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INTER-ORGANIZATIONAL COLLABORATION - IN THEORY AND PRACTICE:

Based on a multiple-case study in the automotive industry

Master's Thesis in the Master's Programme
Quality and Operations Management

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Abstract

Nowadays, many organizations pursue an open approach towards innovations and technology generation, where firms internal R&D are not as central. This has placed pressure on many multinational companies and particularly the automotive industry. The increased interactions between car manufacturers and actors external to the focal company request greater considerations to how firms collaborate and how the reciprocal process is managed. The purpose of this study is to investigate what inter-organizational collaboration means and analyze the collaborative environment within the Swedish automotive industry. To fulfill the aim of this study a multiple case study has been conducted. During this study eleven semi-structured interviews with respondents from an OEM, four first-tier suppliers and an industry association have been conducted. A framework including preconditions, the process and outcome of collaboration guides the study. The process of collaborating involves five dimensions, i.e. governance & administration (structural), organizational autonomy (agency), mutuality & trust (social).

During the empirical investigation it was found that the way practitioners defines and relate to collaboration narrates much confusion. However, it was found that mutuality was considered key in inter-organizational collaborations. Suppliers were referred to as the most common external actor in an inter-organizational collaboration with an OEM, where cost advantages and knowledge development are the main motives. Mutuality was emphasized as an important characteristic in a collaboration, however a deeper investigation reflected an over emphasis on the structural dimensions during collaborations. The over emphasis on purchasing and cost were the main deficiency in the collaboration between an OEM and a first tier supplier with development responsibility.

Since there is an over-emphasis on the structural dimensions in inter-organizational collaboration, managers should strive to balance the five dimensions of collaboration. This includes addressing and improving the dimension of trust and mutuality. Trust can act as a substitute for governance mechanisms, which currently are time-consuming and costly activities. Furthermore, only increasing trust is not enough to achieve balance between the five dimensions. A suggestion to improve mutuality is to investigate how other purchasing strategies could improve the collaborative atmosphere. If the purchasing aspect were not as central the inter-organizational collaboration it would be more likely to generate long-term benefits. Thus, posing a competitive advantage for the Swedish automotive industry.

Keywords: inter-organizational collaboration, collaboration, supplier collaboration, automotive industry.

Acknowledgement

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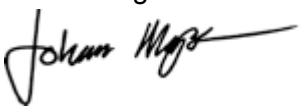
We would also like to thank each other for six inspiring years of studying together. Furthermore, we would also like to thank our families and friends for support during these years.

Gothenburg, June 2016.

Olof Gustafsson

Johan Magnusson



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List of Abbreviations

- R&D – Research and development
- OEM – Original equipment manufacturer
- RQ – Research question
- RFI – Request for information
- RFQ – Request for quotation
- SOP – Start of production
- NPD – New product development

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1. Introduction

In this chapter the researchers aim at presenting the background, overall purpose, research questions, delimitations and the outline of the report.

1.1. Background

Traditionally the source of innovation and technological advancements has solely been a concern for a firm's internal R&D function. In this setup organizations pursue what have been called closed innovation strategies where none or limited interaction with external actors take place (Lichtenthaler, 2011; Chesbrough *et al.*, 2006). This has been in favor for the firm-centric view where value creation occurs within the boundaries of a firm (Binder and Clegg, 2010). However, this view have changed as companies have looked beyond their organizational boundaries and engaged in inter-organizational collaborations to obtain knowledge and innovations (Cropper, 2009; Lichtenthaler, 2011; Kaats and Opheij, 2014). Inter-organizational collaborations are not a new concept. Inter-organizational relations (e.g. inter-company networks, strategic alliances, network alliances, various market transactions, and etcetera) have been pursued for decades to reach new sources of innovation and knowledge (Lorange and Roos, 1992; Un *et al*., 2010).

Furthermore, today's organizations encounter increased global competition where a continuous introduction of new and pioneering innovations has become a necessity to stay competitive (Blake *et al.* 2003; Gesing *et al.,* 2015). The high pace of change has forced organizations to look beyond their organizational boundaries for technological advancements and innovations (Lichtenthaler, 2011; Langner and Seidel, 2009). In this context, the notion of *open innovation* has gained attention from both researchers and practitioners (e.g. Huizingh, 2011; Lichtenthaler, 2011), as a mean to achieve competitive positions and access to new and breakthrough innovations (Chesbrough, 2003). Open innovation suggests an open system approach of a firm's R&D function where both internal and external ideas are used to create value for a firm (Chesbrough *et al.,* 2006). Wallin and Krogh (2010) states that open innovation can increase an organization's competitiveness by; reducing product and process development cost, reducing time to market, improving product quality and by accessing expertise from customers and suppliers.

One industry that particularly face great challenges in today's competitive landscape is the automotive industry. Today's leading car manufacturers experience rising customer expectations, global competition and unpredictable disruptive technologies. Binder and Clegg (2010) state that today's cars involve complex designs and technological breakthroughs that no longer can be reached by a single organization. Blake *et al*. (2003) further argues that key to success in the automotive industry lies within finding new ways to create and distribute value. To encounter these challenges, both scholars and practitioners advocate an open approach to new product development (Gesing *et al*., 2015). Pursuing collaborative inter-organizational relationships is increasingly considered key to organizational success (Sydow *et al.*, 2015), where intense

collaboration between OEMs and suppliers during the earlier phases of new product development (NPD) is essential (Binder and Clegg, 2010).

Therefore, partnering across organizational boundaries elucidates the challenges of how to manage inter-organizational collaborations, e.g. Gesing *et al*. (2015), Van Weele (2014), Thompson and Perry (2006). In this regard, one challenge - that has received sparse attention - is how organizations practically execute the process of inter-organizational collaborations, what it means and how they organize it (Langner and Seidel, 2009; Ystrom, 2013).

