighted the increased speed and level of industry competition as the main reason for why firms should focus on knowledge management. Their view is supported by Bresman et al. (1999) saying that since the speed of competition is so high,



managers might feel the need to acquire new knowledge bases, due to the excessively time-consuming option of organic growth. Findings by Bartlett and Ghoshal (1989) indicated that one of the competitive advantages of multinational corporations (MNC's) compared to for example domestic small and medium-sized enterprises (SME's), is their ability to create and transfer knowledge internally. The MNC's internal organization can be described as a "differentiated network", where knowledge is created in one part of the organization – and then transferred and exploited in one or several other interrelated units (Minbaeva et al., 2014). In other words, the competitive advantage that MNCs enjoy is contingent upon their ability to facilitate and manage inter subsidiary transfer of knowledge (Minbaeva et al., 2014, p. 587).

Regarding the necessary activity of knowledge transfer in M&As, it can be described as a process of systematically organized exchange of information and skills between entities (Wang et al., 2004, p. 173). Minbaeva et al. (2014, p. 587) defines knowledge transfer as "a process that covers several stages starting from identifying the knowledge to the process of transferring the knowledge to its final utilization by the receiving unit". As indicated by the definition the process of knowledge transfer includes both the actual flow of new knowledge, and the implementation and embedding of the acquired knowledge into the new combined organization. Zhou, Fey, and Yildiz (2020, p. 3) similarly divided the stages of knowledge transfer into the inflow stage and the implementation stage. Knowledge inflow refers to the initiation of receiving knowledge, which includes both explicit and tacit knowledge, via formal and informal mechanisms of learning, while knowledge implementation refers to the effective application of the acquired knowledge. In line with previous research (e.g., Kogut and Zander (1992) and Wang et al. (2004)) we define the success of knowledge transfer as the accumulation and assimilation of new knowledge in the new combined entity.

Several studies have been conducted to scrutinize which factors hinders or facilitates knowledge transfer. Bartlett and Ghoshal (1989) highlighted the importance of communication between different units as the main factor to facilitate knowledge transfer within MNCs. Bresman et al. (1999, p. 439) also studied factors facilitating knowledge transfer. Their results indicated a significant correlation between communication, visits and rapid meetings with higher levels of knowledge transfer. Other factors, such as capability to articulate knowledge and time elapsed since the actual acquisition, varied according to the type of knowledge (tacit/explicit) being transferred. Explicit knowledge (e.g., patents) are often transferred in the

early stages in post-acquisition, while more sophisticated and tacit knowledge do not transfer until the integration process has proceeded into more advanced stages (Bresman et al., 1999).

The context and mode of governance is also of importance while studying facilitators of knowledge transfer. Bresman et al. (1999) briefly discussed different modes of governance related to knowledge transfer (i.e., within the firm, in alliances or Joint Ventures, between independent firms and in acquisitions). Their most important finding was that knowledge transfer in acquisitions represented a distinctively different situation compared to the other modes of governance. While some of the facilitators, such as communication and ability to articulate knowledge are likely to be found in all modes of governance, the authors found that their relative importance and the post-acquisition process itself was expected to be carried out in distinctively different ways as the integration process runs its course. The main reason for this is that in acquisitions the mode of governance is radically changed - from what is typically labeled 'market transactions' to 'internalization of process' in the transaction cost theory (Bresman et al., 1999). The radical change of governance mode in acquisitions is of particular interest for our study, since we are examining the outcome of one of the largest acquisitions in recent time in Northern Europe.

According to Haasis et al. (2018) acquiring firms often act as knowledge disseminators, while acquired firms adopt the role of knowledge absorbers. However, when both firms have high levels of technological expertise in similar areas, knowledge transfer to some degree occurred in a bi-directional way also in earlier stages. It will be interesting to see if our findings will give further validation to these researchers' findings, based on the understanding we possess that there are some areas of similarity between acquiring and acquired firm's technology and knowledge bases.

Lane and Lubatkin (1998) linked firm's cultural relatedness to absorptive capacity and knowledge transfer by saying that the successfulness of transfer will be dependent on both the source and the recipient firm's similarity and differences in terms of knowledge bases, organizational structures, organizational culture and compensation practices.

It is clear that knowledge transfer is imperative for the performance outcome in international acquisitions. However, transfer of knowledge across organizational boundaries is not an easy task due to its tacit and socially complex nature (Zhou et al., 2020). The research question raised by Calipha et al. (2018) describes the complexity of knowledge transfer in acquisitions:

“Why does knowledge not contribute to a firm’s value in an acquisition, while it does on the individual firm?”. Previous research has shown that the outcome of knowledge transfer between acquiring and acquired firms is contingent on the degree of knowledge overlap in knowledge bases and the extent of effort made by the employees of both sides to let the combined knowledge flow (Zhou et al., 2020). However, the transmission of new knowledge creates no value if this new knowledge is not used by the recipient. Minbaeva et al. (2014) stated that the key element in knowledge transfer is not the knowledge itself, but the relevance of the new knowledge, combined with the degree the recipient can utilize the new, relevant knowledge. This is what Cooley (1987) referred to as tangibility of knowledge. It is only when new information is used by individuals or organizations it becomes knowledge (Trott, 2008). In this regard, absorptive capacity is one of the most important determinants of knowledge and innovation processes because it defines the level to which the firm can obtain external knowledge from its environment (Volberda, Nicolai, & Marjorie, 2010).

In the literature, the work of Cohen and Levinthal (1990) has been widely accepted as the foundation for absorptive capacity as a concept. In the same study the authors argued that external sources of knowledge are often considered critical to a firm’s innovation processes. Absorptive capacity derives from the dynamic capability view of the firm and has been used by researchers in the past to explain several organizational phenomena in the fields of strategic management, technology management, international business, in the field of acquisitions among others (Zahra & George, 2002). In this context we define absorptive capacity in line with Cohen and Levinthal (1990, p. 128) definition which states that a firm’s capability to value new external information, assimilate and apply it to commercial ends is critical to the firm’s innovative capabilities.

Zahra and George (2002) made a distinction between potential and realized absorptive capacity in acquisitions. The first of the two subsets, potential absorptive capacity, includes knowledge acquisition (identification of relevant external knowledge) and assimilation (analyzing and understanding) capabilities, while knowledge transformation (internalization and conversion) and exploitation (implementation, use and incorporating acquired and transformed knowledge into the firm’s actual operations) of new knowledge is viewed as realized absorptive capacity. The two subsets have separate but complementary roles. However, the two subsets are coexistent and together fulfill a necessary but insufficient requirement to improve the firm’s performance (Zahra & George, 2002). Prior research conducted by Cohen and Levinthal (1990)

has shown a significant relationship between firms' absorptive capacity and innovation outcome. This outcome mainly reflects the firm's realized capacity. New products, processes, organizational forms, and knowledge are all dependent on firm's systematic exploitation routines. Variations in the firm's capability to transform and exploit their knowledge base is one of several plausible explanations to why similar firms, in similar industries, vary in their ability to create value (Zahra & George, 2002). Therefore, it is important for managers to understand that a firm's ability to assimilate and integrate knowledge varies based on several dimensions including characteristics of the acquired knowledge, combinative capabilities, knowledge sharing/learning and technological overlaps. Realization is dependent on the firm's ability to apply new knowledge, which again is based on the amount of relevant knowledge available and appropriability (Cohen & Levinthal, 1990; Deng, 2010).

It is imperative that firms are able to utilize the knowledge which they gather through an acquisition strategy. However, not all firms are able to use the acquired knowledge or technology in the fullest sense. In other words, these firms lack the capability to embrace some degree of the available knowledge. According to Cohen and Levinthal (1990, p. 128), a firm's ability to evaluate and utilize external knowledge is largely a function of prior related knowledge. Thus, the accumulation of past experiences facilitates a higher degree of absorptive capacity. Therefore, firms striving to develop effective absorptive capacity needs to expose their employees to relevant knowledge prior to the exposure of new knowledge. Employees with similar backgrounds, training and scientific knowledge are more likely to transfer, embed and learn from each other (Lane & Lubatkin, 1998; Volberda et al., 2010).

Furthermore, Björkman et al. (2007, p. 667) argue that acquisitions having high levels of potential absorptive capacity would be associated with higher levels of capability transfer between the acquiring and acquired firm. Thus, prior to the acquisition, the acquiring firm should analyze and evaluate their own capabilities in order to get an understanding about to what degree they can utilize from the actual acquisition. Based on this evaluation firms can take necessary actions to improve their absorptive capacity if needed.

In the acquisition literature there are numerous examples of firm's acquiring for example new technology to complement their present portfolio. However, the effectiveness of such options has been proven limited primarily because of highly firm-specific knowledge related products and processes (Cohen & Levinthal, 1990). Firm specific differences in absorptive capacity may experience vastly different post-acquisition outcomes, even while facing the exact same

competitive landscape (Deng, 2010). In the same study the researcher discovered that firms possessing high degrees of absorptive capacity were able to utilize and harness new knowledge to improve innovative activities. However, firms lacking these capabilities can acquire relevant knowledge, but end up failing to transfer and embed the new knowledge in the post-acquisition phase (Deng, 2010). This is in line with Zahra and George (2002) findings, which implies that firms may acquire knowledge but not have internal capabilities to utilize and transform the acquired knowledge to profit the new organization. The same firms are often not able to change internal structures and/or practices that are necessary to succeed in new markets (Deng, 2010). Similar to this is the concept of dynamic capabilities. Eisenhardt and Martin (2000, p. 1107) define dynamic capabilities as the firm's processes to integrate, reconfigure, gain, and release resources, to match and even create market change. Dynamic capabilities are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die.

## **2.4 Innovation performance**

Gaining new technologies and capabilities through the strategic use of acquisitions is an important feature of M&As. In all sectors, especially for technology driven sectors, the need to access the knowledge and technology expertise drives the decision of M&As (Rossi et al., 2013). In their literature review of M&As in the high-tech industry, Rossi et al. (2013) found that the largest number of scholarly contributions emphasized the integration process for successful knowledge transfer. Key motivation behind technological M&As is to acquire new knowledge and to create new innovation (Han, Jo, & Kang, 2018). Now the question remains whether the transferred knowledge impacts the innovation performance of the acquiring firm.

Meglio (2009, p. 104) defined innovation performance as the long-term gains resulting from technology-driven M&As through inventing new product and process related technologies. This definition captures all the aspects of different stages starting from R&D expenditure to new product launches and patenting (Meglio, 2009). A great variety can be observed in the literature for measuring innovation performance of M&As (Ahuja & Katila, 2001; Cassiman et al., 2005; Cloudt et al., 2006; Hagedoorn & Duysters, 2002; Hitt, Hoskisson, Ireland, & Harrison, 1991; Puranam & Srikanth, 2007). Several previous studies on TAs measured the innovation performance using patent counts (Han et al., 2018). This is based on the argument that patents can objectively reflect the technical capability of a firm and differences in the R&D output of firms in the same industry (Ma & Liu, 2017). Das and Kapil (2012) have observed

that depending on the individual study objectives, researchers have constructed performance measures. The authors argue that as there is a variety of M&A motives, therefore it is essential to find linkage between the different measures and acquisition motives while conducting a performance measurement study (Das & Kapil, 2012).

Relationship between M&A and innovation input, innovation processes, and innovation output are explored in previous studies. For instance, it is found that firms intend to foster innovation and improve their innovation output as acquisitions allow access to external knowledge bases and resources (Bauer et al., 2016). By using the superior innovation capability of one of the merged firms, innovation capability can be enhanced in horizontal acquisitions to enhance product features or to improve organizational effectiveness (Capron, 1999). Through the invention of new product and process related technologies by the combined firms, TAs can contribute to improved technological performance (Hagedoorn & Duysters, 2002). Despite this acknowledgement, (Bauer et al., 2016) indicated that the link between R&D & M&A is not well researched.

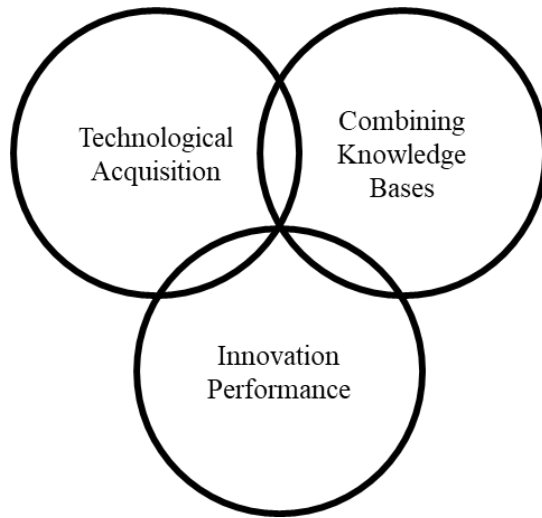
There are studies that found negative or no effect on firms' innovation performance which might happen from acquiring knowledge and technologies. Analysing post acquisition performance, particularly innovative performance, Hitt et al. (1991) concluded that acquisitions had a double negative effect, on "R&D intensity" and on "patent intensity". Within TAs, Ahuja and Katila (2001) found that the relatedness of acquired and acquiring knowledge bases has a nonlinear impact on innovation output. Analysing the consequences of the acquisition of biotech companies by pharmaceutical companies for knowledge transfer, Schweizer (2005) concluded that there is no systematic biotechnological know-how transfer from the biotech to the pharmaceutical firm after the acquisition. Clodt et al. (2006) analysed post-M&A innovative performance of firms operating in four high-tech sectors and concluded that the relatedness between the acquired and acquiring firms' knowledge bases has a curvilinear effect on the acquiring firm's innovative performance. Colombo and Rabbiosi (2014) found a strong negative direct link between technological similarity and post-acquisition innovation performance.

However, there are studies which tried to explain how firms can benefit from M&A in terms of knowledge and innovation. Grimpe and Hussinger (2014) acknowledged that acquiring resources that are complementary to the firm, can drive the innovation performance. Han et al. (2018) indicated that while acquiring high-quality knowledge, the overlap in the acquired

knowledge has a higher degree of positive effect on subsequent innovation, compared to the non-overlapped knowledge. This is possible when the knowledge bases of the acquirer and target firms are complementary. For creating new knowledge or new applications and subsequent innovation, firms may combine differentiated yet complementary external knowledge with existing knowledge of the firm (Jiang, Jiao, Lin, & Xia, 2019). Though a significant amount of M&As in the high-tech industry are driven to gain technological knowledge, a major challenge lies in absorbing and transferring the acquired knowledge (Aminova, 2016).

Although there are many publications that provide valuable insights about TAs, empirical studies conducted have generated varied results and thus are difficult to generalize (Bauer et al., 2016). Especially from high-tech industries, where empirical evidence is limited about how the TA influences the innovation performance demands to be explored. Although Bauer et al. (2016) pointed out integration approaches as a possible explanation to the diverging results in the literature, there might be other critical success factors that play a crucial role for achieving improved innovation performance in TAs.

Based on the comprehensive literature review presented above, we created our own conceptual framework that will act as the foundation throughout this thesis. The framework consists of three interconnected elements derived from previous literature. We want to analyse how the different elements affect or impact the subsequent element. The first element in the framework is technology acquisition. Incorporated in this element we find the concepts innovation potential (from section 2.2) and to some degree integration (section 2.1). In the second element, combination of knowledge bases, the actual exchange of information, and consequently the incorporation of knowledge (knowledge transfer from section 2.3) takes place. Finally, we analyse how the utilization of the combined knowledge bases affects the firm's innovation performance (section 2.4). The research question in 1.2 is a reflection of our conceptual framework. Figure 3 presented in the next page, illustrates our conceptual framework.



*Figure 3: Conceptual framework*



## **Chapter 3.0: Research Methodology**

This chapter provides an overview of the applied research techniques and procedures for collecting and analysing data in this thesis. Since there has been limited qualitative research and the fact that most of these studies are empirical, we have found that employing a qualitative study is suitable. In this chapter, we will start by discussing the chosen research design and method. After that, the data collection process will be described and discussed. Finally, we will provide a discussion regarding the validity and reliability of the study.

### **3.1 Research design**

Fundamentally, research is conducted to enhance our existing knowledge about aspects of the world that we possess zero or very little information, and to enable a better understanding about the world we live in (Adams, Khan, & Raeside, 2013). The research design sets the overall plan to relate the conceptual research problem with the existing and relevant empirical research (Ghauri & Grønhaug, 2005, p. 56). All empirical studies have a research design, either implicit or explicit. Yin (2018, p. 63) defined research design as the linkage between the collected data and the research question(s) which will lead to the conclusions being drawn. There are a number of different types of research studies that are aimed at achieving different knowledge outcomes (Adams et al., 2013). Based on the research problem structure, Ghauri and Grønhaug (2005, p. 58) suggested three main classes of research design. These are: exploratory, descriptive and causal research.

When the research problem under scrutiny is only partly or less understood, exploratory research is deemed suitable. Saunders, Lewis, and Thornhill (2019, p. 186) termed exploratory studies as a valuable means for asking open questions in order to gain insights about a topic of interest and discover what is happening. Exploratory research has a flexible approach that while working with the collected data, the researcher may change direction as new pieces of information become available. The process in exploratory research can be summarized as follows: observe, collect data and construct explanations, which is in other words theorizing (Ghauri & Grønhaug, 2005, p. 58).

In order to get an exact profile of events, persons or situations, descriptive research is deemed suitable (Saunders et al., 2019). When the research problem is structured and well understood, researchers use descriptive research design (Ghauri & Grønhaug, 2005). Structure, precise

rules and procedures are the main characteristics of descriptive research (Ghauri & Grønhaug, 2005). Researchers should maintain and follow these characteristics throughout the entire course of the research. It is essential to have a clear picture of the phenomenon of interest on which the data will be collected before conducting the actual data collection (Saunders et al., 2019). According to Saunders et al. (2019), descriptive research can be an extended piece of exploratory research or the background for causal research.

Causal research, also termed explanatory research, attempts to establish causal relationships between variables (Saunders et al., 2019). Then the problem(s) under scrutiny is also structured in causal research (Ghauri & Grønhaug, 2005). Additionally, compared to descriptive research, the researchers also encounter ‘cause-and-effect’ problems (Ghauri & Grønhaug, 2005). The key tasks in such research are to study a situation or a problem, isolate the cause(s), and explain the relationships between variables linking the cause(s) and effect(s) (Ghauri & Grønhaug, 2005; Saunders et al., 2019).

We have opted for an exploratory research approach for our study. In exploratory research, the research problem or phenomenon most likely starts with ‘What’ or ‘How’ (Saunders et al., 2019, p. 186). This is consistent with the research question of our thesis. Exploratory research can be conducted in a number of ways: by conducting in-depth individual interviews or focus group interviews, searching for the relevant literature, interviewing ‘experts’ in the subject of interest etc. (Saunders et al., 2019, p. 187). For our research, we initially searched through literature. Based on the literature review we followingly developed an interview-guide. Based on the interview-guide we conducted in-depth (semi-structured) interviews with employees belonging to both sides of the involved firms, where the direction of each interview was partly guided by the respondents.

For conducting research, researchers need to decide on the process of theory building. Depending on the choice of research design, researchers can opt for different approaches. In this regard, there are three choices: ‘inductive approach’ which involves theory generation and building, ‘deductive approach’ which involves theory falsification and verification, and ‘abductive approach’ which is a mix of the two previous approaches, providing the possibility of going back and forth between the inductive and deductive approach (Saunders et al., 2019). Selection of the research approach for our study is explained in the following section.

## 3.2 Research approach

For theory development, researchers can adopt three main approaches: deduction, induction and abduction (Ghauri & Grønhaug, 2005; Saunders et al., 2019). When the conclusion of a research is derived logically from a set of theory-derived premises, and if all the premises are true, the conclusion becomes true, then deductive reasoning transpires (Ketokivi & Mantere, 2010). In the deduction approach, researchers hypothesize relationship(s) among variables based on existing knowledge, and further gather facets to confirm or disprove the relationship(s) (Ghauri & Grønhaug, 2005, p. 16). On the other hand, inductive reasoning happens when there is a gap in the logic argument between the conclusion and the premises observed, and the conclusion being considered to be supported by the observations made (Ketokivi & Mantere, 2010). Ghauri and Grønhaug (2005, p. 16) referred to induction as the process of observing facts, in order to produce a theory. General conclusions are drawn from the empirical observations through induction approach (Ghauri & Grønhaug, 2005, p. 15). In the abduction approach, researchers use data for exploring a phenomenon, identifying themes and explaining patterns which lead to new or modified theory generation. This theory is then tested again, often through additional data collection (Saunders et al., 2019).

In our research, we started inductively by exploring the existing literature and found a few relevant themes. These themes worked as the foundation when we developed our conceptual model. We wanted to investigate the conceptual model based on data that we collected through semi-structured interviews. In other words, switching to use a deductive approach. In the semi-structured interviews that we have conducted, we have applied theoretically deduced themes in a consistent way. We chose to do it this way so that we can review the applicability of the emerging model in the context of these interview settings (Saunders et al., 2019).

