



UNIVERSITY OF GOTHENBURG  
SCHOOL OF BUSINESS, ECONOMICS AND LAW

Master Degree Project in Innovation and Industrial Management

## **Disseminative Capabilities in New Product Development Projects**

A Single Case Study about Inter-Organizational Knowledge  
Transfer at CEVT

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## Abstract

Previous studies in the field of knowledge transfer have continuously emphasized the knowledge receiver's characteristics and how these influence the knowledge transfer process. However, more recent research has identified and emphasized the role of the sender in an inter-organizational knowledge transfer.

The main purpose of this single case-study is to investigate how China Euro Vehicle Technology AB (CEVT) can improve their disseminative capabilities to enhance the knowledge transfer process in the inter-organizational new product development (NPD) projects with Geely. By firstly identify the current challenges regarding the knowledge transfer process and conclusively come up with recommendations.

Theoretical findings show that the disseminative capabilities comprise several different phases and challenges related to these; *realization of knowledge, assessment of recipient knowledge base, encoding of knowledge, transfer mechanisms and support activities*. Further it displays challenges related to a NPD collaboration, and the subsequent inter-organizational knowledge transfer. These challenges are; *organizational distance, communication & interaction distance and cultural distance*

Within each phase related to the disseminative capabilities challenges were identified, mainly related to the disclosure of valuable knowledge, awareness of the processes of the other party, as well as other activities. The three different challenges proposed by the literature were further reflected in the specific case study. This paper proposes three main recommendations; aligning the project management system to fit both organizations properly, lessons learned structures in order to evaluate future projects and a more pro-active approach in regards of support post the project hand over.

**Keywords:** *Knowledge Transfer, Disseminative Capabilities, Inter-Organizational Knowledge Transfer*

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# 1. Introduction

*In this section, we will give a background on the subject of this thesis, both from an academic and corporate perspective. Further, this background discussion will subsequently result in this paper's objective, research question, and limitations of this study.*

## 1.1 Background

In today's business, companies face a dramatically changing economic landscape, triggered by development in the emerging markets, a rapid development of new technologies, changing consumer preferences, and sustainability policies. The digital revolution and novel business models have disrupted several industries (Gao *et al.* 2016). Companies need to develop dynamic business models to encounter these uncertainties faced. A failure of acknowledging innovation and knowledge might render one's business obsolete. Simultaneously, competition is getting fiercer and fiercer, which has initiated an era of open innovation where numerous companies seek joint partnerships to acquire relevant knowledge facilitating innovative strategies for long-term sustainable advantages.

Many researchers point out that knowledge-based activities are the ground pillar of sustainable competitive advantage and further claim that companies should put a significant effort in the creation and accumulation of competencies based on knowledge, in order to yield long-term survival (Barney, 1991; Grant, 1996; Teece 2000; Khamseh and Jolly, 2008). A firm's performance is significantly influenced by the strength and foundation of the relationship to the partner firm (Dyer and Singh, 1998). However, a failure of supplying the knowledge to the right partner(s) significantly reduces the value of the knowledge. Hence there is a required fit between knowledge, transfer channel and partner characteristics (Teece, 2000; Hutzschenreuter and Horstkotte, 2010).

Oppat (2008) argues that in the field of new product development (NPD), companies aim at achieving the potentials of joint development, namely overcoming limitations regarding resources and competencies, increasing flexibility, enhancing competencies, as well as reducing risks and costs. Having an effective NPD is crucial for businesses, whose long-term competitive advantage and economic success are based on technical and knowledge-intensive activities (Clark & Fujimoto, 1991; MacVaugh, 2008). As a consequence of recognized advantages of joint product development, one vital issue concerns the required transfer of knowledge and skills. According to Si & Burton (1999); Soekijad & Andriessen (2003); Khamseh & Jolly (2008) joint inter-firm knowledge agreements and product development projects provide opportunities for knowledge transfers. For companies involved in joint development activities to nurture these opportunities created, and unleash the potential of combined partner capabilities, they have to develop some sort of interlinking process between each respective knowledge base. The linkage could take various forms, though with the purpose of operating as an overlap process of the knowledge bases, thus requiring significant knowledge transfer (Oppat, 2008). Chini (2004) defines knowledge transfer as the most



important phase within a knowledge management value chain, moreover comprising strategy, creation, distribution, and application. Organizations that successfully manage inter-organizational knowledge transfer are more likely to outperform competitors and thus survive in the long run, by exploiting internally created advantages (Argote & Ingram, 2000) Especially in new product development, knowledge transfer is regarded as a key success factor (Cummings & Teng, 2003).

According to Argote & Ingram (2000) knowledge transfer within organizations is a process where one unit is affected by the experience of another, should it be a group, a division, or a department. The process of knowledge transfers within organizations involves different dimensions, both individual and groups. For example, it could regard how a manufacturing unit are to learn from another unit how to most properly assemble a product. The main objective of knowledge transfer is to, through the use of a transfer mechanism/channel, transfer information, data, and knowledge, from the sender to the receiver, which contains interactive processes (Cummings *et al.* 2003).

Researchers have identified critical determinants within the process of knowledge transfer, affecting the success of the transfer (Argote & Ingram, 2000; Zander & Kogut, 1996; Von Krogh *et al.* 2014). Cummings & Teng (2003) have identified four different contextual fields; from within success factors and categories have been derived. These contextual fields include *Relational context* (organizational and knowledge distance); *Knowledge context* (characteristics of the knowledge); *Activity context* (mechanism of knowledge transfer); and *Receiver context* (e.g. absorptive capacity). Dyer & Sing (1998) elaborate on knowledge sharing routines and governance mechanism as determinants for a successful inter-organizational knowledge transfer.

Szulanski (2000) argues that the knowledge transfer process comprises certain phases that have significant impact on the success of a partnership, or a joint project. He further elaborates on the knowledge transfer process as a reciprocal process where these distinct phases lie along a timeline with milestones and stages. The initiation phase is argued to be the seed of the whole knowledge transfer process, where there is a recognized opportunity to transfer, such as an identified knowledge gap between organizations. When the knowledge gap is identified a subsequent search for a suitable solution initiates. Following the initiation phase does the implementation phase, where efforts are directed to the exchange process between the source of knowledge and the recipient. Specific ties are developed between the sender and the recipient, and information and resource flow increase. To effectively assure that the acquired knowledge is interpreted properly the third phase (ramp-up) follows. The recipient has at that time started to integrate the new source of knowledge - e.g. started up a new product facility, implemented a new operational system- and the main focus concerns identifying problems that might arise, and resolve these problems that hamper the recipient's ability from matching the prior expectations with the post-transfer performance. The final phase, integration, regards routinizing the use of the new knowledge, after satisfactory results have been obtained considering objectives and expectations prior the transfer.

Previous scholars in management have continuously emphasized that the knowledge sender's characteristics influence the knowledge transfer process (Davenport & Prusak, 1998; Gupta & Govindarajan 2000; Szulanski, 2000; Oppat, 2008). However, the research on the knowledge sender's capability is not new. Concepts such as disseminative capacity, source transfer capabilities have been introduced previously, (Minbaeva & Michailova 2004; Minbaeva, 2007; Oppat, 2008) focusing on identifying success factors and mechanisms that ease the transferring process.

## 1.2 Research Gap

With the background in mind where knowledge-based activities are argued to be a cornerstone for sustainable competitive advantage, and a prerequisite for yielding long-term survival (Barney, 1991; Grant, 1996; Teece 2000; Khamseh and Jolly, 2008), and simultaneously the era open innovation and joint partnerships between companies to accumulate and acquire valuable knowledge, it is evident that the process of knowledge transfer plays a significant part. A substantial amount of literature covers the recipient context, e.g. absorptive capacity, and the subsequent effects on knowledge transfer success (Cummings & Teng, 2003; Von Krogh *et al.* 2014). Von Krogh *et al.* 2014 further argues that the characteristics of the knowledge transfer process and the recipient firm are well understood, whereas limited attention has been brought upon the knowledge sender's capability to transfer knowledge within an inter-organizational context. Oppat (2008) argue that the sender's disseminative capabilities are vital for a successful inter-organizational knowledge transfer. It is in the field of academic research related to the sender's disseminative capability in an inter-organizational knowledge transfer context, where we have identified a research gap, which enforced our topic of choice for the master thesis. In particular, we have perceived a lack of empirical evidence derived from real case examples of the focusing on the sender's capability in the knowledge transfer process.

The aim of our study from an academic standpoint is to contribute to bridging the identified research gap by conducting a case study providing empirical evidence from an actual knowledge transfer process in a joint inter-organizational NPD project. The scope of the research is to study the current knowledge-transfer process, involving actions prior the transfer, during the transfer, and actions post-transfer. In essence the hand-over of a project. (See Appendix Figure 10) Secondly, the research aims to understand what can be done in order to facilitate an effective knowledge transfer from a joint research center to the different actors involved.

## 1.3 Case Study Background

China has, during the past two decades, earned a reputation for being the "manufacturing powerhouse" of the world, where both global and domestic firms have successfully been exploiting low-cost labor, generating high volume and low-cost products (Slepnirov *et al.* 2015). China's establishment as a manufacturing powerhouse has during the past decades brought upon tremendous growth numbers. However, during recent years these tremendous growth numbers have decreased, mainly due to the governmental policy shift, where the

parliament is initiating a transition from growth led by investments and manufacturing towards increased services and consumption (Magnier, 2016). Simultaneously Chinese companies are seeking growth and industrial development through innovation. To upgrade their innovative capability these Chinese companies are increasingly required to tap into more advanced technologies and knowledge (Gifford *et al.* 2015). One strategy that has evolved in order to improve their innovative capabilities has been to relocate innovation operation and other related activities to more innovation-intensive locations.

One industry where the Chinese significantly has increased their research and development spending is the automotive industry. In 2007, the share of China's R&D spending was 4 percent of the total expenditure within the industry, in 2015 this figure had risen to 11 percent (PwC, 2015). The automotive industry among several other industries faces technology-driven trends that will revolutionize how the industry actors respond to, for instance changing consumer behavior, industry concentration regarding development, and transformational changes. Digitization, automation, and changing business models are heavily affecting the industry which gives rise to four disruptive trends according to Gao *et al.* (2016); *Diverse mobility, autonomous driving, electrification, and connectivity*. Connectivity and autonomous driving might in the long term make the car into a platform where passengers can use their time in transit for novel forms of media and other activities as such. Moreover, the increasing speed of innovation and software-based systems will require the cars to be upgradable. Also, shared mobility solutions with shorter life cycles will be more common, where consumers will be more aware of technological advances, which in turn will increase the demand for upgradable cars.

The most apparent and recent example of the phenomena of a Chinese automaker seeking innovation opportunities abroad, in Sweden and Gothenburg, is the acquisition of Volvo Car Corporation by the Chinese giant Geely, followed by the opening of a joint R&D center on Lindholmen, China European Vehicle Technology (CEVT). In 2010 Geely acquired Volvo Cars Corporation from the US automotive company, Ford. The strategic rationale of the acquisition from Geely's standpoint was apparently to build up its brand, technological capabilities and tap into to Swedish engineering. Something that becomes evident when in retrospect chairman and owner of Geely, Li Shufu said prior to the acquisition. He argued that the acquisition would give Volvo access to low-cost production facilities, as well as knowledge of the local market of China, while Geely would gain access to a well-renowned brand, as well as top of the line engineering, (China Daily, 2009).

Aforementioned, Volvo was acquired by Geely in 2010. In the beginning, it was a clear separation between the corporations due to a conflict regarding IP-rights from the previous owners, Ford (Nueno & Liu, 2012). Over time the integration process has gradually grown and culminated with the setup of a shared research and development center in Lindholmen, Gothenburg with the first goal to develop shared modular architecture between the two companies (Pröckl, 2013).

Since the opening of CEVT, the joint research center, the number of employees has significantly increased and the R&D center's first car Lynk & Co has been developed and launched. This initial car is built with a novel business model based on future trends of increased connectivity through innovative software solutions, as well as a shared mobility platform. As CEVT is continuously growing so are the challenges connected to a successful knowledge-transfer between the different stakeholders.

As of now, CEVT is developing a shared modular architecture to be used by Volvo, Geely and Lynk & Co, as well as top-hat solutions used by Lynk & Co and Geely. CEVT deploy a New Product Development System, (NPDS), which is a system for architecture and vehicle development, following the concept of milestones and gateways over time of a project. The NPDS logic is built upon partly parallel processes and around a few jobs simultaneously being developed. In other words, when the first project comes to the industrialization phase, the second is in its early strategic phases. (The NPDS will further be elaborated on in the Empirical section). As aforementioned, CEVT develops the shared platform and architecture, as well as top-hats to be utilized by all stakeholders. Eventually, within the NPDS the developed architecture and top-hat will come to a hand-over gateway, where there is a significant transfer of knowledge to the other stakeholders. Post-transfer, the responsibilities, both functional and product-related, shift to CEVT's recipients, in our case Geely.

We have got the opportunity of studying past projects. Our focus will be directed towards actions taken prior, during, and post-transfer, as well as identifying certain challenges, and subsequent improvements that would enhance the knowledge transfer process, from the perspective of the sender's capabilities.

#### 1.4 Objective

The objective of our thesis is twofold, one from an academic standpoint and one from a corporate standpoint. Our academic objective is as aforementioned to contribute the bridging of the research gap identified within the field of the sender's disseminative capability in an inter-organizational knowledge transfer setting. The corporate objective, in this case, is to investigate the knowledge transfer of the previously shared projects to Geely. The corporate objective follows the same approach, in the way we seek to find answers what CEVT, as the knowledge sender, can do to enhance the knowledge transfer process towards Geely.

In order to provide a broader understanding related to our main focus of research, i.e. the sender's disseminative capability in an inter-organizational knowledge transfer setting, we have created one sub-question that will complement our research. The initial sub-question regards identifying the challenges of the current transfer mechanisms that possibly could hamper the successful knowledge transfer.

## 1.5 Research Question

The previously mentioned background and discussion of the field of research lead up to our main research question:

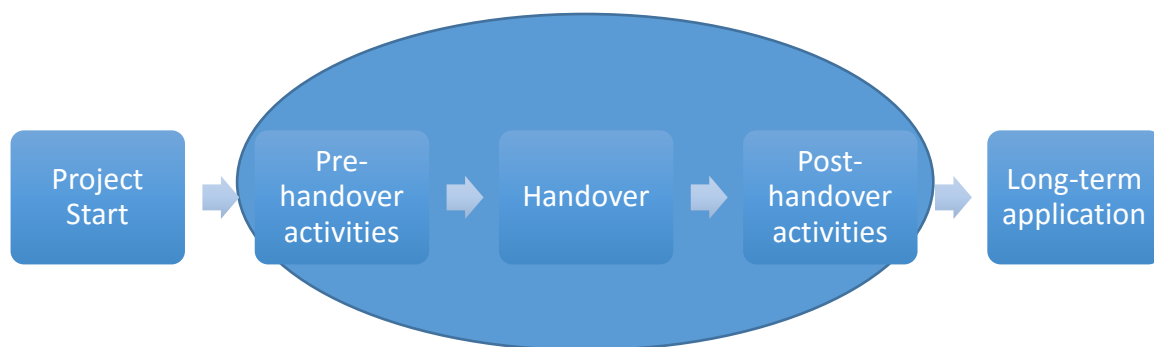
**How can CEVT improve their disseminative capabilities to enhance the knowledge transfer process in inter-organizational NPD projects?**

Following, we have one sub-question that will broaden the understanding related to the main focus of research:

What are the current challenges in the knowledge transfer process towards Geely at CEVT?

## 1.6 Delimitation

Since our main objective is to identify current challenges, and Key Success Factors (KSFs) in the knowledge transfer process, by conducting a case study, aiming at suggesting enhancements of CEVT's disseminative capability, we will focus on the actions prior the transfer, actions taken during the transfer, and finally the short-term actions taken post-transfer of the architecture and top-hat. We will thereby exclude the long-term application and long-term integration of the knowledge transferred, due to the fact that the application process mainly regards the recipient's capability from a long-term perspective, even though the long-term utilization is of importance. The underlying factor of excluding the long-term application phase is due to the research scope and time-scope. Rather our findings from the performed handovers might be useful in the knowledge transfer of future jobs.



*Figure 1. Thesis Disposition*

## 1.7 Thesis Disposition

The introduction chapter introduces the research relevance, the identified research gap, case study background, and subsequent research questions that guide our work. Moreover, we briefly introduce literature within the field of knowledge transfer, along with certain sub-concepts related.

In the theoretical framework, we present an overview of the relevant literature within the field of knowledge transfer, in accordance with our delimitation towards the sender's disseminative capability. Initially, we come at the literature with a wide view, defining knowledge, knowledge transfer, disseminative capability, knowledge transfer mechanisms, and knowledge transfer success. We present a comprehensive literature review and finish with our theoretical section by presenting theories around organizational challenges and KSFs within the sender's disseminative capability within inter-organizational knowledge transfer.

Next, we present the methodologies section, which accounts for the basis of the conducted research. We outline the rationale for the chosen research strategy, research design, and research method. In this section, we further discuss the trustworthiness of the study, as well as the research ethics.

In the empirical section, we display our empirical findings derived from our qualitative data collected. The empirical section will be the cornerstone in the subsequent analysis chapter. We start this section with the background of CEVT and the empirical findings from the observations and secondary data. Following we present an overview of the coding from the qualitative interviews. Finally, we present the results of the knowledge transfer process and mechanisms relevant for the subsequent analysis section.

In the analysis section, we connect the theories presented in the theoretical framework and the empirical findings. We perform the analysis with our main research question in mind, and our chosen sub-question, thus starting with the challenges identified at CEVT's current knowledge transfer process, and guiding the process towards the enhancements of CEVT's disseminative capabilities, overcoming the challenges.

Finally, in our conclusion section we provide a summary and discussion of the results of our research. We answer our main research question and provide recommendations, of how CEVT can improve their disseminative capability and thus enhance the knowledge transfer process in inter-organizational NPD projects. Also, we come up with future topics for research.



*Figure 2. Thesis Disposition*

## 2. Theoretical Framework

*This section introduces a theoretical foundation derived from previous research. The theoretical framework section begins with a broad perspective defining knowledge. Further, it goes deeper into concepts directly linked to the purpose of this study i.e. managing knowledge, knowledge transfer, disseminative capabilities and challenges.*

### 2.1 Knowledge

“Knowledge” is not easily defined, and a unified definition of the concept does not exist. Scholars have defined the concept by distinguishing between knowledge, data, and information (Liyanage *et al.* 2009; Albers and Brewer, 2003). One common view regarding the distinction mentioned above is that numbers and facts are accounted for as data, information as processed data, and knowledge as legitimates information (Alavi & Leidner, 2001). In Davenport & Prusak’s (1998) seminal work they elaborate on the concept, defining knowledge as:

*“A fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories, but also in organizational routines, process, practice, and norms” (p.5).*

According to Bender & Fish (2000) knowledge has its origin in the head of the individuals, building on transformed information, and enriched by personal experiences, beliefs, and values. An individual interprets information and subsequently apply this information to the purpose of which it is needed. Due to various interpretation of information received, among individuals, knowledge between them will differ. Due to the complexity of knowledge, and various interpretation, knowledge can be seen as a mental state of ideas, facts, concepts, data and techniques, where accumulated knowledge is stored in an individual's memory.