1.2. Problem Analysis

To concretize the problem depicted above and to orient the reader, an illustration of the network for a carmaker is depicted in figure 1 below. As described in the background, car manufactures historically pursued a rather closed innovation strategy. Though, during the 90's car model boom, not at least within the European market, car manufacturers were not able to handle the increasing demand on their own. Thus, suppliers became an important actor and deliverer of not only production capacity but also a source of R&D (Jürgen, 2004).

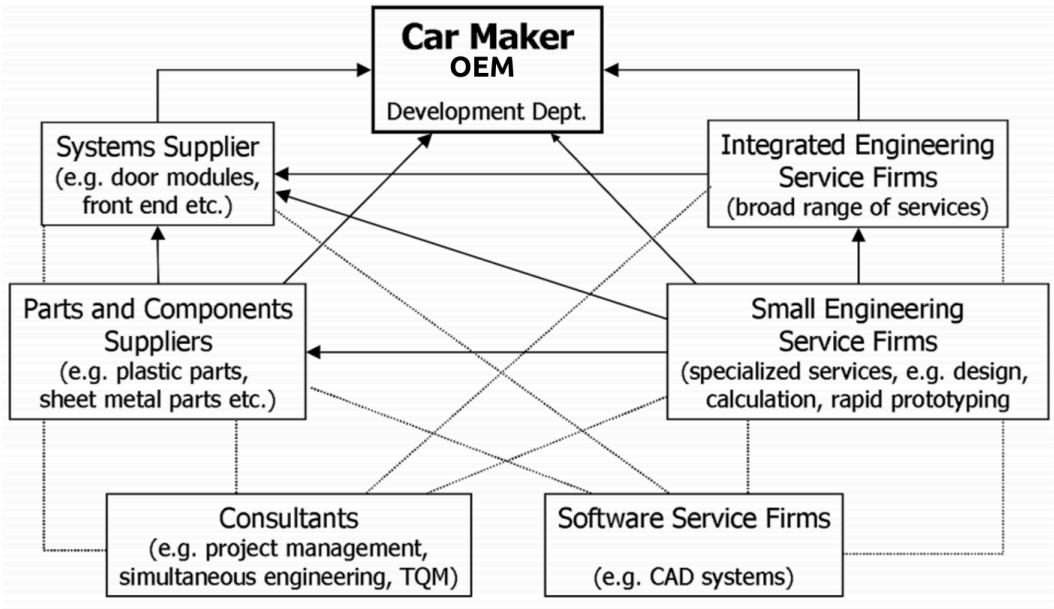


Figure 1 Network for car development, actors and relationships. (adapted from Jürgen, 2004)

In a recent report, the western Swedish automotive cluster was researched and a number of interesting advantages and disadvantages of the region's automotive industry were identified. One of the greatest strengths in the automotive cluster is that complete vehicle production exists in the region, including broad expertise from the industry, public sector and academia (Automotive Sweden, 2012). Furthermore, in the study it was also depicted that there is great preconditions for collaboration among the incumbents in the region. However, what becomes troublesome and problematic with these advantages is one of the main disadvantages presented in the report. It was underlined that collaboration among the actors in the automotive cluster is deficient, mainly as the incumbents are worried of losing business opportunities to a business partner.

Furthermore, a vice president at a first tier system supplier[1] who was interviewed during this research, elaborated upon how much of the content of a car that is produced by the OEM versus its suppliers. Ten years ago, the vice president argued, 30% of a car was developed by supplier, today 50% and in 10 years it is estimated that 70% of a car is developed by suppliers. The vice president further argued that the trend within the automotive industry moves towards black box engineering and system solutions, rather than component outsourcing. Thus, the interaction and interdependence between OEMs and suppliers increases. This interaction is in figure 1 depict as the relation between a carmaker and a system supplier. Further on, one academic field that has encapsulated and surfaced the importance of an open approach to R&D is *open innovation,* where internal as well as external ideas are used to realize value for the organization (Chesbrough *et al.,* 2006). The same issue has been elucidated from another angle, namely, from the purchasing and supply chain perspective (e.g. van Weele, 2014). From this angle a contractual approach has traditionally been pursued. Though, success in today's competitive landscape requires OEMs to involve suppliers early in the NPD process, where the supplier's competencies are exploited in a sustainable fashion (Binder and Clegg, 2010).

Furthermore, Gassmann and Enkel (2004) stated that the concept open innovation can be compressed into three different process archetypes of how companies work with open innovation; inbound, outbound and coupled. Huizingh (2011) stated that organizations that pursue an outside-in approach (or inbound) heavily rely on cooperation with external actors such as customers and suppliers. Järrehult (2011) elucidated the issue of open innovation and cooperation. The author stated that *"… open innovation is totally built upon … cooperation …. or actually on collaboration … or …. yeah, what do we really mean? What is the difference between the two?"* (p.1). This discussion elucidates the essence of the concept of collaboration and what the concept includes. Therefore, it is interesting to further investigate the role of inter-organizational collaboration in the western Swedish automotive cluster. The immature collaborative atmosphere in the region and the increased reliance on suppliers provides even more substance to the study and its relevance. Finally, Binder and Clegg (2010) argue that validated frameworks and guidelines supporting professional in strategic decisions of inter-organizational collaboration are still missing.

1.3. Purpose and Research Questions

The aim of this study is to investigate what inter-organizational collaboration means and analyze the collaborative environment between OEMs and external actors within the Swedish automotive industry. To answer the purpose stated above, the authors have formulated two research questions (RQ).

> *RQ1: What characterizes inter-organizational collaborations between an OEM and external actors in the Swedish automotive industry?*

[1] Vice President, First tier supplier (2016). Interview 2016-03-04

The first question, stated above, aims at creating a deeper theoretical understanding of what *inter-organizational collaboration* is, i.e. investigate the dimensions and factors that describe collaboration. The aim of the question is also to investigate how the theoretical dimensions of inter-organizational collaborations correspond to inter-organizational relations within the Swedish automotive industry. The authors of this report find this question interesting as the global competition the automotive industry's incumbents encounter, put large pressure on their organizations. The increased pressure forces the actors within the industry to become more creative and innovative. An example of the disruption within the industry and reasons for why the automotive industry pursues increased levels of innovation is autonomous cars. These future challenges imply new ways to organize and interact with new actors within the industry. One can expect that the OEM's within the industry will experience a shift in power balance due to the shift in technology. Thus, it is interesting to investigate how the actors within the Swedish automotive industry perceive collaboration across organizational boundaries.