## 3.3 Research method

When conducting research, one of the first things to determine is what type of method is best suited for the research. A research method is defined as a way of conducting and implementing research (Adams et al., 2013, p. 5). Ghauri and Grønhaug (2005, p. 109) provided an elaborated definition saying that *research methods refer to the systematic, focused, and orderly collection of data for the purpose of obtaining information from them, to solve/answer a particular research problem or question*. A researcher can choose from two principal research methods which are qualitative and quantitative research methods. As there is a significant difference

between the two, and the choice of method depends heavily on the type of research being done, it should be chosen very carefully (Walle, 2014, p. 43).

The methods are different in their data collection techniques (Ghauri & Grønhaug, 2005, p. 109). Contrary to qualitative research, quantitative research is statistical in nature and applies numerical data. Qualitative research is much more subjective compared to quantitative research, making room for interpretations, personal judgments, and evaluations by the researchers (Walle, 2014). In our research, we wanted to explore the perceptions, thoughts and opinions of the respondents regarding the topics of interest. Based on this, we have found the qualitative research method as the most suitable method for our thesis. Additionally, qualitative methods are generally accepted to be most useful for exploratory research (Ghauri & Grønhaug, 2005, p. 111).

Once we have decided on conducting qualitative research, the next step is to select an appropriate research strategy. The different choices a researcher can choose will be discussed in the following sub-section.

### **3.3.1 Choice of research method**

According to Yin (2018, p. 43), choice of research method is dependent on three conditions: (a) the form of research question posed, (b) the control a researcher has over actual behavioural events, and (c) the degree of focus on contemporary events. The three conditions create further distinctions among five different research methods: experiments, surveys, archival analysis, histories, and case studies (Yin, 2018, p. 43). While there is no definite conclusion about which method is superior, the choice depends largely on the research approach and objectives (Saunders et al., 2019).

We have selected case study as the research method for this study. Our choice is supported by the conditions set for selecting case study research by Yin (2018). Yin (2018) explained that when the research question focuses on ‘how’ or ‘why’ and the phenomenon/event to be examined is contemporary but cannot be manipulated, it is likely to favour the use of case study. As we are concentrating on *how* a firm’s innovation performance is impacted by the technology acquisitions, focusing on contemporary events and no control is required over the behavioural event, a case study is the optimal choice. Eisenhardt and Yin are two of the most

popular methodological authorities related to case studies in management (Cassell, Cunliffe, & Grandy, 2017a, p. 345).

There are three types of case studies which are used for different research purposes: (a) explanatory case studies, (b) descriptive case studies, and (c) exploratory case studies (Yin, 2018). Descriptive case studies are used to present a rarely encountered situation or one not normally accessible to researchers. The purpose of an explanatory case study is to explain how or why some conditions occurred or did not occur. Furthermore, the purpose of an exploratory case study is to identify the research questions or procedures to be used in a subsequent research study - which might or might not be a case study (Yin, 2018). Given the novelty and characteristics of the phenomenon that we were going to investigate, we opted for an explorative case study approach.

Furthermore, a case study can include both single- and multiple-cases (Yin, 2018). Within each of these two types of case studies, there can be multiple or unitary units of analysis. Unitary unit of analysis is also termed as holistic, while multiple units of analysis is termed as embedded analysis. When there is only one unit of analysis involved, it is referred to as holistic analysis. And when multiple subunits of analysis are incorporated, a more complex case study design emerges which is labelled embedded analysis. Thus, for case studies there are four types of designs which are: single case - holistic designs, single case - embedded design, multiple case - holistic designs, and multiple case - embedded design Yin (2018).

By reviewing the existing literature, we have found a clear set of circumstances and themes based on which we have devised our research question. For determining if the propositions are correct or if some other set of explanations might be more relevant, single case studies can be used (Yin, 2018). Also, by confirming, challenging, or extending the theory, single case can contribute significantly in knowledge and theory building (Yin, 2018). In exploratory research of a new phenomenon, a research design involving a single unit of observation (e.g., individual, firm, country) at one point in time can be useful (Ghauri & Grønhaug, 2005, p. 71). Therefore, we opted for a single case study method for our exploratory research. As our study does not involve several subunits of analysis and we will only be focused on a single unit, a holistic analysis within single-case study design has been selected.

### 3.3.2 Case selection

In order to select cases for in-depth case study analysis, fundamentally, researchers can choose between random or purposive modes of sampling. However, when the number of cases to be selected is small, it is not viable to opt for random sampling (Seawright & Gerring, 2008). Randomized case selection procedure creates a sample which might be considerably unrepresentative of the total population. In this regard, purposive case selection is a stronger choice as it enables the researchers to select appropriate cases for the given study (Seawright & Gerring, 2008). According to Miles and Huberman (1994), rather than being random, samples in qualitative studies tend to be purposive. However, Yin (2018) suggested to avoid referring to any sort of sampling, either purposive or otherwise. Instead, a case should be seen as an opportunity to shed empirical light about any theoretical principle or concept, rather than thinking of it as a sample (Yin, 2018).

Therefore, we have adopted a set of criteria proposed by Miles and Huberman (1994) where the authors suggested that sampling strategies in a qualitative research can be evaluated in terms of six different attributes:

- The sampling strategy needs to be relevant to the conceptual framework and the research questions.
- The sample needs to generate rich information on the phenomenon of interest.
- The sample needs to produce descriptions and explanations that are believable and true to real life.
- The sampling plan needs to be feasible in terms of time, money, access to people and the working style of the researchers.

Keeping these six attributes in mind, we have selected the specific case of the multinational corporation ‘Alpha’ acquiring another multinational corporation ‘Beta’, for our case study research. We choose to refer to the newly formed organization as Delta, which is a large organization with various departments that are directly involved and have been impacted by the technological acquisition which is our phenomenon of interest. Hence, this case is very well suited to provide several different perspectives on how the innovation performance has been impacted by a technological acquisition. The questions in the interview guide were designed to acquire information that is relevant to our study, and hence, it was possible to deduce the impact we are assessing from that information.

Owing to the qualitative nature of the sample, the findings can only be generalized from an analytical perspective, rather than a statistical one. Some of the findings may be applicable to other similar organizations, but still cannot pose as absolute deductions. Analytic generalization is referred to as *the logic whereby case study findings can apply to situations beyond the original case study, based on the relevance of similar theoretical concepts or principles*. Whereas statistical generalization is referred to as *the logic whereby the findings from a sample are claimed to apply to its universe, usually involving some statistical inference which is not usually relevant for generalizing* (Yin, 2018, pp. 286-288). Since the process of research included gathering information directly from current employees, the explanations we received are considered to have high credibility. To ensure that we get perspectives from both sides in the acquisition, we have respondents from both acquiring and acquired firms.

Based on the fact that there are no relationships or personal interest involved between the researchers and the organization, the biases were minimized in the sample selection. Information collected from the organization was consensual and the respondents have been informed of how, and for what purpose, the information would be used. The researchers had sufficient time and resources to work with the sample since the employees of the focal organization readily agreed to provide information. The process did not require additional funding and hence, was quite feasible for the researchers.

The selected case was a notable technological acquisition in Northern Europe in 2018. Prior to the acquisition Alpha and Beta were competitors in several segments of the same industry. However, both firms also had complementary and unique offerings. In the time leading up to the acquisition Beta was not performing well financially and was looking for buyers to acquire their business. To further strengthen their position, Alpha signed an agreement for acquiring Beta. Before the acquisition, Alpha had operations in 25 countries. The purchase gave Alpha access to Beta's wide range of products, systems, knowledge, technology and competence. After the unification of Alpha and Beta, Delta got approximately 4000 additional employees and are represented in 34 countries world-wide.

### **3.4 Data collection**

In this section, we will describe the data collection process. There are two types of data sources: primary and secondary. The general distinction between these two types of data is that primary data are original data collected by the researcher to solve the problem at hand, whereas

secondary data are collected by others for their own purposes (Ghauri & Grønhaug, 2005, p. 91). Once the research method has been selected, the researchers now need to decide which data collection method to use. Yin (2018) mentioned six different sources for collecting data in case studies: documents, archival records, interviews, direct observations, participant observation, and physical artifacts (Yin, 2018). We have opted to conduct interviews to collect primary data in our study. This is in line with Yin (2018) suggestion that for collecting case study evidence, interview is one of the most important sources.

### **3.4.1 Primary data collection: Interviews**

Brinkmann and Kvale (2015, p. 3) defined qualitative research interviews as an attempt of understanding the world from the subjects' point of view in order to create meaning of their experiences. The research interview is a real interaction between two or more people, during which the researcher and the respondents talk about a theme of mutual interest (Brinkmann & Kvale, 2015; Ghauri & Grønhaug, 2005; Saunders et al., 2019). In our study, we wanted to explore how technological acquisitions impact a firm's innovation performance. We also seek to clarify and confirm meanings regarding different identified themes, which can be done effectively by collecting data through interviews (Saunders et al., 2019). Furthermore, Yin (2018) mentioned that for exploring explanations (i.e., the "how's" and "why's") of key events, interviews can be helpful. This strengthens our basis for selection of a suitable primary data collection method.

There are different forms of interviews. In terms of the structure of the interview, there are three types of interviews: structured, semi-structured and in-depth (Saunders et al., 2019). Researchers use structured interviews to collect quantifiable data where they employ questionnaires based on a predetermined set of identical questions and record the response using a standardized schedule, often with pre-coded answers (Saunders et al., 2019). In semi-structured interviews, researchers begin with a predetermined list of themes and some possible key questions related to these themes for guiding the interviews (Saunders et al., 2019). Lastly, in-depth interviews, also termed unstructured interviews, which are informal in nature, and where researchers do not commence with predetermined themes because they are more interested in finding out which themes emerge from the collected data (Saunders et al., 2019). In our study, a semi-structured interview structure was adopted because we wanted to systematically explore different themes with every interview participant. We also wanted the opportunity to 'probe' a response provided by the respondents by asking them to explain, or



build on, their previous answers, which is possible in semi-structured interviews. Semi-structured interviews contain a sequence of themes to be covered and some suggested questions. However, it allows the researcher to change the sequence of questions and the possibility of following up on the specific answers given the respondents (Brinkmann & Kvale, 2015). Thus, it matched our data collection requirements.

## **Sample selection**

Sample in a research is a subset of the population which is selected for investigation. It needs to be selected in such a manner that the sample is representative for the population from which it is drawn. If the sample fulfils these requirements, researchers can generalize any findings to the population (Ghauri & Grønhaug, 2005). In this study, we have used the ‘Purposive Sampling’ technique to select the participants. Purposive sampling is a non-probability sample that conforms to certain criteria (Adams et al., 2013), and is normally used to choose a small number of participants who will be particularly informative (Cassell, Cunliffe, & Grandy, 2017b). We have set the following characteristics as a requirement to qualify for being a respondent: (a) holding a mid to high level management position in the merged entity; (b) has to be involved in either pre-acquisition planning or post-acquisition integration planning and implementation process. Considering the number of respondents to be interviewed within a limited period of time, time available for transcription, and data analysis, the number of interviews was limited to 10-15. For obtaining a better understanding about the impact of technological acquisitions on a firm’s innovation performance and capturing different perspectives, we interviewed employees from both acquiring and the acquired company.

We received a list of 11 contacts from Delta based on the set criteria. Followingly, the respondents were shortly briefed about our research. Upon receiving the contact details and available schedule, we sent the respondents emails to set up the interviews online. Due to the ongoing Covid-19 situation, all the interviews were conducted online using Microsoft Teams. Thus, it enabled us to adapt to the respondents’ time-schedule and also removed the geographical barrier since many of the respondents were geographically distant from our location. All the participants kept their camera on during the interviews. This enabled us to notice non-verbal cues. The interviews were conducted between March 3., 2021 and April 20., 2021. The average duration of the interviews was 60-70 minutes. Interviews were conducted in English, as English is the official working language of both Alpha and Beta. All the interviews were recorded, stored securely in cloud storage and later transcribed for analysing

the content. Permission was given by the respondents before recording the interviews. The respondents were guaranteed anonymity in their conversations with us. Assurances about anonymity increase the level of confidence in the researcher’s trustworthiness and thus reduce the possibility of response bias (Saunders et al., 2019). Thus, it allowed us to ask follow-up questions to the responses that we found particularly interesting, or responses that needed further clarification and/or explanation.

The following table depicts the overall sample of our research, which consists of 11 respondents whom we interviewed. Each respondent was appointed with a unique ID-code (R0-R11). This code is used later in the following chapters to distinguish between the information retrieved from different respondents. Previous affiliations of the respondents are also mentioned in the table. This was included so that we could differentiate various findings with significant impact on several levels.

ID-code	Former affiliation	Position and department	Time and date	Topics/themes covered from the Interview guide
R0 (Contact person)	Alpha	Vice President	February 25, 2021, 13:00 - 15:00	Master thesis proposal and Interview guide discussion
R1	Beta	Technical Product Manager	March 3, 2021, 12:00 - 13:05	Innovation performance, Technological acquisition and Combining knowledge bases
R2	Beta	Product Advisor	March 8, 2021, 10:00 - 11:15	Innovation performance and Combining knowledge bases
R3	Alpha	Senior Vice President	March 9, 2021, 09:00 - 10:00	Innovation performance and Technological acquisition
R4	Alpha	Department Manager	March 9, 2021, 13:00 - 14:10	Technological acquisition and Combining knowledge bases
R5	Alpha	Technical Product Manager	March 11, 2021, 09:00 - 10:00	Technological acquisition and Combining knowledge bases
R6	Beta	Senior Project Leader	March 15, 2021, 13:00 - 14:10	Technological acquisition and Combining knowledge bases

R7	Beta	Vice President	March 16, 2021, 11:00 - 12:10	Innovation performance, Technological acquisition and Combining knowledge bases
R8	Alpha	Vice President	March 16, 2021, 13:00 - 14:10	Technological acquisition and Combining knowledge bases
R9	Alpha	Vice President	March 17, 2021, 09:30 - 10:50	Innovation performance, Technological acquisition and Combining knowledge bases
R10	Alpha	Department Manager	March 18, 2021, 12:00 - 13:05	Technological acquisition and Combining knowledge bases
R11	Alpha	Vice President	April 20, 2021, 12:00 - 13:05	Innovation performance and Technological acquisition

*Table 1: Overview of the interviews*

## **Interview guide**

Before conducting the semi-structured interviews, we prepared an interview guide. The course of the interview is structured more or less tightly using a script called an ‘interview guide’. As we decided to conduct semi-structured interviews, our interview guide had an outline of the topics to be covered and included suggested questions (Ghauri & Grønhaug, 2005). Based on the research problem and our conceptual framework, we developed the interview guide. It was divided into three parts: innovation performance, technology acquisition and combining knowledge bases. The complete interview guide that we used throughout the research is given in appendix 2.

We used open-ended questions to encourage the respondents to provide extensive and developmental answers in order to reveal or obtain facts (Saunders et al., 2019). Furthermore, use of open questions helps to avoid biases and can be followed up by the use of appropriately worded probing questions (Saunders et al., 2019). We also tried to avoid too many theoretical concepts or jargons while preparing our interview guide. This was done since the respondent’s understanding of such terms may vary from ours. The initial interview guide was first discussed with the contact person in Delta (R0). Based on feedback provided in this meeting the interview

guide was further developed. We tried to ensure that the questions were adapted for respondents from both sides in the acquisition, their current role, their involvement in the acquisition, their knowledge and their prior experience.

Furthermore, our data collection process was iterative. We tried to modify the subsequent data collection sticking to the original interview guide based on the insights from the first interviews. For example, after conducting the first seven interviews, we observed that employee turnover and communication gap emerged as more frequent themes. Therefore, in the next interviews we asked some specific questions to explore these themes in depth, while sticking to our actual interview guide.

### **3.4.2 Secondary data**

Secondary data are useful for solving the research problem as well as for creating a better understanding and explaining the research problem (Ghuri & Grønhaug, 2005). Ghauri and Grønhaug (2005) mentioned that secondary data may have been collected for a different purpose but still provides valuable information about the topic of interest. Secondary data sources include books, newspaper articles, journal articles, websites, company reports etc. In this study we have used several of these different sources to study the phenomenon of interest. First, we began with reviewing previous literature related to our research topic. We used books and articles from top ranked journals in IB to conceptualize and specify our research problem. Journal articles were also used for the preparation of the interview guide. We had a guest lecture held by R0 where the topic was the motive and the actual transaction of the acquisition. Later, we had a meeting with R0 regarding the research proposal and the interview guide. These initial meetings provided a holistic understanding regarding the acquisition and gave us comprehensive, useful and relevant background information. According to Bowen (2009) it is very helpful to get this kind of background information in order to understand the roots of the investigated phenomenon. Company websites, reports and newspaper articles were used as a supplementary source to provide valuable information. This information enriched our general knowledge and allowed us to go in-depth on the topic. Use of secondary data helped us to develop a holistic understanding of the industry in which Alpha and Beta operated in and provided us valuable insights about their history and historical performance. We also used LinkedIn to get an overview of each respondent's background before conducting the interviews. Furthermore, Yin (2018) mentioned field notes as another common component of the case study database. Field notes can take a variety of forms. In our case, it was handwritten

memos/notes that we took during the interviews based on observations. These notes later helped us during the data analysis to recall and to understand the context of the data.

### **3.5 Data analysis**

Qualitative data that are collected in natural settings, usually contain rich and contextual details (Saunders et al., 2019). This richness provides the researchers with an opportunity for in-depth analysis. However, these data are non-standardized, complex in nature and large in volume (Saunders et al., 2019). In this section, we will discuss the process of how the collected data are systematically analysed to yield high quality results. The main data analysis of this study began with preparing the collected data and then we followed the coding procedure by Charmaz (2014). Followingly, the detailed data analysis procedure is discussed in the following section.

#### **3.5.1 Data preparation**

Basic raw data, which in our case is the interview recordings, were processed before conducting the analysis. In this regard the voice recordings were transcribed into text format. Transcribing is referred to as the activity to reproduce verbatim as a word-processed account (Saunders et al., 2019). We have adopted the touch-typist technique to transcribe the recordings. In other words, we listened to the recordings and typed in the verbatim. As it is essential that the transcriptions are accurate, we went through the initial transcripts several times while listening to the recordings. This was done to enhance the quality control. Since both researchers went through the entire set of transcripts individually, this can be considered as a quantified reliability check (Brinkmann & Kvale, 2015). During this process, we tried to identify how the respondents expressed themselves through non-verbal communication. These observations could prove to be insightful later in the analysis process. We also omitted repetitions and filler words such as ‘um’, ‘eh’, ‘erm’ ‘so’, ‘you know’, ‘like’ etc., because such wording can make it hard to grasp the actual intention of the respondents’ statement. We put the initials of the respondents, in capitals, at the beginning of each paragraph. This was done to enable us to do a case sensitive search later (Gibbs & Flick, 2007).

We strived to do the transcription in parallel with the data collection. This helped us to limit the danger of data overload and provided us the opportunity to understand what the data reveal in relation to our research question (Saunders et al., 2019). We were able to get acquainted with the data quite well and delve into the dialogues through this process. Another important

aspect of data preparation is to organize the storage of the collected data files (Boeije, 2010). Each transcript was saved as a separate word-process file and the files were renamed according to the date of the interview and respondents ID-code/initials. Thus, the confidentiality and anonymity were preserved, and it was easier to retrieve the data later (Saunders et al., 2019). Once all the transcripts were ready, they were imported into NVivo, which is a popular Computer Assisted Qualitative Data Analysis Software (CAQDAS) for analysing qualitative data.

### 3.5.2 Coding

Analysis of qualitative data involves coding and categorizing data (Saunders et al., 2019). There are different software programs which are designed for facilitating qualitative data analysis (Yin, 2018). These are known by the acronym CAQDAS. Software is helpful for researchers to code and categorize enormous amounts of data. However, it is only a tool that serves as an assistant and does not complete the finished analysis on its own (Yin, 2018). As Ghauri and Grønhaug (2005) claims that using NVivo brings potential benefits in IB research, we have incorporated use of NVivo in our study for coding and organizing data. Coding refers to the categorizing data with similar meaning which involves *labelling each unit of data within a data item (such as a transcript or document) with a code that symbolizes or summarizes that extract's meaning* (Saunders et al., 2019). According to Miles and Huberman (1994) codes are employed to extract and organize *words, phases, sentences, or whole paragraphs connected or unconnected*.

We created a 'project' in NVivo for this study and imported all the transcripts into the project. We have followed the step-by-step coding technique developed by Charmaz (2014) which involves initial coding and focused coding. We started with initial coding by disaggregating our collected data into conceptual units and coded with a label. For the initial coding, we have used data driven coding where the labels were derived from the data (Saunders et al., 2019). As we were going line by line through the transcripts in NVivo, we created the codes and continued coding all the transcripts. Once the initial open coding was completed, we started with the focused coding. Here, we re-coded data from various initial codes to a smaller number of more focused codes (Saunders et al., 2019). For focused coding, we were more theory driven (i.e., the codes were derived from existing theory and literature) (Saunders et al., 2019). While doing focused coding we worked through the initial codes to decide which codes to be put under the different focused codes. This led us to re-code some of the data and develop a new

set of codes. In the focused coding, we concentrated more on the themes related to our research. These theory-driven focused codes helped us to gain further insights and led us towards an emergent explanation based on the data (Saunders et al., 2019). An example of the focused coding using NVivo is shown below in figure 4.