Furthermore, the authors elaborate on the concept of expertise, arguing that expertise is deeply embedded knowledge, specialized towards a certain field, possessed by an individual. An individual possessing expertise knowledge within a specific field can create unique new knowledge and solutions related to his/her field. Expertise knowledge is gained over a long period of time, formed from experiences, education, and training. The previously defined concepts of knowledge and expertise can be organized into a hierarchy explaining how expertise are built up from data to information to knowledge seen in figure 3.



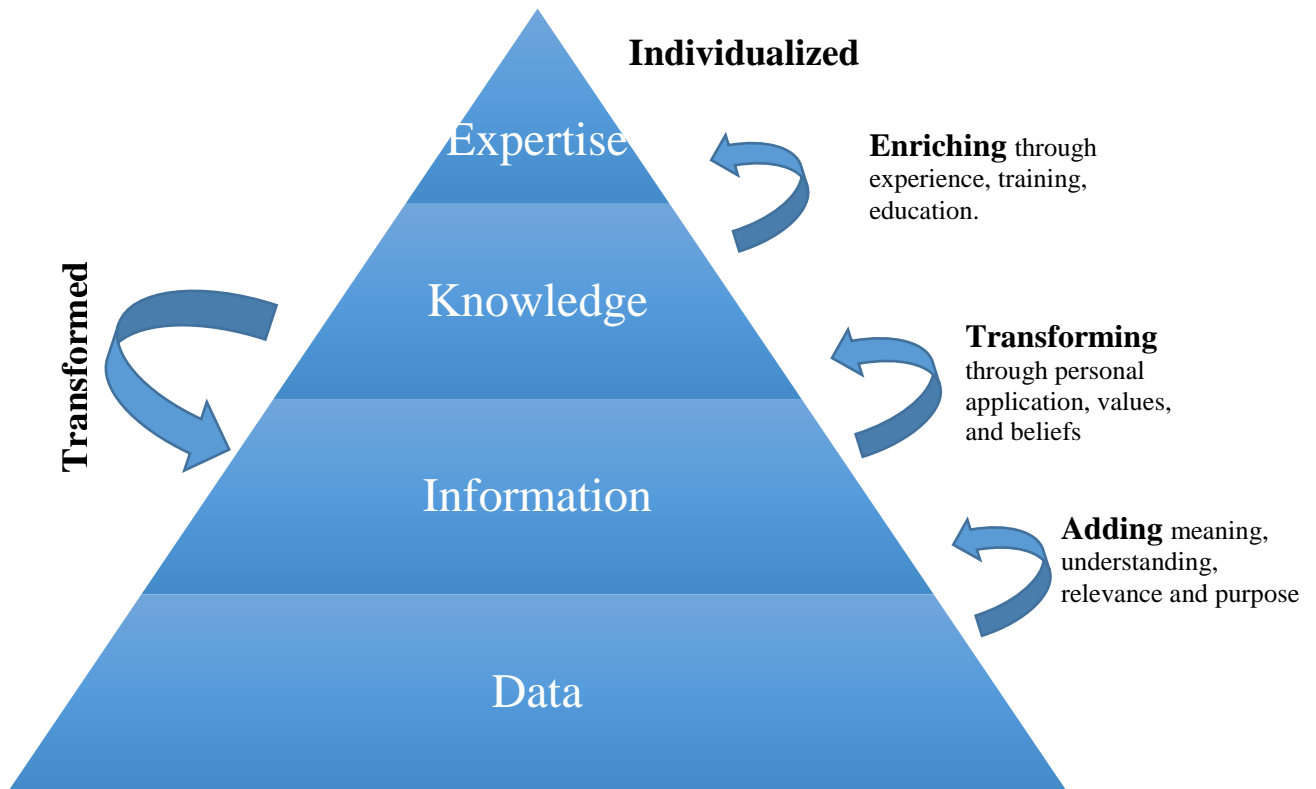


Figure 3. Knowledge Hierarchy, Bender & Fish (2000)

According to von Krogh *et al.* (2000) knowledge works as a facilitator in the way it allows people to define, prepare, shape, and learn how to solve a task. Knowledge is further a justified true belief; in the way individuals justify truthfulness of their beliefs based on their interaction with the real world (Nonaka, 1994). Scholars in the field of knowledge further view knowledge distinguishing between two main dimensions i.e. *explicit* and *tacit* (Polanyi, 1966; Nonaka & Takeuchi (1995). The two-dimensional classification of knowledge is based on its complexity of knowledge continuum (Koulopoulos & Frappaolo, 1999). According to Koulopoulos & Frappaolo (1999) explicit knowledge is a knowledge that easily can be articulated, codified, documented and transmitted amongst individuals. Tacit knowledge, on the other hand, is complex, unarticulated, rather hard to disseminate amongst individuals. It is knowledge that is deeply embedded in the head of the individual, and thus it cannot so easily be transferred or codified (Nonaka & Takeuchi, 1995). Even though tacit knowledge is hard to transfer, it adds more value to the organization, (Liyanage *et al.* 2009).

According to Alavi & Leidner (2001) knowledge may be viewed from several perspectives; *A state of mind, an object, a process, a condition of having access to information, a capability.* Knowledge as a state of mind puts emphasis on the individual's ability of accumulating and expanding personal knowledge a subsequent application to the organization's need. Knowledge as an object suggests that the knowledge accumulated by an individual can be stored and manipulated. Viewing knowledge as process puts emphasis on the individual's ability on applying his or her expertise. Knowledge as a condition of having access to information postulates that knowledge accumulated by an organization must initially be organized to facilitate accessibility and retrieval of content. The fifth perspective of

knowledge, by the authors, is that it can be viewed as a capability, with the possibility of impacting future action.

Kogut & Zander (1995) have developed five different constructs, by which a firm's knowledge is characterized at different levels of individual competence and group and organizational capability. These constructs are "codifiability" - the degree to which knowledge can be encoded, "teachability" - the degree to which employees can be trained, in contrary to codifiability, "complexity" - regards the different variations from combining specific competencies, in turn hard to grasp, "system dependence" - the degree to which a capability is dependent on people with different accumulated experience, for instance, related to production, "product observability" - the degree to which one's expertise knowledge, e.g. functions of the product.

## 2.2 Managing Knowledge

As aforementioned in the background knowledge-based activities are argued to be a cornerstone for sustainable competitive advantage, and a prerequisite for yielding long-term survival (Barney, 1991; Grant, 1996; Teece 2000; Khamseh and Jolly, 2008). Thus, managing knowledge has become an imperative in order for organizations to yield growth. Wiig (1997) argue that the main objectives of knowledge management are 1) *as an organization operate as intelligent as possible to secure long-term sustainability and overall success and growth.* 2) *To acknowledge the most proper value of its knowledge assets.* The author postulates that in order to succeed in reaching these objectives, successful organizations craft internal processes of transforming, organizing, deploying and using the identified knowledge assets as effectively as possible. He continues explaining that knowledge management is about understanding, recognizing, emphasizing, and managing systematic, explicit, and deliberate knowledge creation, knowledge renewal, and knowledge application.

In his study of organizations Wiig (1997), he observed that they pursued different knowledge management strategies to best match their capabilities, company culture, and priorities. Thereby, they tried to derive, from their existing knowledge assets, the best business value and identify areas where new competitive knowledge assets were required. However, many the organizations either pursued one or several amongst five central knowledge strategies covered next.

*Knowledge strategy as a business strategy* - where emphasis is directed at creation, renewal, capture, organization, sharing, and use in order to at each point of action have the best possible knowledge at hand. *Intellectual asset management strategy* - where management of patents, technologies, operational and management practices, customer relations, organizational arrangements and other structural knowledge assets, on an enterprise level, is of essence. *Personal knowledge asset responsibility strategy* - where emphasis is put on individual knowledge responsibility for investments and innovations related to knowledge. Also, availability of the knowledge assets to other employees, within their respective area of

accountability, in order for them to be able to apply the knowledge deemed most competitive for the company. *Knowledge creation strategy* - where the main focus lies on knowledge learning, and motivation of employees to innovate and create, within the field of basic and applied R&D, and capture lessons learned in order to enhance the future capabilities, and thus lead to improved competitiveness. *Knowledge transfer strategy* - where the emphasis is directed at systematic approaches to transfer knowledge within the organization, in order to apply the knowledge to situations requiring each specific type of knowledge.

Argote *et al.* (2003) state that successful knowledge management is significantly depending on ability, motivation, and opportunity. Ability is one important factor when it comes to knowledge management process. Training, such as analogical reasoning, can enhance abilities. Motivation is important in the knowledge management system since rewards and incentives impact potential success. The "not invented here" syndrome in organizations displays rewards impact on the process. Opportunity is a deciding factor when it comes to knowledge management since an organization needs to create opportunities to craft, retain, and transfer valuable knowledge, in order to succeed and experience growth long-term.

Davenport and Prusak (1998) argue that most the existing knowledge management approaches comprise one of three aims:

1. To display knowledge and explain the role of knowledge in the organization, with mechanisms such as knowledge maps, yellow pages, and hypertext tools;
2. To craft one unified knowledge-intensive culture through encouraging activities, with the purpose of achieving aggregating behavior, such as knowledge sharing routines, and mindset of proactively seeking and offering knowledge;
3. To create a knowledge infrastructure of with various dimensions, such as a technical system, a web of connections among employees given space, time, tools, and continuously encourage interaction and collaboration.

As Liyanage *et al.* (2009) claim that although existing perspectives on knowledge management differ in context, they seem to have two common characteristics. The first one is mentioned above, suggested by Davenport & Prusak (1998) and the second one is according to the authors that the significance in knowledge management is that it encourages acquisition and creation of new knowledge, regardless of the point, place or situation it is occurring. Knowledge management is a continuous process where people and organizations can acquire knowledge, transform it, and subsequently disseminate the knowledge. It further improves decision-making, learning curves, and endorses innovation Liyanage *et al.* (2009).

### 2.3 Knowledge Transfer

Within the field of knowledge management, knowledge transfer is an area emphasizing the movement of knowledge across boundaries created by specialized knowledge domains, aforementioned in the background (Carlile & Reber, 2003). Argote & Ingram (2000) defines knowledge transfer as "the process through which one unit (e.g. individual, group, or

division) is affected by the experience of another". Liyanage *et al.* (2009) define knowledge transfer as follows, adapted from Christensen (2003):

*“Knowledge transfer is about identifying (accessible) knowledge that already exists, acquiring it, and subsequently applying this knowledge to develop new ideas or enhance the existing ideas to make a process/action faster, better, or safer than they would have otherwise been. So basically, knowledge transfer is not only about exploiting accessible resources, i.e. knowledge, but also how to acquire and absorb it well to make, and to make things more efficient and effective”* (p.122)

Liyanage *et al.* (2009) explain that knowledge transfer is the dissemination of knowledge from a person, a place, or organization to another. A transfer of knowledge could be regarded as successful if the receiver manages to properly create and apply the transferred knowledge in his/her organization. Many scholars have introduced models explaining the actors and the process of knowledge transfer, (Nonaka & Takeuchi, 1995; Wiig, 1997; Davenport & Prusak, 1998; Cummings & Teng, 2003; Carlile & Reberntsch, 2003; Carlile, 2004; Oppat, 2008). Cummings & Teng (2003) present a model, based on previous research streams, different factors that impact the success of a knowledge transfer across four broad contextual domains.

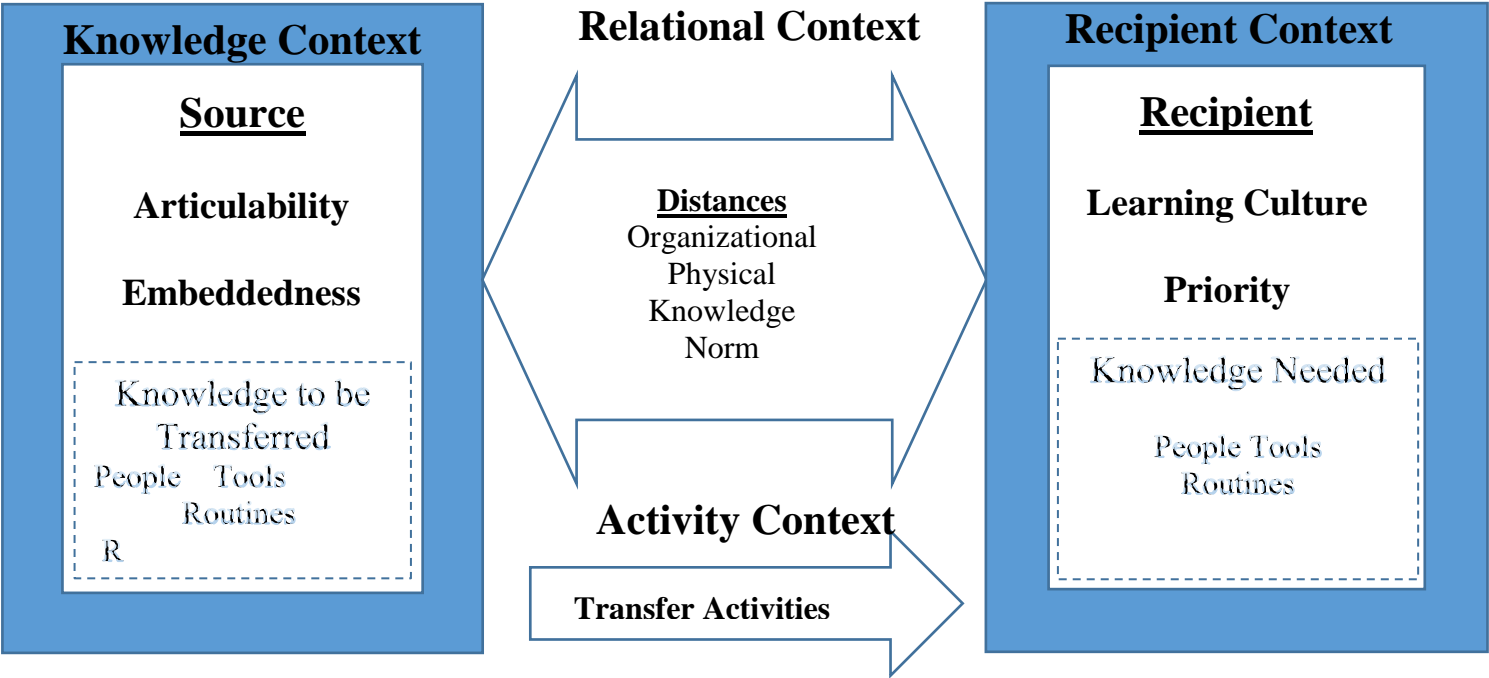


Figure 4. Four Contextual Knowledge Domains, Cummings & Teng (2003)

As aforementioned, some scholars have focused on the knowledge context, (Kogut & Zander, 1995; Bender & Fish, 2000; Alavi & Leidner, 2001) how knowledge is argued to have different characteristics, which in turn impact the ability to properly transfer to a receiver. Some scholars emphasize the relational contexts impact on the ability to successfully transfer

knowledge (Szulanski, 1996; Dyer & Singh, 1998). The activity context also impacts the ability to successfully transfer the knowledge (Davenport & Prusak, 1998). Looking at the recipient's context scholars has identified how capabilities of the receiver affect the ability of a successful transfer (Davenport & Prusak, 1998). Since our main focus of the thesis regards the knowledge sender's disseminative capability in order to successfully transfer knowledge, following Cummings & Teng's model, the knowledge context, relational context, and activity context are highly significant.

Carlile (2004) discuss three gradually complex boundaries - syntactic, semantic, and pragmatic and three gradually complex processes transfer, translation, and transformation (figure 5) While focusing on the effectiveness of managing knowledge across boundaries it is clarified that the relationship between actors not only regard sharing of knowledge, but also an assessment of each other's knowledge. In his development of a framework, he uses three different attributes of knowledge (Carlile & Reberntisch, 2003): *difference*, *dependence*, and *novelty*.

Difference refers to differential aspects of each party's' knowledge base, for instance, different requirements of knowledge, when for instance creating a complex product or service, which as a consequence generate differences in the levels of expertise, terminologies, tools, and incentives that are exclusive to respective context. An industry example could be in an NPD process making a car; actors in design, powertrain, and safety specialize in different types of work, requiring varied knowledge and responsibility (Carlile, 2004). Dependence refers to when two or several departments, or units must consider each other's operations if they are to jointly achieve predetermined objectives. In other words when a decision to use one tool, deploy changes to a shared component *et cetera* affects another unit's operations. The third dimension of knowledge at a boundary is how novel the knowledge circumstances are. In a new product development setting a novel situation could be a shift in consumer demand for instance (Carlile & Reberntisch, 2003; Carlile, 2004).

At the syntactic boundary, there are known differences and dependencies, and a common "lexicon" is crafted characterized by proper mechanisms of sharing and assessing knowledge at a boundary. Information is processed, and knowledge is transferred, by using different storage and retrieval technologies, and the challenge at this stage is increasing capacity to process more information.

At the semantic boundary differences and dependencies that are unclear occurs, in the way that there might be different interpretations, due to some level of novelty. To properly transfer and assessing each party's knowledge base, common means need to be developed, i.e. communities of practice to translate knowledge, by the use of cross-functional teams. In such a case the challenge is to make tacit knowledge explicit. At the pragmatic boundary different interest among actors, generated from levels of novelty, cause a somewhat inability to share and assess knowledge. Herein common interest needs to be developed, by transforming knowledge, for instance through prototyping boundary objects that can be transformed (Carlile, 2004).