> *RQ2: How do an OEM and a first tier supplier collaborate during NPD within the Swedish automotive industry?*

The second question aims at describing the process of inter-organizational collaboration between an OEM and a first tier supplier in the Swedish automotive industry. The question will also provide the reader with an understanding of under what circumstances inter-organizational collaborations take place, and when a relation to a supplier not reflect the characteristics of a collaborative arrangement. To be able to answer the question, different forms of inter-organizational arrangements need to be elaborated upon, as well as when and where these arrangements occur. However, just because there is an interaction between two different organizations it does not imply that it narrates an inter-organizational collaboration. The second question is interesting, as it gives the reader a nuanced view of how the process of inter-organizational collaboration is managed in practice. It is also interesting since the most commonly occurring interaction in the automotive industry are said to occur between OEMs and suppliers.

1.4. Delimitations and Limitations

This research is delimited to only treat the process inter-organizational collaborations in new product development, which means collaboration taking place in-between the idea phase and start of production (SOP). Furthermore, the research will also be delimited to a small selection of actors in the automotive industry, i.e. an OEM and four first tier system suppliers. By first tier *system supplier* the authors refer to a supplier who directly delivers a whole sub-system to the OEM, in contrast to *parts and component suppliers* who delivers/supply single parts (see figure 1.). The term supplier is typically related to suppliers of physical goods and materials. However, while referring to system suppliers, not only system suppliers delivering tangible goods are addressed, but also suppliers that provide knowledge and other expertise (Cropper *et al.*, 2009). Furthermore, even though the respondents mentioned second and third tier suppliers (from the perspective of the OEM) they were left out of scope. This was chosen as one specific and clearly delimited relation could provide insightful input to the study.

Further on, the focus of this report is on inter-organizational collaboration, i.e. collaboration between organizations. Thus, this report does not consider interpersonal collaborations within organizations or collaboration between different organizational departments. However, the aspects considered in this report are core for any type of collaboration, and thus, implications from this study is likely to be useful insight for all kind of collaborations. Moreover, when the authors of this report refers to, or uses the word *collaboration*, either with or without the words *external* or *inter-organizational* it relates to collaborations between organizations. This research focuses on inter-organizational collaboration within the Swedish automotive industry, and thus, cultural influences different from the Swedish context are not considered in the report. The empirical data presented in this report is mainly based on interviews with project managers, as respondents in higher, more strategic positions did not respond to this research.

1.5. Outline of the Report

This master's thesis consists of eight chapters. Below, a short description of each chapter is provided to guide the reader.

Chapter 1 - The first chapter aims at presenting the background to the research and why the topic chosen is of interest, what purpose the researchers aims to fulfill, the research questions constructed to fulfill the purpose, and lastly, outlining the limitations in this study.

Chapter 2 - The theoretical framework aims at providing the reader with relevant theoretical concepts and is presented in chapter two. Initially, the chapter describes *inter-organizational relations* and different *inter-organizational arrangements.* Thereafter two streams of literature that consider inter-organizational collaboration are presented, i.e. *open innovation* and *purchasing and supply strategy*. These are followed by an extensive clarification of the concept of collaboration. In the end of the chapter, a summary of the most important theories and frameworks are presented.

Chapter 3 - The third chapter aims at outlining the chosen research method, including how the research has been conducted, what research strategy the researchers has pursued, and how the study has been designed. The chapter also aims at presenting other components that contributes and enhances the validity of the report. The chapter is finalized with a discussion of the appropriateness of the method chosen.

Chapter 4 - The fourth chapter presents the empirical findings from the conducted interviews with professionals in the Swedish automotive industry. In the offset of this chapter a summary of the respondent are presented. Thereafter the result from the explorative interviews and the results from the in-depth interviews are presented.

Chapter 5 - The findings from the empirical investigation are analyzed in chapter five. The analysis is conducted by interpreting and evaluating the empirical data in comparison to the theoretical framework. The chapter is structured after the two RQs and each of the RQs represents a sub-chapter within the analysis chapter. Lastly, each

of the sub-chapters is finalized with a discussion for how the analysis and empirical findings contribute to the conclusion of this report and the conclusion of the RQs.

Chapter 6 - The sixth chapter aims at presenting the conclusions of the study and areas for future research. The conclusion presents the answers to the research questions and is followed by managerial implications and future research.

Chapter 7 - The list of references used in this master's thesis are presented in the seventh chapter.

Chapter 8 - Appendices, including timetable of the research and the interview guide are presented in chapter eight.

2. Theoretical Background

This chapter outlines the theoretical framework that the authors have constructed during the literature review. Initially the rationale for inter-organizational relations and different inter-organizational arrangements are depicted. Thereafter, two streams of literature that consider inter-organizational collaborations are presented, which are followed by an clarification of the concept of collaborating. The first sections of the theoretical background aim at clarifying the context in which inter-organizational collaborations take place. Whereas the sections covering collaboration represents the main body for the analysis. For the convenient reader, a summary of vital theories is found in the end of the chapter.

2.1. Inter-Organizational Relations

Just as no man is an island, no organization is an enterprise itself. The dynamics of inter-organizational relations achieve attention among scholars from different disciplines of management, as it is evident that organizations do not evolve or fail in isolation. Instead, this occurs in arenas of greater inter-organizational systems (Rossignoli and Ricciardi, 2014). Cropper *et al.* (2009) stated that *"... inter-organizational relations, as its subject name suggests, is concerned with relationships between and among organizations"* (p.4). The study and phenomenon of inter-organizational relations involves interpretation and analysis of the characteristics, origins, patterns, rationale and consequences of such relations (Cropper *et al.,* 2009).