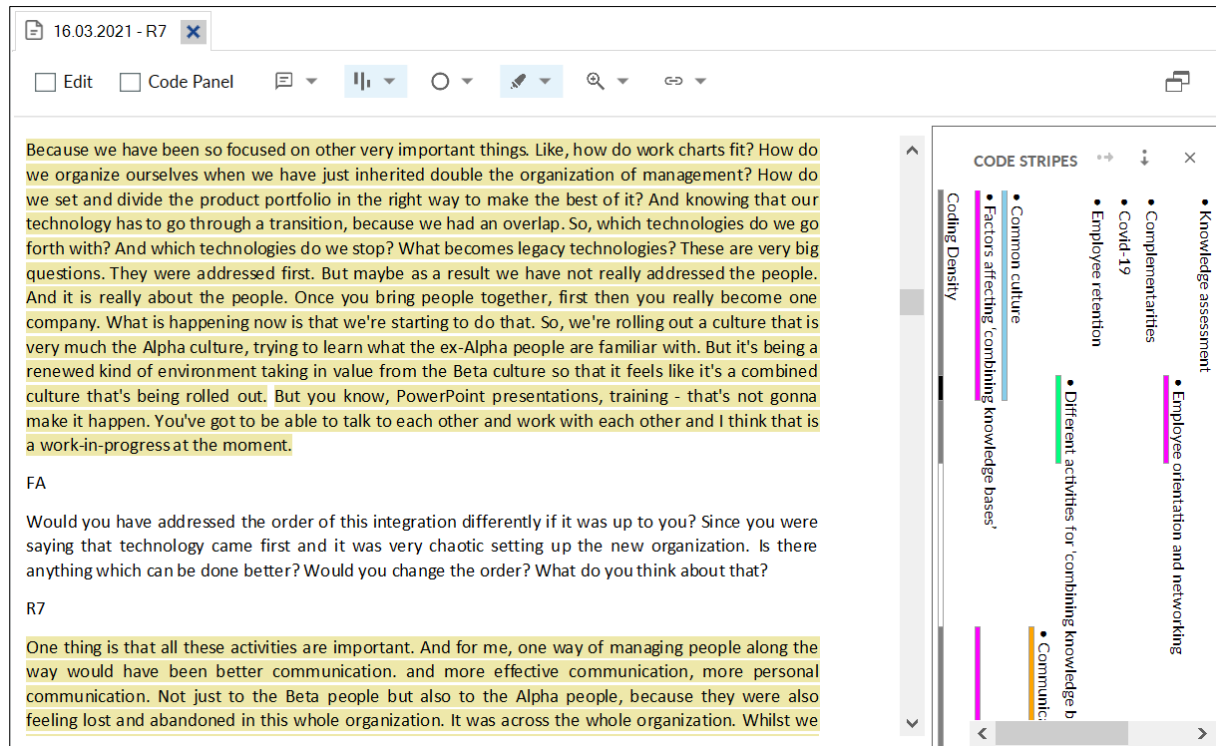


Figure 4: Screenshot showing an example of the focused coding using NVivo

### 3.5.3 Data reduction

For analysing large quantities of non-standardized data in qualitative analysis, it is generally accepted to simplify or reduce the qualitative data by summarizing their meanings (Saunders et al., 2019). Thus, these data become comprehensible and further analysis can be undertaken. According to Miles and Huberman (1994), the data analysis process consists of three concurrent steps: data reduction, data display and drawing conclusions. Data reduction refers to *the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written up field notes or transcriptions* (Miles & Huberman, 1994). It is a form of analysis that involves sharpening, sorting, focusing, discarding, and/or organizing data in such a manner so that research can draw the final conclusion out of this (Miles & Huberman, 1994). As suggested by Miles and Huberman (1994), in this study we have coded our data and made summaries for data reduction. After data reduction, data can be displayed in an organized and

compressed way which helps to reach the conclusion. Different types of matrices, graphs, charts, and networks are used for displaying data (Miles & Huberman, 1994). We have applied displays frequently to summarize our findings in a structured way. An example of such displays is added in Appendix 3.

### **3.6 Quality criteria**

In this section, the quality of the research study will be discussed and assessed with the aim to establish trustworthiness of the research findings. There are four main tests that have been employed for establishing the quality of empirical social research: construct validity, internal validity, external validity and reliability (Yin, 2018). However, the criteria of validity and reliability are more appropriate to assess quantitative research and makes it difficult for the qualitative researchers to show that their research has high credibility (Saunders et al., 2019). In this regard, Lincoln and Guba (1985) has formulated alternative quality criteria which are suitable for qualitative research: ‘credibility’ for ‘internal validity’, ‘transferability’ for ‘external validity’ and ‘dependability’ for ‘reliability’. We will discuss each of these parallel criteria in the following sections to establish and assess the quality of our research.

#### **3.6.1 Credibility**

Whether the representations of the socially constructed realities by the qualitative research respondents actually reflect what the respondents intended, is determined by credibility (Saunders et al., 2019). Walle (2014) described credibility as the degree to which the subjective “reality” experienced by informants is understood by the researcher. To increase the credibility, we have asked follow-up questions during the interviews to make sure that we interpreted the respondents’ statements as intended. Furthermore, whenever necessary we rephrased the interview questions in order to facilitate better understanding for the respondent. The respondents in our sample were representing various functions in different departments and seniority within the firm. We ensured that there were respondents from both the acquiring and acquired firm, which had either been involved in the pre or post acquisition integration phase. Thus, the diverse set of respondents was a credible source for obtaining information. The sample possessed sufficient knowledge and experience about the investigated phenomenon and provided us with different point of views about the specific case. We put a lot of effort while doing the focused coding. We read through and analysed the initial coding several times before



re-coding, grouping, and re-grouping categories to match what the respondents actually intended to express.

Another technique of confirming the credibility of the research is to conduct triangulation. Triangulation is referred to as the activity of examining a phenomenon from different angles (Boeije, 2010). The purpose of triangulation is to use multiple independent sources of data within one study. This is done to confirm the researcher's concluded findings based on the collected data (Saunders et al., 2019). Yin (2018) emphasized that the findings of a case study is likely to be more credible if several different sources of information are used to reach the conclusion. Yin (2018) also suggested using data triangulation to develop convergent evidence in order to strengthen the validity of the case study. By collecting data through several methods or even gathering various kinds of data on the subject matter of the study, the research can improve the accuracy of judgements and thus the results through triangulation (Ghauri & Grønhaug, 2005).

In this study we have used secondary data from publicly available information gathered from company websites, reports, news articles etc. Data collected through the interviews were analysed and then triangulated with the secondary inputs previously mentioned. The answers provided by the respondents during the interviews were compared to findings from previous articles from different journals, and conclusions were drawn only when several respondents validated the idea. Additionally, the key initial findings were shared with our contact person in Delta to discuss ideas and test out findings. Consequently, this strengthens the internal validity of our research.

### **3.6.2 Transferability**

Transferability refers to what extent the findings of the research can be transferred or generalized to different settings (Ghauri & Grønhaug, 2005; Saunders et al., 2019). However, Guba and Lincoln (1981) stated that due to its naturalistic nature, case studies are not intended to produce statistically generalizable findings. Because case studies are context dependent, Lincoln and Guba (1985) argued that instead of generalizing, qualitative researchers should strive for measuring transferability of the study. It is more appropriate for our research since it is constituted as a single case study. Since our research is a single case study, it is context dependent rather than being generalizable. Therefore, generalizing the findings to a larger population is challenging. In this regard, it is imperative that we provide the reader enough

context to understand the setting of our research. Transferability can be achieved by providing a complete description of the research questions, design, context, findings and interpretations. By doing so the researcher gives the reader the opportunity to evaluate to what degree the findings are transferable (Saunders et al., 2019).

We have described every step throughout the research elaborately, starting from the research context and further through the research design, selection of participants, to data collection and analysis procedures. Thus, this will help the reader to understand our research, and better make decisions about the transferability of this study to other settings. Furthermore, this enables other researchers to use our study as a point of departure for other prospective comparative studies across various contexts.

### **3.6.3 Dependability**

Dependability refers to replication and consistency (Saunders et al., 2019). Walle (2014) described it as the tendency for a method of investigation, instrument, or experiment to create the same results or outcome if the research is replicated. Guba and Lincoln (1981) suggested developing a case study protocol for providing the reader valuable insights regarding data collection and data analysis processes, so that the study can be replicated later. We have documented, explained, and justified all the choices and approaches made throughout the research in a very detailed way. Thus, a reliable/dependable account of the emerging research focus can be produced which is understood and evaluated by others (Saunders et al., 2019). The development of the conceptual framework is explained in the theoretical background chapter and the step-by-step research process is described in this methodology chapter which makes it possible for others to replicate our study.

There are several important considerations related to dependability, where the main ones are: participant error and participant bias (Saunders et al., 2019). Participant error relates to any factor that can negatively change the way that the respondent performs. On the other hand, participant bias is related to any factor which provokes the respondent to provide false information (Saunders et al., 2019). We scheduled the interviews at a preferable time chosen by the respondents. Considerable attention was given during the interviews to identify cues/traits that might cause participant error. To reduce participant bias, prior to the interviews, we ensured the participants that their responses would be anonymous and therefore could not be traced back to them.

Errors and biases can also occur among the researchers. Researcher error refers to the factors for which the researcher misunderstands the intended meaning of the respondent's response, and thereby alters the interpretation. Research bias refers to the factors which cause bias in fairly and accurately recording and interpreting responses by the researcher (Saunders et al., 2019). To reduce the researcher error, we followed a step-by-step research design procedure and prepared an interview guide in advance based on relevant literature. The interview guide was discussed and assessed by our thesis supervisors. Furthermore, we discussed the interview guide with the contact person from Delta. Consequently, it was further developed before the actual interviews. In order to reduce the research bias, we avoided extensive use of jargon during the interviews. We also asked follow-up questions to make sure that we had the correct understanding of the given responses.

### **3.7 Research ethics**

According to Miles, Huberman, and Saldaña (2020), there are several ethical matters and issues which need to be reflected upon while conducting qualitative research. Of these issues, Boeije (2010) has highlighted three dimensions: informed consent, privacy, confidentiality and anonymity. The researcher has the obligation to outline the data collection procedure and the purpose for collecting data from the participants (Boeije, 2010). The quality of data is usually poor when the consent is weaker (Miles et al., 2020). In such cases, the respondents try to protect themselves and thereby refrain from sharing actual information. All the respondents were initially sent an email, informing them about the purpose of the study. Also, before starting the interviews, we discussed the purpose and method of data collection with the respondents. Therefore, all our respondents were well informed about how the collected data would be used.

The term 'privacy' is referred to as control over others' access to the collected data. It means that the researcher has to maintain the secrecy of the information (Miles et al., 2020). Before recording the interviews, we ensured the respondents about privacy, and also explained to them how the data would be collected, stored and maintained. We used the video recording feature in Microsoft Teams. Thus, all the recordings were stored in one-drive automatically. These recordings are only accessible to the researchers.

Privacy, confidentiality, and anonymity are often used interchangeably by researchers. However, there is a difference between these terms. Confidentiality refers to the scope of the

research, what can be done or cannot be done, and is an agreement with the respondent or organization (Miles et al., 2020). Anonymity refers to the assurance that individuals or organizations who are providing the data cannot be traced back to its origin (Miles et al., 2020). This research is approved by Norsk senter for forskningsdata (NSD). We assured the respondents that while using the information provided by them, we would make everything anonymous in the report. While preparing the report, we kept this issue in mind and coded the respondents as R0-R12 instead of using their actual names. We also avoided mentioning specific traits that could work as an identifier.

When you start doing qualitative research it is hard to predict the findings and conclusions in advance. Gibbs and Flick (2007) suggested that to deal with the emergent issue's researchers should develop an ethical and politically aware practice. Providing feedback can be one way to deal with this issue. Feedback can be offered to the participants in such a way that it creates an understanding, and the feedback then demonstrates how confidentiality and privacy have been maintained. It also shows that the efforts that the participants have put in this study has been worthwhile. In this regard, we have shared our initial findings with the contact person in the company. The final report will be shared with Delta when it is completed. Another important issue is research integrity and quality. According to Miles et al. (2020), a study needs to be conducted carefully, thoughtfully, and correctly in terms of some reasonable set of standards and established practices. Our master thesis supervisors have prepared us sufficiently for the independent fieldwork (taking interviews), and we have had constant communication and monitoring throughout the entire process. This has helped us to produce quality research work.

## **Chapter 4.0: Description of the case**

In this chapter we will briefly present the two case companies: Alpha and Beta. Before starting the work with this thesis, we signed a confidential agreement restricting us from using firm names, and information that could expose the firms in any way. Therefore, we will only present generic information regarding the organization(s).

### **Description of Alpha's operations before merger**

Alpha was a part of Alpha Group which was considered as a global leading technological firm serving primarily the maritime industry. The Alpha group was based in Northern Europe and represented in more than 40 countries world-wide and employed approximately 7000 people. The firm was operating with increasing profitability, organic revenue growth and had offices in more than 30 countries. The market covered a broad array of vessels including naval, tankers, fishing, and cargo, among several others. Alpha also delivered solutions to subsea installations, aquaculture, offshore E&P, and onshore service centres. In the maritime market there were more than 30.000 vessels operating with systems delivered from Alpha.

### **Description of Beta's operations before merger**

Similar to Alpha, Beta was part of a larger group prior to the acquisition. The Beta group was based outside of Northern Europe, with headquarters in Western-Europe. Beta focused its offerings towards the offshore, merchant, and naval markets. The firm was considered as one of the leading providers of maritime solutions and a world leader in vessel design. Beta's core business areas were within products related to propulsion. Additionally, Beta delivered ship design and platform systems to a variety of vessels including cruise, offshore, merchant and fishing segments.

### **Beta's declining financial performance**

In contrast to Alpha, Beta's organic revenue growth had been decreasing in the years leading up to the acquisition. The main reason for the negative revenue growth was the ongoing weakness in the offshore market environment. Beta had been operating with loss for several successive years. Reasons for the operating loss were varied, including ongoing investments in production facilities and profound investments in R&D, focusing on autonomous shipping. The diverse negative tendencies forced the firm to focus on strong cost controls, closing down non-

core facilities and a substantial reduction in employees. In the last years before Alpha's acquisition of Beta, the headquarters of the Beta group had announced that Beta would either be subject to major strategic renewal, or potentially sold to an external source.

### **Alpha's decision to acquire Beta**

The board of Alpha considered the timing of the acquisition as appropriate, which placed Alpha in an advantageous position for future market recovery. In 2019, the acquisition of Beta was finalized, and Beta became an integrated part of Alpha, as Delta. The acquisition was financed through a combination of rights issues and issuance of bonds and was the largest M&A-deal in Alpha Group's history. The acquisition of Beta would make Delta a leading provider of integrated solutions and led the combined entity to have a full picture offering across mission critical marine systems. The deal added a complementary and well-established portfolio of products to the existing portfolio, and consequently, creating significant benefits for the customers since Delta now could increase their scope and scale of total offerings.

## Chapter 5.0: Findings

In this chapter, we have applied our conceptual framework introduced in chapter 2 to present our findings. Our findings are arranged according to the sequence in the conceptual framework. First, we present findings related to technological acquisition. In the next subsection, we address how Delta is combining the two knowledge bases (i.e., Alpha and Beta). Lastly, we present findings related to innovation performance.

### 5.1 Technological Acquisition

Through the acquisition of Beta, Alpha got access to Beta's technology and knowledge. In this section we will present our findings regarding these additional gains. We categorize these gains into two segments: gains that were similar and overlapping, and gains that were complementary. The technological acquisition component is the first component in our theoretical framework, and mainly consists of the concept Innovation potential in acquisitions (section 2.2) from the theoretical background chapter.

#### 5.1.1 Delta's similar and overlapped gains from the acquisition

Both firms had several similar products in the category of automation systems. In the automation segment the nature of the products were more overlapping. In integrated solutions, which is a part of automation and bridge systems, both firms had several similar systems. Almost the complete product range within this division had overlapping systems. In certain areas, there were multiple systems with identical features. One respondent explained:

*“We had a lot of similarities. We had the same systems in Alpha and Beta. But even worse, we had several systems in Alpha, and several systems in Beta” – R1.*

However, the representation and development of products was somewhat different between Alpha and Beta within automation. Thus, the maturity level of products from Alpha and Beta was different. Some of the overlapping products were far more developed than the others. There were overlapping products in several fields: automation, control, and digital remote autonomous environment. In all these fields Alpha and Beta had different technological approaches. Alpha had a long successful history with a solid technological base. It had its own automation platform and on top of that the propulsion control systems were built in. Beta did not have this feature. However, they had tried to build the systems on top of an automation

system enabling a ‘plug and play’ feature. Similarly, in control systems for propulsion and thruster products, there were similarities and overlapping systems. They had their own remote-control system for thrusters. Another area having a high degree of overlapping is within ship intelligence.

Another aspect with similarity and overlapping is within *knowledge*. A considerable amount of knowledge possessed by the employees were similar in Alpha and Beta. The key reason reported by the respondents for having high levels of similarity in knowledge and competences, was that a considerable amount of the employees had similar educational background, in some instances from the same educational institution (e.g., engineering background from NTNU in Trondheim). Consequently, similar technical terms were used in the corporate language of both firms.

Several respondents mentioned that Alpha and Beta were competing within some areas of the industry. Thus, both firms had relations with the same clients, and/or customers. Specifically, in Digital Positioning System Business, Alpha and Beta were rivals. Within this area Beta was one of the biggest competitors to Alpha prior to the acquisition.

### **5.1.2 Delta’s complementary gains from the acquisition**

When describing the complementarities between Alpha and Beta, one respondent explained in simplified terms that Alpha specialized in software, whereas hardware was the strongest forte in Beta:

*“Alpha was in a very much software automation-oriented business. On the other hand, Beta was very much of a conglomerate of mechanical equipment supplier. Bringing these together, you will get a bigger portfolio” - R7.*

Alpha was mostly involved in delivering control equipment to vessels. In these areas Beta did not have lot to offer. The most complementary and unique gain for Delta from this acquisition is the ship design/platforms. Beta brought in extensive offerings that supported a wide range of vessel types. Beta had state-of-the-art vessel design capability which was complementary to the offerings of Alpha. In this regard, a key factor mentioned by one respondent was that: *“Beta had production equipment and facility in-house, whereas Alpha outsourced it” – R2.*



Beta owned a global service network which was focusing on local customer support, spare part distribution and 24/7 technical support across their entire portfolio. Furthermore, they operated advanced customer training facilities on different continents. These features were significantly complementary to Alpha and strengthened Delta’s aftermarket services. Other complementary gains highlighted by respondents are within propulsions and deck machinery. Of course, Delta also gained additional capacity (e.g., additional number of employees) in fields that were complementary, but also within similar and overlapping areas.

### 5.1.3 Summary

Gains from this acquisition were similar in the following segments: integrated bridge, dynamic positioning, automation, electrical systems and ship intelligence. Both firms had their own products and systems in these segments. Thus, it resulted in different overlaps. Alpha was specialized in navigation and sensors. Beta did not have any offerings in these segments. Ship design, deck machinery, propulsion and diesel engine were segments where Beta had complementary gains. Similar and complementary gains from this acquisition are visualized in figure 5. According to the respondents, a high degree of knowledge and competence possessed by employees in Alpha and Beta were similar. Mostly in the overlapped segments. Both firms operated in similar markets, However, the acquisition of Beta provided Delta with the opportunity to operate in additional markets, where Alpha had not been operating earlier.

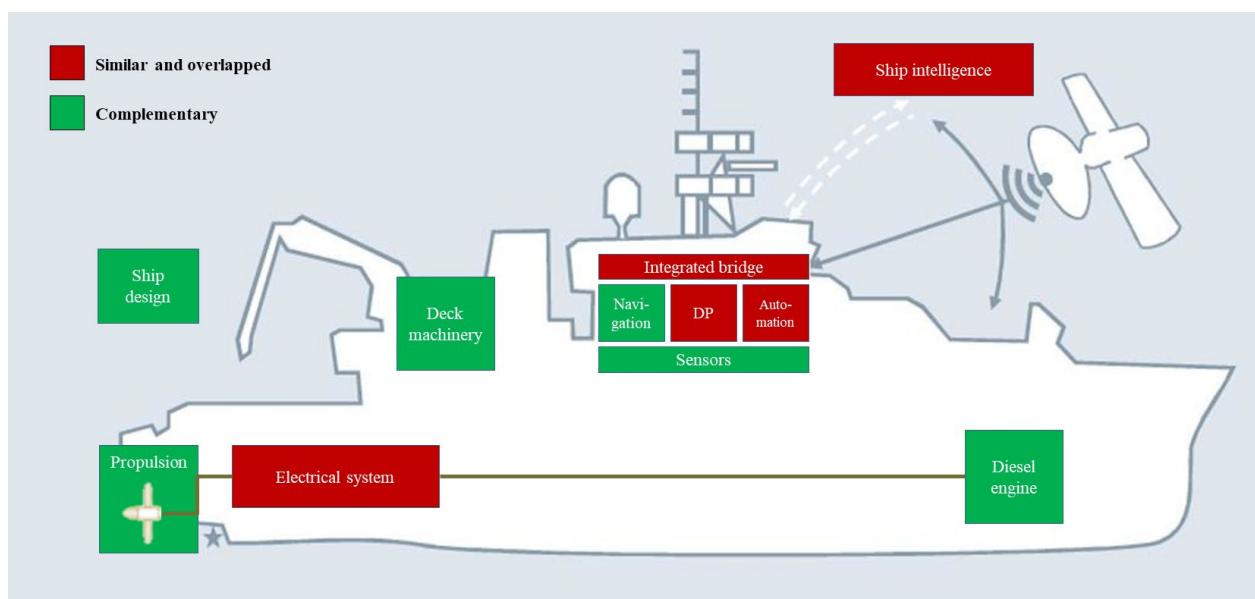


Figure 5: Graphical representation of the similar and complementary gains for Delta from the technological acquisition

## **5.2 Combining knowledge bases**

In this section we will provide a presentation of how Delta is combining the knowledge bases of Alpha and Beta. Combining knowledge bases is the second component in our conceptual framework, covering the concept of knowledge transfer (section 2.3) and to some degree the concept of integration (section 2.1) from the theoretical background chapter.