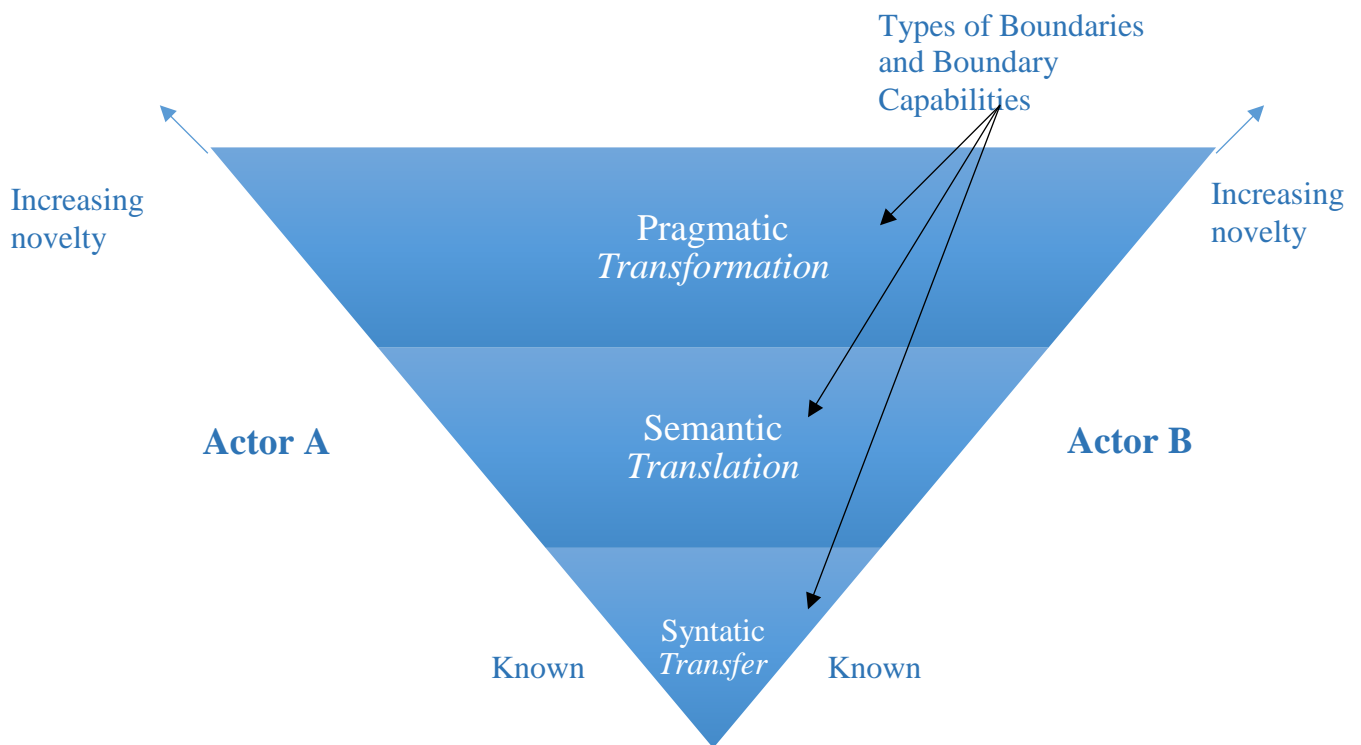


Figure 5. Knowledge Boundaries & Capabilities, Carlile (2004)

As the case with knowledge translation at the semantic boundary, where the challenge is to make tacit knowledge explicit, Nonaka & Takeuchi (1995) in their seminal work introduced a conversion model, where they consider four different modes of knowledge transfer; *Socialization*, *Externalization*, *Combination*, and *Internalization* (figure 6). According to the authors, socialization is defined as an organizational process, where some individual held tacit knowledge and transfer the knowledge in tacit forms to other individuals, with whom they interact.

<p><b>Explicit to Tacit</b> (Internalization) e.g. learn from a report</p>	<p><b>Tacit to Explicit</b> (Externalization) e.g. dialogue within team, answer questions</p>
<p><b>Tacit to Tacit</b> (Socialization) e.g. team meetings and discussions</p>	<p><b>Explicit to Explicit</b> (Combination) e.g. e-mail a report</p>

Figure 6. Knowledge Conversion Model, Nonaka & Takeuchi (1995)

Within the organizational process, tacit knowledge is acquired through sharing of experiences, but other mechanisms for learning new skills could be on-the-job training, team meetings and discussions, and observation *et cetera*. Externalization is defined as the

transformation of tacit knowledge into explicit knowledge, through dialogue within teams, answering questions, or via theories, concepts, models, and metaphors. The externalization of tacit knowledge is often present in the development of a concept, or a new product development setting.

The combination mode of knowledge transfer is according to Nonaka & Takeuchi (1995) defined as the conversion of codified knowledge into new forms of codified knowledge. Through a combination of explicit knowledge, new categories of knowledge are obtained (Liyanage *et al.* 2009). To achieve this conversion, several media of communication within the organization can be used e.g. by e-mailing a report. Internalization mode refers to a conversion of explicit knowledge into tacit knowledge, through a learning process where employees are educated and trained to perform a certain task.

## 2.4 Disseminative Capabilities

Previous scholars have conducted research within field of knowledge transfer, focusing on the disseminative capability from the knowledge sender context (Leonard-Barton, 1995; Dyer & Singh, 1998; Szulanski, 2000; von Krogh *et al.* 2000; Carlile & Rebentisch, 2003; Chini, 2004; Minbaeva, 2007; Oppat, 2008).

### 2.4.1 Realization of Knowledge

Dyer & Singh (1998) argue that the partnering firms should build up knowledge sharing-routines, to effectively develop internal search and evaluation capabilities, in order to properly assess whether one source of knowledge is valuable, and subsequently provide the required knowledge to the partner firm. According to the author a development of an effective knowledge sharing routine, regarding search and evaluation criteria of valuable knowledge help the partner firm to reduce time, search, evaluation, and avoid double work. By building up knowledge sharing routines, the partners develop a partner-specific absorptive capacity, where the concluding idea is to increase the ability to recognize, assess, and assimilate valuable knowledge. In order for such a capacity to work efficiently, inter-organizational processes need to be implemented, from which an allowance each partner to systematically identify valuable know-how and subsequently transfer it across organizational boundaries. This absorptive capacity is according to the author's dependent on to which extent the partners have developed jointly, and overlapping knowledge bases, and to which extent partners have crafted common interaction mechanisms, which augment the interaction frequency and intensity. Furthermore, they argue that as employees within each respective partner firm gets to know each other well enough to recognize who knows what and where critical expertise dwells within each organization, the partner-specific absorptive capacity is enhanced. As the development of partner-specific knowledge, through inter-organizational processes, proceeds both informal and formal means of inter-firm interactions might crystallize.

Carlile & Rebentisch (2003) introduce a framework, the knowledge transformation cycle with three distinctive phases, although it is not always clear in practice to separately define one

stage in the absence of others. For instance, as different actors are involved in the process; they may be positioned at different stages in the cycle in relation to each other. The framework comprises three different phases - *Storage*, *Retrieval*, and *Transformation*. In order to realize and assess the value of knowledge, it must initially be retrieved from its storage. This specific knowledge to be retrieved may be stored across various domains, such as people; it may be embedded in processes or artifacts.

The retrieval process is complex in character due to a path-dependent history of activities within the organization. Such history can be of essential value as an individual retrieve knowledge and a subsequently reuse that knowledge, to perform the task needed. As the novelty and complexity of the task required increases the different actions regarding the retrieval process needs to adapt to consider potential increases of dependencies and sources of specialized knowledge. The purpose of the retrieval phase is identifying potential knowledge that results in a solution, or ground pillar of a decision need to be made, for the partner firm. The activities related to knowledge retrieval regards e.g. information search throughout the organization, dependent on storage source, and acquisition mechanism. Information search refers to an iterative process identifying different sources of knowledge that can be useful, and subsequently assess to their extent of relevance towards the task required, and eventually worth acquiring.

#### 2.4.2 Assessment of Recipient's Knowledge Base

Many scholars have emphasized the Knowledge sender's capability of assessing the knowledge base of the recipient (Leonard-Barton, 1988; Doz & Hamel, 1998; Carlile & Reberich, 2003; Martin & Salomon, 2003; von Krogh *et al.* 2014). As each partner in an alliance seeks to secure its specialization, it can become difficult to facilitate a new product development, through connected knowledge bases (Grant & Baden-Fuller, 2004; von Krogh *et al.* 2014). The realization of knowledge is crucial since only the valuable knowledge is needed to craft connected knowledge bases, closing the knowledge gap. Thus, the knowledge sender's capability of assessing the recipient's knowledge base and the value of selected knowledge for the joint new product development is essential (Carlile & Reberich, 2003; Martin & Salomon, 2003; von Krogh *et al.* 2014). As the assessment of the recipient's knowledge base progress, the knowledge sender further has the ability of identifying strengths and weaknesses of the partner firm, as well as the absorptive capacity in relation to the knowledge source, and subsequently align transfer mechanisms accordingly (Doz & Hamel, 1998; Martin & Salomon, 2003; von Krogh *et al.* 2000).

Doz & Hamel (1998) argue that at the beginning of a partnership, there exists a "*skill understanding gap*," where the main problem is the own company's ability to understand the skills of their counterpart. In order to bridge the skill-understanding gap, and combine each other's skills, one ought to familiarize with the partner's skills. This gets, according to the authors, particularly important when the organizational context, knowledge base, and skill were shaped over a long time. The process of familiarizing with the partner's knowledge base is not performed overnight, especially when the realized knowledge is of tacit character and



emergent, i.e. the extent of novelty. It begins with an assessment of the distance between each of the partner's respective skills. One initial way of building an understanding of one's partner's skills is to document processes in detail and make this documentation easy accessible for employees to appraise. Need for combining each other's skills becomes significant when process integration is required. However, one cannot neglect the difficulties of combining skills, in a setting where skill bases are reflected in different organizational contexts, thus hard to connect. Martin & Salomon (2003) emphasize that the knowledge sender needs to evaluate the receiver's readiness and ability to access the valuable knowledge, and subsequently assimilate it within the organization.

#### 2.4.3 Encoding Knowledge

As the process of identifying valuable knowledge, and assessing the recipient's knowledge and absorptive capacity progress, another ground pillar in reaching knowledge transfer success is de-contextualizing knowledge from various sources within the organization, such as people, processes, artifacts, routines, *et cetera*, and subsequently encoding the knowledge in accordance with the transfer purpose (Carlile & Reberich, 2003; Minbaeva & Michailova, 2004; Oppat, 2008).

Chini (2004) emphasize the significance of de-contextualizing and encoding activities performed by the knowledge sender, and further claim that such activities alike have a positive impact on the knowledge transfer. She further elaborates on the fact that not all knowledge is compliant to transfer, and that both parties need to perform transformation processes prior the transfer.

Cummings & Teng (2003) as aforementioned argues that nine factors impact knowledge transfer, divided into four main domains, where the first context is "*knowledge context*." This knowledge domain comprises two sub-contexts - Embeddedness and Articulability. The former affects the receiver's ability to access the source knowledge. Lacking an understanding where the knowledge resides within an organization, might negatively affect the recipient in terms of increasing the risk of missing absorbing key knowledge. The articulation process refers to the extent knowledge can be verbalized, documented, or otherwise articulated. Furthermore the authors elaborate on how to effectively perform a knowledge transfer process in a joint R&D project, where it is argued that a participation of both R&D parties in the articulation process of key knowledge is vital since - it facilitates the recipient's post ownership and usage of the acquired knowledge, also it provides a linkage between otherwise less organizationally inverted units, finally it significantly improves the relationship between the each pre-transfer separated parties.

Following our definition of knowledge previously defined, where knowledge differs from data and information, based on previous beliefs and experiences of its source, path-dependency, and novelty, it can be interpreted differently amongst individuals (Nonaka & Takeuchi, 1995). Furthermore, organizations may often have their firm-specific language and abbreviations, which might confuse the recipient, and therefore hamper the knowledge

transfer's success (von Krogh *et al.* 2014). Due to these complexities of knowledge transferring knowledge requires proper mechanisms for de-contextualizing and encoding knowledge (Carlile & Reberntisch, 2003) so the transferred knowledge can be adapted in such a way that the recipient partner can grasp the knowledge and assimilate it. The process of encoding refers to being aware of the use of different tools, taxonomies, and arrangements performed within the organization, as this is an imperative for the receiver's ability to decode at a distance (von Krogh *et al.* 2014). To achieve knowledge transfer success, the knowledge sender needs to be able to articulate, de-contextualize, and encode both explicit and tacit knowledge (Minbaeva & Michailova, 2004; Minbaeva, 2007).

According to Argote & Ingram (2000) the source firm needs to, in detail, de-contextualize transfer relevant knowledge from its current context. The sender does so by abstracting the knowledge from its local context, i.e. routines, tools, and experiences. Simultaneously, the sender furthermore should provide the partner with as comprehensive background information, and explain certain rationales, in order to increase the chances of a successful transfer (Carlile & Reberntisch, 2003; Cummings & Teng, 2003; von Krogh *et al.* 2014). Even though de-contextualizing involves abstracting valuable knowledge from its local context, such project-related information may be of value to the recipient due to the path-dependency, and past activities of some relevant knowledge (Carlile & Reberntisch, 2003).

#### 2.4.4 Transfer of Knowledge & Transfer Mechanism

Essential, in the process of achieving knowledge transfer success, is the mechanisms or methods of transfer. Previous scholars have focused on the transfer approach mechanisms (Leonard-Barton, 1995; Martin & Salomon, 2002:2003; Pedersen *et al.* 2003; Chini, 2004; Minbaeva, 2007; Murray & Peyrefitte, 2007; Oppat, 2008; von Krogh *et al.* 2014). Leonard-Barton (1995); Chini (2004) conceptualize how employees involved in certain knowledge transfer projects need to have a profound understanding of how to properly use transfer tools, thus increase the receiver's capability of absorbing transferred knowledge. Chini (2004) further emphasize the essence of designing the transfer approach as a facilitating mechanism, requiring an adequate infrastructure within the organization.

According to Gupta & Govindarajan (2000), the transfer channels can be both formal and informal. A key formal structural method, regarding integrating units of an organization, could be liaison positions, task forces, committees (Galbraith, 1973). When it comes to the informal methods, it refers to the socialization process within the company, in which the openness of communication between interacting members increases through interpersonal understanding.

As previously mentioned in the knowledge transfer section Nonaka & Takeuchi (1995) discuss different modes of transfer via their conversion model. Depending on the knowledge characteristics (explicit or tacit), knowledge is converted through various processes, and thus transferred towards the receiver. Conversion processes could as mentioned be interpreting a

report, a group dialogue within the project joint project team, team meetings and discussions, and an e-mail conversation.

Pedersen *et al.* (2003) further argue that there are a variety of different modes to be used when transferring knowledge to one's partner, though they simplify these modes into two different knowledge transfer mechanisms; "*Rich communication media*" and "*written media*." These two mechanisms account for two extremes, and in practice, these mechanisms seldom occur in pure forms, but rather in tandem with each other, including both face-to-face communication and written media (Håkansson, 2000; Pedersen *et al.* 2003). According to Daft & Lengel (1986), rich media communication comprises different types of communication mechanisms, such as face-to-face communication, informal interaction, and team interaction mechanisms. Performing these types of communication modes requires partner visits; sharing of experiences, face-to-face interaction, and socialization and face-to-face interaction amongst individuals facilitate transfer of knowledge that is experience-based, as it allows interactive communication, questioning, flexibility *et cetera* (Nonaka & Takeuchi 1995; Bresman *et al.* 1999; Pedersen *et al.* 2003).

Knowledge transfer through rich media communication further might generate transfer of knowledge that the sender is unaware of, or is not able to transform into written media. It is further argued that this type of rich media communication, when transferring knowledge, is appropriate when the transfer setting regard adapting new joint practices. Adaptations might concern business practices, cultural differences, and laws (Pedersen *et al.* 2003). However, rich communication media, i.e. face-to-face interaction may be difficult due to the cost of travel, too dissimilar organizational structures and cultures, and different languages.

Looking at the knowledge transfer through written media, this extreme could take various forms involving manuals, databases, and blueprints, written instructions. In relation to rich media communication channels these types of written media are less costly to transfer, due to less required face-to-face communication. Within these types of media companies can achieve economies of scales through digital share point systems, but if the degree of *tacitness* increases regarding the knowledge to be transferred, the less efficient it becomes using written media communication channels (Pedersen *et al.* 2003). The authors further argue that the choice of transfer mechanism is not predetermined by the characteristics of the knowledge, where anomalies might occur.

Murray & Peyrefitte (2007) categorize communication media when used as knowledge sharing activities, in three classifications; technology-assisted communication, meetings, and training methods, where each of the classifications has components that are high and low in media richness. Technology assisted communication comprise video conferencing, accounted for high in the rich media theory, where members can sort out complex problems face-to-face. Components within this classification accounted for as low media richness are e-mail, databanks, and teleconferencing. Meetings comprise formal and informal component, and the richness of the communication medium is likely to be determined by the degree of formality. An informal meeting is argued to generate opportunities for networking across organizational

boundaries, compared with formal meetings/conferences, which are accounted for as low in media richness. Though, formal meetings are deemed a proper transfer mechanism when communicating less complex knowledge. For instance, when the content of the meeting is information-oriented, e.g. budgets.

However, as interpersonal ties developed during formal meetings are low, these meetings are likely to impede transfer of complex knowledge (Hansen, 1999). Looking at training methods that are high in media richness, the authors identify mentoring, simulations games, role-playing, and job-rotation. The rationale of why these methods are argued to comprise high media richness is that they require more face-to-face interaction, rapid feedback, and transfer complex know-how. Training methods that are low in media richness are video instructions for instance (Murray & Peyrefitte, 2007).

#### 2.4.5 Support of Knowledge Application

The final stage of the knowledge transfer process regards the support activities towards the knowledge receiver's application of the transferred knowledge. Previous scholars have investigated the field of support activities, related to the knowledge transfer process. (Szulanski, 2000; Cummings & Teng, 2003; Carlile & Reberich, 2003; von Krogh *et al.* 2014). According to Nonaka & Takeuchi (1995), knowledge, tacit and expertise, in particular, is related to human action and are accounted for as successfully transferred as soon as the recipient independently can apply and work with the transferred knowledge. Cummings & Teng (2003) argues that such a transfer of knowledge-ownership means that the recipient can independently use it to complete tasks, and contribute to the joint product development.

It is not sufficient to only receive the knowledge; the received knowledge must also be applied. In the application process, the knowledge transfer success might be hampered by misunderstandings, causal ambiguity, and the recipient's absorptive capacity (Szulanski, 2000; Lucas & Ogilvie, 2006). As discussed before knowledge realized, de-contextualized, and encoded might have followed different paths, actions, decisions, and solutions (Galbraith, 1990; von Krogh *et al.* 2014) and thus the sender need to mitigate barriers that might impede the knowledge application. These mitigating efforts might include on-site training, where the sender acts as a teacher, teaching the recipient firm how to apply the specific knowledge (Szulanski, 2000).

Also, people from the source firm can act as coaches, providing real-time support, and answer questions when problems arise, as well as providing additional knowledge when such is required (Carlile & Reberich, 2003; von Krogh *et al.* 2014). When the source firm supports the recipient's knowledge application, knowledge transfer success is more likely.

#### 2.5 Inter-Organizational Knowledge Transfer Challenges

In a joint new product development setting, certain barriers/distances exist towards transferring knowledge across different levels, such as geographical, functional, organizational, culture *et cetera* (Dougherty & Hardy, 1996; Cummings & Teng, 2003).