Organizations that are present in inter-organizational relations could be business enterprises, public units, non-profit, where the relation can be dyadic (involving two organizations), triadic (e.g. Wu and Choi, 2005), or even multiplicities, i.e. complex networks formed by many organizations (Cropper *et al.,* 2009; Sydow *et al.*, 2015). These arrangements could be between firms, e.g. Fuji and Xerox; Bosch and Siemens Hausgeräte; and in automotive industry alliances. Furthermore, these relations can also be between firms and state owned enterprises, among a plethora of other combinations (Cropper *et al.,* 2009). To this, Sydow *et al.* (2015) added that inter-organizational relations are not only found between large corporations, public utilities, universities, small start-up companies, among other types of research organizations, but also in between nongovernmental organizations and governmental agencies.

Cropper *et al.* (2009) stated that focus in the everyday language of inter-organizational interactions is on different forms of interaction rather than the relation in between the actors. The authors stated that networks, partnerships, and alliances are inconsistently and incoherently used to describe different forms of inter-organizational entities, or inter-organizational arrangements. Clegg *et al.* (2012) agreed to this statement as they articulated that there is little consistency in the use of terminology within literature of inter-organizational architectures. In their book, Cropper *et al.* (2009) stated that different nouns are used within inter-organizational relation research as names for different inter-organizational arrangements, but on the same time as adjectives. Furthermore, words, e.g. *coordination and cooperation, are* frequently used as descriptors for inter-

organizational undertakings such as *coordinated* service agreements, *cooperative* ventures, etc.

Cropper *et al.* (2009) argued that the usage of different words and what different labels include creates confusion within the topic. Sydow *et al.* (2015) added that the research in the field of inter-organizational relations occur in different contexts and from multiple angles, where a variety of terms can be found that is used as synonyms. Besides, Cropper *et al.* (2009) also stated that phrases, such as *collaboration, outsourcing* and *contracting,* are used to describe the actual act of inter-organizational relations. These three different categories, and thus, the confusion around inter-organizational relations are depicted in figure 2 below.

Names for inter-organizational entities			
an alliance	an association	a cluster	a coalition
a collaboration	a consortium	a constellation	a cooperation
a federation	a joint venture	a network	a one stop shop
a partnership	a relationship	a strategic alliance	a zone
Descriptors for inter-organizational entities			
collaborative	cooperative …	coordinated …	interlocking …
inter-organizational …	inter-professional …	joined-up …	joint …
multi-agency …	multi-party …	multi-organizational …	multiplex …
trans-organizational …	virtual …		
Names for inter-organizational acts			
bridging	collaboration	contracting	cooperation
franchising	networking	outsourcing	partnering
working together			

Figure 2 Commonly used language in inter-organizational relations (Cropper et al., 2009)

As can be seen in figure 2 above, the term *collaboration* is used both as a name for different forms of inter-organizational relations, descriptor for different inter-organizational arrangements, as well as name for inter-organizational acts, i.e. *collaboration, collaborative* and *collaboration.* The definition of collaboration that has been used to position the authors' interpretation of collaboration and what it includes reads; *"[...] a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions"* (Thomson and Perry, 2006, p.23). The definition of collaboration and a broader description of the inter-organizational relation are depicted in a coming chapter. Furthermore, Cropper *et al.* (2009) argued that the dimension of mutuality could be used as as a differentiating factor Cropper *et al.* (2009). The authors who stated that their research focused on inter-organizational relations that involved mutual interest, i.e. collaboration and cooperation.

Relations involving mutual interest are also of main focus in this study, though, inter-organizational relations involving lower degrees of mutuality are also depicted to provide

a nuanced view of the relations. Cropper *et al.* (2009) stated that their interpretation of inter-organizational relations excludes passing interactions such as market transactions. However, their interpretation includes supply chain arrangements when the relation refers to a long-term cooperative arrangement, though, it does not include arm's length, spot market buyer-seller relations. Lastly, their interpretation of inter-organizational relations does neither include mergers and acquisitions as they argue that these often result in one formal organization. In respect to these boundaries, concepts based on transaction cost theory for analyzing and conceptualizing inter-organizational arrangements are developed in further detail in the next section.

2.1.1. Inter-Organizational Arrangements

Interaction between organizations has traditionally been seen as either pure market transactions or hierarchical vertical integrations (Powell, 1987). Nowadays the distinction is not as clear and interaction between organizations occur in partnerships, franchises, coalitions, joint ventures, research-consortiums, various forms of network organizations, among others (Ring and Van de Ven, 1994). Thus, organizational boundaries have been blurred and the answer either or is no longer straightforward. To be able to provide a nuanced and focused description of different inter-organizational arrangements, Lorange and Roos (1992) suggested that the degree of vertical integration could be used. They further defined a strategic alliances as any venture on a scale between pure market transactions to internal hierarchical structures, see figure 3. These different strategic alliances correspond to what Cropper *et al.* (2009) defined as inter-organizational entities. Furthermore, the idea of positioning inter-organizational arrangements between market transactions and vertical integration is also suggested by Kaats and Opheij (2014).

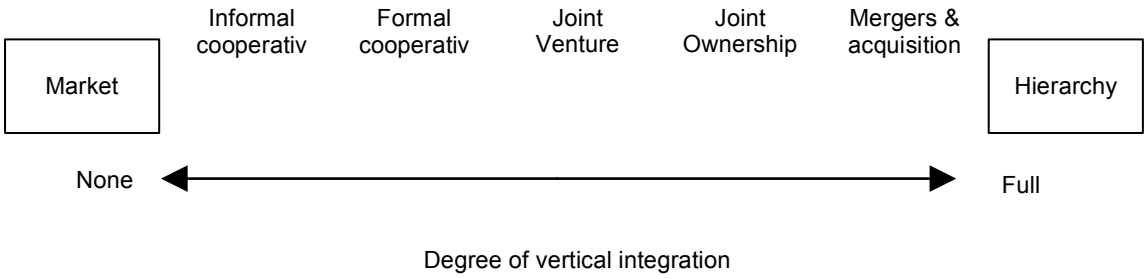


Figure 3 Collaborative arrangements based on degree of vertical integration (Lorange and Roos, 1992)