### **5.2.1 Articulation and direction of knowledge transfer**

The respondents' perception of the amount of knowledge and technology that had been transferred so far following the acquisition varied from a lot to almost nothing. It was stated that there had been a huge amount of technology transferred in both directions. The respondent reported that systems, various amounts of data, manuals, product requirements, and drawings (i.e., explicit knowledge) had been transferred in both directions. Furthermore, others claimed that the direction of transfer was mainly unidirectional: from the acquired firm to the acquirer. Regarding sharing of explicit, but also personified (i.e., tacit) knowledge possessed by the different employees, there were reported various factors that could facilitate or hinder the knowledge transfer, including the sharing of it. The most frequently mentioned factors will be elaborated in the following section.

### **5.2.2 Different factors affecting 'combining knowledge bases' in the acquisition**

#### **Communication**

Communication was identified as the relative strongest factor regarding combining knowledge bases in Delta. Proper communication throughout the process of exchanging, transferring and combining knowledge is considered an absolute requirement among the respondents:

*“The merger here is actually people talking. The technology transfer is people talking, discussing and finding solutions” – R2.*

However, in this area several respondents commented that there was room for improvement. Communication was considered sufficient in and among different teams/units. However, it was reported that communication from the top management to lower levels in Delta during the post-acquisition phase was not satisfactory. Several respondents felt uncertain concerning their role

in the future organization of Delta. They felt uncertain because of unsatisfactory communication from the top management regarding the firm's vision and future strategy. Continuous communication regarding restructuring of the organization, new projects, initiatives, upcoming changes etc., was proposed as elements that would eliminate employee stress, and further reduce insecurity regarding their positions.

## **Common culture**

Respondents from both firms acknowledged that bringing all the employees closer and creating a common culture is necessary to create a successful outcome from the acquisition. Majority of the respondents stated that top management in Delta was initially emphasizing product/system harmonization, resulting in less attention towards cultural issues. The cultural challenges and the differences in approaches were not properly addressed in the early stages. The following statement illustrates these challenges:

*“Because we have been so focused on other important things. Like, how do work charts fit? How do we organize ourselves when we have just inherited double the organization of management? How do we set and divide the product portfolio in the right way to make the best of it? ... We had an overlap. So, which technologies do we go forth with? And which technologies do we stop? What becomes legacy technologies? These are very big questions. They were addressed first. But maybe as a result we have not really addressed the people. And it is really about the people. Once you bring people together, first then you really become one company” – R7.*

Furthermore, several of the respondents stated that Delta initiated a culture rollout that was very similar to Alpha's culture. However, the management in Delta said that they still wanted to renew the environment, while simultaneously incorporating some values from Beta. One manager from Alpha explained that the intention was to make Beta's employees feel that a combined culture was rolled out, but still to keep it recognizable for the former employees of Alpha.

## **Open mindset**

Embarking upon something new with an open mindset was reported to increase adaptability. Being open and willing to listen to ideas from co-workers was mentioned as an important factor in order to share knowledge in the new setting: *“An open and curious mindset is always a good*

thing” – R11. To do so, it was identified that the participants need to be curious and interested in what the counterpart has to offer. One manager said that a knowledgeable person with a reserved attitude and mindset could single-handedly ruin the environment in a team. By doing so the team member would act as a hindrance to knowledge sharing. However, in many cases, employees who had an open mindset and curious attitude made great efforts in teams consisting of members from both sides. These teams reportedly produced good results while collaborating closely, sharing knowledge and utilizing competence.

### **Involvement from the leaders**

To facilitate and ensure that knowledge transfer was happening, employees in leadership positions were aiming to play an active role. It was mentioned by one respondent that as a leader it could be beneficial to choose like-minded people and put them into the same team based on their skills and competences. This was done to create an environment where the employees felt comfortable to discuss and exchange ideas:

*“Although similar competences might create insecurities and restrict employees from sharing knowledge, leaders’ involvement reduced this issue” – R9.*

Regarding ‘style’ of management, the respondents explained that the team members appreciated involvement from their leaders. Team members had also reported that the team cohesion increased and consequently, also enhanced cooperation among the team members. The involved participants clarified that increased confidence and higher levels of trust among team members affected knowledge transfer and sharing positively.

### **Covid-19 pandemic**

This factor was identified by all respondents and was the relatively strongest factor impacting the combination of knowledge bases solely negatively. Covid-19 pandemic was reported to impact several areas within the combination of knowledge bases. It was explained that when such an extreme and external variable as a pandemic occurs, it can change the entire demand in a market. To exemplify the same respondent mentioned the cruise market. Prior to the outbreak, this market was identified as a revenue driver for Delta. However, due to the pandemic, the entire demand suddenly disappeared. Various responses described the pandemic as disruptive regarding integration. Suddenly, people could not meet in different gathering settings, mix ideas, collaborate across departments or units and so on.

## **Employee retention**

Employee retention was acknowledged as another factor that could impact the combination of knowledge bases negatively. Respondents emphasized the importance of retaining employees who possess personalized and highly valuable knowledge. Two key reasons were mentioned when the respondents were probed regarding employee turnover. First, they identified ownership towards their own work and products. One respondent explained:

*“They feel ownership to the product, and if the product is not brought forward, then they don’t work here anymore either” - R11.*

The second reason stressed by several others was the element of uncertainty. Although this factor is slightly different from the ownership factor, it is somehow intertwined in this context as it is about employees feeling uncertain about their future in Delta. A striking example of such issues was explained as follows:

*“The best technical people have a high ownership of what they make. And if they feel that they are uncertain, then they quit” – R8.*

### **5.2.3 Different activities for combining knowledge bases**

In reply to our enquiry regarding how Delta is combining the acquired knowledge from Beta, respondents also highlighted various steps taken by Delta. We will present the most frequently mentioned steps in the following section.

## **Knowledge assessment**

Prior to the acquisition, Alpha initially assessed what technology and knowledge they were getting by acquiring Beta. In addition, they analysed what kind of technology and knowledge they already possessed internally. Once Alpha and Beta merged into Delta, a further assessment was conducted through interviews and mapping sessions with employees from Beta. This was done to get an overall picture of the combined competences, so that Delta could ensure that they placed the right person in the right place:

*“There are so many different areas we are working on. So, if you manage to pinpoint areas where knowledge sharing can be utilized, this would clearly, in my opinion, be a big advantage for the organization. Because I am quite sure that many are working on*

*some issues, or innovations, or product development in areas where someone else may have done it before” - R1.*

## **Organization restructuring**

Based on the knowledge assessment, different new projects were set up in different departments. Followingly, new roles were created to fit the new employees into the organization. Likewise, Delta also transferred employees with previous affiliations in Alpha to different suitable positions across the firm to facilitate knowledge transfer:

*“These projects were created so that similar minded people could work on the same projects, exchanging their knowledge with each other” – R11.*

The initial restructuring process took place a few months before the acquisition was finalized. However, after operating in the new set-up for a while, it was found that some of the employees were better suited in some other role in a different department. Therefore, adjustments were made when it was deemed necessary.

## **Employee orientation and networking**

For combining the acquired knowledge into the new setting, it was mentioned that a good start would be to start mixing people, and especially managers and engineers. Mixing employees facilitated knowledge exchange.

*“The crucial key factors here are getting to know the people, getting to know the organization, getting to know not only who does what, but you know understanding who is good at doing different things.” - R1*

Once the acquisition was official, departments from Alpha and Beta could start to talk directly and start sharing information about their organization, how it was structured, and their corporate strategies. Top management and leaders regularly travelled to different locations to meet team members face-to-face and various workshops were arranged. Department managers had gatherings where they got to know each other. However, the Covid-19 outbreak hindered the progression of employee orientation and networking. Because of this, online live events were organized. Online events facilitated virtual mixing of employees from various locations to further facilitate employee orientation and networking.

## 5.2.4 Summary

Different factors were identified which affected the process of combining and merging the knowledge bases of Alpha and Beta. Communication, common culture, open mindset, involvement of the leaders, Covid-19 pandemic and employee retention were mentioned as significant factors in this regard. Some of the factors facilitated knowledge sharing and knowledge transfer, whilst others acted as a hindrance. Furthermore, the respondents described different activities organized by Delta to combine the knowledge bases of Alpha and Beta. These activities were categorized into three sequential categories: knowledge assessment, organization restructuring, employee orientation and networking.

## 5.3 Innovation performance

In our thesis we are aiming to evaluate the impact of the shared new entity's innovation performance after merging the knowledge bases of Alpha and Beta. To be able to fully comprehend the impact of the acquisition in terms of innovation performance, we first needed to get an impression of the different respondents' thoughts and subjective understanding of innovation as a phenomenon. In this initial section we present an overview of how the employees in Delta perceived and defined innovation and innovation performance of a firm.

The respondents provided wide-ranging answers regarding their perceptions about innovation. It could be new ways of thinking, new ways of working, new ways of carrying out existing processes (e.g., digitalization, delivery), new ways of utilizing existing knowledge/technology, and developing completely new products and/or solutions, as described below:

*“When I am thinking of innovation, I am thinking of new things, new ways of working, digitalization of your workday, doing things in a smarter way, and of course, completely new products” – R9.*

There was a consensus regarding the definition of innovation performance that it is needed to put forward a solution (e.g., product, system etc.) which could be industrialized, so the firm could capitalize on the specific investment now or in the future. Innovation performance is the final component in our conceptual framework, covering the last concept (section 2.4) from the theoretical background chapter.

### **5.3.1 Measurement of innovation performance in Delta**

Our findings of Delta's methods of measuring innovation performance were inconclusive. Two respondents reported that Delta to some extent uses firm level KPI's. However, these KPIs were not specifically directed towards measuring innovation. The KPI's listed were related to financial terms such as cash-flow, turnover, profit margins etc. Prior to the merger Beta had a history of using patents as a measurement of their innovation performance. All respondents confirm that Delta does not focus on patenting in their current operations.

Instead, different measurements were brought forward, such as benchmarking product portfolio against competitors, number of new contracts, number of new ideas and sold/completed deliveries. However, none of the measurement terms was mentioned by more than one respondent.

### **5.3.2 Factors facilitating the increased rate of innovation**

There was only one respondent saying that the rate of innovation had increased following the acquisition. More specifically this respondent stated that there had been an increased rate of new product development and new projects in this specific unit. This was in a unit where the gains were complementary to Alpha's prior offerings. The respondent claimed that since the top management is performance focused, the different units might feel forced to emphasize and report strong numbers in these areas. In some cases, these numbers might even not represent reality.

The factor complementarity of knowledge was considered the strongest factor for facilitating an increase in innovation and/or the innovation performance. Several respondents pointed out that Delta now have access to the aggregated skillsets, competences, product portfolio, technologies and knowledge bases of both firms. Different related sub-factors to complementarity of knowledge were discussed. The most significant sub-factor mentioned was moving employees (managers and engineers) around in the organization.

### **5.3.3 Factors influencing the decreased rate of innovation**

Harmonization processes were identified as the relative strongest factor hindering the rate of innovation. The concept of harmonization was referred to interchangeably as a process which



included integration and combination of e.g., components, products, operations and systems, but also as the process of selection of which of these elements to preserve or to discontinue:

*“A merger requires product harmonization, getting IT-systems to work together, and a lot of administrative and cultural focus. A lot of things that do not give innovation itself” – R11.*

Moreover, harmonization could be divided into several sub-categories including parallel operations, offering two product lines simultaneously, tying up resources (people and funds) in non-innovative activities, among others. Particularly, areas, units and departments where there were similarities and overlapping between Alpha and Beta, were affected by harmonization processes.

Focus on other areas than innovation from the top management of Delta was also identified as an important factor hindering the innovation rate. This factor is closely linked with harmonization regarding top management’s post-acquisition focus on different processes (e.g., integration, selection etc.). However, the responses related to this factor are also distinctively different in terms of the nature of the focus areas. One respondent explained that focus on financial performance was creating a dilemma with respect to innovation performance because the innovation process itself does not necessarily generate economic gains. At least not in the short run:

*“Top management is following all the time: Do we deliver? Do we earn money and so on... It is all about the money” – R9.*

Most respondents stated that Delta is doing ‘brilliantly’ in financial terms, and that the economic results hopefully will facilitate innovation and innovation performance subsequently. It was also mentioned that top management were monitoring performance related to completed deliveries, new products brought to market, the number of new contracts and so on.

### **5.3.4 Difference in approaches toward innovation**

There was unanimity among the respondents that the innovation processes in Beta and Alpha were dissimilar. All the respondents with backgrounds from Beta stated that the innovation processes were slower and more conservative in Delta compared to Beta. Longer

communication lines, financial-oriented and process-oriented focus, and more 'handshaking'/hierarchy was mentioned as factors influencing the speed of innovative processes. Beta's approach towards innovation was referred to as proactive, while Alpha's approach was more reactive to the market demands. Furthermore, it was concluded by the majority of the respondents that although both Alpha and Beta had a focus on incremental innovation, Beta's management was also supportive to a higher degree towards radical and disruptive innovation compared to Alpha.

### **5.3.5 Summary**

Respondents revealed that there were no specific KPI, or measurement criterion used by Delta to measure innovation performance. Although respondents could not provide any specific or quantifiable data that indicated whether the innovation rate in Delta had increased or decreased, most of the respondents perceived that the rate had declined. Factors affecting the rate were mentioned, where complementary gains from the acquisition were pointed out to be facilitating an increase, while harmonization processes were identified as the relatively strongest factors affecting the innovation rate negatively.

## **Chapter 6.0: Analysis and Discussion**

In this chapter, we analyse the findings from the previous chapter in more detail and discuss and reflect upon them against the literature review presented in chapter 2.

### **6.1 Technological acquisition**

In this section, we will discuss how similar and complementary gains from the acquisition impacted the integration in Delta.

#### **6.1.1 Similarities and overlapping between Alpha and Beta impacting the acquisition**

There are several consequences following when a firm acquires similar products, systems, knowledge, and competences from a competitor. What we have found is that when products and systems are similar or overlapping, both human and task integration is impacted negatively. Some of the products could not simply be discontinued or merged due to the ‘legacy’ nature of these products. Legacy nature denotes that when firms have been present in a market for a long period of time. Consequently, these firms have delivered substantial amounts of product and solutions to their customers. Deliveries of such products are often contractually guaranteed for maintenance for 5-10 years. Therefore, it is hard, or even sometimes impossible, to stop these offerings abruptly. As a result, Delta had to continue with some legacy products from both sides. Many of these products are highly similar and even overlapping. Since Delta continued with two similar product lines in some areas, they also needed to maintain and produce from two different, but similar sets of hardware. The legacy impact did not stop here. Several other departments were also affected:

*“In the sales organization, they have to choose. Should we sell this product line, or the other?” - R5.*

Furthermore, for delivery of two different products, Delta had to build up two delivery organizations. It was the same for the aftermarket unit. Employees all over the world had to be aware of both products. They had to maintain relationships with diverse stakeholders and continue the after sales support. These factors caused redundancy and were time-consuming. This finding is in line with the description by Sears and Hoetker (2014) who explained that

similarities lead to overlaps and redundancies. Ultimately, the overlaps and redundancies affected task integration negatively. It is obvious that this was not an optimal solution.

However, it was hard for Delta to overcome this issue since they were forced to continue with several legacy products. As Delta had no other choice but to continue with two similar and overlapped products, the employees could not work as one unified team. One respondent illustrated:

*“They have 20.000 sailing vessels in legacy that they need to cater to. So, reality sort of inhibits innovation here... You still need to have the interchangeable spare parts. So, the new part you're going to make needs to fit where the old part once was, and that restricts the innovation rate” – R2.*

As employees were divided and kept on working on their own products, the process of combining the two knowledge bases was hindered. This further indicates that the overlapping and similarities in products and systems caused some problems related to human integration as well.

In contrast, similarities in knowledge and competence made it easier for the employees in the new organization to communicate, exchange knowledge and discuss strategies. In this regard, similarities were also positive for the ground-level technical employees (engineers) because they were familiar with similar technical terms. Ultimately, similarities in knowledge and competences impacted human integration positively. Our findings confirm findings from Reus (2012) saying that similar backgrounds and competences reduce the difficulties to comprehend and value each other's knowledge. This makes sense as individuals tend to socialise better with other similar minded individuals.

However, having similarities and overlapping fields in both knowledge and products caused tension among the employees in some areas of mid-management. Specifically, within the remote digital and autonomous technology area where both knowledge and products were almost entirely similar and overlapping there was much tension. In the areas where there were high levels of similarities and overlaps, Delta received very little additional knowledge. Instead of adding knowledge, the great extent of similarity created uncertainty. One respondent remarked:

*“There was insecurity because we’re having overlaps on basically everything. So, something had to be chosen over another in every area of that portfolio”- R7.*

This insecurity led to ‘a feeling of fear’ that their positions in the company were threatened. Sears and Hoetker (2014) observed the same issue. The working environment becomes hostile and competitive when there are too many similarities between the acquiring and the acquired firms. This is exactly what we observed in Delta.

As Alpha and Beta were competing in different segments and therefore had some similar offerings, one of the product lines had to be chosen over another. According to Cassiman et al. (2005), competitors operating in the same market gain very little from technology acquisition. Our findings show that this to some extent is true. The parts of the acquired company that are similar and overlapping does not create significant gains. However, the complementary parts do. Everyone in Delta understood that since the products were so similar, or in some cases even completely overlapping, choices had to be made concerning which ones to keep. Choosing one product over another impacted the employees who were working with the discontinued products. One respondent noted:

*“You do create losers in mergers where there are a lot of similarities. And people feel more strongly about the products that they have been working for and put their hearts into” – R2.*

Employees on both sides have been passionately working on their projects for a longer period. Therefore, it became challenging for them when opposite products were chosen over their own due to overlaps:

*“The challenging part was the ownership of the products. And it is not easy to agree on putting your own product line down and doing it like the former competitor” – R11.*

Choosing one product or system over another due to similarities and overlapping was ‘emotionally problematic’ for some employees. As a result, some employees left the firm. This matter will be further elaborated in section 6.2.2, more specifically under the factor labelled ‘employee retention’. Overall, the similarities and overlaps between Alpha and Beta did not affect the acquisition in a very positive manner. Similarities and overlapping products and systems forced management to choose between the human and task side of integration. Apparently, management chose to focus on operations (task) first. A few managers from Alpha

referred to the acquisition as a strategic, or protective move by the owners. They were saying that the acquisition was a protective strategy, where the acquisition of a rival firm gives the acquirer a more robust position in the market. The competition is eliminated. Or even better, it is internalized. If the following statement represents reality, it is not hard to understand why our findings suggest that Delta has been focusing on task integration rather than the human side:

*“We did not acquire Beta for the people” – R8.*

The key reason for overlaps was that Alpha and Beta operated in the same industry. One respondent described the extent of similarities between Alpha and Beta:

*“Alpha was the world leader in DP systems, but Beta was one of the upcoming competitors. So, we had two DP systems and in order to be allowed to do the acquisition, we had to sell Beta’s DP business. Prior to the acquisition, Beta’s DP was sold to an American company because there are some regulations that you are not allowed to buy one of your biggest competitors” – R5.*

It was further affirmed by several respondents that Alpha and Beta considered each other as competitors, or even rivals. This impression lasted even after they merged into Delta. When analysing the answers from the different respondents we kept the context of these answers in mind.

The combination of tension due to prior rivalry and the choice made by top management to focus on harmonization processes (task) in the initial stages, clearly set limitations to the subsequent step in our conceptual framework, combination of knowledge bases.

### **6.1.2 Complementarities between Alpha and Beta impacting the acquisition**

As stated above, the acquisition of Beta also brought complementary offerings to Alpha’s existing portfolio. Since both Alpha and Beta focused on some narrowly specified areas of knowledge which were within the broad area of knowledge in the maritime industry, Alpha and Beta were complementary in other areas. This matches the definition presented by Makri et al. (2010) saying that technology similarity between firms is defined as the degree to which firms focus on the same narrowly specified areas of knowledge for solving their technological problems.