Doz & Santos (1997) elaborate on how the dimension distance affects different flows within MNCs, distinguishing between spatial "dispersion," such as the distribution of knowledge between the sender and the receiver in space, and contextual differentiation, such as linguistic, cultural, professional differences of knowledge senders and recipients.

### 2.5.1 Organizational Distance

According to Cummings & Teng (2003), organizational distance measures the degree to which involved R&D parties are integrated organizationally when performing a knowledge transfer. In other words, its rationale lies in how the knowledge sender and the knowledge recipient choose what organization mode to be used transferring knowledge inter-organization wise. The organizational governance mode chosen significantly shapes the flow of assets, the depth and breadth of interaction between the two R&D units, and the incentives for collaboration (Baughn *et al.* 1997). The degree to which the units are organizationally internalized, (the smaller the organizational distance) will affect the strength of social ties, free-flow communication, administrative consistency, and levels of trust between the knowledge sender and the knowledge receiver (Cummings & Teng, 2003). The authors further elaborate on the degree of organizational internalization, arguing that it is greatest in an intra-firm mode, less so with recently acquired units, and the least within an alliance inter-firm relationship.

Doz & Hamel (1998) argues that one barrier or gap that needs to be accounted for, when it comes to increasing the potential for knowledge transfer success, is the organizational context gap. The gap matters since the partners' structures and processes for decision-making, organization, performance and learning may be more or less compatible with each other. The underlying reason or source to the existence of such a gap is an incongruity in organizational size and style. Intuitive and analytical styles make sharing systems and expectations difficult. Also, differences in the handling of knowledge, speed of decision-making somewhat hamper a joint decision-making to take place between partners. Hence, the authors argue that it is of importance recognizing organizational and cultural compatibility between partners, considered the other party's organization, milieu, and origins, and adjust to each other as much as possible, e.g. through buffers and gatekeepers.

### 2.5.2 Communication & Interaction Distance

When the R&D unit that is working with joint product development are geographically dispersed, the physical distance between them can incorporate significant amount of time, and expenses in communicating and interact face-to-face. Gailbrath (1990); Cummings & Teng (2003), argues that the greater the distances between the parties, the slower and less the knowledge/technology transfer. Another factor considered by Doz & Hamel (1998) argue that there might be an information gap between the cooperating parties, and in such a case their information needs to be shared and disclosed. The authors discuss the source of information gaps and argue that negotiation can generate information and knowledge asymmetry. Also, a rivalry between the parties might bring information asymmetry in the relationship.

When operating in a joint product development, the differences between them might be several in character; decision-making processes, organizational structure, which defines authority and responsibility, and company norms and objectives (Narteh, 2008). According to the author, all these different aspects influence the way employees within the organizations interact with each other. The fact that knowledge bases between individuals, prior a partnership, most likely differ it is vital that these individuals interact (Cohen & Levinthal, 1990); in particular, when the two organizations are geographically separated (Tsang, 2002).

According to social network theorists the frequency, emotional intensity, and intimacy within the relationship decide the strength of the partnership (Brass *et al.* 1998; Rowley *et al.* 2000; Narteh, 2008). The authors argue that the partnering corporations develop ties to each other, where a strong tie is characterized by frequent interaction. A weak tie, on the other hand, is characterized by infrequent and distanced interaction. Further, they argue that knowledge transfer occurs with both ties. When transferring non-redundant, basic information, and public information, weak ties fulfill the purpose (Granovetter, 1985; Brass *et al.* 1998; Rowley *et al.* 2000; Narteh, 2008), whilst strong ties are more preferable when complexity and privacy characterize the knowledge transferred (Hansen, 1999; Uzzi & Lancaster, 2003; Narteh; 2008).

### 2.5.3 Cultural Distance

Simonin (1999) argues that several ambiguities affect the knowledge transfer success, where one of these ambiguities is cultural distance. According to him the possible negative effects of cultural distance in different aspects of collaboration could regard difficulties and challenges for managers to allocate more time on communication, design of compatible copyright. According to Mowery *et al.* (1996), distance and cultural differences between cooperating partners are key obstacles to inter-firm knowledge transfer. Hamel, (1991) further argues that cultural asymmetry, rather than cultural distance generate imbalances when it comes to decoding and interpreting knowledge. As documents, charts, and other specifications may be performed in English; there could be only a few individuals within the counterpart organization that has the ability to interpret, decode, and understands the information (Simonin, 1999). Simonin (1999) further argues that cultural distance does not only create difficulties of identifying opportunities in the market, crafting market mechanisms, but the distance also creates barriers of communication between partners. Pucik (1991) also acknowledge the cultural distance factor in knowledge transfer, arguing that, a lack of inter-cultural skills and awareness for a partner will impact the learning ability, as well as the ability to perform control in the alliance.

### 2.6 Knowledge Transfer Success/Key Success Factors

When it comes to measurements of knowledge transfer success of different projects with the purpose of crafting a “lessons learned” mindset Oppat (2008) defines knowledge transfer success as:

“... I consider knowledge transfer successful if transferred know-how is applied to commercial ends, in my case, for the advancement of the project work, and generates benefits for the involved partners” (p.12)

The author further states four different levels within knowledge transfer success, with multiple indicators, displayed in figure 8.

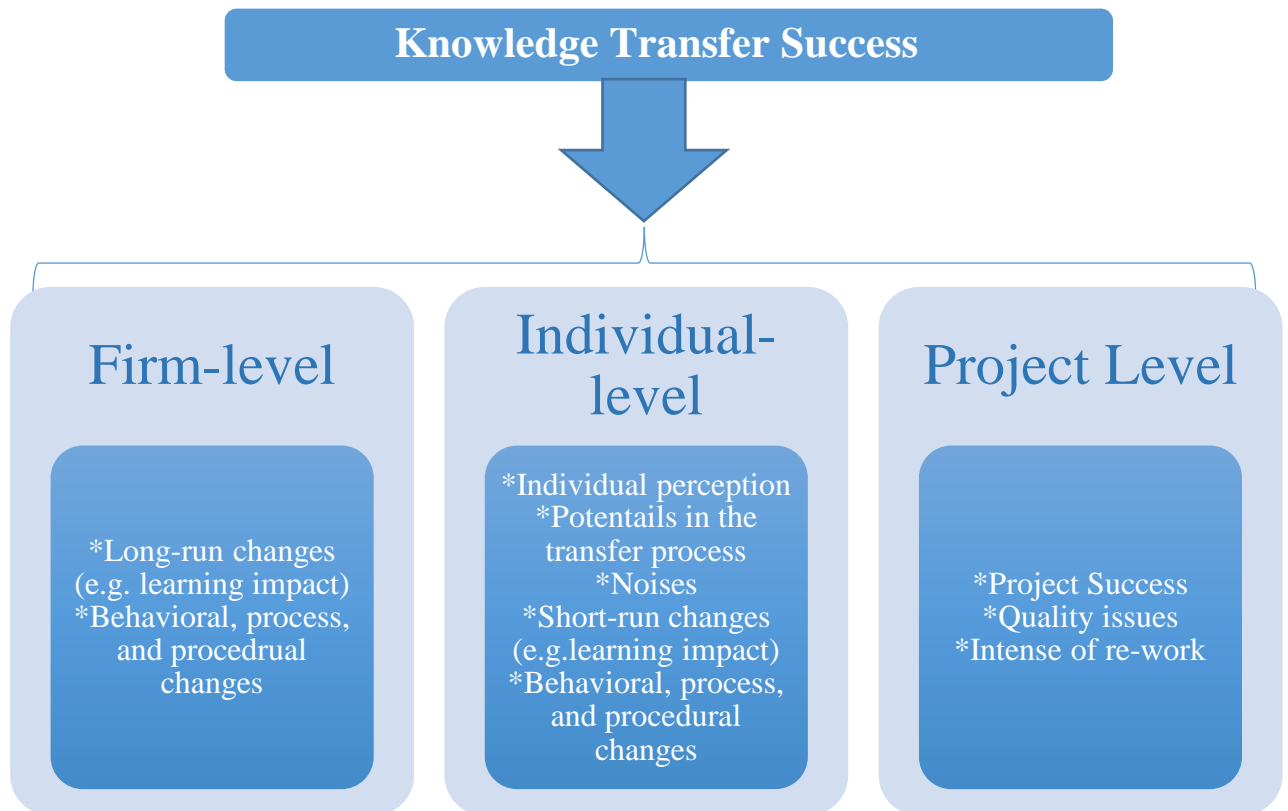


Figure 7. Knowledge Transfer Success Indicators, Oppat (2008)

The *firm level* emphasizes learning effects in the long run. At least one partner or in the best case both partners learn from each other, generating an increased overall performance, by leveraging combined capabilities from joint work. The firm level also considers a behavioral and procedural change in the way processes, technologies, or procedural changes can be traced back to collaborating partner influence. When looking at the *collaboration level*, one analyzes the potential for follow-up collaborations. In the partnership, if the partners are both satisfied with the knowledge exchange, generating reciprocal benefits, there is an increased chance of future collaborations.

On the *individual level*, the indicators measure various aspects of the knowledge transfer success. For instance, they measure the individual satisfaction of the transferred knowledge, e.g. if the application for the project work was easy. Also, what possible potentials were identified in the knowledge transfer process and which one of them had the biggest impact on

the knowledge transfer. Furthermore, what the barriers and interferences in the knowledge transfer process are caused by. The author further discusses learning on the individual level, i.e. what the individual learn from the ongoing collaboration between employees from the partner firm, as well as the differences or changes related to processes, behaviors, and operations in the joint partnership, compared to original behavior.

Knowledge transfer success on a project level could be indicated and measured by evaluating whether the project has been successful. One could check if the project has been on time, within budget *et cetera* (Oppat, 2008). According to Cooper (2000), one could also use the standard measure for product development, and two closely related to those standard product development measures are *quality issues* and *re-work* (Oppat, 2008). Quality issues regard problems that arose both during and after the project and can result from ineffective knowledge transfer, along with difficulties in understanding and applying the transferred knowledge, thus resulting in quality problems and product call-backs. When it comes to re-work it is argued that the intense of re-work is increased when knowledge is transferred improperly.



### 3. Methodologies

*In the following section, the chosen research strategy, design and method are being presented, as well as motivated to provide an understanding of why certain choices have been made and how these choices have benefited the purpose of this study. Further, the use of primary and secondary data sources will be addressed together with a discussion about the reliability and validity of the research.*

#### 3.1 Research Strategy

This research holds the design of an explorative study, as the nature of the topic is of such kind that little of the outcome can be known beforehand. Further, the purpose of this research is to explore what can be made from the case company's side to enhance their knowledge-transfer. The rationale for answering such purpose is believed to be that a qualitative research strategy is the most suitable strategy.

Building further on the aforementioned, as the nature of the study is in essence exploratory, an inductive approach will be applied regarding the relationship between theory and research. The logic of an inductive approach is that it has its starting point in empirical material and the research findings are what in the end generate theories. (Bryman & Bell, 2011) The inductive approach thus uses explorative questions which in hand generates explorative answers. In this study and the uniqueness of the research at the case, where the previous empirical evidence is scarce, the aim becomes on drawing conclusions from the observations and interviews made during the research process. This project is intended to enhance the case company's transfer process, but to be able to do so, one must take into consideration the other stakeholders as it will mainly be them that will be affected by potential changes to a transfer process. Therefore, an inductive approach will allow the research to test more general theories applicability to this case and the possibility to make use of the material emerging during the research.

It does exist empirical evidence on what characterize a successful knowledge transfer process between "experts" and "novices" in new product development; however, each partnership regarding new product development is unique and contingent on the unique composition of stakeholders and each of their nature. Therefore, we insist that to rely too heavy on theories for deducting hypotheses to guide the research process will probably limit the ability to objectively interpret the data collected and to draw conclusions from this. By choosing to take an inductive pathway, we will keep the ability to gather valuable data that might not have been anticipated prior to the study and therefore be able to obtain a holistic understanding of the field of research in this case.

#### 3.2 Research Design

This research is designed as a single case study. This type of design aims its interest at the complexity and the uniqueness of the chosen case object and is preferable when it is the case that is of importance and when its complexity benefits from in-depth clarification (Bryman &

Bell, 2011). When referring to a single case study, it can be a single company, a location or activity. What is of importance is the specific focus on a bounded system or situation in terms of an entity with a specific purpose. In our case, we focus on the single activity of knowledge-transfer at a single company, even though the actions taken will have an impact on other stakeholders, it would still classify as a single case study. Moreover, a case study is focused on generating claims and is therefore often exploratory in character. Hence the choice of a case study suits this research properly, since the collaboration between the two organizations in the NPD process and related knowledge transfer setting is unique for the region. Further, case studies are advantageous as it facilitates the gathering of important information regarding both real-life events and organizational processes. (Yin, 2003) As this study aims to investigate the current operations of a knowledge-transfer at the case company and we believe that information to be of a quite complex nature, a research design that facilitates the gathering of such data will be beneficial.

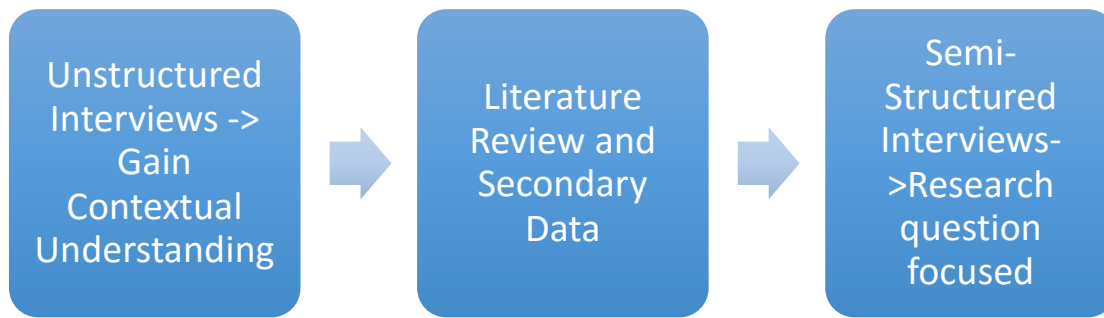
### 3.3 Research Method

To be able to fulfill the aims of this research and to gather the data needed, aligning with the chosen research design of a case study, interviews is the choice of as the primary method of data collection. Qualitative interviews can be divided into two main different means of categories, semi-structured and unstructured. (Bryman & Bell, 2011) This research makes use of both different types of interviews, as it is likely to best serve the purpose of this study. The unstructured interview closely resembles an informal conversation as it allows for spontaneity and lets the respondent talk freely around a topic stated by the researchers. (Bryman & Bell, 2011) During this research, unstructured interviews were mainly conducted in the beginning of the project to gain a basic understanding around the case investigated. One could see the unstructured interviews as a preparation of the actual data collection. However, the main part of the data material collected during this research was through semi-structured interviews, guided by the research questions and thus based around predefined topics of interest.

Another mean of gathering data has been to review written material obtained from the case company's database, such as knowledge transfer documentation and planning documentation. Through gaining access to this database, the authors could deepen their understanding as well as gain a basic understanding around how the specific case company has set up their processes around a successful knowledge transfer between the parties involved. The reviewed material consists of reports, planning documentation and process maps.

### 3.4 Data Collection

The data collection has comprised different modes, ranging from initial unstructured interviews, examining literature in the chosen field, and finally semi-structured interviews, outlined in figure 8.



*Figure 8. Modes of Data Collection*

### 3.4.1 Primary Data

The material obtained through unstructured and semi-structured interviews, discussions and observations from meetings has been considered as gathered from primary sources of data. In the following section of this paper, the choices of these means of data, as well as the process of the gathering will be explained thoroughly. All the interviews were conducted face-to-face at each companies' premises, as most of the information required was experimental in character, in line with Jacobsen (2002). The locations were Gothenburg, Sweden at CEVT's headquarter and Cixi, China at Geely's R&D center.

#### 3.4.1.1 Unstructured Interviews

At the beginning of this research, several initial meetings were arranged to gain a basic understanding of the problems and processes that were employed at the case company. At this stage, no prior knowledge of the case company and their processes existed. Hence, the purpose of these meeting was to gain as much knowledge as possible and build a basic understanding around the case company, their background, and their processes. Our procedure followed an invitation from our supervisors at CEVT, where we prior these meetings had prepared basic questions related to the subject, and our supervisors presented basic concepts and organizational aspects. Our supervisors both work within business development and project management related to the knowledge transfer, thus suitable for presenting such matters related to our research. Further, the authors were invited to participate in a hand-over meeting with participants from all the different stakeholders. As the authors' knowledge about the case was limited prior to these meetings and therefore it was hard to steer the discussions in a specific direction, these meetings much resembled unstructured interviews. Both the initial meeting to help the authors grasp a basic understanding of the case company and the hand-over meeting were held at CEVT's premises at Lindholmen, Gothenburg. At the initial meeting, our supervisors presented the case company in Swedish, as that is the mother tongue of both the authors and the supervisors. At the hand-over meeting people from both CEVT and Geely were invited; therefore the meeting was held in English as a common language.

### *3.4.1.2 Semi-Structured Interviews*

Post the initial phase of grasping the basic understanding of the company, the collaboration and working methods, more formal meetings and interviews were arranged with the purpose of gathering data that could possibly answer the stated research question. Thus, the main body of the data collected during this research was collected through semi-structured interviews. Such interviews are based around predetermined topics of interest, but depending on which direction the interviews take they allow for open discussions and deepening of the questions on the specific direction that the interview takes (Björklund & Paulsson, 2012). Using this interview technique, the authors were able to utilize most of the interviews and to focus them on a set of predetermined topics, at the same time allow for spontaneity and to speak relatively freely around potential important topics that could emerge during the interview. As the aim of this study was to understand how the case company could enhance their disseminative capabilities against their stakeholders on all different levels between the different organizations, this interview method allowed for the interviewees to speak freely about their view of the stated research question and give a sense of their specific departments challenges in the knowledge transfer process. For the purpose of this study, this was considered beneficiary, as the different interviewees have very different experiences from the knowledge transfer process, depending on their department within the organizations. A more structured approach would therefore not be sufficient to fully capture the diversity of experiences among the different interviewees.

Through using a semi-structured approach, the interviews could be tailored to suit every interviewee and allowed these to reflect upon knowledge transfer in general as well as in relation to their counterparts. By maintaining guidelines for the interviews, it helped the interviewers to ensure that the discussions did not stray too far from the intended subject and became irrelevant. Semi-structured interview guidelines involve a list of questions on which the interview is based around, but the order and importance of the questions stated in the interview guide may vary for each specific interview (Saunders et al., 2000). Based on aforementioned, no single predetermined interview schedule was created, but instead predefined topics, related to the different disseminative capabilities and challenges mentioned in the theoretical framework, were used as a basis for creating questions and discussions designed specifically for each interviewee. This approach was necessary as each interviewee had different backgrounds about the specific case. Prior to the interviews, we sent the interviewees a list of broad questions that they could reflect upon. The reason to do so was first to give the interviewees a background of the study. Secondly, this allowed the interviewees to reflect upon the purpose of the study and be a prepared for the actual interview.