Moving from the hierarchy-end of the spectra - where rules and commands represents the vitality in the information (Sydow *et al.,* 2015) - mergers and acquisitions, open innovation, knowledge networks, joint ownership, joint ventures and decentralized profit centers, are examples of strategic alliances that could be identified on the continuum (Lorange and Roos, 1992; Kaats and Opheij, 2014). Approaching the other end of the spectrum, i.e. market exchange, where price constitutes an important ingredient of the information, consortia's, subcontracting arrangements, formal and informal cooperative ventures and various trading arrangements are found (Lorange and Roos, 1992; Powell, 1990). Furthermore, Kaats and Opheij (2014) depicted different forms of inter-organizational arrangements based on the duration of commitment and the degree of joint decision making, see figure 4 below. The authors stated that the grey area between

the two ends represents the world of alliances and networks, where neither the law of market transactions nor the laws of organizational hierarchy works.

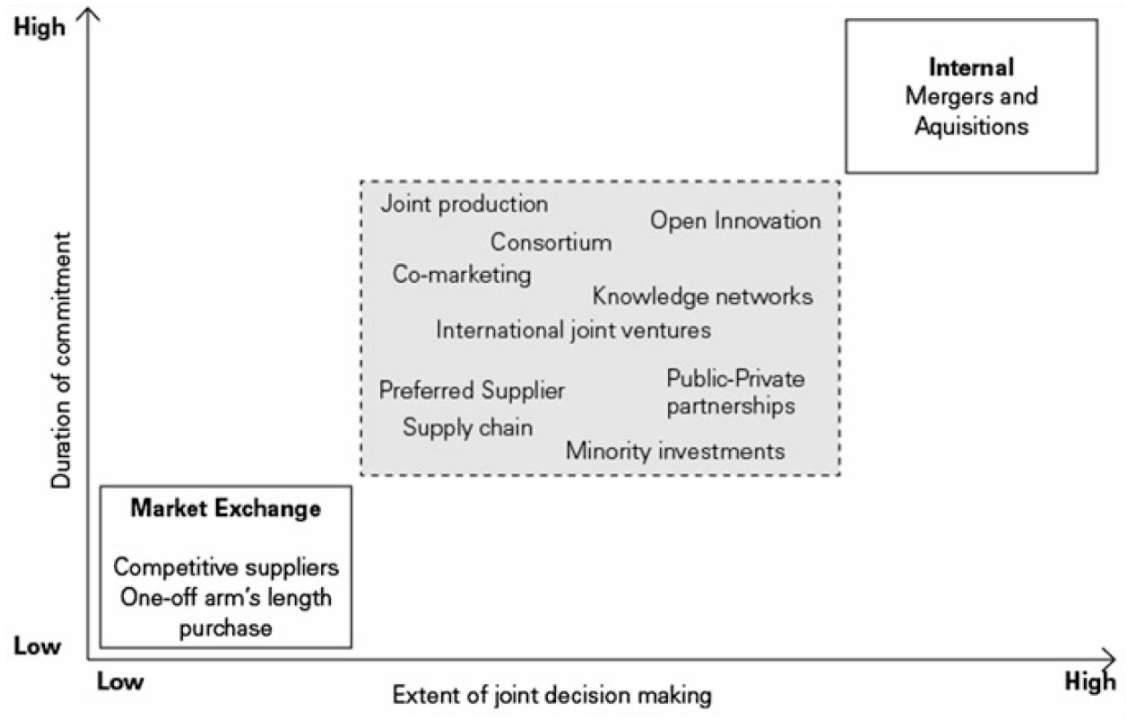


Figure 4 Inter-organizational relations (Kaats and Opheij, 2014)

Kaats and Opheij (2014) stated that they were inspired by Gomes-Casseres paper from 2003 for describing the degree of collaboration in inter-organizational arrangements. Gomes-Casseres (2003) argued that two factors could be used to describe the degree of collaboration, i.e. the level of joint decision-making and the duration of the relationship. Kaats and Opheij (2014) applied Gomes-Casseres two descriptive factors on a vertical and horizontal axle to illustrate different forms of inter-organizational collaboration. The authors stated that inter-organizational collaboration falls in the middle area (the grey area), where none of the parties retain its autonomy and the decision making process is complex. Thus, the degree of collaboration varies within different forms of collaborative arrangement. This view of inter-organizational collaboration could be argued to coincide with Cropper *et al.* (2009). Cropper *et al.* (2009) saw inter-organizational relations as interactions between mergers and acquisitions and market transactions that in some extent involved mutual interest.

Another theoretical way suggested to define inter-organizational arrangements is to identify the degree of interdependence between organizations (Lorange and Roos, 1992). On a scale from low to high degree of interdependence (see figure 5 below), informal/formal cooperative ventures are depicted in the top where none, or a low degree of interdependence exists between the actors in the interaction. On the contrary, mergers and acquisitions are found at the bottom of the scale, and involve a much higher degree of interdependence among participants. This is argued as mergers and acquisitions imply an integration of the firm into the focal organization. Håkansson *et al*. (2003) argued that the interaction between interdependent organizations requires simultaneous actions of cooperation, integration, conflict and separation in the

organizations' relationships. The author further stresses that interdependence means that the relationship is essential to manage equally by the organizations involved.