Combining the complementary parts of the two firms provided Delta with the opportunity to offer complete solutions to the market. Earlier, Alpha lacked the understanding of complete operations of the vessel. As Beta was specialized and oriented towards the mechanical side, this combination helped Delta to close this gap which was present in Alpha. One respondent said: *“We can now offer a much bigger scope in our offerings”* – R11. This is well supported by Makri et al. (2010) who explained that complementary knowledge stimulates more novel solutions in the new entity after the acquisition.

Because Alpha was outsourcing the production of equipment to low-cost countries such as China, Korea etc., they had less control and autonomy to make continuous changes and improvements. However, when Alpha acquired Beta who had their production in-house, this issue was mitigated. The complementary gains increased the potential for revenue synergies for Delta through cross-sales, integrated packages, and services. This indicates that the productivity in Delta increased due to the complementary gains. Similarly, Makri et al. (2010) concluded that for enhancing the firm’s productivity in innovation, firms should acquire knowledge which is complementary.

As a consequence of the acquisition, Alpha gained complementary knowledge, competences and products. Consequently, Delta possessed high levels of expertise in multiple areas:

*“We have such a high level of expertise in-house right now. Because we have been working on these systems, with the business for more than a decade”* – R7.

The complementarities between Alpha and Beta facilitated the integration process. In these areas, less attention was required towards harmonization, and subsequently more time was available to focus on human integration. One respondent explained that in the part where the firms were complementary, the human integration process was going quite smoothly. In areas where the knowledge was more complementary, employees did not feel reluctance and job insecurity, and this created an environment where it was easy to share and comprehend knowledge from both firms. This observation we made in Delta is in line with Reus (2012) who stated that externally acquired knowledge will be easily comprehensible and new when it is complementary to the existing knowledge.

Contrary to the areas that were similar, the complementary gains did not raise any alarm among the employees in Alpha and Beta. There was some degree of reluctance to share, interact and welcome the employees from Beta in the initial stages. The feelings of reluctance and

uncertainty was mostly related to the rivalry of the two firms. This is somehow natural, since it takes time to get to know each other, and develop sufficient levels of trust in the new setting. However, there were fewer harmonization processes needed in the complementary areas, which resulted in simpler task and human integration processes. Consequently, lower levels of harmonization, allowing initiation of human integration in the complementary fields, led to higher levels of knowledge sharing and knowledge transfer in these areas.

## **6.2 Combining knowledge bases**

In this section we will provide a discussion and analysis of our findings related to the combination of knowledge bases of Alpha and Beta. As the combination of knowledge bases is the second component in our conceptual framework, the combination of knowledge is impacted by component one, which is technological acquisition. We expect that the degree of utilization of the aggregated knowledge bases of Alpha and Beta will further impact the overall innovation performance (third element in our conceptual framework) of the firm.

### **6.2.1 Articulation of knowledge and direction of knowledge transfer**

The distinction between explicit and tacit knowledge created by the respondents is consistent with the existing literature. Several scholars including Nonaka and Takeuchi (1995), Haasis et al. (2018) and Grant (1996) made the same distinction when talking about knowledge and knowledge transfer. It seems that a prominent amount of explicit knowledge had been transferred so far. The majority of this exchange seems to be in the areas where the knowledge bases of Alpha and Beta were complementary. This is natural since our findings indicate that complex and demanding harmonization processes have been required in areas which were similar and overlapping. In this acquisition, Alpha seemingly did not acquire Beta for the similarities, but for the complementarities. The acquisition added Beta's skills, knowledge, technology, competence and products into the existing portfolio of Alpha. Haasis et al. (2018) observed that acquiring firms often act as knowledge disseminators, while acquired firms adopt the role of knowledge absorbers.

*"These areas are new for Beta. So, I am pretty sure that there are loads of areas where many, many Beta employees have gained access to new knowledge" – R1*

In our case these findings, to some degree, match with the roles taken by Alpha and Beta. For many instances, in the fields of similarities, the existing offerings of Alpha were considered as



superior to Beta's, consequently leading Alpha to act as knowledge disseminators, and Beta as knowledge absorbers. However, Beta's similar offerings have been included in Delta's new portfolio in some areas, resulting in some degree of bi-directional transfer. Thus, in this case our findings resonate with the literature. On the other hand, in the fields where Delta's gains were complementary, the roles were reversed. This is quite natural since the additional knowledge was not a part of Alpha's business area prior to the acquisition. Alpha had no knowledge to transfer. Consequently, in these areas Beta acted as disseminators, while Alpha adopted the role as absorbers. In other words, in these areas the transfer was unidirectional. Again, matching the observations of Haasis et al. (2018).

### **6.2.2 Different factors affecting 'combining knowledge bases' in the acquisition**

From the interview transcripts, we have identified several factors mentioned frequently by the respondents. The most common factors were presented in chapter 5.2. In this section we will discuss and analyse the same factors, and how they are affecting the combination of the two knowledge bases.

#### **Communication**

In the literature review (chapter 2), we presented a clarifying definition of the distinction between tacit and explicit knowledge transfer made by Grant (1996, p. 111) saying that "tacit knowledge is revealed through its application, while knowledge is revealed by its communication". So far, our findings strongly indicate that the exchange of knowledge between Alpha and Beta was mainly explicit. Processes related to similarities (e.g., harmonization) and other factors such as, the covid-19 pandemic were restricting some of the focus towards combination of knowledge. Hence, this is somewhat natural. In the literature, Bartlett and Ghoshal (1989) highlighted the importance of communication in knowledge transfer. However, communication only acts as a facilitator for converting information into actual knowledge. Information does not become knowledge before it is utilized by individuals or organizations. This is what Cooley (1987) referred to as tangibility of knowledge.

Communication alone is not sufficient to convert the potential of the tacit component of knowledge into realized knowledge transfer. In many ways, what we have found is that Delta has been realizing high levels of knowledge transfer regarding explicit knowledge. Even with

restrictions such as harmonization and covid-19 pandemic, communication was enabling knowledge sharing and knowledge transfer of explicit knowledge. This is in line with the literature saying that explicit knowledge is revealed through communication (Grant, 1996). However, there seems to be a high degree of unrealized potential regarding the tacit element of knowledge, which is revealed through its application. In this regard, the rivalry, combined with focus on harmonization processes has hindered the application. Subsequently, this has impacted the combination of knowledge negatively.

### **Common culture**

Bartlett and Ghoshal (1989) indicated that there was a significant correlation between communication, visits, and rapid meetings with higher levels of knowledge transfer. Visits and meetings have been negatively impacted and been highly restricted by covid-19 pandemic. Furthermore, visits and meetings were significant contributors to creating a common culture. As our findings indicate that Delta was choosing 'route B' in the model of integration by Birkinshaw et al. (2000), the culture in Delta has not been yet unified. It is quite obvious that to enhance the likelihood of exploiting the full potential of the aggregate knowledge base, a unified culture would be helpful.

In other words, there are still cultural challenges that need to be addressed to create a sufficient level of trust and confidence among the employees from Alpha and Beta. This would consequently enhance the likelihood of exploiting a higher degree of the acquisition potential. Again, this is confirming previous literature. Without a sufficient level of human integration, there will be lower levels of trust among the employees (engineers, managers, and scientists), ultimately hindering (tacit) knowledge transfer. This is exactly what Birkinshaw et al. (2000) is saying, and what we observed in Delta.

### **Open mindset and involvement of leaders**

Furthermore, we found that in some instances there were some reluctances to share knowledge in the new setting. In this context the two firms were rivals prior to the acquisition. Hence, the reluctance might be natural. Some respondents from Beta revealed that they did not feel that Alpha entered the integration phase with an open mind, or with curiosity about the counterpart. Since there was a lack of proper communication from the top to mid-management, Beta's employees perceived that Alpha did not recognize the value that Beta could offer. Top

management obviously recognized the value of Beta, while some lower levels of the organization did not:

*“We were perceived much more as a threat, and we were not well received” – R8.*

Consequently, the context of the acquisition might have set a limitation to the degree of knowledge transfer. At least in the short term. With time, it will hopefully reduce the tension and reluctance among the former rival employees. This is an important area for Delta since the outcome of knowledge transfer is contingent upon the extent of effort made by the employees on both sides to let the combined knowledge flow (Zhou et al., 2020). In this regard, involvement of leaders can work as an important facilitator. Even though Alpha and Beta used to be competitors, still some parts of their knowledge bases are similar. This is in line with findings by Zhou et al. (2020), saying that similarity, or overlap in knowledge bases, is an important factor impacting the outcome success of knowledge transfer. As reported by one of the managers, the strategy of setting up teams with similar minded workers could ensure that the flow of knowledge increases, despite being prior rivals.

Another interesting aspect to how Delta was setting up teams, is within the mechanism of control. We observed biases in the mechanism for setting up new teams. None of the respondents mentioned any new teams consisting of only Beta employees. In all teams, even teams within fields where Delta had no prior experience, Alpha employees were included. It appears that Delta wanted Alpha's management in positions executing control. That can explain the imbalance in the newly created teams. That would also explain why Delta initiated a culture rollout that was almost identical to the Alpha culture.

Furthermore, moving managers and engineers around inside the organization was done to generate knowledge spillover and create different synergy effects. Interaction across units has been helpful to tear down 'silo'-mentalities, facilitating knowledge transfer, and ultimately increasing the innovation potential of the firm. However, there is also a negative aspect to moving employees around. Persistency is important for managers. High turnover in departments, teams and projects, will eventually set certain limitations regarding the level of novelty in e.g., new product development. If the people who invented or created a specific product moves on to another department, the potential of incrementally improving that specific product may decrease. This is a dilemma managers and organizations need to be aware of regarding innovation utilization.

## **Covid-19 pandemic**

The factor labelled covid-19 pandemic possesses the most unique characteristic of the factors we identified. What makes it distinct from the others is that covid-19 has a reinforcing effect on all the other factors, in a negative manner. It is also the only factor that is solely external, and completely impossible to avoid. What is also of importance is that even though every single firm in the world has been affected by the pandemic, it is hard to argue against the fact that the timing of the outbreak was disastrous for Delta. In addition to managing all the other conditions and high operational uncertainty, Delta also needed to address a complex integration of two rival organizations. When such disruptive events occur, the adaptability of the firm is of significant importance. This is what is referred to as the dynamic capability of a firm in the literature (Eisenhardt & Martin, 2000; Zahra & George, 2002). If the firm possesses higher degrees of dynamic capabilities than the competitors, it will enhance the likelihood of managing such exceptional external factors in a superior manner. Delta has been able to adapt in a satisfactory way. To replace physical meetings, visits etc., communication has been maintained through online communication platforms like Microsoft Teams and Zoom. Some managers have also arranged virtual gatherings to continue the integration process:

*“So, we decided to run the ‘Alpha Marathon’ – virtually. There were participants from all our locations around the world” – R9.*

However, covid-19 pandemic has restricted the combination of knowledge significantly. Unfortunately, in a negative way.

## **Employee retention**

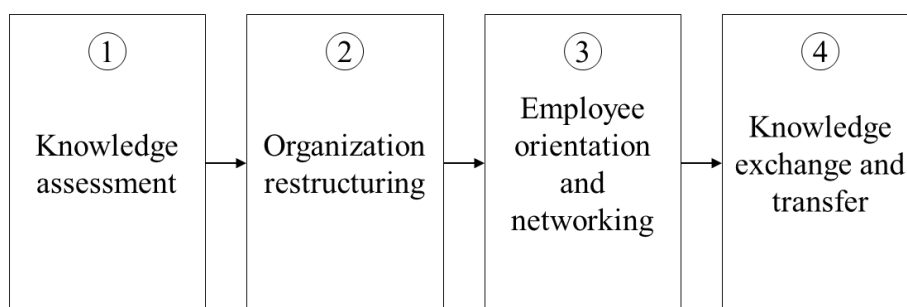
In most acquisitions the acquirer expects that some number of employees will not join the new firm. Therefore, it is important to retain the most critical employees. These employees often possess knowledge and competences that are tacit, and therefore not easily transferable. Hence, if these employees leave, the tacit information leaves with them. This is not necessarily the case for explicit knowledge. Explicit knowledge is easier, not just to understand, it is also accessible through manuals, documents etc., and therefore not lost when the employees who have created them leave. In the case of Delta, management had to choose which products to harmonize out, and which ones to keep due to some level of similarity and overlap.

If we go back and look at the graphical representation of Delta’s gains from the acquisition in figure 5, our findings are indicating that most employees who left were in the red areas (e.g., similar and overlapping). In other words, these employees were affected by the harmonization processes. On the other hand, employees in the complementary (green) areas were not. Thus, we have identified a clear connection between Delta’s choice of integration ‘route’, and the overall potential to exploit the acquired knowledge. It is obvious that at least some part of the potential knowledge utilization was restricted by the fact that some key personnel in similar areas left.

This matches perfectly with findings of Bauer, Schriber, Degischer, and King (2018) which states that key employees tend to leave when changes are too disruptive. A higher retention rate of key personnel could have further improved the performance rate in the acquisition (Kiessling, Harvey, & Moeller, 2012). When a firm loses highly competent personnel, there is a triple negative effect. First, the focal firm loses out on the knowledge possessed by these individuals. Secondly, it is hard to find adequate replacements. And lastly, the knowledge possessed by the individuals become available to competitors.

### 6.2.3 The different activities for combining knowledge bases

During the data analysis we identified various activities and initiatives taken by Delta for combining the two knowledge bases. Further, we identified links between the initiatives, which we then organized in sequential manner. Thus, a process for combining knowledge bases emerged. The process is described in the figure 6 below. However, the process of combining knowledge is not linear in nature, resulting in an interconnectedness between the different steps. To simplify the complexity in the process, although we acknowledge that this is not linear in nature, we choose to illustrate it as a step-by-step sequence.



*Figure 6: Process for combining knowledge bases at Delta*

Wang et al. (2004) described knowledge transfer in M&A to be a systematic process for exchanging information and skills. This is exactly what we identified. In the literature we have not found any clarifying model explaining this process. Therefore, we created a model presenting the subsequent steps relevant for Delta as they aimed to combine the two knowledge bases.

Transferring explicit knowledge which is formalized and codified is comparatively easier and it happens through the exchange of data, technical specifications, manuals, universal principles, patents and engineering drawings (Haasis et al., 2018). This was also the case for Delta. However, exchanging and sharing knowledge that is embedded within the employees (i.e., tacit), proved to be more challenging and difficult for Delta.

## **1. Knowledge assessment**

The first step in the process is assessing knowledge of both acquiring and acquired firms. Alpha assessed the knowledge base of Beta, and also conducted a corresponding internal analysis before merging the two firms. This was the starting point where Delta knew what they could expect from the acquisition. Consequently, they could address their shortcomings from reaching their ambition:

*“We were doing an exercise where we were checking what kind of skills we had, and where we had gaps. We were making a complete analysis over this. Making a database. Then we wanted to look at the strategic future plans and then see, okay for the next five years, we go in that direction. And this is what we currently have, and the gap is here, so we compared it to what we wanted it to be in the future” – R9.*

The first step in the process was crucial to put the right people in the right places. Putting the right people together is important for creating an environment where the employees understand each other. When people understand each other, they often become interested in the counterpart, and subsequently start sharing and receiving knowledge. This step is supported by literature as Minbaeva et al. (2014) mentioned that the identification of knowledge is the start of the knowledge transfer process. To sum up the first step; acquiring firms should not only assess their own knowledge base, but also the knowledge base of the acquired firm in advance.

## 2. Organization restructuring

In order to put the right people in the right places, changes were made in the organizational structure of Delta. This restructuring was done based on the initial knowledge assessment. Restructuring helped to ensure that the new knowledge and competence were capitalized:

*“In my experience, moving people around, into the right places is maybe the most effective way of sharing knowledge” - R11.*

This response demonstrates the importance of having a dynamic organization to create knowledge synergies across departments. It is important to place employees together who will be able to comprehend each other's knowledge, utilize the aggregated potential and work together. If employees with similar backgrounds, knowledge and competences are put together, they should be able to comprehend and share knowledge more effectively. However, that is not always the case in reality. What happened in some areas of Delta was that similarities in products and products created overlaps and consequently, a competitive environment. Also, employees felt insecure and had less motivation to share knowledge and work together. Our findings show that restructuring works better when it is done based on complementary knowledge and competence. For instance, the navigation segment in Delta did not have any overlaps. Here the restructuring worked very well. In this regard, one respondent stated:

*“The key point here is that there was no competition between the products. So, they (the employees who were put together from Alpha and Beta) saw the benefit of using each other and that way it just went to be an adventure to be honest. Right now, it is a strong, good team, they see the benefit of each other, and cool stuff is coming from these people” – R9.*

Thus, this indicates that when the gain from the acquisition is more complementary, restructuring the organization facilitates knowledge transfer, which consequently increases the innovation potential.

However, this might not be the case in similar areas. Based on our findings, we argue that in acquisitions with high levels of similarities and overlaps, employees in the merged entity will find that they encountered the same issues in their previously affiliated organization. This argument is in line with Makri et al. (2010) who stated that similarities do not help in enriching the innovation capability as the employees will address these problems with solutions which

are close to the existing solutions. Hence, it does not facilitate innovation potential in the same way as for complementary gains.

### **3. Employee orientation and networking**

Once the organizational restructuring was handled, employees in Delta were provided with the opportunity to mix and get to know each other. This is how the actual knowledge sharing started:

*“Involving employees as early as possible to understand the capabilities within the organization is the best way to understand how you can utilize the total organization in the future” – R1.*

Employee orientation and networking enhanced the probability to produce positive results. This was a mechanism to let employees get to know their co-workers, their skillset and their expertise. Using employee orientation and networking to create interfirm relations is supported by the findings of Seligman (2011) saying that positive relations are the pillars of human wellbeing. Consequently, it was possible to exchange knowledge and ideas, and thereby utilizing the competence potential:

*“As people are getting to know each other, they are really being able to take strength from each other, and the experience base that they represent” – R11.*

In an acquisition, the acquiring firm has the responsibility to facilitate employee orientation and networking. Therefore, before starting to mix-up the employees of the acquiring and acquired firms, the acquiring firms need to prepare their own employees and clarify objectives and roles. Ultimately, this will motivate the employees to get acquainted and share knowledge.

Covid-19 pandemic disrupted the employee orientation and networking in Delta since employees could not travel, nor meet physically. Physical meetings are an important social element because physical meetings increase trust and confidence among the employees. Consequently, these meetings facilitate building effective working relations. The pandemic suddenly hindered all forms for physical meetings. Despite restructuring and putting employees from both firms together, employees will not share knowledge with each other without having strong working relations. Thus, the innovation potential in the merged entity will be hampered.



#### **4. Knowledge exchange and transfer**

During the interview process the respondents appeared to talk about knowledge sharing – as knowledge transfer. The distinction between the two concepts is blurry and are hard to grasp even for scholars. In the literature, knowledge sharing, and knowledge transfer are mentioned interchangeably. However, according to Tangaraja et al. (2016) knowledge sharing is just a subset of knowledge transfer. The three first steps in the knowledge transfer process mostly cover the knowledge sharing aspect. We argue that even though Delta restructured their organization based on their knowledge assessment, and thereby tried to facilitate employee orientation and networking, they did not ensure that the knowledge was fully transferred.

With that said, the incorporation of external knowledge has to some degree been successful in Delta. The employees recognize the benefits of breaking down ‘silo-mentalities’, working together and creating knowledge synergies. However, to be able to utilize the skillsets, knowledge and competence of every single employee fully, there is a recognition that a new re-mapping process needs to be conducted in some departments. In other words, there seems to be an awareness and willingness to do things differently to realize a higher degree of the acquisition potential. This is in line with the findings of Zahra and George (2002), saying that successful firms are expected to target and relocate their internal knowledge. Thereby, the firm can utilize its knowledge to enhance current initiatives or to encourage new initiatives within the firm.

Employees in Alpha and Beta have shared and exchanged knowledge. However, cognitive understanding and the ability to apply the knowledge are needed to fully complete the knowledge transfer (Schwartz, 2006). This is what we have referred to as ‘absorptive capacity’ in our literature review. We argue that the combination of the two knowledge bases in the acquisition will increase the innovation potential. In other words, fully utilizing the aggregated knowledge bases will lead to increased innovation performance. However, only when the shared and exchanged knowledge is applied in the new context.

Our findings suggest that Delta has a high degree of potential absorptive capacity. However, there are lower levels of realized absorptive capacity at this point. This is further supported by our findings saying that there have been high levels of knowledge sharing, while the level of knowledge transfer is not fully realized. Particularly for the tacit component. The required

cognitive understanding is considered lower for explicit knowledge, explaining our findings that there has been some knowledge transfer of the explicit component.

However, in some instances the ability to understand and apply the new knowledge, seems to be missing for the tacit component. In the areas where Alpha and Beta were complementary, this gap is supported by Cohen and Levinthal (1990, p. 128) who claimed that a firm's ability to evaluate and utilize external knowledge is largely a function of prior related knowledge. It might be challenging to do in reality, but maybe Alpha should have exposed their employees to the complementary knowledge they knew they were getting (identified through mapping processes), to enhance the knowledge accumulation probability. Regardless, this is suggested by scholars such as Cohen and Levinthal (1990) and Reagans and McEvily (2003).