All the interviews were recorded, and additional notes were taken during the interviews. By recording instead of solely relying on notes, it allowed both interviewers to be able to ask follow-up questions where necessary, thus stimulating the conversation and allowing the authors to obtain possibly richer answers, as well as clarifications where needed. Further, by

recording all interviews instead of solely relying on notes, the authors could gain a significantly more detailed report and the possibility to listen to the interviews several times if needed (Bryman, 2001).

Further, all the semi-structured interviews were conducted face-to-face. In regards to the interviews with people working at CEVT, the interviews were conducted at CEVT's premises at Lindholmen, Gothenburg. The interviews with the respondents from Geely were conducted at Geely's R&D center in Cixi, China. In Sweden the interviews were held in either Swedish or English, depending on the respondent's nationality. In China, all the interviews were conducted in English.

By conducting face-to-face interviews with all the respondents, the authors could draw advantages that no other medium of interviews have, like non-verbal cues and spontaneity in the answers (Emans, 1986; Wengraf, 2001). In face-to-face interviews, there is no significant delay between the question and the answer, meaning that the interviewer and the interviewee can promptly react to what the other says or does. The main advantage of this synchronous communication is that the answer of the interviewee comes more spontaneous and without an extended time of reflection (Opdenakker, 2006). For this research, such advantage was beneficial, as an extended time of reflection from the respondents might give a more distorted answer in the sense the interviewees might answer what the authors want to hear. The authors found this especially important in the interviews conducted in China, as there in some cases were a language barrier between the interviewee and interviewers. The synchronous nature of face-to-face interviews allowed to quickly ask for clarifications were needed.

#### *3.4.1.3 Workshop*

At the end of the process of this thesis, the authors held a workshop at the case company, presenting the findings of the research so far. Apart from presenting our findings to the case company, the workshop functioned as a second round to either confirm or deny our findings from the participants' point of view. At the workshop, previous interviewees together with other employees that in some way were touched by the field of study participated. The workshop itself were structured as a presentation with time for discussions and reflections between all different parts of the study.

#### *3.4.1.4 Respondents*

For this research, an important aspect to consider has been to include employees from both CEVT and Geely from many different backgrounds. Initially, the selection process was aided by obtaining recommendations from our supervisor at CEVT, as he already had a broad perspective on the problem as well as the different organizations. Our selection criteria choosing interviewees were that everyone had some involvement in the handovers currently completed, or handovers to come, either had a manager, project leader, or engineering role, to be able to contrast perspectives depending on different roles. After the initial interviews, the interviewees further guided the data collection by suggesting other people in the organization,

which they believed could give the research valuable inputs. In that way, the interviews and the respondent numbers grew organically based on recommendations. For the sake of the research the it was beneficial that the respondents stayed anonymous, so that they would feel they had the ability to speak freely and criticize when needed.

<b>Role</b>	<b>Time</b>	<b>Code</b>
<b>Project Leader</b>	58 minutes	<b>SWE 1</b>
<b>Project Management</b>	46 minutes	<b>SWE 2</b>
<b>Software Development</b>	37 minutes	<b>SWE 3</b>
<b>Project Management</b>	41 minutes	<b>SWE 4</b>
<b>Quality Manager</b>	32 minutes	<b>SWE 5</b>
<b>Quality Manager</b>	32 minutes	<b>SWE 6</b>
<b>VP Manufacturing</b>	50 minutes	<b>SWE 7</b>
<b>Project Coordinator</b>	38 minutes	<b>SWE 8</b>
<b>Liaison Officer</b>	56 minutes	<b>SWE 9</b>
<b>Project Manager</b>	47 minutes	<b>SWE 10</b>
<b>Project Management</b>	32 minutes	<b>SWE 11</b>
<b>Manager</b>	<b>Workshop</b>	<b>SWE 12</b>
<b>Project Leader</b>	44 minutes	<b>CHN 1</b>
<b>Project Management</b>	41 minutes	<b>CHN 2</b>
<b>Project Management</b>	38 minutes	<b>CHN 3</b>
<b>Project Management</b>	43 minutes	<b>CHN 4</b>
<b>Project Leader</b>	56 minutes	<b>CHN 5</b>
<b>Project Leader</b>	32 minutes	<b>CHN 6</b>
<b>Project Management</b>	34 minutes	<b>CHN 7</b>
<b>Project Management</b>	<b>Workshop</b>	<b>CHN 8</b>

*Table 1. Respondents*

### 3.4.2 Secondary Data

#### 3.4.2.1 Corporate Data

In addition to aforementioned primary data, secondary data such as intranet documentation, presentations, and further material have been obtained through CEVT's intranet. The purpose of these presentations and documentations was to deepening our conceptual understanding of the collaboration, processes, systems, and responsibilities. Further, the literature studied to create the theoretical framework is also to be regarded as secondary data, as other authors as to suit their specific research and purposes create it. All secondary data used in this research has been critically reviewed to ensure its suitability for the purpose of this specific study. When creating the theoretical framework, the authors relied solely on academic journal articles. As to understand the background of the project and the possible problems that could arise in this specific case, the authors relied on documentation obtained from the case company's database. Examples of such documentation are steering and planning documentation.

### 3.4.2.2 Literature Review

The theoretical framework is based on a literature review, which helped the study to identify and pick relevant published research in the specific field of joint product development with emphasis on knowledge-transfer. This literature review has provided a steady foundation to further elaborate the theoretical framework section, and further, in the long run, the empirical section of this paper. In the beginning, most efforts were aimed at a thorough review of relevant literature on the predetermined field of research to be able to gain a deeper understanding and valuable insights on basic theories and models.

### 3.5 Data Analysis

Aligning with the choice of keeping an inductive approach, this paper is based on and utilizes grounded theory. Grounded theory is often deployed when analyzing qualitative data and makes use of an iterative strategy in terms of a constant comparative analysis, where data analysis and theoretical reflection are conducted simultaneously (Bryman & Bell, 2011). This strategy fits well with the purpose of this study, as aforementioned, little is known beforehand about the outcome, and the aim is to compare qualitative findings to theory. By using this theory, we searched for common concepts between interviewees, when identified we subsequently categorized them, providing a proper foundation for the analysis of the data. Further, the interviewees are different in nature as all comes from different background and departments within the case company, but at the same time interdependent, as all stakeholders are contingent on each other's willingness to contribute to the research. Bryman & Bell (2011) says that the iterative process of continuously gathering data helps to shape subsequent steps in the data gathering process. It has proved suitable in this study as the basic knowledge around the case were gathered in Sweden, as well as the data from a Swedish perspective. Thus, by using a grounded theory approach for the data analysis helped in designing the later interviews conducted in China by getting leads and clues what to specifically focus the interviews around from a Swedish perspective. In other words, early interviews and analysis of them helped in shaping later interviews.

### 3.6 Data Quality

According to Bryman & Bell (2011) the most prominent criteria, when evaluating business and management research are reliability, replication, and validity. Reliability is concerned with the repeatability of the research result. The measure is particularly used in relation to the question whether measures that are formulated in business and management are consistent. Replication regards the replicability of the research, meaning that the study must be capable of replication. Hence, it is evident that the research procedures need to be declared in detail. The third measure, validity, concerns the ability to draw conclusions with integrity, from a piece of study. The measure is often divided into internal and external validity. The former relates to the causality, in other words, the question whether conclusions can be drawn from a causal relationship between two, or several variables. The latter relates to the question

whether one can generalize findings from the study afar the specific research context (Bryman & Bell, 2011).

However, according to Bryman & Bell (2011), these concepts aforementioned often relates to quality measures used in quantitative research. Some researchers have sought to apply these measurement concepts to qualitative studies (LeCompte & Goetz, 1982; Kirk & Miller 1986), while others argue that these concepts are inapplicable to, or inappropriate for qualitative research (Bryman & Bell, 2011). As we perform a single case study, we sought to apply research quality measures more applicable to our single case study at CEVT. Lincoln & Guba (1985) propose *trustworthiness* as an alternative measure to reliability and validity, appropriate for qualitative research. The concept of trustworthiness has four different aspects, each with a parallel to criteria in quantitative research.

*Credibility* concerning how believable the findings are and if the study is performed with good practice. Performing a comprehensive literature review, covering the previous studies by researchers well experienced within the subject, where we extensively investigated and examined these studies, reinforces the credibility of our research. *Transferability* is it possible to apply the findings to another context. Lincoln & Guba (1985) argue that the fact that a qualitative study often incorporates an intensive study of a small group, holding similar characteristics results in an empirical issue. In our study, we increase the transferability by present the previous scholars' theories in a broad perspective, and subsequently, in the analysis, putting these theories in contrast to our empirical findings.

*Dependability*, paralleling reliability, regards how likely the findings is to apply at other times. Lincoln & Guba (1985) suggests that the researcher should take an auditing approach, in order to establish quality of research, by keeping records and document all aspects of the research process in an accessible manner. In our research, we strengthen the dependability by providing a thorough methodology section, in detail describing each step of the research process. Furthermore, dependability we increase dependability by recording the interviews conducted, documenting interview guidelines, and coding the findings in our study. Thereby, we make sure that our interpretations of the primary and secondary data are as accurate as possible. Moreover, apart from following a clear and transparent structure of the study, all our information gathered and used is disclosed and documented.

*Confirmability* concerns the objectivity of the research, i.e. to what extent the researcher has allowed personal values to interfere in the study. To increase the confirmability of our research we make sure that we have a clear and well-defined separation of our own values opinions, and the ones of previous scholars, through thorough referencing. Also, we have a well-defined connection our data and interpretation. The confirmability concept is also enforced by throughout the thesis providing a clear disposition, systematic data interpretation, and an introduction to each section, all of which increase the easiness for the reader to follow.



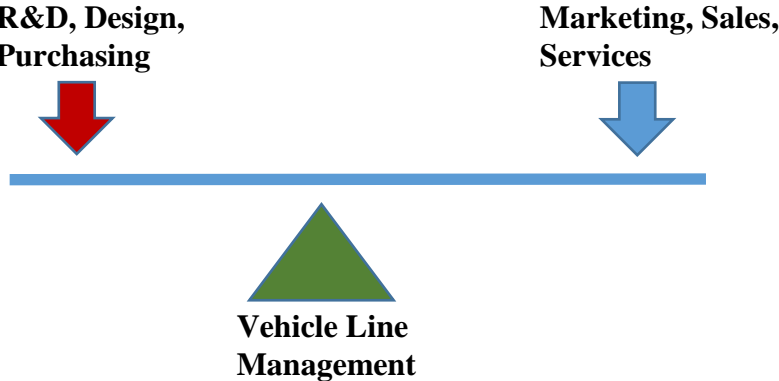
## 4. Empirical Findings

*In the following section, the empiric findings of this study will be presented divided into sections derived from the theoretical section, as well as grouped between the different actors. Firstly, conceptual findings will be presented to gain a basic understanding,, followed by the findings derived from the semi-structured interviews.*

### 4.1 Case Background

In order to be able to fully understand the rationale of the NPDS deployed at CEVT one need to clearly understand the concepts and definitions of architecture and vehicle platform. Vehicle architecture defines system functional relations, standardized interfaces and modules, shared bill of process and industrial structure. The architecture further defines platform partitioning and the development framework, regarding requirements, constraints and scalable solutions, for vehicle platform development. A vehicle platform is among others the lower body, the chassis, steering and safety systems, selected powertrain integration parts (e.g. cooling and exhaust), the electrical architecture as well as selected interior parts. It is designed to be common between a group of cars, kept together in time and organization. A platform is based on vehicle architecture.

The objective of deploying aforementioned rationale is to allow for vehicle modularity, to be able to decrease development costs and time. The vehicle derivatives are falling from a family to a program, and finally to a vehicle project based on vehicle architecture. At the bottom, the architecture defines the common base of which a family is developed. A vehicle family comprises of several vehicle programs and is based on the same architecture. The vehicle program is the actual vehicle, which includes several vehicle projects in chronological order. Last, the vehicle project is an actual vehicle version (e.g. first model, second model, facelift of a model). The vehicle program management is a cross-functional team effort led by the vehicle line management (the green team). The objective of this team is to balance inputs from the Marketing Sales and Services (blue team) and the technical side e.g. R&D or design (the red team) to ensure completion of a total project considering costs, time and content.



*Figure 9. The Role of Vehicle Line Management*

The NPDS is a state-of-the-art product development system for the vehicle development applied by CEVT. By continuously collaborating with all functions the purpose of the system is to generate an industry competitive timing at a competitive cost. Initially, Volvo developed the new product development system, however, in order for the system to fit the new collaboration setting with Geely, the system was aligned and improved. The system comprises three development phases, *Program Strategy*, *Concept*, and *Industrialization*. As mentioned in the introduction section, each project developed by CEVT follows an NPDS with milestones and gateways. Each of the three phases contains corporate and business milestones as well as functional gateways. The NPDS content can be structured in a pyramid, with the development logic at the top and increasing level of detail below. At the top level, there are several corporate and business milestone descriptions including overall timing. The second level comprises an increasing number of functional level gateway descriptions per function. The bottom level of the pyramid consists of more than thousand numbers of processes, methods, and tools described in detail. The vehicle development itself is divided into architecture and top-hat development. As the vehicle development progress towards the industrialization phase, the development of costs increase significantly, while the possibility to influence costs decrease. The relationship is displayed in the figure below (s.10 Handbook)

#### 4.1.1 Program Strategy

In the initial development phase, the strategy of the new vehicle is crafted, decided by the strategy, marketing, product planning functions. The program strategy output includes targets, intents, requirements, attributes, functions, and definitions of the new vehicle program.

#### 4.1.2 Concept

In the concept phase, the shared architecture is developed, and compatibility between technology plans set in the program strategy is confirmed. In this phase, the design and electrical architecture are also developed and finalized. To ensure compatibility and feasibility pre-industrialization, continuous checks are performed along the progress. The output of the concept phase is a virtual architecture to be handed over to Geely.

#### 4.1.3 Industrialization

Post concepts phase Geely starts to prototype the virtual architecture in physical form, in order to validate and confirm the feasibility and quality of the vehicle program, or project developed by CEVT. Subsequently, given that the program is completely feasible, the mass production starts, and eventually the cars are launched. (CEVT, 2017).

## 4.2 Disseminative Capabilities

### 4.2.1 Realization of Knowledge

#### 4.2.1.1 CEVT

Much of the knowledge within CEVT resides within individuals, previously working at Volvo, where they have developed knowledge derived from processes, logics, and experiences from settings, which they now are supposed to apply at CEVT towards Geely:

*“Looking at the employees at CEVT it seems to me like I am the only one who has not got a background working for Volvo” - SWE 2*

He stresses the importance of having a shared documentation platform, where decisions regarding the architecture development, for instance, are disclosed, in order for the Chinese counterparts to be able to follow the development progress, as well as the building an understanding of how to proceed with the project post hand over. By having these shared systems, he explains that the organization has a somewhat foundation facilitating access to knowledge for all parties involved in the joint project development.

SWE 1 explains that the procedures and systems how the different actors should work jointly are clear, by having the colored books, structuring different aspects and functional levels of the collaboration. Furthermore, by having the team-center and share-point platform from which knowledge can be derived regarding the different functions and parts for the current project, the knowledge is stored and accessible for every employee within the organizations. Though he explains that it is rather unknown if the systems are deployed in practice. He continues discussing that even though much of all knowledge is available in the shared-systems, the system fails to rank or assess the value for the counterpart taking over the project post hand over.

*“A big challenge for us at CEVT is to still deliver a good ordering at the time of the handover, and simultaneously with the handover bring path-dependent knowledge and decisions taken, to our Chinese counterparts” – SWE 1*

*"Both Geely and Volvo initiate these changes as a project progress and disclose these requests in a shared forum VLAM. Here one can access all new requests that most likely have an impact on the platform"- SWE 8*

SWE 8 explains that the shared systems between CEVT and Geely exist where knowledge potentially can be stored for all employees to access. She emphasizes the importance of documenting any changes or requests appearing during the joint projects since the platform and the top-hat development are performed in tandem. Even though the basic development of the platform is initially set, there is a continuous development meaning that changes might appear as project progress:

*“We need to become increasingly formal with roles, responsibilities, procedures and systems in the initial planning of our joint projects and make sure that these are disclosed in our shared systems. We cannot have a fix-that-later mindset where already planned time is moved back and forth. It becomes problematic” - SWE 8*

#### 4.2.1.2 Geely

When asking about how the documents, roles, and responsibilities transferred, in the different projects performed at present, CHN 1 explains that all information and documentation is structured in certain colored books working as guidelines for every step in the process. He states that they follow the predetermined working system for the actors in the joint development NPDS, with the different milestones and gates.

*“We have the guidelines with the different development systems we can follow, where each step gate and milestone is defined. The progress, procedures, and issues are disclosed in our shared systems, such as share-point. There we can access the knowledge required for continuing the project” - CHN 1*

When further discussing the realization of knowledge and the subsequent communication, he mentions that it is stated in a shared file which the responsible manager or engineer for a completed task is, which means that knowledge or decision taken residing within the mind of that individual is to be reached by contacting that person.

#### 4.2.2 Assessment of Recipient's Knowledge Base

##### 4.2.2.1 CEVT

SWE 1 explains that the rationale for doing a hand-over in FDJ is because it is the phase where a project goes from being virtual to being industrialized. After the handover, all physical investments are being made e.g. machines, factories, and other production related investments. These investments are being made in China, and therefore it makes sense that the handover is at this point, as the recipient is closer to the initial market and therefore possesses the knowledge necessary for doing such work and taking the project further.

*“All the cars are produced in China; therefore, it makes sense that they take over the project at FDJ” - SWE 1*

*“It is said that we should work in the same way, but we do not really know actually” - SWE 1*

He further stresses the importance of using the same method in a joint new product development. According to his standpoint, both sides of the project have committed to sharing the NPDS logic of working, but from the Swedish side, it is unclear whether this agreement is

followed or if they use other methods at Geely. He further explains that these working methods and agreements are new and that they probably will develop to the better over time when the parties have started to be getting used.

There seems to be somewhat of different experiences on how the processes work together with Geely depending on which department you work on. One of the interviewees shared his experience and meant that the ones that follow the NPDS logic most accurate are his Chinese counterparts.

*“The ones that know the NPDS logic the best are the Chinese. They are super informed”* - SWE 3

SWE 5 explained her experiences contrasting those mentioned above, stressing the importance of having shared routines and working methods, but meant that the routines both parties have committed to were not followed in China.