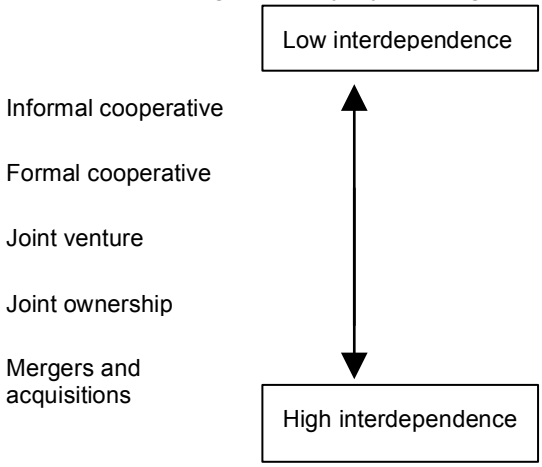


Figure 5 Inter-organizational arrangements based on degree of interdependence (Lorange and Roos, 1992)

2.1.2. Management Issues in Inter-organizational Relations

As the awareness and consciousness of the importance of inter-organizational relations increases, scholars and practitioners increasingly addresses the issue of the importance of how inter-organizational interaction should be managed. In this regard, Kaats and Opheij (2014) argued that in the world of alliances and network, neither the laws of hierarchy nor the laws of market transactions work. In this respect, Rossignoli and Ricciardi (2014) argued that there is no best way of managing inter-organizational relations. The authors stated that long-term, trustful supply chain relations facilitates and enhance efficient and smooth processes, though, the counterproductive outcome of these arrangements could result in inward-looking conservatism and culture. Rossignoli and Ricciardi (2014) argued that the complexity and inconsistency of management implications in inter-organizational relations is explained by the wide array of theories explaining the relations.

Rossignoli and Ricciardi (2014) further stated that, for instance, Agency Theory assumes that partners in inter-organizational relations only consider the partnering organizations goals if they formally is forced to do so, otherwise they are presupposed to act opportunistically (the agency theory are developed further in coming sections). On the contrary, Rossignoli and Ricciardi (2014) stated that partnering organizations are highly interested of the reputation and legitimacy that could be obtained by the interaction, even if it is connected to the cost of losing efficiency. Binder and Clegg (2010) emphasized that organizations should be aware of the possibility of a partnering organization acting opportunistically, and thus, devote attention to inter-organizational structures, processes and transactions.

2.2. Open Innovation

This section aims at providing the reader with basic understanding of the concept of open innovation and how it relates to inter-organizational collaboration. Open innovation can be seen as a new paradigm for both researchers and practitioners, where firms move from closed innovation towards strong interaction with the firm's environment

(Lichtenthaler, 2011). Closed innovation is according to Chesbrough (2003) concerned with control of the internal R&D. Meaning that organizations keeps their innovation efforts in-house and then commercialize the ideas that were generated in the process. The closed innovation process was for many years seen as the right way for organizations to focus their R&D efforts. Chesbrough (2003) further argued that organizations invested large amounts of resources and efforts in internal R&D efforts, both to hire the best people in the market and to come up with better ideas than their competitors. When a product is developed, the organization's ensure competitive advantage by aggressively protect their ideas with intellectual property rights (IP). The protection of their ideas enabled organizations to make large profits, which they could reinvest in their internal R&D. Chesbrough (2003) argued that the shift towards an open innovation approach started by the increased troubles for organizations to retain the knowledge inside the firm, which he explained could be due to increased mobility of skilled workers. He also stated that venture capital helped skilled workers with investment to create their own breakthrough products outside large organizations and research labs. Furthermore, Lichtenthaler (2011) argued that during 1980 firms started to acquire external technology as complement to the internal R&D. Thereby the shift from solely relying on internal R&D efforts towards investigating the surrounding environment for new technology had begun.

Henry Chesbrough first coined the term open innovation in his book from 2003, thereafter it have gained large attention from both scholars and practitioners (Huizingh, 2011). When Chesbrough, Vanhaverbeke and West (2006, p.1) compressed the concept of open innovation in a sentence it resulted in; *"Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively".* Through the concept of open innovation, Chesbrough created an umbrella term for many already existing activities in both academia and practice. This enabled a new way of viewing the innovation strategies employed in the cooperative environment (Huizingh, 2011). He further states that the timing of the concept was great since more interest for outsourcing and focus on core competences had emerged at that time. Furthermore, Gassmann and Enkel (2004) stated that open innovation can be compressed in three different processes archetypes of how companies work with open innovation, i.e. *inbound*, *outbound* and *coupled*. These are described in figure 6 below, which also illustrates the process of open innovation.

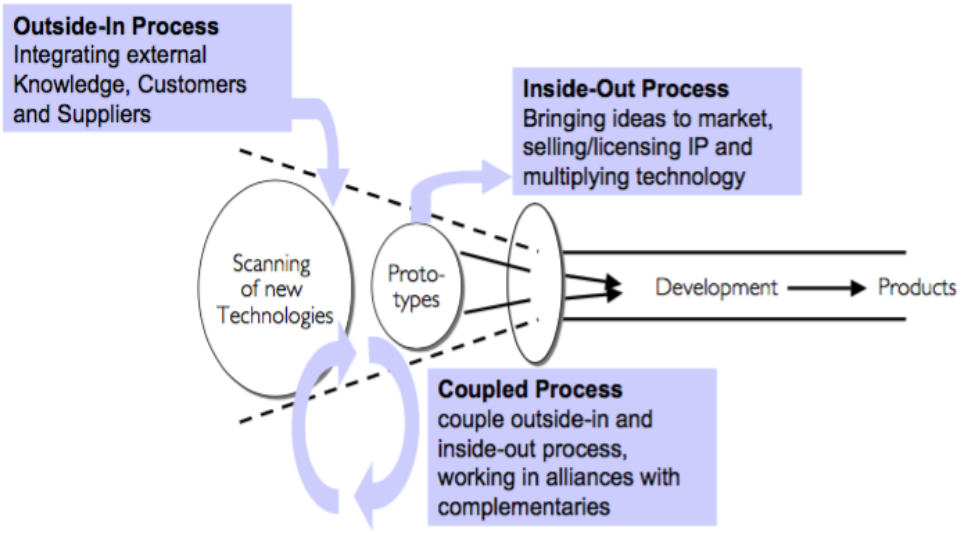


Figure 6 Three types of open innovation processes (Gassman and Enkel, 2004).