When comparing our findings with the literature, there are some mismatches. We know that there are factors (e.g., external forces, harmonization etc.) affecting knowledge transfer negatively. However, these factors are not new to the literature. Furthermore, Delta possesses several characteristics that should facilitate a higher degree of knowledge transfer. The cognitive understanding required to ensure knowledge transfer, or assimilation of knowledge, is already in place. Delta's employees are well educated and possess some level of similar knowledge and competences. Furthermore, Alpha did an extensive mapping prior to the acquisition, and corresponding changes to the organization. But still, the potential is not utilized:

*“We have not had the ‘knowledge transfer’ that we hoped for” – R9.*

So, why are our findings distinct from the literature? Our answer to this question takes us back to the prior rivalry. In the literature there was no mention of the element of rivalry in regards of absorptive capacity. However, in technological acquisitions it appears to be of significant importance. If the acquirer perceives themselves as superior to the acquired firm in some areas, maybe they do not want to use the acquired knowledge? That would at least to some extent explain the gap between potential and realized knowledge transfer.

Our findings demonstrate that without a satisfactory level of absorptive capacity, a firm will not be able to transfer, and therefore not utilize the potential of the aggregated knowledge through an acquisition. According to Jo et al. (2016), this is exactly why firms engage in TAs; to create more innovation by absorbing the knowledge of the acquired firm. When the

knowledge potential is restricted by the firm's absorptive capacity, ultimately the innovation potential from the acquisition will not be fully exploited.

## **6.3 Innovation performance**

In this section we will provide a discussion and analysis of our findings related to the innovation performance of Delta. This is the final component in our conceptual framework, and therefore expected to be impacted by the previous step, which is combining the two knowledge bases of Alpha and Beta. In the first subsection we analyse measurement of innovation performance in Delta. Followingly, we discuss how the innovation rate is impacted by elements of the acquisition. Finally, we discuss the differences regarding approaches towards innovation in Alpha and Beta, and how this is affecting the innovation outcome in Delta.

### **6.3.1 Measurement of innovation performance**

Our findings showed that Delta does not apply any holistic measurement term, scale, or tool to measure innovation performance. They do not use any firm level KPIs such as, patents to measure innovation. One respondent identified this measurement gap and suggested that innovation performance should be measured throughout the entire 'lifeline' of the innovation process:

*"I think it should be measured in several ways along the 'line'. It starts in the sky, as something abstract. People talking together by the coffee machine, saying 'why don't we do it like this, and that'. So, we have to measure how we facilitate people to actually sit together and talk about innovation, creating new ideas. The next is to say okay, how many registered new ideas are there in our system, and do we have a system for that? Have we built up our portfolio of what we call 'phase 1-reports'? That is an idea report. How many ideas have we produced in the last year? And then the next step along the line is to measure how many products, or solutions, have we actually developed. How does the roadmap look, and is it more complete?" – R8.*

In other words, our findings are not completely matching the literature. According to Han et al. (2018), a variety of researchers in the field of innovation and innovation performance have presented findings that support the use of patents as a firm KPI when measuring innovation performance. Patents were collectively accepted as a way of measuring innovation

performance since they in many cases objectively reflect the technical capability of a firm's R&D output in the same industry (Ma & Liu, 2017).

There are several factors that can explain this contradiction. The patenting process is considered time- and resource consuming. Also, patents do not always seem to hold up very well in reality. One respondent visualized this problem by asking how we can tell the "Chinese Tesla" apart from the original Tesla: "*We can't*" – R2. The fact that Delta is highly software-oriented represents an opportunity to "hide" critical information inside their own software. Furthermore, Delta uses PowerPoint-presentations in places like Nor-Shipping. This is done so that when a competitor files for a patent, they can block the patenting process saying: "*This is our idea – not yours*" – R2.

These methods are considered cost efficient ways of staying ahead, without the expenses of the patenting process. It is also interesting that Beta, which used to be more mechanical-oriented compared to Alpha, used patents to a larger extent than Alpha, and now Delta. The software-orientation of Delta seems to create opportunities for "hiding" critical information through 'coding' in a superior way compared to mechanical-oriented firms.

### **6.3.2 The rate of innovation**

As described in different sections earlier, there were several areas where Alpha and Beta had similar, related and overlapping technology and products. Followingly, these similarities had to be addressed through various harmonization processes. As these processes were dealt with in the initial stages of pre-acquisition stages, they consequently impacted the innovation outcome in a negative manner. There may not be any clear direct links between harmonization and innovation performance. However, there is a concomitant effect throughout our framework. Product and system similarities forced Delta to handle the harmonization processes. Focus on task integration in the initial stages neglects the human integration aspect and consequently, setting limitations for the combination of knowledge. Hence, there is no direct link between harmonization and innovation performance, however harmonization has a subsequential effect on innovation performance. Even though the innovation potential of a firm is expected increase when the aggregated knowledge available to the firm increases, the realization is dependent on the effort towards exploiting the existing potential:

*“I would say that bringing more people in and together, and having new views, has a potential for being or giving more innovation. But it's not automatic. It doesn't come by itself, it needs to be, you have to have the right attitude, and put together the right people. And be allowed to do the right thing” – R11.*

When firms need to focus on non-innovative areas the innovation outcome can be negatively affected, particularly in the short run. The decreased rate of innovation in Delta is in line with findings from Colombo and Rabbiosi (2014) who identified a strong negative direct link between technological similarities and post-acquisition outcome. Having said that, Meglio (2009, p. 104) emphasized the aspect of time in her definition of innovation performance saying that “innovation performance is the long-term gains resulting from technology-driven M&As through inventing new product- and process related technologies”. Considering the complexity of the products Delta are producing, it is obvious that innovation and commercialization of new products will take time. The shared entity has not existed for more than three years. So, there is still a great possibility regarding innovation potential and innovation performance for Delta in the years to come.

### **6.3.3 Difference in approaches towards innovation**

It was obvious that the respondents from Alpha and Beta were used to two distinctively different innovation cultures. Michaelis, Aladin, and Pollack (2018, p. 117) defined innovation culture as “the values, beliefs, assumptions, and symbols in an entrepreneurial venture that facilitate activities including, but not limited to, the pursuit of novel products, services, and/or production processes”. The overall agreement among the respondents was that Alpha were more reactive, while Beta had a proactive innovation culture. What is particularly interesting is when analysing and comparing answers between Alpha and Beta respondents’, it seems that both sides consider their “own” approach as superior. Respondents from Beta stated that processes were slow, and characterized by higher levels of bureaucracy in Alpha, while respondents from Alpha were talking about their own approach and products as more “mature” compared to Beta. Based on the context of these responses it seemed to us that stating that “our products are more ‘mature’” was a nicer way to say that Alpha in some areas expected much more from the acquisition, compared to what they got. While some were obviously ‘sugar-coating’ their answers, others were much more direct:

*“You expect that you buy something that is complete, and you can just put it out into the market. You can inherit, and then you carry on. But it's not like that. You buy something, and then you have to clean up the closet” – R8.*

Since Alpha and Beta were rivals prior to the acquisition, it is not very hard to understand the opposition to each other's approach. To draw a parallel to the world of sports; how many teams competing in the same league, consider themselves inferior to their rivals? In rivalries, objectivity is not the dominant factor. In terms of financial performance, it is hard to argue that Alpha's business approach is not superior to Beta's. Alpha was, and Delta is, performing very well financially. On the other hand, Beta were struggling intensely. Again, this is contradictory to parts of the literature. Michaelis et al. (2018) found that firms with more 'aggressive' innovation culture usually have higher sales and profits. However, financial performance is also impacted by numerous other factors, not solely on how the employees are approaching innovation. In the literature there are findings saying that by using the superior innovation capability of one of the merged firms, innovation capability can be enhanced (Capron, 1999).

In this case, Beta's approach might have been too proactive, while Alpha's approach was too reactive. Respondents on both sides concluded that the incorporation and integration of the two different innovation cultures could improve the innovation performance of the shared entity in the future:

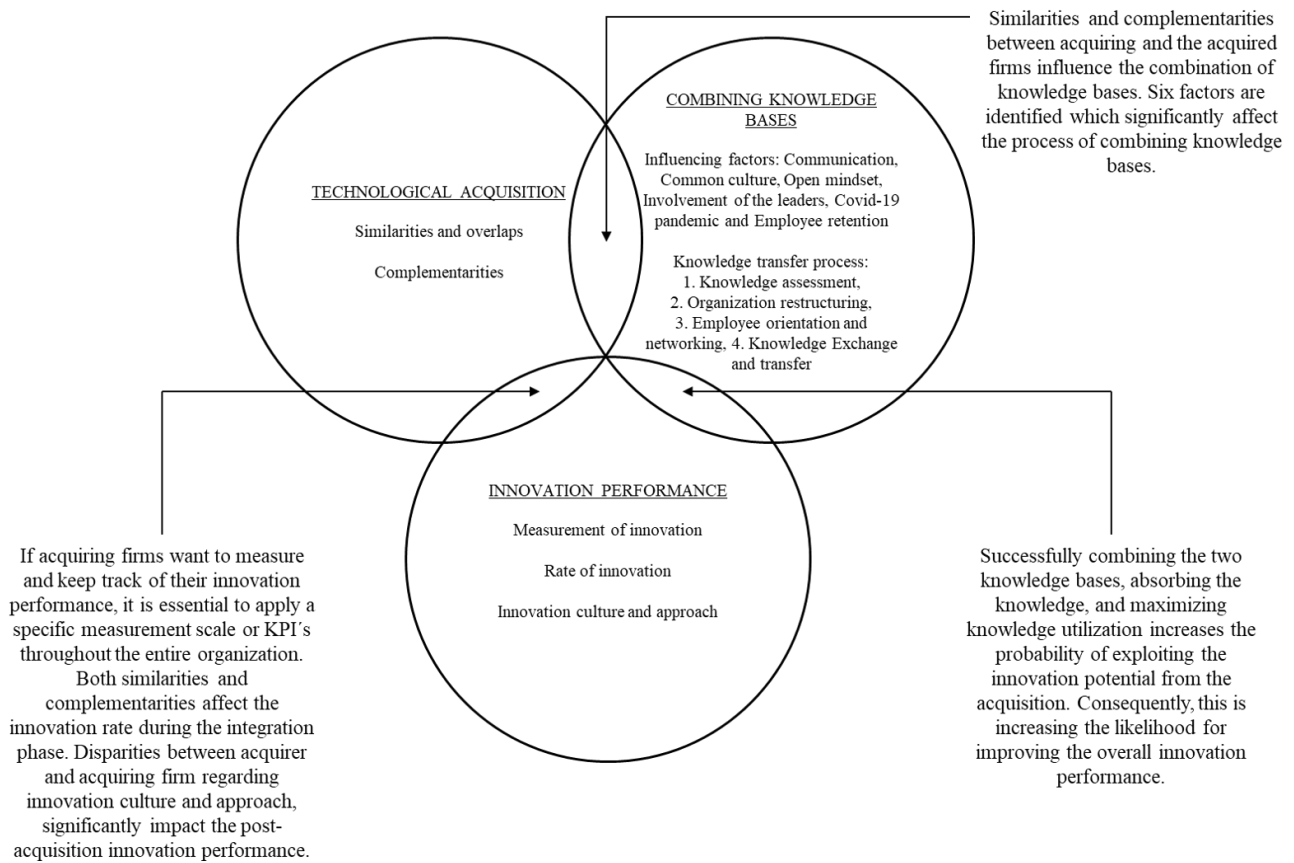
*“So, if we combine these two (referring to culture) together, and work together, maybe we even have everything we need today. And to be honest, I don't think we have succeeded with that 100%, but we are on our way” – R9.*

Three years into the post-acquisition phase many non-innovative tasks have been addressed, handled and processed. Several of these tasks will continue to require focus and resources in the upcoming years. However, when these resource consuming activities require less and less attention subsequently, Delta possesses vital resources (human and financial capital) to redirect attention to core innovation activities. Availability of funding was already in place before the acquisition of Beta, and the acquisition has additionally added human resources and higher innovation potential due to the increased aggregate knowledge base. Increased complementarity in products and knowledge should also provide Delta with the opportunity to enhance their innovation performance in the unforeseen future.

### **6.3.4 Summary**

To better visualize our overall findings and the outcome of the above discussion, we have created a figure that summarizes the most significant elements of the thesis. This illustration is presented on the next page in figure 7. We have placed the key findings inside our conceptual framework and added an outline from the discussion regarding how the elements of our framework intervene. Furthermore, we will provide a short elaboration regarding how the elements in the framework impact innovation performance.

What we have identified is that when acquiring and acquired firms have high degrees of similarities in products and systems, this impacts innovation performance negatively. This is because similarities require more focus on task integration and thereby neglecting human integration, making it difficult to exchange and transfer knowledge. For complementary gains, evidence indicates that complementarity in systems, products and knowledge facilitates the combination of knowledge bases which ultimately increases the potential for innovation performance through e.g., new product development. Successfully combining the two knowledge bases has a significant impact on innovation performance of the merged entity. We have identified several factors and a process that impact and are required to enhance the likelihood of utilizing the knowledge potential. If the acquired knowledge is not successfully transferred, just shared, the firm will not be able to increase its innovation performance fully. Also, in the last element there are factors that would make it easier to keep track of the innovation performance of the firm. For instance, direct measurement by applying innovation specific KPI's will help the firm to monitor its own performance.



*Figure 7: Summary of the research*



## **Chapter 7.0: Conclusion, Implications and Further Research**

In this chapter, first we present our conclusion. This is followed by the theoretical contribution and managerial implications. Finally, we highlight the limitations and our suggestions for further research.

### **7.1 Conclusion**

During the past six months we have focused most of our energy towards putting ourselves in the best possible position to answer the following question:

*“How does a technology acquisition strategy impact innovation performance?”*

In the case we studied, the acquiring and acquired firm operated in the same industry and were rivals prior to the acquisition. In other words, to enhance their own position in the market for the future, they found it strategically fit to acquire a rival that was operating in the same industry. Consequently, this forced the firm to handle several harmonization processes in areas where the two firms had high levels of similarities. When a firm acquires a firm with similar and overlapping products and systems, these processes need to be handled at some point. However, they do not need to be addressed first. If the firm chooses to focus on task integration (e.g., operations), and thereby to some degree neglect human integration (e.g., creating a common culture), there will be a subsequent effect on innovation performance. Innovation is driven by knowledge. And by neglecting the human aspect regarding integration, the observed firm set certain limitations to the combination of knowledge bases and knowledge transfer. So, what we have observed is that when a firm chooses a technological acquisition strategy that requires complex handling of operations in the initial post-acquisition stages, this impacts the innovation performance negatively.

### **7.2 Theoretical contribution and managerial implications**

#### **Theoretical contribution**

The findings of this study contribute to IB literature within the streams of M&A by exploring how technological acquisitions impact the innovation performance of a firm. The research findings demonstrate that similarities and complementarities between the acquiring and acquired firms affects the knowledge assimilation in the merged entity and subsequently

impacts the innovation performance. In the existing literature, it is documented that similarities impact post acquisition innovation performance negatively (Colombo & Rabbiosi, 2014), while complementarities can drive innovation (Grimpe & Hussinger, 2014). However, the literature fails to acknowledge how knowledge transfer is impacted from this distinction between similarities and complementarities. Our research emphasizes the knowledge transfer perspective, since knowledge is a driver for innovation. This study provides empirical evidence of how similarities and complementarities influence task and human integration in the post-acquisition phase, which again is interconnected with knowledge transfer.

Moreover, this study contributes significantly to the existing literature by identifying specific steps in the process for combining knowledge bases. Previous studies that focus on knowledge transfer in acquisitions, have termed knowledge transfer as a process (Minbaeva et al. (2014); Wang et al. (2004)). However, no step-by-step process is mentioned. Our findings are consistent with the existing literature within IB. Still, we manage to contribute by providing more holistic understanding of this process. In particular, this study is unique in the way that it covers how the step-by-step process can be applied for improving innovation potential in the merged entity. Our findings indicate that technological acquisitions and innovation performance do not have a straight-forward link. Rather it is dependent on the accumulation, assimilation and realization of the acquired knowledge in the new combined entity. The process we have identified also integrates the concept ‘Absorptive capacity’ introduced by Cohen and Levinthal (1990) and explains how accumulation, assimilation and realization of acquired knowledge impact the post-acquisition innovation performance. Our findings strongly indicate that when the involved firms are competitors in the same industry, assimilation of knowledge is affected negatively. Even though the cognitive understanding is in place, the prior rivalry acts as a hindrance to knowledge transfer.

Additionally, this study specified six key factors that are crucial for the process of combining knowledge bases, which again is essential in realizing the innovation potential from the acquisition. Unlike previous research that has focused on identifying either critical success factors in pre- and post-acquisition phase (Gomes, Angwin, Weber, & Yedidia Tarba, 2013) or facilitators of international knowledge transfer in acquisitions (Birkinshaw et al., 2010), the identified factors in our study are not solely inclined towards successes. The factors we have uncovered consist of both facilitators as well as hindrances regarding knowledge assimilation

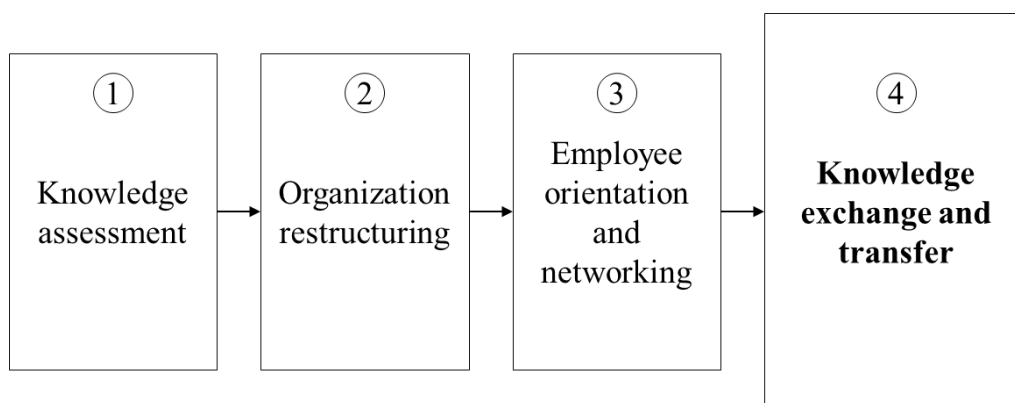
in acquisitions. Our findings also include some factors that were not previously mentioned in the literature, one of them being a recent global phenomenon: the Covid-19 pandemic.

## Managerial implications

Our findings have implications for managers in firms considering technological acquisitions.

First, firms should be very careful when considering acquiring competitors operating in the same industry. The motives behind such acquisitions must be clarified in advance. By acquiring competitors from the same industry, the probability of getting similar and overlapped technology and knowledge increases. Therefore, if the motivation is to drive innovation performance, managers should search for complementary gains from the acquisition. Characteristics of the gains, either similar or complementary, influences the subsequential knowledge transfer process, which further impacts exploitation of the innovation potential.

Second, managers should be aware and pay close attention to the knowledge combining process that we have identified. We have closely reviewed over sixty papers and none of them mentioned this process. Again, we want to highlight our contribution in this regard. Although the entire process is important, the last element in this process, referred to as ‘Knowledge exchange and transfer’ (in figure 6 below), is of higher significance for managers involved in integration, especially for the cases of technological acquisition involving rivals.



*Figure 6: Process for combining knowledge bases at Delta*

The last element is the most significant since it is also the hardest to achieve. Managers can perform knowledge assessment quite easily through verbal communication. Also, there are several knowledge management systems available to aid knowledge assessment. Decisions regarding organization restructuring that can easily be taken by managers, also depend on the

characteristics of the employees. The last two steps need the most focus. Managers can create an environment to facilitate employee orientation and networking where people can exchange and share knowledge. However, it is much harder to actually implement the knowledge into the new setting. This is because just creating an environment for knowledge sharing does not guarantee that knowledge will actually be transferred. Furthermore, employees also need to have the cognitive ability to utilize the knowledge. While the other elements are facilitating innovation performance, the last step realises innovation.

Third, our study identified several factors that influence the process of combining different knowledge bases. Some of them are communication, employee retention and creating a common culture. Managers involved in the integration phase need to make sure that there is sufficient communication throughout the entire organization. Identifying and retaining key employees who possess valuable tacit knowledge is critical for firms who aim to foster innovation. By creating a common organizational culture in the initial stages, managers will enhance the likelihood of acquisition success.

Fourth, our findings suggest that a firm's ability to exchange and transfer knowledge is dependent on the absorptive capacity. Therefore, an internal analysis of the firm's absorptive capacity should be conducted prior to the acquisition. Consequently, the firm can make necessary adjustments to its organization accordingly.

Finally, to realize the full innovation potential, firms should have innovation specific KPIs. It is well documented in the literature that if firms do not use any form for measurement, it is really hard to control the performance level in these areas.

### **7.3 Limitations and further research**

This section presents the limitations of the study. Presenting limitations provides the readers the opportunity to evaluate the study's quality. Followingly, suggestions for future research scopes are presented.