*“We have to work structured and in line with NPDS. The Chinese team has committed, but they do not follow it at all. They do it in their way. Now, it does not work at all.”* - SWE 5

#### 4.2.2.2 Geely

CHN 6 at Geely explains that before the joint development with CEVT and VCC, Geely had their own New Product Development System, which differed quite a lot from the now deployed NPDS system. He further elaborates that he understands that such partnership they have today needs a detailed methodology of driving a project as much of the continuous development is performed simultaneously. Previously, the method of developing cars had been more agile and fast moving. He further stresses that the NPDS is good, but not fully deployed within the organization as they need time and training to be able to fully reach its potential. CHN 5 at Geely agrees in this matter and explains that these processes and rules are entirely new to him.

*“The biggest challenge right now is to adapt to all new rules and processes”* - CHN 5

*“The NPDS-way is a new way of working for us. We have never developed cars in this way before”* - CHN 3

#### 4.2.3 Encoding Knowledge

##### 4.2.3.1 CEVT

The encoding process of knowledge or project progress is a significant stage in the knowledge transfer in our joint projects, SWE 1 explains. He explains that much of all the realized knowledge, decisions taken, and issues appearing as such are disclosed in the shared systems accessible for all actors active in the ongoing projects. He states that the system used clearly

describes the actual data and decisions taken, but fails to in-depth describe rationales behind certain decisions taken, or open issues and balanced processes related to these issues.

When asked about how the knowledge and information disclosed are prepared and evaluated to be helpful for a Chinese engineer taking over the project at a certain stage SWE 1 continues to explain that most of the technical data do not need to be translated or transformed in an extensive way, such data are easily understood by an engineer in China. Rather it is balanced issues, or historical records and more detailed reasoning of why certain data is disclosed, or decisions taken, that increasingly needs to be mentioned. Those types of information are hard to suppose for an engineer taking over a task, and therefore we can improve the disclosure of such information, as well as finding suitable translating efforts making sure that the knowledge is of value for our Chinese counterparts, says SWE 1

*“We do not hand over any processes and rationale behind decisions. That is the challenge! The technical aspect we have got covered” - SWE 1*

SWE 8 elaborate on the shared system where employees access valuable knowledge and required information to progress with the ongoing project emphasizing that the present situation where a lot of the talk around project issues, or requests goes around in corridors or other informal settings, which negatively can impact the success of the project or the cost of a project, as some critical issues might be missed:

*“At the current state, she mentions that there is a significant risk that changes or requests are not captured or documented in the shared systems, rather discussed in informal settings” - SWE 8*

The appointed project leader in specific business areas has standing meetings, where current and upcoming issues/changes are being discussed. She mentions that the content being often discussed becomes rather informal than formally disclosed, where it is easy that issues disappear. Thus, the dialogue project leaders' in-between needs to be improved, as well as the communication post meetings.

*"If one is to discuss major improvements with the current knowledge sharing routines, making sure that every aspect of issues, requests et cetera always are clearly documented in share-point, team-center or any other shared system." - SWE 8*

Another key aspect regarding key knowledge in the shared project is to from the beginning of the project, when responsibilities, budget allocation, and cost structures are set, more in-depth make sure that each role is defined in detail, she explains. Also, the dispersion between cost aspects related to platform and top-hat are clearly dispersed, so that all employees are well familiar with what factors affects the other, as well as where to access certain knowledge within the organization if required. Sometimes at CEVT we do not clearly divide platform and top-hat development initially, but rather subconsciously have the distinction in the back

of our heads, she explains. This could complicate the understanding of consequences of future changes in processes when an appointed colleague is supposed to take over the project.

SWE 10 explains that some disclosure of specific attributes and articles lacks detailed path dependent data required to continue working on a project. A significant amount of information and data are accounted for in an extensive excel file, where it is not always clear where the data is derived from, and what it means, even though the function or business area is evident:

*"The Excel file where a lot of knowledge are disclosed builds upon the rationale that employees in question actually communicate with each other. That is something we do not measure or emphasize even though a lot of the knowledge sharing process heavily relies on a mutual understanding of certain knowledge" - SWE 10*

#### 4.2.3.2 Geely

When asked about how easy the interpretation process of disclosed knowledge in the shared routines are, CHN 4 explains that the data in the share-point system often is distinct and clear in nature, from a technical perspective with attributes as such. If there is any additional information required to understand an issue or the context of knowledge, we can send a request to CEVT and achieve the proper guidance or knowledge.

*"All knowledge and data are accessible from the early stages of a project in our shared systems, but we do not use them widely due to a lack of understanding how to interpret some information. Instead, we use our own systems, mostly Microsoft Excel" - CHN 2*

#### 4.2.4 Knowledge Transfer Mechanism

##### 4.2.4.1 CEVT

At the core of the investigated transfer mechanism is tools like Share-Point and Team-Center. These databases should be accessible through the intranet by all employees at both CEVT and Geely. It is in these systems where both parties can access information during the whole course of the process. At the actual handover in FDJ, each department that is responsible for a handover prepares an Excel file where open issues, responsibilities and report structure is detailed.

*"The Chinese teams have access to the systems at an early stage and full insight in all documentation" - SWE 2*

*"In order to ensure the right quality of vital elements in the project, we have a continuous exchange of staff, where we have Geely representatives at our premises all the time" - SWE 4*

At the point of the actual handover in FDJ, a sign-off meeting is being held with representatives from CEVT, handing over their specific project to their Chinese counterparts. At this meeting, each department goes over the status of what is being handed over, regarding open issues and how to solve these problems. At the point, after the sign-off meeting, each project is considered to fully been handed over.

*“How each team want to communicate with its counterparts is up to them” -SWE 1*

SWE 7 explains that it is up to each specific department how they want to handle the actual handover with regards to documentations *et cetera*. He elaborates saying that some departments do it in the systems, while others use methods like email or Excel sheets. The interviewee says that it is beneficial to give each department that freedom as the nature of what they hand-over differ dramatically from every department. At the same time, each department should know best how to successfully handover what they have worked with.

*“Maybe we should not handover a project with a lot of open issues. I think we need to reach higher level of maturity before handing over in some cases” -SWE 1*

SWE 3 explains that even though a project has not reached requested maturity at the point of handover, it is being handed over anyways. Now, the FDJ is decided by time instead of level of maturity. He elaborates, saying that one way to mitigate misunderstandings regarding late changes might be to let the maturity decide instead.

#### 4.2.4.2 Geely

From Geely’s perspective, there is a consensus among the interviewees that a clear shift of responsibilities is beneficial for both parts, as it is today with the sign-off meetings. CHN2 elaborates and explains that by having the hand-over and the shift of responsibilities at a predetermined date, it makes it easier to plan. At the same time, he explains that by deciding the FDJ quite early might hamper level of maturity of what is being handed-over. CHN4 further explains that there is no such thing as a clear hand-over, he means that there will always be open issues that come with the shift in responsibilities. Though, by having the hand-over decided by time instead of maturity the risk is that issues that are being handed-over are more complex than that they would have been if FDJ was decided on the level of maturity.

*“There is no such thing as a clear-cut regarding the hand-over, it is a dream world” - CHN4*

Now, the formal sign-off meeting is being held in Sweden for all departments except one. Prior to the sign-off meeting, most departments make use of that Geely representatives visit to discuss issues around the hand-over. CHN2 proposed that it might be a better idea to have the sign-off meeting in China with the motivation that the information around the hand-over would be easier accessible for engineers in the different teams.



## 4.2.5 Support of Knowledge Application

### 4.2.5.1 CEVT

Looking at the knowledge supporting activities provided by CEVT in general, the methods used are directed at aiding the takeover of certain knowledge, functions, attributes, data prior the industrialization phase performed by Geely. Employees at both companies have access to the shared systems, but the main hand-over regards the product specifications derived from team-center, according to SWE 2.

Within the hand-over product specification, there are also defined responsibilities, who has been responsible for what area or specifications in Sweden, and who the responsible person in China will be. Thereby, if there are any uncertainties post official hand-over of knowledge the contact person is stated in the shared Excel file used, explains SWE 10. SWE 1 mentions that at present situation the strategy from CEVT's perspective is to support as much as possible after the handover, having a shared responsibility even though Geely has taken over the project:

*"At present, we have a shared responsibility. At CEVT we support Geely as much as possible after the handover, with additional requirements of uncertainties when interpreting data decisions. Eventually, in future joint projects, the strategy will be to let Geely have responsibility post-handover, on an increasing level". SWE 1*

SWE 1 further discusses that the joint working processes, with the handover, responsibilities as such are rather new. At present, there are a lot of uncertainties and if the method goes hand in hand with the working processes of Geely is hard to say, from a company perspective.

SWE 3 states that the post support practices, in general, are good.

*"At present, there is no such thing as a clean cut, when it comes to the handover. Team-center as a system relates to the drawing specifications for the industrialization phase of the project, where it is more about release management and level of maturity. We have people who have lived in China to support on the location, and we perform supporting activities on a continuous basis, though without measuring the result of our support" - SWE 4*

SWE 5 explains that on the quality side we have struggled to support them fully, due to communication issues and different functions organization-wide. Also in order to support them better, we need an improved change management system, they continue.

*"A clean cut does not work in reality when. A lack of employees with the right competence at Geely, who experience tremendous growth now, means that at present we need to support them on a continuous basis. At my division chose to support Geely during and post-handover, by sending people to China. For me personally, I think it's better to support with people in*

*China to make sure they know how to proceed with the product development and subsequent industrialization" - SWE 7*

#### 4.2.5.2 Geely

When looking at the supporting activities performed by CEVT from Geely's perspective, one can see that support is provided in those areas needed, where Geely either lacks competence or where CEVT at present are better at performing certain activities

*"We have defined which job need support from the Swedish team. It is clearly communicated, and in general, I think the support is very positive" CHN 4*

He continues to explain that in certain areas we do not have relevant competencies or abilities to handle it here in China, such as safety and calibration. We have clearly defined for CEVT in which areas we need their support, and in those areas, we cannot handle at present we hope to absorb relevant knowledge to take over the responsibility in the future.

*"There are several attributes to consider in our joint product development projects, and not all of these are handed over at present. Full responsibility stays in Sweden for those areas where Geely lack competence" - CHN 4*

He elaborates on the process of support post-handover explaining that the China team are very good at pushing issues from a time perspective, but that there still are some issues after the handover. There are some test results performed back in Sweden that we need to follow, and sometimes the communication is not very good, and problems appear, he continues.

*"There have been cases where we identified an issue related to an activity, where we see that we will not be able to meet the criteria at a gate in the NPDS. At that point, we ask for a little bending of the gate or required alternative options for completing a certain task. Instead of providing support of any kind, the answer we get is to just follow the development system step by step. It's not like we don't have any innovation at Geely" - CHN 3*

*"Even though it's a struggle sometimes communicating with each other, if we ask CEVT for additional requirements or supporting actions, they deliver" - CHN 7*

When asking CHN 3 & CHN 6 about the provided support from CEVT post-handover they explain that the support, in general, are good, but sometimes there are many quality issues left. However, we have a clear responsibility, and they have a plan for the next step.

### 4.3 Inter-Organizational Knowledge Transfer Challenges

The biggest challenge within the knowledge transfer in the joint product development projects between the actors are the different organization and company structure, communication problem and adopting the shared knowledge-sharing routines.

#### 4.3.1 Organizational Distance

##### 4.3.1.1 CEVT

A big challenge in the knowledge transfer process of the shared projects between CEVT and Geely are the different organization structure within some areas. At the beginning of the joint product development, there was a CEVT Sweden and CEVT China, where CEVT China comprised employees that had been educated in the new processes, with the purpose to act as a facilitating actor in the cooperation between the two companies. These employees went back to China, post education, in order to share the knowledge of the new systems and run CEVT China. Eventually, the CEVT China was absorbed by Geely, and became Geely Research Institute. As the organization structure differs in some functions, so does the company culture and thinking when conducting business.

The colored books, and joint NPDS logic, and shared knowledge systems have been developed in order to facilitate the product development and the joint projects between the organizations, but there are still many problematic issues with regards to these systems.

*“Department structures are not alike at all between the Swedish organization and the Chinese organization, and the project constellation is not the same either” - SWE 1*

*“There is a different in the mindset of the two organizations. While we have adopted the waterfall project management structure, they have a more agile project management thinking. Also, the process of working with shared architecture and platforms are new processes to them. Meaning that instead of calling us directly, they check with their local supplier and solve the eventual issue through them” - SWE 3*

*“In the quality department, we have quality responsibility for both the products and processes accordingly, while in Geely the focus lies more on product quality. Such a difference in the view of quality might become a problem since at present CEVT is responsible for the overall quality of the cars” - SWE 6*

*“The biggest challenge is the organization and the division of responsibility between the organizations. Geely is more characterized by levels of hierarchy, while CEVT has a flatter organization structure” - SWE 3*

*"As for the project structure in our department, we have tried to introduce a project matrix, where the line organization appoints a project leader with the mandate to run the project. However, business and project management in China, are more characterized by hierarchies, which makes a project matrix hard to introduce" - SWE 7*

#### 4.3.1.2 Geely

Looking at the organizational distance in the joint product development projects from the Chinese perspective, there have been some problematic changes too.

*"In the beginning when I joined Geely in 2015, we were kind of like one company. My team was called CEVT China, and it was easier to collaborate. Now we have a new organization with new processes" - CHN 1*

He continues to explain that the new organization sometimes is an obstacle, where many of his team members are not familiar with working with the NPDS. Sometimes the department equivalent does not even exist, which makes the handover more problematic since there will be a need for a clear distinction to ease the transfer of knowledge, he explains. When asking CHN 5 about the inter-organizational knowledge transfer challenges, and challenges within the joint R&D collaboration he explains that adopting to a lot of new rules and processes, such as platform logic as a business case is a big challenge.

*"Adopting to several new logics and rules such as the CMA and NPDS is a very big project. Top-hat and product plant business case is completely new for us" - CHN 5.*

#### 4.3.2 Communication & Interaction Distance

##### 4.3.2.1 CEVT

Having interviewed representatives from both CEVT and Geely regarding challenges cooperating almost everyone came about communication issues. Face-to-face communication is not used that often, only when events such as formal project handovers, or introductions of new plants are performed. The most common communication method used is e-mail, whereas Skype and video meetings seldom work without connectivity problems. For Geely some problems with access to knowledge-sharing systems occur, making the collaboration and application of the knowledge transferred even harder. SWE 1 explains the communication issue:

*"The issue that is a really big challenge is the system speed between China and Sweden" - SWE 1*

He continues to emphasize the challenge of communication, where the communication itself is central for a joint project to work. Effective connections are vital in the work that is performed at CEVT and subsequently handed over to Geely. He explains that it is hard for the

employees at Geely to initially access team-center, share-point, and other shared systems, and while eventually working in the systems the connection is poor and slow.

Regarding the knowledge transfer and handover method of the projects there are also certain identified challenges, described by SWE 10 accordingly:

*"In team-center and the extensive Microsoft Excel file that we use to signoff different areas in the project, and confirm the actual shift in area of responsibility there are room for questions referred" - SWE 10*

He continues to explain that it sometimes could be rather confusing when communicating the handover inside the file and that the success of the knowledge and project transfer heavily relies on an actual person-to-person communication. The current method is built upon mutual trust, a trust that might not always be there.

*"It feels like the more detailed you have been in the documentation process, the more can you expect that the handover has gone proper, or can you? It's still a guess" - SWE 10*

On the quality side, the same communication issue is present, where the daily contact is non-existent according to SWE 5. They mention that all communication is decided upon the daily shape of our IT-systems. SWE 5 emphasize that it surprises her significantly that one within such a big company does not have a commonly working IT-platform. However, SWE 8 emphasize that even though there is a struggle with the communication the whole working method between the two organizations is new and adapting to it requires significant efforts in regards of time and patience.

When asked about the communication take place within the joint development SWE 7 explains that the communication as such is hard. From the technical perspective, it is catastrophic, where the telephone line does not work, screen sharing is not possible, and as weird as it is video conferencing is the only method that works, in some locations.

*"Confirming a purchasing order here requires 10 seconds, while in some locations in China the same procedure is not even possible" - SWE 7*

#### 4.3.2.2 Geely

From the Chinese side, the communication challenge is further acknowledged, specifically emphasizing the transfer process and system used for the transferred knowledge. The knowledge-sharing systems used are accessible, but the interpretation and encoding of the knowledge disclosed within the systems seem to be the biggest issue.

For CHN 5 the communication challenge is the main issue where especially the handover communication needs to be improved. For me, the documentation is not perfect, and we need to make sure that we define technical responsibility on an increasing level, he says.

*“We need to establish handover content, define the scope, how to prepare, and define the people responsible for what functional area to a greater extent. And as the systems and processes are completely new for some employees at Geely, we need the support from the Swedish team on a continuous basis until we are mature enough to handle the project” - CHN 5*

He continues to explain that one need to find a way of structure to encourage communication on each level is essential. We should have a mindset of building a car in one room, where knowledge and experiences are shared, he says enthusiastically.

CHN 1 argues that communication, in general, is good and the communicated product specifications and shared knowledge are disclosed in a much greater and more effective system than is used at present in the Geely Research Institute (GRI) organization. The problem is that many the employees do not know how to use it. CHN 4 explains that the communication of some issues regarding attributes can be problematic. As tests are performed in Sweden, and subsequent follow-up meetings does not work as proper as they should. He explains that his perception of the critical area of cooperation is the communication of attributes. The way that we use lessons learned or follow-up status does not work as good as it did at the beginning of the collaboration, he continues.

*"The communication tools are not very good, and that is the main problem when seeking to facilitate knowledge transfer at a distance. In the beginning, CEVT China visited Sweden more often to do status checks, and now only top management go, generating a low level of engineer visits" - CHN 3*

#### 4.3.3 Cultural Distance

##### 4.3.3.1 CEVT

In all the interviews conducted at CEVT, the interviewees touched upon the cultural differences between the actors as being a big challenge for a successful knowledge-transfer between the two organizations. The cultural differences pose a challenge. What was different between the interviewees was their mindset of working jointly with their Chinese counterparts.

*"As the language and cultural barrier are obvious it is increasingly important to be very clear when we communicate. I have had experiences at the start of this project that made me mad, now I have come to understand that these differences are there no matter how mad I am. It does not make any difference in the end.” SWE4*

He further elaborates saying that he understands that many of his newer colleagues get frustrated by trying to overcome the cultural barriers that lead to a lot of misunderstandings

and reworks. He means that you over time learn to understand your counterparts in China the better you get to know them and that it is important to give the collaboration time to grow.

Other interviewees express a more critical and frustrated view on the cultural differences and say that these differences make it impossible to collaborate in some cases.

*"Sometimes it feels hopeless. I can explain a task repeatedly, but in some way, they still find a way to misinterpret it and do something else". SWE 6*

She further explains that at the beginning of the joint project, both parties committed to following certain procedures and routines. Though, this commitment is not followed from the Chinese side. In the long run, this has led to tensions between her department and their Chinese counterparts.