Gassmann and Enkel (2004) stated that those organizations that pursue the outside-in process of open innovation rely on cooperation with external sources, such as customers and suppliers. Huizingh (2011) refers to the outside-in process as inbound open innovation. These co-operations aim at integrating external knowledge into the firm's internal R&D processes. The authors further stated that customers and supplier should be included in the product development process, since they are a valuable source of knowledge. This is also supported by Ili *et al*. (2010) as they state that suppliers along with customers, competitors and lawmakers are important sources of innovation in the automotive industry. Clark (1989) states that relationships with suppliers in the automotive industries help the auto firm to benefit from the suppliers knowledge and utilize it more effectively during product development. He further argues that to grasp this benefit the relationship with the suppliers must be mutual beneficial for the involved parties. Furthermore, Un *et al*. (2010) also stated that universities and suppliers provide organizations with long-term positive effect on innovation while competitors have a short-term negative effect on innovation.

Gassmann and Enkel (2004) described the inside-out process as companies trying to grasp benefits from externalizing internal knowledge and innovation. This process is also referred to as outbound open innovation (Huizingh, 2011). Organizations using this type of open innovation process might reach the market faster as they can leverage on external capabilities. This process includes making profit by licensing out IP and/or making the technology available for other applications in other organizations. Furthermore, Huizingh (2011) argues that by focusing on externalizing knowledge, companies can increase the profit of their product development efforts. The coupled process is a combination of the inside-out and outside-in process. Which refers to utilizing external knowledge internally and also transferring internal knowledge externally either by licensing out a product/solution in a new existing setting (Gassmann and Enkel, 2004).

Furthermore, open innovation is both a theoretical concept as well as a practice of how to organize to grasp external knowledge and leverage from internal knowledge. Many

firms have started to move from their closed view of innovation to an open innovation approach (Huizingh, 2011). Open innovation has a large impact on organizations and how they view the innovation process. Huizingh (2011) stated that this include managers in organizations to take new actions and decisions regarding when to open up the innovation process, how they should collaborate, with whom they should engage in the collaboration, and for what purpose. Huizingh (2011), further state that depending on the purpose for the innovation process, organizations can decide to collaborate with suppliers, customers, competitors or research institutions. These collaboration may also extend over different time periods and be repeated depending on the characteristics of the collaboration.

Huizingh (2011) further argues that collaboration is not restricted to only one organization neither one department. He also state that the initiator does not have to be the focal firm, instead a supplier or other actor might reach out to a larger organization and offer to provide an improvement of a product or process. Furthermore, this coincides with Gassmann (2006) as he suggests a contingency approach to open innovation efforts. Therefore, it is argued that open innovation implies an open mind to collaborative arrangements and collaborative partners. As stated above, suppliers play an important role as source for innovation for a firm's internal R&D activities. Open innovation efforts often start with an outsourcing decision to reduce cost, overcapacity, and risk or grow through complementary assets to move towards a more strategic implication for the firm (Gassmann *et al*., 2010). According to Gassmann (2006), research streams such as *early supplier integration* and *outsourcing of R&D* have contributed to the concept of open innovation. These and other fields of research that acknowledge an open approach to a firm's R&D and innovation, that have been around for decades are therefore presented below.

2.3. Purchasing and Supply Strategy

In this section the authors aim at providing the reader with basic understanding of relevant theories and concepts related to the issue of purchasing and supply strategy. The section covers the rationale behind the reason for why an OEM becomes involved in inter-organizational relations, different buyer-supplier relations, and lastly, some issues related to buyer-supplier interactions are depicted. Much literature on buyer-supplier relation stems from the field of supply chain management (e.g. van Weele, 2014), as well as from the field of operations management (e.g. Slack and Lewis, 2011). However, the two fields depict a congruent approach towards purchase and supply strategy and address the issue of make-or-buy in the same way. With regards to the make or buy dilemma, the issue of outsourcing and rationality behind it have received great attention from academia (e.g. Slack and Lewis, 2011; Momme and Hvolby, 2002; Kraljic, 1983). In their paper, Momme and Hvolby (2002) presented a six-phase framework for guiding the outsourcing process.

These phases included competence analysis, assessment and approval, contract negotiation, project execution and transfer, managing relationship, and contract termination. Van Weele (2014) argued that this framework could be divided into three phases of higher abstraction, namely; the strategic phase; the transition phase; and the

operational phase. Where the first includes *why, what, who?*, the second *how?*, and the third *how to manage?* As a step in the strategic phase, the *why* and *what* is sorted out. In this regard, Kraljic (1983) presented a purchasing product portfolio model for determining a company's supply strategy. Kraljic (1983) argued that a supply strategy is dependent on two factors, i.e. strategic importance of the product and the complexity of the supply market. Gelderman and Van Weele (2005) argued that Kraljic's purchasing product portfolio has become standard for purchasing portfolio models and constitute the foundation on which other models are based. Based on the same logic as Kraljic's initial model van Weele (2014) constructed a model to guide professionals working with sourcing strategies, see figure 7 below.