We have applied a qualitative method in our thesis by conducting a case study. Thus, the applied method restricts generalization of our findings. However, we did not intend to generalize our findings to a wider population. Rather, we wanted to develop a conceptual framework that explains how technological acquisition impacts a firm's innovation performance. Furthermore, we wanted to provide explanations that support other researchers'

findings using the same approach. Even though our findings are supported by previous literature, the fact that the sample is a single case study, limits the generalizability of our findings. We would suggest increasing the number of cases in order to increase the literal replication. This could be done by e.g., increasing the number of the cases. Preferably, in the same industry. This would ensure that our results are significant and increase the applicability of our conceptual framework.

Moreover, in our study, the respondents could not give us any specific numbers that clearly indicated that the innovation performance in Delta was either increasing or decreasing. Their responses were based solely on their personal perceptions regarding the current innovation rates in Delta, compared to their previously affiliated firms. Furthermore, Delta did not use any measurement scale or KPI's for measuring innovation performance. Consequently, measurement of innovation became highly subjective. Also, innovation performance is often considered long-term output. In other words, it takes time to realize the potential. Although a considerable amount of time has passed since the acquisition (2,5 years), the nature of innovation and innovation performance might require that studies focusing on the same output should not be conducted before at least 5-7 years have passed.

It is also necessary to further investigate the context of our study to validate our findings. We have justified our methodological choices elaborately and attached the interview guide in appendix 2. Hence, the same methods and questions can be used for validation purposes in future studies.

In our study we analyzed how similar and complementary gains impact the acquisition. We have also presented the impact these characteristics have on a firm's innovation performance. However, it would be interesting to go in-depth, investigating a firm's underlying motivation to gain similar and/or complementary technology and knowledge. Furthermore, there seems to be a gap in IB investigating which extent of similarity and complementarity between the acquiring and acquired firm is beneficial for increasing different acquisition outcomes.

Finally, we have presented a simplified knowledge exchange and transfer process based on our findings. However, this process might have other mediating elements which researchers can further investigate.

## List of references

- Adams, John, Khan, Hafiz T. A., & Raeside, Robert. (2013). *Research Methods for Business and Social Science Students*. New Delhi: New Delhi: SAGE Publications.
- Ahuja, Gautam, & Katila, Riitta. (2001). Technological Acquisitions and the Innovation Performance of Acquiring Firms: A Longitudinal Study. *Strategic management journal*, 22(3), 197-220. doi:10.1002/smj.157
- Ajith Kumar, J., & Ganesh, L. S. (2009). Research on knowledge transfer in organizations: a morphology. *Journal of knowledge management*, 13(4), 161-174. doi:10.1108/13673270910971905
- Aminova, Elena. (2016). Forecasting potential innovation activities in high-tech industries triggered by merger and acquisition deals: a framework of analysis. *European journal of futures research*, 4(1), 1-18. doi:10.1007/s40309-016-0086-0
- Bartlett, CA, & Ghoshal, S. (1989). *Managing Across Borders*, Harvard Business School Press, Boston. In.
- Bauer, Florian, Matzler, Kurt, & Wolf, Stefan. (2016). M&A and innovation: The role of integration and cultural differences—A central European targets perspective. *International Business Review*, 25(1), 76-86.
- Bauer, Florian, Schriber, Svante, Degischer, Daniel, & King, David R. (2018). Contextualizing speed and cross-border acquisition performance: Labor market flexibility and efficiency effects. *Journal of World Business*, 53(2), 290-301. doi:10.1016/j.jwb.2018.01.001
- Birkinshaw, Julian, Bresman, Henrik, & Håkanson, Lars. (2000). Managing the post-acquisition integration process: How the human iintegration and task integration processes interact to foster value creation. *Journal of management studies*, 37(3), 395-425.
- Birkinshaw, Julian, Bresman, Henrik, & Nobel, Robert. (2010). Knowledge transfer in international acquisitions: A retrospective. *Journal of international business studies*, 41(1), 21-26. doi:10.1057/jibs.2009.71

- Björkman, Ingmar, Stahl, Günter K, & Vaara, Eero. (2007). Cultural differences and capability transfer in cross-border acquisitions: The mediating roles of capability complementarity, absorptive capacity, and social integration. *Journal of international business studies*, 38(4), 658-672.
- Boeije, Hennie. (2010). *Analysis in qualitative research*. Los Angeles: SAGE.
- Bowen, Glenn A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative research journal*, 9(2), 27-40. doi:10.3316/QRJ0902027
- Bresman, Henrik, Birkinshaw, Julian, & Nobel, Robert. (1999). Knowledge Transfer in International Acquisitions. *Journal of international business studies*, 30(3), 439-462. doi:10.1057/palgrave.jibs.8490078
- Brinkmann, Svend, & Kvale, Steinar. (2015). *InterViews : learning the craft of qualitative research interviewing* (3rd ed. ed.). Thousand Oaks, Calif: Sage.
- Cai, Li, Liu, Qing, Deng, Shengliang, & Cao, Dan. (2014). Entrepreneurial orientation and external technology acquisition: an empirical test on performance of technology-based new ventures. *Journal of Business Economics and Management*, 15(3), 544-561. doi:10.3846/16111699.2013.770786
- Calipha, Rachel, Brock, David M, Rosenfeld, Ahron, & Dvir, Dov. (2018). Acquired, transferred and integrated knowledge: a study of M&A knowledge performance. *Journal of Strategy and Management*.
- Capron, Laurence. (1999). The long-term performance of horizontal acquisitions. *Strat. Mgmt. J*, 20(11), 987-1018.
- Carmeli, Abraham, & Tishler, Ashler. (2004). The relationships between intangible organizational elements and organizational performance. *Strategic management journal*, 25(13), 1257-1278.
- Cassell, Cathy, Cunliffe, Ann L., & Grandy, Gina. (2017a). *The SAGE Handbook of Qualitative Business and Management Research Methods: History and Traditions* (Vol. 1). London: London: SAGE Publications.

- Cassell, Cathy, Cunliffe, Ann L., & Grandy, Gina. (2017b). *The SAGE Handbook of Qualitative Business and Management Research Methods: Methods and Challenges* (Vol. 2). London: London: SAGE Publications.
- Cassiman, Bruno, Colombo, M., Gerrone, P., & Veugelers, Reinhilde. (2005). The impact of M&A on the R&D process. An empirical analysis of the role of technological and market relatedness. doi:10.1016/j.respol.2005.01.002
- Charmaz, Kathy. (2014). *Constructing grounded theory* (2nd ed. ed.). London: Sage.
- Cloodt, Myriam, Hagedoorn, John, & Van Kranenburg, Hans. (2006). Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. *Research policy*, 35(5), 642-654. doi:10.1016/j.respol.2006.02.007
- Cohen, Wesley M., & Levinthal, Daniel A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative science quarterly*, 35(1), 128-152. doi:10.2307/2393553
- Colombo, Massimo G., & Rabbiosi, Larissa. (2014). Technological similarity, post-acquisition R&D reorganization, and innovation performance in horizontal acquisitions. *Research policy*, 43(6), 1039-1054. doi:10.1016/j.respol.2014.01.013
- Cooley, Mike. (1987). Architect or bee? The human price of technology (Second). In: London: Hogarth Press.
- Cummings, Jeffrey L., & Teng, Bing-Sheng. (2003). Transferring R&D knowledge: the key factors affecting knowledge transfer success. *Journal of engineering and technology management*, 20(1), 39-68. doi:10.1016/S0923-4748(03)00004-3
- Danis, Wade M, & Shipilov, Andrew. (2012). Knowledge acquisition strategies of small and medium-sized enterprises during institutional transition: Evidence from Hungary and Ukraine. *Thunderbird international business review*, 54(3), 327-345.
- Das, Arindam, & Kapil, Sheeba. (2012). Explaining M&A performance: a review of empirical research. *Journal of strategy and management*, 5(3), 284-330. doi:10.1108/17554251211247580



- Deng, Ping. (2010). What determines performance of cross-border M&As by Chinese companies? An absorptive capacity perspective. *Thunderbird international business review*, 52(6), 509-524.
- Eisenhardt, Kathleen M, & Martin, Jeffrey A. (2000). Dynamic capabilities: what are they? *Strategic management journal*, 21(10-11), 1105-1121.
- Ghauri, Pervez N., & Grønhaug, Kjell. (2005). *Research methods in business studies : a practical guide* (3rd ed. ed.). Harlow: Financial Times Prentice Hall.
- Gibbs, Graham, & Flick, Uwe. (2007). *Analyzing qualitative data*. London: SAGE.
- Gomes, Emanuel, Angwin, Duncan N., Weber, Yaakov, & Yedidia Tarba, Shlomo. (2013). Critical Success Factors through the Mergers and Acquisitions Process: Revealing Pre- and Post-M&A Connections for Improved Performance. *Thunderbird international business review*, 55(1), 13-35. doi:10.1002/tie.21521
- Grant, Robert M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal*, 17(S2), 109-122.
- Grimpe, Christoph, & Hussinger, Katrin. (2014). Resource complementarity and value capture in firm acquisitions: The role of intellectual property rights: Resource Complementarity and Value Capture. *Strategic management journal*, 35(12), 1762-1780. doi:10.1002/smj.2181
- Guba, E.G., & Lincoln, Y.S. (1981). *Effective Evaluation: Improving the Usefulness of Evaluation Results Through Responsive and Naturalistic Approaches*: Wiley.
- Haasis, Timon Immanuel, Liefner, Ingo, & Garg, Ritam. (2018). The organization of knowledge transfer in the context of Chinese cross-border acquisitions in developed economies. *Asian Business & Management*, 17(4), 286-311.
- Hagedoorn, John, & Duysters, Geert. (2002). The Effect of Mergers and Acquisitions on the Technological Performance of Companies in a High-tech Environment. *Technology analysis & strategic management*, 14(1), 67-85. doi:10.1080/09537320220125892
- Han, John, Jo, Gil S., & Kang, Jina. (2018). Is high-quality knowledge always beneficial? Knowledge overlap and innovation performance in technological mergers and

- acquisitions. *Journal of management & organization*, 24(2), 258-278.  
doi:10.1017/jmo.2016.35
- Hitt, Michael A., Franklin, Victor, & Zhu, Hong. (2006). Culture, institutions and international strategy. *Journal of international management*, 12(2), 222-234.  
doi:10.1016/j.intman.2006.02.007
- Hitt, Michael A., Hoskisson, Robert E., Ireland, R. Duane, & Harrison, Jeffrey S. (1991). Effects of Acquisitions on R&D Inputs and Outputs. *Academy of Management journal*, 34(3), 693-706. doi:10.2307/256412
- Jiang, Marshall S., Jiao, Jie, Lin, Zhouyu, & Xia, Jun. (2019). Learning through observation or through acquisition? Innovation performance as an outcome of internal and external knowledge combination. *Asia Pacific journal of management*, 38(1), 1-29.  
doi:10.1007/s10490-018-9592-x
- Jo, Gil S., Park, Gunno, & Kang, Jina. (2016). Unravelling the link between technological M&A and innovation performance using the concept of relative absorptive capacity. *Asian Journal of Technology Innovation*, 24(1), 55-76.  
doi:10.1080/19761597.2015.1128340
- Ketokivi, Mikko, & Mantere, Saku. (2010). Two Strategies for Inductive Reasoning in Organizational Research. *The Academy of Management review*, 35(2), 315-333.  
doi:10.5465/amr.35.2.zok315
- Kiessling, Timothy, Harvey, Michael, & Moeller, Miriam. (2012). Supply-chain corporate venturing through acquisition: Key management team retention. *Journal of World Business*, 47(1), 81-92. doi:10.1016/j.jwb.2010.10.023
- Kogut, Bruce, & Zander, Udo. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383-397.
- Lane, Peter J, & Lubatkin, Michael. (1998). Relative absorptive capacity and interorganizational learning. *Strategic management journal*, 19(5), 461-477.

- Larsson, Rikard, & Finkelstein, Sydney. (1999). Integrating Strategic, Organizational, and Human Resource Perspectives on Mergers and Acquisitions: A Case Survey of Synergy Realization. *Organization science*, 10(1), 1-26. doi:10.1287/orsc.10.1.1
- Lincoln, Yvonna S., & Guba, Egon G. (1985). *Naturalistic inquiry*. Beverly Hills, Calif: Sage.
- Ma, Chaoliang, & Liu, Zhiying. (2017). Effects of M&As on innovation performance: empirical evidence from Chinese listed manufacturing enterprises. *Technology analysis & strategic management*, 29(8), 960-972. doi:10.1080/09537325.2016.1260104
- Makri, Marianna, Hitt, Michael A, & Lane, Peter J. (2010). Complementary technologies, knowledge relatedness, and invention outcomes in high technology mergers and acquisitions. *Strategic management journal*, 31(6), 602-628. doi:10.1002/smj.829
- Meglio, Olimpia. (2009). Measuring performance in technology-driven M&AS: Insights from a literature review. In (Vol. 8, pp. 103-118): Emerald Group Publishing Limited.
- Michaelis, Timothy L, Aladin, Roberly, & Pollack, Jeffrey M. (2018). Innovation culture and the performance of new product launches: A global study. *Journal of Business Venturing Insights*, 9, 116-127.
- Miles, Matthew B., & Huberman, A. Michael. (1994). *Qualitative data analysis : an expanded sourcebook* (2nd ed. ed.). Thousand Oaks, Calif: Sage.
- Miles, Matthew B., Huberman, A. Michael, & Saldaña, Johnny. (2020). *Qualitative data analysis : a methods sourcebook* (Fourth edition. ed.). Los Angeles, Calif: SAGE.
- Minbaeva, Dana, Pedersen, Torben, Björkman, Ingmar, Fey, Carl F., & Park, Hyeon Jeong. (2014). MNC knowledge transfer, subsidiary absorptive capacity and HRM. *Journal of international business studies*, 45(1), 38-51. doi:10.1057/jibs.2013.43
- Nonaka, Ikujiro, & Takeuchi, Hirotaka. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*: Oxford university press.
- Park, Byung Il. (2011). Knowledge transfer capacity of multinational enterprises and technology acquisition in international joint ventures. *International business review*, 20(1), 75-87. doi:10.1016/j.ibusrev.2010.06.002

- Park, Byung Il, & Ghauri, Pervez N. (2011). Key factors affecting acquisition of technological capabilities from foreign acquiring firms by small and medium sized local firms. *Journal of world business : JWB*, 46(1), 116-125. doi:10.1016/j.jwb.2010.05.023
- Puranam, Phanish, & Srikanth, Kannan. (2007). What they know vs. what they do: How acquirers leverage technology acquisitions. *Strategic management journal*, 28(8), 805-825.
- Ranft, Annette L, & Lord, Michael D. (2002). Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organization science*, 13(4), 420-441.
- Reagans, Ray, & McEvily, Bill. (2003). Network Structure and Knowledge Transfer: The Effects of Cohesion and Range. *Administrative science quarterly*, 48(2), 240-267. doi:10.2307/3556658
- Reus, Taco H. (2012). A knowledge-based view of mergers and acquisitions revisited: Absorptive capacity and combinative capability. In *Advances in Mergers and Acquisitions*: Emerald Group Publishing Limited.
- Rossi, Matteo, Yedidia Tarba, Shlomo, & Raviv, Amos. (2013). Mergers and acquisitions in the hightech industry: a literature review. *International journal of organizational analysis (2005)*, 21(1), 66-82. doi:10.1108/19348831311322542
- Rottig, Daniel, Schappert, Jane, & Starkman, Eytan. (2017). Successfully managing the sociocultural integration process in international acquisitions: A qualitative analysis of Canon's acquisition of Océ. *Thunderbird international business review*, 59(2), 187-208.
- Sarala, Riikka , Junni, Paulina, Cooper, Cary L., & Tarba, Shlomo Yedidia. (2016). A Sociocultural Perspective on Knowledge Transfer in Mergers and Acquisitions. *Journal of management*, 42(5), 1230-1249. doi:10.1177/0149206314530167
- Sarala, Riikka M, & Vaara, Eero. (2010). Cultural differences, convergence, and crossvergence as explanations of knowledge transfer in international acquisitions. *Journal of international business studies*, 41(8), 1365-1390.
- Saunders, M. N. K., Lewis, Philip, & Thornhill, Adrian. (2019). *Research methods for business students*.

- Schwartz, David G. (2006). *Encyclopedia of knowledge management*. Hershey, Pa: Idea Group Reference.
- Schweizer, Lars. (2005). Organizational Integration of Acquired Biotechnology Companies into Pharmaceutical Companies: The Need for a Hybrid Approach. *Academy of Management journal*, 48(6), 1051-1074. doi:10.5465/AMJ.2005.19573109
- Sears, Joshua, & Hoetker, Glenn. (2014). Technological overlap, technological capabilities, and resource recombination in technological acquisitions. *Strat. Mgmt. J*, 35(1), 48-67. doi:10.1002/smj.2083
- Seawright, Jason, & Gerring, J. (2008). Case Selection Techniques in Case Study Research. *Political Research Quarterly*, 61, 294 - 308. doi:10.1177/1065912907313077
- Seligman, Martin E. P. (2011). *Flourish : a new understanding of happiness and well-being : and how to achieve them*. London: Nicholas Brealey.
- Shang, Qingyan, & Poon, Jessie P. H. (2013). International spillovers, knowledge acquisition and transfer among Japanese firms in the United States. *Journal of Business Economics and Management*, 14(3), 535-557. doi:10.3846/16111699.2012.658853
- Tangaraja, Gangeswari, Mohd Rasdi, Roziyah, Abu Samah, Bahaman, & Ismail, Maimunah. (2016). Knowledge sharing is knowledge transfer: a misconception in the literature. *Journal of knowledge management*, 20(4), 653-670. doi:10.1108/JKM-11-2015-0427
- Trott, Paul. (2008). *Innovation management and new product development*: Pearson education.
- Verbeke, Alain. (2010). International acquisition success: Social community and dominant logic dimensions. *Journal of international business studies*, 41(1), 38-46.
- Volberda, Henk, W. , Nicolai, J. Foss, & Marjorie, A. Lyles. (2010). Absorbing the Concept of Absorptive Capacity: How to Realize Its Potential in the Organization Field. *Organization science*, 21(4), 931-951. doi:10.1287/orsc.1090.0503
- Walle, Alf H. (2014). *Qualitative Research in Business: A Practical Overview*. Newcastle-upon-Tyne: Newcastle-upon-Tyne: Cambridge Scholars Publisher.

- Wang, Pien, Tong, Tony W, & Koh, Chun Peng. (2004). An integrated model of knowledge transfer from MNC parent to China subsidiary. *Journal of World Business*, 39(2), 168-182.
- Wang, Yuandi, Cao, Wei, Zhou, Zhao, & Ning, Lutao. (2013). Does external technology acquisition determine export performance? Evidence from Chinese manufacturing firms. *International business review*, 22(6), 1079-1091. doi:10.1016/j.ibusrev.2013.02.009
- Yin, Robert K. (2018). *Case study research and applications : design and methods* (6. utgave. ed.). Los Angeles: SAGE.
- Zahra, Shaker A, & George, Gerard. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of management review*, 27(2), 185-203.
- Zhou, Abby Jingzi, Fey, Carl, & Yildiz, H Emre. (2020). Fostering integration through HRM practices: An empirical examination of absorptive capacity and knowledge transfer in cross-border M&As. *Journal of World Business*, 55(2), 100947.

## Appendix

*Appendix 1: Literature review matrix*

Author(s), Title, Journal	Year Published	Concept Relation	Keywords	Key Purpose/Contribution
Larsson, R., & Finkelstein, S. - Integrating Strategic, Organizational, and Human Resource Perspectives on Mergers and Acquisitions: A Case Survey of Synergy Realization. Organization science	1999	Integration	Integration, M&A, human resources	Synthesizes several theoretical perspectives into an integrative model and addresses mergers and acquisitions, emphasizing managerial relevance.
Birkinshaw, J., Bersman, H., Håkanson, L. - Managing post-acquisition integration process: How human integration and task integration process interact to foster value creation. Journal of management studies	2000	Integration, Knowledge transfer	Task integration, human integration, M&A, value creation	Reports a study of the post-acquisition integration process. The sub-processes of task integration and human integration are separated out and it is shown that effective integration in these cases was achieved through a two-phase process.
Ranft, A. L., Lord, M.D. - Acquiring new technologies and capabilities: A grounded model of acquisition implementation. Organization science	2002	Integration	Acquisitions, Knowledge and Technology Transfer, Integration	An assessment of how the nature of the acquired knowledge-based resources, as well as multiple dimensions of implementation, have independent and interactive effects on the success of the appropriation of technologies and capabilities by the acquirer.
Puranam, P., Srikanth, K. - What they know vs what they do: How acquirers leverage technology acquisitions. Strategic management journal	2007	Integration, Innovation performance	Technology acquisition, post-merger integration, coordination	Showing that integration helps acquirers use the acquired firm's existing knowledge as an input to their own innovation processes by leveraging what they know but hinders their reliance on the acquired firm as an independent source of ongoing innovation by leveraging what they do.