#### 4.3.3.2 Geely

From the Chinese perspective, the cultural differences are further acknowledged, though in general in a very positive manner. Most interviewees touched upon this matter without being explicitly asked about it. It is widely understood that the cultural difference between the organizations poses significant challenges on both a personal and organizational level. As CHN 5 put it:

*"One challenge is culture, where there are several differences between the Chinese philosophy and the Western philosophy, which in turn is hard to coordinate. However, it should not be neglected that these differences also benefit the collaboration through diverse perspectives" CHN 5*

#### 4.3.4 Knowledge Transfer Success Measures

##### 4.3.4.1 CEVT

The measurement of knowledge transfer success of the few projects managed and handed over to Geely at present has not clearly been structured efficiently, where some employees do not know if there is supposed to be lessons learned process or a project evaluation at all. SWE 12 defines the current process for lessons learned and evaluation of projects as weak, with no clear objectives or guidelines:

*"At present, we have performed two-three handover of projects, but after the handover, we do not have proper measurements to evaluate what things went good and what things went bad" – SWE 12*

When asking SWE 10 about how knowledge transfer success or project handover success is measured he explains that it is not clear how the lessons learned process should be managed and facilitate future planning of project handovers:

*“Not only are there a lot of things that are being changed without documentation in the shared systems from the beginning, but instead are the consequences of these changes dealt with at the end of the project. I mean how are we supposed to learn from the consequences if we don't have clear lessons learned process” - SWE 10*

Many the employees at CEVT explained that support is provided in the knowledge application phase if required by Geely, though only focusing on specific processes or issues as such. No structure measure exists measuring the knowledge transfer success of the actual handover processes. Also, evaluation of facilitating actions prior the knowledge transfer is neither assessed after a handover.

#### *4.3.4.2 Geely*

When interviewing Geely representatives about the support provided by CEVT, there was consensus that it, in general, were proper support when requested. However, there was no actual evaluation of the handover or knowledge transfer. A project leader at Geely CHN 8 explained that there need to be more pro-activeness towards support in general, as well as lessons learned procedure:

*“At present, much of the support offered comes when asked for it. Sometimes one does not even know that support might be required, and in those cases, it would be more sufficient if support could be proactive in nature. That also does regard evaluations and lessons learned from previously performed projects. How will we otherwise be able to improve the success of our future projects?” – CHN 8*

When asking CHN 4 on this matter, he further acknowledges the question of lessons learned he explains that communication is the most critical aspect in crafting a successful knowledge transfer or project success in general:

*“When it comes to success of knowledge transfer and the subsequent handover, lessons learned process is vital, with meetings related to follow-up status of recent handover could be a mechanism” - CHN 4*

He further elaborates on the fact that the support often is more significant at the beginning of different projects, but emphasize that pro-active support directed at measurement post projects are important when it comes to learnings and improvements.



## 5. Analysis

*In this chapter, we will provide an analysis of the empirical findings, and connect these to the theoretical framework. One will be able to identify areas where the empirical findings deviate from the theory and find similarities. Furthermore, we will discuss certain factors that significantly influence the knowledge transfer process*

### 5.1 Disseminative Capabilities

#### 5.1.1 Realization of Knowledge

Investigating the knowledge-sharing routines between the two organizations, one can clearly see that efforts have been made for crafting joint systems where knowledge, data, and information are accessible for all employees, for instance with team-center and share-point. The former working as a blueprint with product specifications to be followed when industrializing the car in later stages of the production, and the latter providing decision logs, issues, responsibilities of employees involved in a project *et cetera*. This crafting of joint knowledge-sharing routines goes in line with what Dyer & Singh (1998) propose, that in order to succeed in a collaboration between two different organizations, mechanisms for providing knowledge for the other partner need to be developed.

From our accounts, both organizations address knowledge as key in their joint product development, where the competence of the employees within each respective company is the driving force in developing and manufacturing profitable cars, and subsequently achieve growth. The emphasis and pervading mindset of knowledge-based activities as the key driving force in the two organizations goes in line with the argumentation that such activities are the cornerstone for sustainable competitive advantage, and a prerequisite for yielding long-term survival in today's economic landscape (Barney, 1991; Grant, 1996; Teece, 2000; Khamseh & Jolly, 2008).

Furthermore, the crafted knowledge-sharing routines differ in character in displaying and trying to explain the role of different types of knowledge within the organization, related to activities performed. Such methods of displaying knowledge go in accordance with Davenport & Prusak (1998) rationale of what aims different knowledge management strategies within organizations comprise, for instance, knowledge maps, yellow pages as such. In our case, team-center and share-point account for such mechanisms. Also, since most representatives from both organizations acknowledge that processes determining how the collaboration is supposed to take place, and where the knowledge is accessible, and who the responsible person is, one can argue that a knowledge infrastructure of various dimensions is in place. For instance, technical systems, a web of connections among employees given space, time, tools, and continuously being encouraged by management to interact and collaborate, as proposed as one of Davenport & Prusak's (1998) three aims, mentioned in the theoretical framework.

However, in the process of assessing whether a specific type of knowledge is valuable to disclose for the other partner, there seem to be some areas of improvement at CEVT. At present, there is a risk of knowledge leakage, where knowledge stays in the corridors and is not documented in the knowledge-sharing systems as mentioned by SWE 8 in the empirical section. Also, because most of the development systems and processes deployed at the organization, as well as the employees working at CEVT comes from Volvo, there is a high risk of assumptions made that certain knowledge is obvious, thus not disclosed. Meaning that when the receiver of knowledge, in this case, Geely, takes over the project or accessing knowledge there might be confusions of why that specific decision was taken. From our accounts, this means that a reverse effect of the proposed benefits of joint knowledge-sharing routines by Dyer & Singh (1998) could be achieved. Instead of reducing the time for search, interpretation, and evaluation of knowledge, the time for that process would be increased.

From our accounts, there are as previously mentioned acknowledged flaws within the realization of knowledge, in the way some knowledge stays within the employees and are not being properly disclosed in the knowledge systems, generating difficulties in the retrieval process for the partner. However, much of the knowledge, regarding technical data, disclosed in the shared systems is properly accounted for, and assessed from the perspective of Geely. The process of storage and retrieval of knowledge at the CEVT goes in line with the knowledge transformation cycle proposed by Carlile & Rebentisch (2003), where the storage and evaluation of much of all knowledge are properly disclosed.

One can see that the partnership along with the newly adopted working procedures and collaboration logics is taking place, even though the whole system is in the development stage. An inter-organizational knowledge-sharing system is developing along with overlapping knowledge bases. After speaking with representatives from both companies, it is evident that even though there is room for improvements, it is clearly disclosed in the shared systems where to search for specific knowledge, and who to talk to when uncertainties occur. A partner-specific absorptive capacity is being crafted, where both informal and formal means of interaction grow, in line with potential benefits of jointly formed knowledge-sharing systems proposed by Dyer & Singh (1998).

#### 5.1.2 Assessment of Recipient's Knowledge Base

When analyzing CEVT's ability to assess the knowledge base of the recipient the empirical findings shows that when it comes to assessing the competence of performing a specific task, CEVT, in general, possesses a proper ability. However, the ability to assess the usage of the joint systems by Geely, in this case, is almost non-existent.

The skill understanding gap between the two organizations has gradually grown to become a successful division of tasks, where the understanding of what competence each respective company function manage to perform is present. The tasks where Geely still does not have the proper competence, in terms of people and tools, are performed elsewhere by either CEVT or VCC, while tasks, where Geely has the right competence, are gradually performed in-house.

The representatives from Geely confirmed this division of competence-based tasks, where in the future the division might look different. Furthermore, in some tasks performed by Geely responsibility still stays at CEVT, according to the NPDS logic. This initial development of knowledge sharing partnership goes in line with the distance theories proposed by Doz & Hamel (1998) where there, in the beginning always exist a skill understanding gap, which gradually is bridged.

From our accounts, due to the difference in knowledge capabilities acknowledged by both organizations, varied knowledge management strategies are pursued to best match respective capabilities and priorities as proposed by Wiig (1997) in his study of organizations. In those areas where Geely currently lack capabilities of performing a certain task, the responsibility stays at CEVT until such a capability is absorbed by Geely, and a sufficient application of required knowledge is in place.

However, one can argue that since the capability gap is acknowledged, there are knowledge sharing routines and systems in place, and a positive view towards such a structure, a continuous process of knowledge management has been crafted, where employees can acquire, transform, and disseminate knowledge to other actors, in accordance with the claim of Liyanage *et al.* (2009)

On the other hand, when looking at CEVT's ability to assess the recipient's knowledge in working according to the NPDS, or managerial skills of using the knowledge-sharing systems team-center and share-point, a lack is evident. Confirmed by representatives from both organizations, where the main take at CEVT was that most the interviewees mentioned that at their department they either did not know if the same systems were used at Geely or that they almost were certain that the counterpart did not follow the same procedures.

This lack of understanding goes in contrast with the way of building a mutual understanding of each other's knowledge bases and competencies, leading to a successful partnership proposed by Doz & Hamel (1998), where documentation of processes and disclosure of working methods and make them accessible to all employees are argued to be the critical factor. From our accounts, in this case, the reason why there exists a lack of understanding whether a system is used or not could be traced by a disability of assessing the receiver's readiness and ability to deploy the system, and subsequently assimilate it within the organization, in line with Martin & Salomon (2003).

### 5.1.3 Encoding Knowledge

Analyzing the encoding processes of knowledge, information and data within CEVT there have been several efforts directed at crafting a knowledge sharing system built in a way that as much knowledge, disclosure of documents, and other information related to projects, can be encoded, as acknowledged by Carlile & Reber (2003); Minbaeva *et al.* 2004; Oppat, 2008). Because the joint project will be handed over at the FDJ-gate, it becomes essential that

all required information is accounted for in team-center, share-point, Vlam and other shared systems.

The use of various systems to encode knowledge, based on its character, prior the actual transfer goes in line with the knowledge context and activity context, proposed as two out of four domains by Cummings & Teng (2003), where the character of knowledge impact the ability to properly transfer it to the receiver, depending on the explicitness and *tacitness* (Nonaka & Takeuchi, 1995). One can argue that the novelty and complexity and path-dependency in our case impact the CEVT's ability to perform a proper transfer. When the knowledge is complex, and the capability of Geely is assessed not to be sufficient transfer occur in person. As mentioned in the empirical section some safety activities and calibration activities in were still performed by CEVT, in line with Carlile (2004) arguing that different units specialize in different types of work, thus requiring varied knowledge and responsibilities.

Furthermore, the knowledge-sharing activities performed inter-organization wise, dependent on the nature of the knowledge, goes in line with Carlile's (2004) model, which emphasize that an increasing level of novelty regarding the knowledge at different boundaries and boundary capabilities requires different activities, to properly transfer it to the receiver.

From our account, the procedures and systems set up for encoding and sharing of knowledge, in general, is effective, as well as the pre-determined objective. However, since the transfer of knowledge significantly is impacted by the context of the knowledge CEVT needs to acknowledge this fact. Many of the systems used are new Geely, the receiver of knowledge, and most the systems arguably come from Volvo. At present, there are many assumptions when disclosing knowledge, preparing the handover, generating lacking encoding efforts, and thus negatively impacting the interpretation ability for Geely. There seems to be a high risk that certain knowledge deemed to potentially be important for progressing with the projects after the handover is left out, or disappears in the corridors at CEVT as one employee did put it, thus in line with the negative consequences of not in detail de-contextualize knowledge residing in routines, tools, and experiences, from its current context, as proposed by Argote & Ingram (2000).

Thus, from our account, the transformation efforts, making knowledge, decisions, and information more compliant to transfer are lacking. Thus, the current system may negatively affect the Geely's ability to properly interpret the knowledge transferred, due to that valuable knowledge still resides within CEVT, and that the articulation process does not work efficient enough, in line with an improper acknowledgement of the variables Embeddedness and Articulability proposed by Cummings & Teng, 2003). The system deployed might also hamper the knowledge transfer success to some extent, due to not being able to articulate, de-contextualize, and encode both explicit and tacit knowledge, in line with Minbaeva & Michailova, 2004; Minbaeva, 2007.

#### 5.1.4 Knowledge Transfer Mechanism

In short, the knowledge transfer mechanisms applied between CEVT and Geely are various, ranging from knowledge-sharing systems, meetings, emails, formal senior management sign off meetings *et cetera*. From our accounts, some mechanisms are more or less proper for transferring specific knowledge between the organizations.

Initially, the acknowledgment for designing a proper knowledge transfer approach exist within CEVT, where there is a will of disclosing as much knowledge as possible to facilitate a successful knowledge application post-handover, as well as a successful collaboration. Furthermore, employees within the organization understand that the disclosure of valuable knowledge in the different systems and tools used operate as a knowledge transfer mechanism. This acknowledgment within the organization goes in line with theories of knowledge transfer approaches researched by (Leonard-Barton, 1995; Martin & Salomon, 2002:2003; Pedersen *et al.* 2003; Oppat, 2008; von Krogh *et al.* 20014).

As proposed by Gupta & Govindarajan (2000) transferring channels can be both formal and informal, and looking at the knowledge transfer methods within the organizations both channels are deployed. Key formal methods deployed within each respective organization are liaison managers and project managers. These key persons operate as facilitating actors between the organizations with the purpose of making the knowledge transfer process increasingly lean, minimizing the knowledge leakages. Such a formal knowledge transfer tool goes in line with the methods proposed by Gailbrath, (1973); Nadler & Tushman, (1987)

Other formal knowledge transfer mechanisms used on a continuous basis are the shared systems, where knowledge is to be tracked down, and applied for a certain task, even though as discussed earlier there are some managerial problems in accessing and using these systems. The perhaps most important document related to the handover of the project is the team-center Microsoft Excel file where the responsible person from each organization and business area communicate how and when the project is formally handed over. Along with the document, there is a formal senior management sign-off meeting, declaring that the handover of responsibilities in chosen areas are confirmed. As aforementioned in the empirical section, SWE 10 explained that the system heavily relies on an actual communication between the responsible employees within each are and that there is room for misunderstandings and uncertainties with the method used at present.

From our accounts, the knowledge within such a document is hardly evaluated and subsequently displayed based on characteristics of knowledge in terms of its *tacitness* or *explicitness*. As proposed by Nonaka & Takeuchi (1995) in their conversion model, the knowledge is conversed through various processes, and thus transferred to the receiver. When it comes to the processes covered in the excel file, there is a significant risk of uncertainties since the ability to derive historical information and other information does not exist in the file, only technical data, and product specifications. An excel file as a conversion process, hardly facilitates a knowledge transfer of knowledge tacit in character, but rather a packaged file of explicit data.

When instead looking at share-point, another formal mechanism of knowledge transfer tool used, in which much more background knowledge, open issues, decisions are disclosed, such knowledge comprise an increasing amount of tacit knowledge, in accordance with Nonaka & Takeuchi (1995), and should be directed more effort towards. From our accounts, this information could though be hard to interpret for the Geely, the receiver, since much of the knowledge within the system are path-dependent from previous decisions and assumptions. Different modes of conversion could be considered as a compliment to share-point. Also, when looking at the actual handover, the shared system that in fact comprises much of the handover is team-center. One could consider involving share-point in the handover as well, in order to ensure that the path of different product specifications.

On the other hand, CEVT does deploy various modes, based on the *tacitness* of the knowledge transferred. These different modes performed are either in line with the two extremes *rich communication media* and *written communication media*, proposed by Pedersen *et al.* (2003), or in practice a mixture of the two. The most commonly used media are written e-mails, which are deployed daily, where the knowledge communicated often is explicit in character. To a large extent, it does only regard booking meeting, and status updates on different tasks as such. As the complexity of knowledge increases so does the transfer media used within the organization. Furthermore, the weekly team-meetings, mostly performed via Skype or other video conferencing media, facilitate the transfer of knowledge when the characteristics of the knowledge are more tacit. From our accounts, it is easier for Geely to interpret information, data, and decisions through face-to-face meetings, though connections sometimes are problematic.

This form of rich media communication allows interactive communication, questioning, flexibility, and is from our accounts vital in facilitating a successful joint knowledge sharing. Especially because much of the knowledge, regarding processes used at CEVT has a background at Volvo, meaning that it is novel for Geely. By these partner visits, sharing of expertise, and socialization procedures much of the experienced based knowledge can be transferred, in line with the theories covered by Nonaka n/a; Bresman *et al.* 1999; Pedersen *et al.* 2003).

#### 5.1.5 Support of Knowledge Application

Analyzing the level of knowledge support provided by CEVT, in the application process operated by Geely employees from both organizations have described the process as in general good. From our accounts, looking at the handover, it is arguably clear who the responsible person for a decision or business area are, hence eliminating misunderstandings who to contact if an issue for instance. Furthermore, both organizations acknowledge the importance of the application support, and those unnecessary misunderstandings might hamper the knowledge transfer success, in line with Szulanski, (2000); Lucas & Oglive, (2006).

Also, in those areas both technical and commercial where Geely yet does not have the right competence to perform individually CEVT either perform them completely or partially, still providing required support. The support activities used such as real-time support, answering questions as they arise in accordance with Carlile & Reber, (2003); von Krogh *et al.* (2014) increasing the chances of knowledge transfer success. However, in some areas, the knowledge application supporting activities could be increased by a larger extent of transparency.

Analyzing the perhaps most important supporting activity, personal visits at premises, there was an increased activity at the beginning of the partnership. At CEVT there were more Geely representatives present to learn the new way of working. At Geely, there is a continuous flow of employees visiting Geely when it comes to different occasions, planning of a new factory, initial actions in a new project as such. This on-site training activity, where sender teaches the receiver how to apply specific knowledge is in accordance with Szulanski (2000). From our accounts, most the supporting activities are directed at procedures how to perform an action in a factory for instance, rather than on how to operate in the different knowledge-sharing systems.

## 5.2 Factors Influencing the Process

Analyzing the different challenges in terms of distances between the organizations we identify several, from which knowledge transfer success might be hampered. The organizational distance was one of them, related to both familiarities with product and processes. Communication and Interaction distance another one, related to language, IT-systems, and the ability to communicate the knowledge, data, information inter-organization wise *et cetera*. The third was culture, related to the distance both in national culture and company culture. All of which were acknowledged by Dougherty & Hardy, (1996); Doz & Santos 1997 Cummings & Teng, (2003) and next will be analyzed in detail

### 5.2.1 Organizational Distance

On distance that many the respondents touched upon was the organizational structure of the two companies, where different departments did not have an exact counterpart in the other organization making it hard sometimes to know how to realize, encode, and transfer certain knowledge. At the beginning of the joint R&D collaboration the extent to which the two organizations were integrated, was significantly higher than the previous structure. At present, the guidelines of how to collaborate and the new processes to follow have been deployed for months, and the distance has increased from our accounts.

When CEVT China initially started to be educated at the Swedish premises, the purpose was to teach them how to operate according to the NPDS, and teach them how to configure the shared systems. As that Chinese team went back to China to spread the knowledge, there have been changes in the procedures how to work and how the development is supposed to progress, generating distances between the organizations. Now CEVT China has been

absorbed by GRI, meaning that no exact counterpart exists anymore. In accordance with Baughn *et al.* (1997) less internalization organizationally might negatively affect the social ties, free-flow communication, and the level of trust between the partners. The organization structure might thus from our accounts lead to transparency issues in cases where deeper information is requested from CEVT by Geely, and that information not is shared.

Furthermore, the organizational dissimilarities also create problems when looking at the hand-over. For example, as the case of the body and exterior departments explained in the empirical section. From our accounts, one does not acknowledge this aspect enough in the handover process. In accordance with the work from Doz & Hamel (1998) explained in the theoretical framework the partners' structures and processes for decision making, organization, and learning might be more or less compatible with each other. The fact that the organizational distance was large initially, and even though lesser now with the crafted joint systems and NPDS as such their distance is still large. With a large distance and inappropriate measures or knowledge for using these systems correctly, the collaboration and project success might be hampered. Thus, at present, the potential for successful knowledge transfer routines between the organizations exist, but efforts need to be directed at increasing the compatibility and consistency of using these systems. The fact that GRI is closer to the market, and involved in the industrialization and marketing of the vehicles, makes them increasingly suitable for agile measures when it comes to product planning and manufacturing. On the other hand, the current NPDS stems from Volvo and is increasingly characterized by a waterfall project management perspective, with a less try and error mentality, from our accounts. Inability to use the shared systems, as well as path dependency, an incompatibility could be reasons why the current NPDS not fully operate as well as it should.

### 5.2.2 Communication and Interaction Distance

The distance related to communication and interaction is evident due to several reasons. From a geographical point of view, the distance is large, sometimes making it problematic to interact. When the physical distance is large between two collaborating R&D units the communication procedures might incorporate significant expenses in interacting face-to-face. However, from a knowledge transfer perspective, the face-to-face communication is the most proper way of transfer knowledge, especially tacit in character. As explained by interviewees from both organizations there is a continuous flow of employees operating in both organizations to a certain extent with the purpose to learn to interpret information, manage knowledge sharing systems, and apply specific knowledge. The flow of employees mitigates the communication distance and makes it easier for the partners to collaborate, in line with Szulanski (2000). Also, these efforts of decreasing the distance in general between the organizations further affect the speed and volume of knowledge transfer, as Gailbrath (1990); Cummings & Teng, (2003) emphasize.

Furthermore, an information gap is also present between the organizations, though natural when it comes to a joint product development collaboration. As representatives from both organizations have touched upon mentioned in the empirical section it does often regard



either information not disclosed in the shared systems, or lack of explanation from path-dependent decisions taken, a gap significantly impacting the overall quality of knowledge transferred, in line with Doz & Hamel (1998). The explanation behind these information asymmetries is not evident in nature, but rather natural when it comes to collaboration between two companies, with geographically dispersed R&D units.

From our accounts, the reason behind these asymmetries could be twofold. One explanation could be that path-dependent knowledge residing in CEVT might in some cases be left out from the knowledge sharing systems, due to an assessment failure whether the knowledge is valuable or not for Geely. As several employees from CEVT explained, there is room for many assumptions when it comes to systems, decisions as such since many employees within the organization stem from Volvo. Another explanation regarding information gaps could from our accounts be related to transparency when it comes to disclosing knowledge, on an engineering level. As discussed in the workshop one might work significantly on a project and feel reluctant when it comes to handing over the responsibility to another employee, thus not disclosing all information necessary. From our accounts, the former seems to be the most logic explanation of why information asymmetries occur between the two organizations.

The communication and interaction frequency between the organizations is characterized by day-to-day communication, and group meetings, *et cetera*, though heavily dependent on the extent to which communication systems are sufficient. From our accounts communication occur frequency, meaning that the strength of the relationship, and subsequent knowledge transfer is facilitated, in accordance with Brass *et al.* (1998); Rowley *et al.* (2000); Narteh, (2008). As the knowledge transferred, include both basic explicit knowledge, as well as tacit knowledge the ties between the organizations are significantly important, where knowledge can occur in both weak and strong ties. As the level of *tacitness* increases with the knowledge ought to be transferred the greater the importance of a strong tie with frequent communication, (Hansen, 1999; Uzzi & Lancaster, 2003; Narteh; 2008).

From our accounts this importance is acknowledged by CEVT, in accordance with theory, in the way physical visits and face-to-face communication of knowledge is performed in those cases such manners are required, for instance, a handover, introducing a new factory, or implementing a new process. However, one factor significantly hampering the transfer of knowledge regardless of the nature of knowledge is weak connections when it comes to IT-systems, Skype conversations, and video conferencing. Also, as explained in the empirical section some knowledge sharing systems are not even accessible, or operates properly meaning that the chances of a successful communication of knowledge are hampered.

### 5.2.3 Cultural Distance

Cultural distance is arguably one ambiguity that affects the knowledge transfer success in this case. This goes in line with Simonin (1999) who argues that the possible negative effects of cultural distance could lead to difficulties and challenges for a knowledge transfer, especially regarding to allocating more time for communication between the different parties. Further

research that emphasizes this matter is Mowery *et al.* (1996) who argues that the cultural distance and differences often is a key obstacle between the cooperating actors in an inter-firm knowledge transfer.

At CEVT and Geely these differences regarding culture between the companies are acknowledged as aforementioned in the empirical section where most interviewees from both companies touched upon this matter. From our account, it seems like most employees from each side are aware of the problems, but do not know how to mitigate those. Further, there was a difference how the interviewees addressed these problems. Some addressed it positively, acknowledging the problems but were eager to learn and get to know the other culture. Other interviewees had a more negative mindset and did not understand why the Chinese teams could not follow the processes and routines which they initially had committed to.

From our point of view, it is of essential matter to keep an open mindset and to be able to see the potential and how an inter-cultural cooperation can benefit the NPD-process.

#### 5.2.4 Knowledge Transfer Success Measures

When looking at the different key measurements of knowledge transfer success in the different projects completed there is an evident lack of lessons learned acknowledgments, at present. In short, from our accounts, the projects proceed without a structured evaluation of why certain knowledge-transfer processes were successful, while others failed. However, there seems to be joint understanding on what a successful knowledge transfer means.

The learning effects in the long run between the two parties on a firm level are rather understood from both organizations, where competencies different in character are shared. For instance, there are shared technologies, processes, and systems, market knowledge *et cetera*. Since the collaboration only is in its initial phase the measurement of these activities are hard to concretize, apart from viewing the financial figures. The acknowledgment of the long-run effects in the collaboration is in line with the firm-level knowledge transfer indicator proposed by Oppat (2008), even though an exact measure related to the knowledge transfer process, in the long run, is hard to address in our case.

Looking at individual learning related to the collaboration between the two parties, there are different views regarding success factors and barriers, in line with the individual level knowledge transfer success indicator provided by Oppat (2008). From our accounts, several representatives from both organizations identified certain barriers related to the handover and the knowledge transfer in general, but on the other hand failed to address potentials related to the collaboration. These different views could be explained by the fact that employees from several divisions were interviewed. Another explanation could also be the fact that no clear indicators evaluating each individual performance related to the projects completed do currently exist, and thus do not contribute to an evaluation and lessons learned process. On

the other hand, one can question the importance of this measure in contrast to firm level and project-level.

From our accounts, the most important knowledge transfer success indicator, applicable in this collaboration between CEVT and Geely is on a project-level. Since the collaboration is operated through joint projects, through shared technology, knowledge, and processes an application of this indicator seem evident. When conducting the workshop with representatives from both organizations, there were a somewhat consensus that sufficient lessons learned process at current do not exist, though a significant demand for such a process was great for the upcoming projects. Another aspect mentioned by some representatives was a desire for a decrease in the intense of re-works. One explanation could be related to the organizational distance, both directly through structures and indirectly through NPDS. Another explanation could be that a lack of clear measures related to which factors impact the project success the most. With such measures in place, the overall project success could be improved.

## 6 Conclusion

*In this chapter, we will synopsise and review our conclusions derived from our sub-question in order to answer our main research question “How can CEVT improve their disseminative capabilities in order to enhance the knowledge transfer process in inter-organizational NPD projects?” through providing recommendations and implications for CEVT. Finally, we discuss implications and recommendations for future research.*

The corporate objective of this master thesis research was to study CEVT’s disseminative capabilities in a single-case study. In this way, the goal was to help to improve future activities in the knowledge transfer process for CEVT and to come up with valuable insights and recommendations in the end. Along the study, we also had our academic objective which was to contribute to the bridging of the identified research gap; to focus the research on the disseminative capabilities of the sender in a knowledge-transfer collaboration. To help us to reach our main question: “How can CEVT improve their disseminative capabilities in order to enhance the knowledge transfer process in inter-organizational NPD projects?” we have one guiding sub-question to broaden the perspective and to gain deeper understanding around the subject. The sub-question “What are the current challenges in the knowledge transfer process towards Geely at CEVT?” was answered by reviewing the challenges that CEVT was facing in the knowledge transfer process towards Geely. The challenges identified are summarized below, connected to each disseminative capability phase in the knowledge transfer process:

In the **realization of knowledge** phase, the main challenge identified revolved around making potential valuable information available for both parts. The research identified that much knowledge today is leaked in informal settings at CEVT and therefore not disclosed in the shared systems. In the **assessment of the recipient** phase, the main challenge identified was not around technical knowledge, but rather around the application of NPDS and shared systems. Both parts have committed to shared routines, but the rationale and background behind why this certain process are deployed are rather unclear. Especially from Geely's perspective, but also in some cases from CEVT's side. In the **encoding of knowledge** phase, the main challenge identified regarded the de-contextualization of path-dependent knowledge, i.e. how certain decisions were taken and knowledge, in general, were converted to ease the receiver's ability of interpretation.

In the **knowledge transfer mechanism** phase, a variation of different formal and informal media was deployed regarding the handover, i.e. a formal handover meeting where responsibilities were shifted. The main challenge identified was the process of communication-related to if the shift of responsibility was sufficient from a project maturity perspective, and if it was sufficient, how Geely would proceed with the project. In the **support of knowledge** phase the findings are generally very positive. Geely interviewees express great gratitude towards CEVT’s positivity towards supporting activities. However, now these activities are reactive from CEVT side, while a more proactive approach was requested from a Geely perspective.

Another evident challenge regarded the **organizational differences** between the two companies in terms of dissimilar structures, which impact the knowledge transfer. Furthermore, the NPDS system deployed was identified as another obstacle at present, due to the path-dependency from a previous waterfall PM style adapted from Volvo, thus an inability to match the Geely project management structure, characterized by agility.

Moreover, a challenge identified was related to **communication**, both technical and linguistic in nature. Shared systems were in place, but due to connection problems, many employees could not access these systems, which in turn impact the knowledge transfer and subsequent project success. Also, the accessibility problem of shared systems affects the ability to communicate between the organization, leading to a significant of knowledge being transferred to written media tools instead of rich media communication tools. Thus, a challenge in transferring tacit knowledge was impacted.

An additional challenge identified was related to the **cultural distance** between the two organizations, both national and company, mostly regarding awareness and acknowledgment by the employees. Finally, a key challenge identified was related to the **measurement** of knowledge transfer or project success. At present, no clear structure has been crafted to measure success on a project-level, thus impacting the ability to create "lessons learned" applied in future projects.

## 6.1 Recommendations

Based on our findings derived from our research, in CEVT's company context, we provide recommendations for the company, by answering our main research question "*How can CEVT improve their disseminative capabilities in order to enhance the knowledge transfer process in inter-organizational NPD projects?*" Our strongest recommendation is to align the New Product Development System to fit within both the organizations. At present, it is rather unclear from a Chinese perspective how NPDS benefits the collaboration. As the NPDS is adopted from a Volvo Cars-context, it makes sense when working with a Swedish mindset, but to a agiler and fast moving management style deployed in China, it is somewhat of a clash. Significant effort must be put at management in order to succeed with such transformation.

Secondly, as of today, there is no defined structure of evaluations post the hand-over measuring the success of the project. To be able to improve the hand-over process in the future it is vital to craft a framework for evaluating the project, creating lessons learned after each project. Our recommendation is thus to make sure an evaluation structure is developed and applied. By budgeting for evaluation efforts and lessons learned at the start of each project the company would be able to develop future hand-over processes in line with the areas of improvement identified, and thus mitigate costly mistakes on a reiterative basis.

Another recommendation related to the support activities post hand-over, at present characterized by a reactive approach, would be to instigate an increasingly pro-active

approach. Connected to evaluation and lessons learned aforementioned, CEVT could budget for such support activities initially in early stages, thus facilitating a support environment with increased amounts of training, initiated by CEVT instead of Geely. In order to succeed with such a creation, efforts from management would be vital in order disseminate the message throughout the organization.

Furthermore, we recommend CEVT to identify techniques that facilitate de-contextualization of path-dependent knowledge, as well as making sure all valuable knowledge and decisions are disclosed, in order to improve the knowledge transfer towards Geely. If these functions related to rationality behind decisions are available in today's shared systems, extensive training on how to document such information, as well as encouragement from management is required. If these functions are not available, we recommend CEVT to review the functionality of the systems.

Finally, it is important to note that the cultural distance between the two organizations offers great obstacles within the hand-over process. As the collaboration is rather new a deeper understanding will develop over time. Though it is important to acknowledge these differences and in such way over time gain a deeper understanding.

## 6.2 Future Research

In this section, we discuss our contribution to our academic objective of bridging the identified research gap, as well as limitations in our study. Based on the limitations of our study we identified other interesting areas of research.

Since we conducted research in the form of a single case study in order to provide greater depth in our unique context, we argue that a multiple case study would provide findings more generalizable in nature, and thus valuable for an increasing amount of companies, and at the same time having high academic value. Moreover, one could be able to benchmark key success factors in the knowledge transfer field related to the sender's disseminative capabilities, in an inter-organizational context where Chinese MNCs establish R&D centers in Sweden, by researching more companies.

Furthermore, the fact that the collaboration between CEVT and Geely still is new, and due to limited time to conduct the case study of CEVT's disseminative capabilities, a longitudinal research approach would provide valuable insights how the disseminative capabilities evolve over a longer period.

Also, a more in-depth study of how different joint knowledge-sharing tools e.g. systems and databases affect the transfer of different sources of knowledge, collaborating partners in between. Subsequently, how such systems are implemented.

Also, one challenge that we encountered during the research was how to merge two completely different project management styles, i.e. waterfall vs. agile, in an inter-

organizational NPD setting, where each party deploy either waterfall or an agile project management style. A multiple case study on this matter would benefit companies that will face similar collaboration challenges ahead.

To conclude, we believe that our academic objective of bridging the identified research gap is fulfilled in this thesis.

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## 8. Appendix

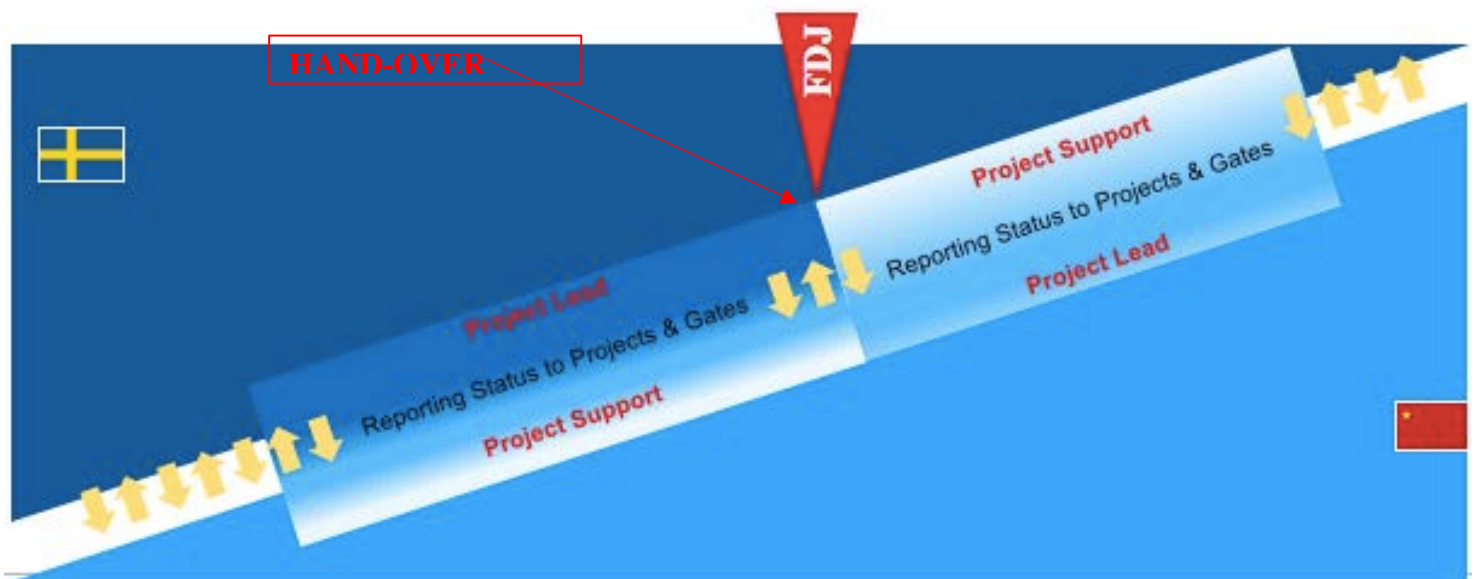


Figure 10. Project Worksplite and Hand-over

## Interview Guide, CEVT

1. Berätta lite övergripande om din roll?
2. Berätta lite övergripande om hur du/din avdelning samarbetar med GEELY?
3. Hur har ni kontakt med Geely? Hur ofta och på vilket sätt sker kontakten?
4. Hur dokumenterar ni på din avdelning ert arbete/processer? Vad är det som skickas över till Geely/Volvo? Bakomliggande syfte? Hur skickas kunskapen över?
5. Vad fungerade bra i transfer-processen (Project CS11)? Final Data Judgment inom NPDS
6. Vad fungerade mindre bra inom projektet? Varför tror du att det gjorde det? Används feedbacken till nästa projekt?
7. Säkerställer man att motparten (Geely) förstår innebörden av överlämnad kunskap, i sådana fall hur? Trust?
8. Hur mäter ni om det projektet varit lyckat? Tid/kostnad/antal re-work/callback

## **Interview Guide, Geely**

1. Can you briefly tell us about what you do at GEELY?
2. Can you briefly explain how you/your department/team works together with CEVT?
3. How do you stay in touch with CEVT? How often and in what way? (skype meetings, phone meetings, face-to.face)?
4. How does it work after a hand-over from CEVT? What do you receive and in what database?
5. What can CEVT do to enhance the hand-over process e.g. preparations for hand-over?
6. How do you measure the success of a hand-over?
7. If any uncertainties regarding the content of the hand-over, do you know who to turn to in the CEVT organization?
8. What are your departments involvement in the project prior to the actual hand-over?