Verbeke, A. - International acquisition success: Social community and dominant logic dimensions. Journal of international business studies	2010	Integration	Acquisitions, dominant logic, social community, asset building	Stating that international acquisitions intended to achieve knowledge transfer and improvements of innovation capacity by devoting balanced attention towards building a unified social community and achieving requisite commonality in dominant logic.
Sarala, R. M., Vaara, E. - Cultural differences, convergence, and crossvergence as explanations of knowledge transfer in international acquisitions. Journal of international business studies	2010	Integration	International acquisitions, culture	Argues that both national and organizational cultural differences and cultural integration in the form of cultural convergence and crossvergence affect knowledge transfer in acquisitions.
Sarala, R. M., Junni, P., Cooper, C. L., Tarba, S. Y. - A sociocultural perspective on knowledge transfer in mergers and acquisitions. Journal of management	2016	Integration	M&A; knowledge transfer, culture, cultural differences, interfirm linkages, HRM	Gives a further clarification of the multifaceted role of sociocultural factors in international M&As.
Bauer, F., Matzler, K., Wolf, S. - M&A and innovation: The role of integration and cultural differences—A central European targets perspective. International Business Review	2016	Integration, Innovation performance	Innovation, M&A, culture	Dividing the post-acquisition integration phase into: task and human, and analyse the different effects of human and task integration on the innovation outcome.
Rossi, M., Tarba, S. Y., Raviv, A. - Mergers and acquisitions in the high-tech industry: a literature review. International Journal of Organizational Analysis	2013	Integration, Innovation potential, Innovation performance	M&A, innovation, high-tech industry, integration, innovation performance, value creation	To present a review of the existing literature.



Kogut, B., Zander, U. - Knowledge of the firm, combinative capabilities, and the replication of technology. Organization science	1992	Innovation potential, Knowledge transfer	Knowledge sharing, technology, capabilities	Argues that what firms do better than markets is the sharing and transfer of knowledge held by individuals or groups within the organization
Brouthers, K. D., van Hastenburg, P., van den Ven, J. - If most mergers fail, why are they so popular? Long range planning	1998	Innovation potential	M&A, methodology, motives, measurement	This study presents a new methodology for evaluating the success or failure of merger activities. The new methodology is based on three key concepts: multiple motives, mode of measurement and improvements.
Ahuja, G., Katila, R. - Technological Acquisitions and the Innovation Performance of Acquiring Firms: A Longitudinal Study. Strategic management journal	2001	Innovation potential, innovation performance	Innovation, acquisitions, knowledge	Development of a framework relating acquisitions to firm innovation performance and develop a set of measures for quantifying the technological inputs a firm obtains through acquisitions.
Hagedoorn, J., Duysters, G. - The Effect of Mergers and Acquisitions on the Technological Performance of Companies in a High-tech Environment. Technology analysis & strategic management	2002	Innovation potential, innovation performance	M&A, technology, technological performance	Compares previous research from industrial organization to firms in high-tech industries.
Cummings, J. L., Teng, B. S. - Transferring R&D knowledge: the key factors affecting knowledge transfer success. Journal of engineering and technology management	2003	Innovation potential	Knowledge transfer, new product development, R&D	Explanation of key variables affecting the success of knowledge transfer: R&D compatibility, similarity of knowledge bases, articulation of knowledge

Cassiman, B., Colombo, M., Gerrone, P., Veugelers. - The impact of M&A on the R&D process. An empirical analysis of the role of technological and market relatedness. Research policy	2005	Innovation potential, innovation performance	M&A, R&D, market-relatedness, technology-relatedness	Show that technological and market-relatedness between M&A partners distinctly affects the inputs, outputs, performance and organisational structure of the R&D process.
Cloodt, M., Hagedoorn, J., Van Kranenburg. - Mergers and acquisitions: Their effect on the innovative performance of companies in high-tech industries. Research policy	2006	Innovation potential, Innovation performance	M&A, innovative performance, high-tech industries	Suggestions that firm's should target M&A 'partners' that are neither too unrelated nor too similar in terms of their own knowledge base.
Meglio, O. - Measuring performance in technology-driven M&As: Insights from a literature review	2009	Innovation potential	M&A, post-acquisition performance, technology	To present a review of the existing literature.
Makri, M., Hitt, M. A., Lane, P. J. - Complementary technologies, knowledge relatedness, and invention outcomes in high technology mergers and acquisitions. Strategic management journal	2010	Innovation potential	M&A, science, technology, innovation, similarity, complementarity	Systematic examination of two types of knowledge differences: knowledge similarity and complementarity
Park, B. I., Ghauri, P. N. - Key factors affecting acquisition of technological capabilities from foreign acquiring firms by small and medium sized local firms. Journal of world business	2011	Innovation potential, Absorptive capacity	International acquisitions, technology acquisition, absorptive capacity, SMEs	Investigation of whether foreign acquiring firms contribute towards enhancing technological capabilities of local firms in foreign markets.

Reus, T. H. - A knowledge-based view of mergers and acquisitions revisited: Absorptive capacity and combinative capability. In Advances in Mergers and Acquisitions: Emerald Group Publishing Limited.	2012	Innovation potential, Absorptive capacity	M&A, knowledge-based view, absorptive capacity, combinative capability	Gives a revisit of central knowledge-based mechanisms that explain variance in value creation through mergers and acquisitions.
Wang, Y., Cao, W., Zhou, Z., Ning, L. - Does external technology acquisition determine export performance? Evidence from Chinese manufacturing firms. International business review	2013	Innovation potential	External technology, export performance, technology licensing, technology sources.	Aims to extend the understanding of the determinants of export performance by examining the impact of the inter-organizational dimension of innovation strategy to export performance.
Shang, Q., Poon, J. P. H. - International spill overs, knowledge acquisition and transfer among Japanese firms in the United States. Journal of Business Economics and Management	2013	Innovation potential	Spill overs, knowledge acquisition, intra-firm transfer, subsidiaries	Investigation of the relationship between international spill overs and knowledge acquisition, and intra-firm subsidiary-to-parent transfer of technology.
Cai, L., Liu, Q., Deng, S., Cao, D. - Entrepreneurial orientation and external technology acquisition: an empirical test on performance of technology-based new ventures. Journal of Business Economics and Management	2014	Innovation potential	Technology-based ventures, entrepreneurial orientation, external technology acquisition, performance, transitional economy.	Findings support the contention that both the acquisition of external technology and entrepreneurial orientation improve new ventures' performance.
Sears, J., Hoetker, G. - Technological overlap, technological capabilities, and resource recombination in technological acquisitions. Strategic Management Journal	2014	Innovation potential	Acquisitions, resource recombination, technological overlap, innovation, capabilities.	Makes a distinction between (1) target overlap in technology, the proportion of the target's knowledge base that the acquirer already possesses, and (2) acquirer overlap, the proportion of the acquirer's knowledge base duplicated by the target firm.

Colombo, M. G., Rabbiosi, L. - Technological similarity, post-acquisition R&D reorganization, and innovation performance in horizontal acquisitions. Research policy	2014	Innovation potential, Innovation performance	Technological similarity, acquisitions, innovation performance, R&D, productivity	Development of a theoretical model linking technological similarity to post-acquisition innovation performance
Jo, Gil S., Park, Gunno, & Kang, Jina. - Unravelling the link between technological M&A and innovation performance using the concept of relative absorptive capacity	2016	Innovation potential	Technological M&A, technological similarity, absorptive capacity	Confirms a positive effect on post-M&A innovation performance when the acquiring firms are smaller in size and have a modest level of similar knowledge.
Hassan, I., Ghauri, P. N., Mayrhofer, U. - Merger and acquisition motives and outcome assessment. Thunderbird international business review	2018	Innovation potential	M&A, motives, outcome assessment, performance criteria, process research	Aims to provide a more accurate assessment of M&A performance by linking tangible as well as intangible M&A motives to outcome assessment.
Cohen, W. M., Levinthal, D. A. - Absorptive capacity: A new perspective on learning and innovation. Administrative science quarterly	1990	Innovation potential, Absorptive capacity	Absorptive capacity, learning, innovation	Provides an additional perspective on learning and innovation through the concept of absorptive capacity
Cooley, M. - Architect or bee? The human price of technology (Second). London: Hogarth Press	1987	Knowledge transfer	Knowledge transfer, intangible, tangibility, information	Visualisation of tangibility of information and knowledge
Bartlett, C., Ghoshal, S. - Managing Across Borders. Harvard Business School Press	1989	Knowledge transfer	MNEs, assets, capabilities, globalization	Typology of MNEs
Nonaka, I., Takeuchi, H. - The knowledge-creating company: How Japanese companies create the dynamics of innovation. Oxford university press	1995	Knowledge transfer	Knowledge, tacit, explicit	Gives a holistic view of knowledge creating firms. Focus towards making tacit knowledge accessible for the entire firm

Grant, R. M. - Toward a knowledge-based theory of the firm. Strategic management journal	1996	Knowledge transfer	Knowledge, theory of the firm, coordination	Exploration of how the coordination mechanisms through which firms integrate the specialist knowledge of their members.
Lane, P. J., & Lubatkin, M. - Relative absorptive capacity and interorganizational learning. Strategic management journal	1998	Knowledge transfer, Absorptive capacity	Absorptive capacity, learning; knowledge, alliances, R&D	To reconceptualize the firm-level construct absorptive capacity as a learning dyad-level construct (e.g., relative absorptive capacity)
Bresman, H., Birkinshaw, J., Nobel, R. - Knowledge Transfer in International Acquisitions. Journal of international business studies	1999	Knowledge transfer	Knowledge transfer, ability to articulate knowledge, know-how, direction of transfer	Shows that the transfer of technological know-how is facilitated by communication, visits & meetings and that the ability to articulate knowledge affects the direction the knowledge transfers
Minbaeva, D., Pedersen, T., Björkman, I., Fey, C. F., Park, H. J. - MNC knowledge transfer, subsidiary absorptive capacity, and HRM. Journal of international business studies	2003	Knowledge transfer	Knowledge transfer, absorptive capacity, HRM	Investigation of the relationship between MNC subsidiary human resource management (HRM) practices, absorptive capacity, and knowledge transfer.
Wang, P., Tong, T. W., Koh, C. P. - An integrated model of knowledge transfer from MNC parent to China subsidiary. Journal of World Business	2004	Knowledge transfer	Knowledge transfer, MNC, parent company	Develops a two-stage model describing knowledge transfer from MNEs to subsidiaries
Carmeli, A., Tishler, A. - The relationships between intangible organizational elements and organizational performance. Strategic management journal	2004	Knowledge transfer	Intangible organizational elements, complementarities, performance	Examines the impact of a set of independent intangible organizational elements and the interactions among them on a set of objective organizational performance measures in a sample of local government authorities

Schwartz, D. G. - Encyclopaedia of knowledge management. Hershey, Pa: Idea Group Reference	2006	Knowledge transfer	Knowledge management, knowledge transfer, information networks, cognibility	The most comprehensive source of coverage related to the past, present, and emerging directions of knowledge management.
Trott, P. - Innovation management and new product development: Pearson education	2008	Knowledge transfer	Innovation, knowledge, ne product development	Book covering innovation management and new product development
Ajith Kumar, J., Ganesh, L. S. - Research on knowledge transfer in organizations: a morphology. Journal of knowledge management	2009	Knowledge transfer	Knowledge transfer, knowledge management	To present and describe a morphology of the research literature on knowledge transfer in organizations.
Volberda, H. W., Foss, N. J., Lyles, M. A. - Absorbing the concept of absorptive capacity : How to realize its potential in the organization field. Organization science	2010	Knowledge transfer, Absorptive capacity	Absorptive capacity, knowledge management, organizational capabilities	To advance the understanding of absorptive capacity, its underlying dimensions, its multilevel antecedents, its impact on firm performance, and the contextual factors that affect absorptive capacity.
Danis, W. M., & Shipilov, A. - Knowledge acquisition strategies of small and medium-sized enterprises during institutional transition: Evidence from Hungary and Ukraine. Thunderbird international business review	2012	Knowledge transfer	Knowledge acquisition, knowledge transfer, SME	Explores how SMEs in transition economies acquire the managerial, marketing, and technological knowledge they need to compete in increasingly competitive local and global markets.
Tangaraja, G., Mohd Rasdi, R., Abu Samah, B., Ismail, M. - Knowledge sharing is knowledge transfer: a misconception in the literature. Journal of knowledge management	2016	Knowledge transfer	Knowledge sharing, knowledge transfer	Provided a clarifying distinction between knowledge transfer and knowledge sharing.

Haasis, T. I., Liefner, I., Garg, R. - The organization of knowledge transfer in the context of Chinese cross-border acquisitions in developed economies. Asian Business & Management	2018	Knowledge transfer	Knowledge transfer, M&A, Post-acquisition integration	To investigate how Chinese MNEs organize knowledge transfer through cross-border acquisitions in developed economies, by employing an organizational learning perspective.
Calipha, R., Brock, D. M., Rosenfeld, A., Dvir, D. - Acquired, transferred and integrated knowledge: a study of M&A knowledge performance. Journal of Strategy and Management	2018	Knowledge transfer	Performance, acquired knowledge, integrated knowledge, measures, M&A process, transferred knowledge	To develop and test a theoretical model of knowledge and performance in the M&A process.
Zhou, A. J., Fey, C., Yildiz, H. E. - Fostering integration through HRM practices: An empirical examination of absorptive capacity and knowledge transfer in cross-border M&As. Journal of World Business	2020	Knowledge transfer	HRM, absorptive capacity, knowledge transfer, M&A	Adding to existing literature by paying attention theoretically and empirically to the multi-dimensional nature of both knowledge transfer and absorptive capacity.
Eisenhardt, K. M., Martin, J. A. - Dynamic capabilities: what are they? Strategic management journal	2000	Absorptive capacity	Dynamic capabilities, competitive advantage, RBV, dynamic markets, resources, organization theory/change	Argues that dynamic capabilities are a set of specific and identifiable processes such as product development, strategic decision making, and alliancing.
Zahra, S. A., George, G. - Absorptive capacity: A review, reconceptualization, and extension. Academy of management review	2002	Absorptive capacity	Absorptive capacity, conceptualization, dynamic capabilities, potential and realized AC	Reconceptualization of the concept of absorptive capacity.
Reagans, R., McEvily, B. - Network structure and knowledge transfer: The effects of cohesion and range. Administrative science quarterly	2003	Absorptive capacity	Networks, knowledge transfer, knowledge sharing, absorptive capacity	Consideration of how different features of informal networks affect knowledge transfer.

Björkman, I., Stahl, G. K., Vaara, E. - Cultural differences and capability transfer in cross-border acquisitions: The mediating roles of capability complementarity, absorptive capacity, and social integration. Journal of international business studies	2007	Absorptive capacity	Acquisitions, cultural differences, capability transfer	Presents an integrative model of the impact of cultural differences on capability transfer in cross-border acquisitions.
Deng, P. - What determines performance of cross-border M&As by Chinese companies? An absorptive capacity perspective. Thunderbird international business review	2010	Absorptive capacity	M&A, absorptive capacity, knowledge, strategic assets	Examines if strategic assets can be effectively acquired by firms, and thereby leading to superior firm performance.
Hitt, M. A., Hoskisson, R. E., Ireland, R. D., Harrison, J. S. - Effects of Acquisitions on R&D Inputs and Outputs. Academy of Management journal	1991	Innovation performance	R&D, input, output, M&A, new product development	Presented findings indicating acquisitions effected research and development negatively in the areas R&D intensity and patent intensity.
Capron, Laurence. - The long-term performance of horizontal acquisitions	1999	Innovation performance	Horizontal M&A, value creation, synergy	Examines how value is created in horizontal M&As and the results show that both resource redeployment and asset divestiture can contribute to acquisition performance.
Schweizer, L. - Organizational Integration of Acquired Biotechnology Companies into Pharmaceutical Companies: The Need for a Hybrid Approach. Academy of Management journal	2005	Innovation performance	Innovation capabilities, M&A, technology, know-how	Firms need to apply a multifaced strategy, thinking short- and long-term, in the integration processes in high tech industries



Das, Arindam, & Kapil, Sheeba. - Explaining M&A performance: a review of empirical research	2012	Innovation performance	Mergers and acquisitions, M&A performance	"M&A performance measures are quite diverse and can be categorized under accounting measures, market measures and other measures, including subjective assessments.
Grimpe, C., Hussinger, K. - Resource complementarity and value capture in firm acquisitions: The role of intellectual property rights: Resource Complementarity and Value Capture. Strategic management journal	2014	Innovation performance	Technology acquisitions, IPRs; value creation, value capture, resource complementarity	Investigates the innovation outcome in acquisitions where the firms' knowledge bases are complementary to each other's.
Aminova, E. - Forecasting potential innovation activities in high-tech industries triggered by merger and acquisition deals: a framework of analysis. European journal of futures research	2016	Innovation performance	High-tech M&As, innovation activities	Intention to forecast the innovation outcome in high-tech M&As.
Ma, Chaoliang, & Liu, Zhiying. - Effects of M&As on innovation performance: empirical evidence from Chinese listed manufacturing enterprises	2017	Innovation performance	Technological M&A, innovation performance	Argues that horizontal M&A and conglomerate M&A can reduce innovation performance, while vertical M&A has no significant effect thereon.
Han, J., Jo, G. S., & Kang, J. - Is high-quality knowledge always beneficial? Knowledge overlap and innovation performance in technological mergers and acquisitions. Journal of management & organization	2018	Innovation performance	Technological M&A, knowledge overlap, innovation performance, absorptive capacity	Studying the impact on performance where there are knowledge overlaps between acquirer and acquiring businesses in high technology M&As.

<p>Jiang, M. S., Jiao, J., Lin, Z., &amp; Xia, J. - Learning through observation or through acquisition? Innovation performance as an outcome of internal and external knowledge combination. Asia Pacific journal of management</p>	<p>2019</p>	<p>Innovation performance</p>	<p>Innovation performance, spillovers, R&amp;D, organizational learning</p>	<p>Argues that innovation performance is a dependent on learning through observation and acquisitions (internal and external knowledge).</p>
--	-------------	-------------------------------	---	--

## *Appendix 2: Interview Guide*

Background: The objective of this interview is to discuss about the innovation performance/outcome of the M&A between X and Y. We want to learn about your experiences from this M&A and your reflection after becoming one entity/firm.

General questions: The interviews all start with general introduction questions covering general information about the business unit; size, product/services, geographical presence and the interviewees roles and backgrounds. For the remaining questions, we portray typical prompts when needed and follow-up questions will be addressed if relevant in the specific setting. Some question might not be asked if captured in previous answers.

### Subject 1: Innovation performance

1. Please explain how you define/perceive innovation performance in the context of an ongoing merger? What is your experience so far?
2. How was the approach towards innovation in your unit before the merger? How is it now?
3. Has the rate of registering new patents increased/decreased after the merger?
4. Has the merger affected new product development/projects in a sufficient way compared to the pre-merger expectations?
5. Have you seen any affects for the financial performance/dimension? – Please elaborate.

### Subject 2: Technology acquisition

1. What kind of technology transfer (TT) was expected to happen in this merger?
2. What type of TT have happened so far? (If none, are there any plans for this, and if so, could you please provide some examples)
3. From your experience with your previous affiliation, how much similarity and overlapping were there in the technology and competence following this potential technology? (If any, how has this facilitated the integration process so far? Please elaborate)
4. What are the enablers to transfer and combine the technology during a merger? Which factors facilitated the implementation and embedding of the acquired knowledge in the merger?

### Subject 3: Combining knowledge bases

1. Do you think the knowledge bases of X and Y are complementary to each other? Yes/no-why and how come?
2. What would you say distinctives your knowledge base from your new colleague's knowledge base in an equivalent business unit? (Emphasize same competences/knowledge/technologies – any differences in dimensions etc.)
3. Prior to the merger, how do you feel about X's capability to utilize, integrate and apply new external information and knowledge?

**Appendix 3: Example of display used for data reduction.**

<b>Factors</b>	<b>Quotes</b>	<b>ID-codes</b>
Communication	<i>“The merger here is actually people talking. The technology transfer is people talking, discussing and finding solutions.” - R2</i>	R1 – R11
Common culture	<i>“The challenge here is that you are working with different people from different organizations and different cultures. And you need to have an understanding that in general people tend to prefer the way they have been working before.” - R1</i>  <i>“To reduce the conflict level, we need to work with common procedures, and create a common culture.” - R4.</i>	R1, R3, R4, R7, R8
Open mindset	<i>“An open and curious mindset is always a good thing.” - R11</i>	R3, R10, R11
Involvement of the leaders	<i>“I do focus on actually bringing people on, and to see the people. I think that is important.” - R10</i>	R4, R9, R10
Covid-19 pandemic	<i>“In the beginning of 2020, we really were up and running, we started traveling, meeting each other, having some workshops and so on. And then the Covid came. So, we just had to cut off all of this.” - R9</i>	R1, R4, R6, R7, R8, R9, R10,
Employee retention	<i>“It might be challenging to keep the good people. We have lost a lot of employees during the transition. Quite high turnover in certain areas. ... There are certain resources that are harder to replace than others. And I think that for certain areas the overall result for the company, the merged company, would have been higher if we managed to keep these resources.” - R1</i>  <i>“I would say that the most important factor areas are keeping the people. Because your company is not anything without their knowledge and skillsets. And you are not able to do a acquisition if you let the people who knows how the in-house stuff works go.” - R2</i>	R1, R2, R5, R6, R7, R8, R9, R11

*Table 2: Display of different factors affecting the unification of the knowledge bases*