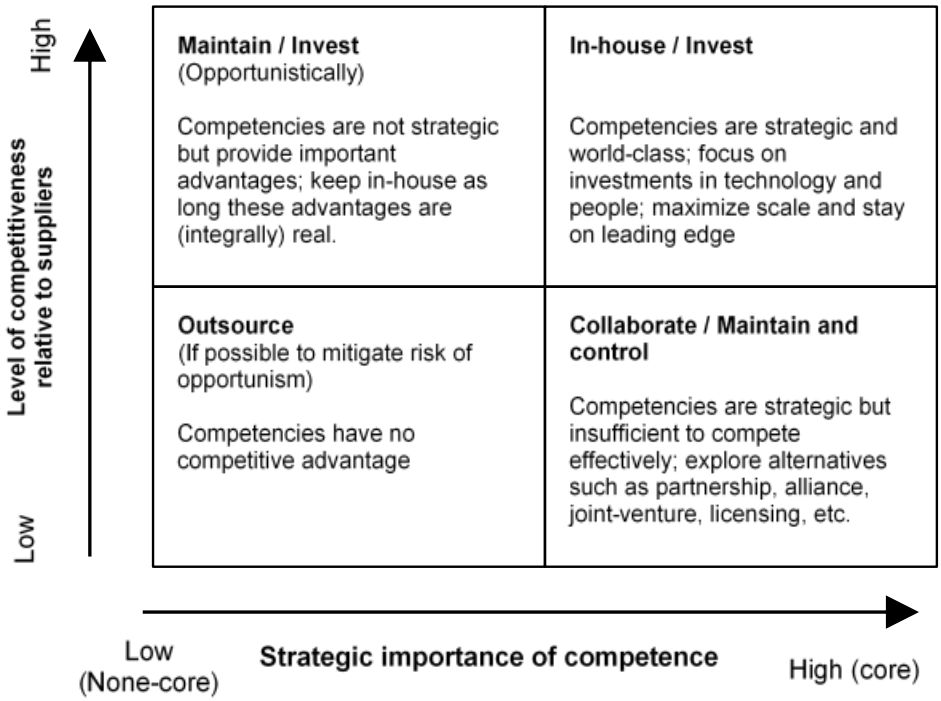


Figure 7 The outsourcing matrix (van Weele, 2014)

In the upper right quadrant of figure 7, strategic products are found. When a company is dealing with these products the focal company is highly experienced and competent relative external actors. It could also be stated that there is few or no other supplier of the same goods (van Weele, 2014). Furthermore, the competence for these strategic products or services differentiates the focal company from competitors, and thus, not an object for outsourcing (Slack and Lewin, 2011). In the upper left quadrant, leverage products are found. If an activity is of less strategic importance but the firm exhibits world-class competence the company is encouraged to continue to perform the activity in-house. However, this should only be pursued as long as they stay on pair with competitors (van Weele, 2014). In the lower left quadrant, non-critical products are found. Here the focal company shows both low core competence and the product have low level of competitiveness compared to competitors (van Weele, 2014). Lastly, in the lower right quadrant, bottleneck products are found. Here the activities are strategically important for the company but the focal company's competence is low relative competitors. In this case the focal company is encouraged to seek long-term collaboration or institutionalize strategic partnerships with external actors.

With respect to *who* in the strategic phase of the outsourcing process, Momme and Hvolby (2002) presented a four-phase strategic outsourcing model. The first two phases refers to the supplier selection process. These include market search, preliminary assessment, generating potential supplier list, detailed audit, confidentiality agreement and finally, an approved supplier list. It is stated that benchmarking is preferred during the second phase based on the information obtained during the first phase to increase the focal firm's bargaining position. The next phase of the outsourcing process refers to the transitional phase. Van Weele (2014) states that the transitional phase includes contract negotiation, project execution and transfer. It is important to note that there are no sharp interfaces between the phases, as the contract negotiation phase is included in both the strategic and the transitional phase.

Van Weele (2014) states that the most vital component of the transition phase is the contract. Though, the author underline that it is important to remember that the contract negotiation process often is the first interaction in a long-term relationship. Thus, it is not only the legal and financial aspects that should be covered, but also the social relation between the people in the concerned organization. Deckelman (1998) in van Weele (2014) argued that the contract is vital as it is the legal binding document, which enables both of the organizations to maximize their output from the relation, while the risk is minimized. Van Weele (2014) argues that it is important that the contract mirror the intended outcome of the relationship. Different types of contracts are not in the focus in this report, but van Weele (2014) argues that service level agreements (SLA) are a popular contract type. The contract type includes the deliverables, different performance indicators, and how the service provider is to be compensated. Van Weele (2014) also added that the question whether to use penalties or incentives have great impact on the relations output. Lastly, the process of outsourcing addresses an operational phase. This phase includes the ongoing management of the relationship and contract termination.

2.3.1. Buyer-Supplier Relation

As highlighted in the outsourcing process above, the relation between the buyer and the supplier is important to maintain. Though, it is just as important to pursue the appropriate relational form. Wu and Choi (2005) stated that the literature field treating buyer-supplier relations covers a range of vertical relationship between, for instance, a manufacturer (OEM) and its suppliers. The authors further state that the one (buyer) versus the other (supplier) perspective holds an extensive range of abstractions of the inter-organizational relationship. Though, the literature could be argued to stem from two different perspectives, namely, competitive versus cooperative relationships (Choi *et al*., 2002). In the same jargon, Dyer and Chu (2011) argued that an OEM could manage its supplier selection process in two different ways, i.e. the arm's length relation (competitive) or a continuous, long-term relation based on trust and reciprocity (cooperative). A bidding process characterizes the arm’s length relationship with suppliers in the selection process where previous experience with a particular supplier does not influence the selection. The competitive relationship refers to buyers and suppliers that engage in competitive arrangements as economic risk constitute a crucial aspect for the parties involved (Wu and Choi, 2005).

On the other hand, the continuous relationship approach is influenced by previous experience where suppliers with a track record get an upper hand position to gain new business. In this situation the buyer reach out to the preferred supplier with an offer of new business, and thereby gives the supplier a first opportunity (Wu and Choi, 2005). According to the authors the former approach is more common in US companies and the latter is more common in Japanese industries. These different approaches have different impact on trust between the suppliers. The authors state that a continuous relationship has a positive impact on trust between the parties in a supplier buyer relationship (Dyer and Chu, 2011). The cooperative relationship advocate openness and collaboration in-between the parties involved. Furthermore, Wu and Choi (2005) also argued that the cooperative relation pushes the buyer and supplier to see their interaction and relation more long-term and envision their counterpart as a strategic partner that work toward a shared goal.

As mentioned in the introduction of this report, the view of suppliers does no longer only relate to suppliers who delivers tangible goods, but also to suppliers who deliver services such as; design consultancy, logistical expertise, knowledge, and etcetera (Cropper *et al*., 2009). This shift has modified the way in which professionals and scholars value the role of suppliers, and the way the relation between buyer and suppliers are understood. Cropper *et al.* (2009) further states that this has led to profound changes in purchasing and supply management and the way in which companies organize their supply relationships. Binder and Clegg (2010) argues that this forces manufacturers to move away from the traditional contractual perspective of collaborations, and shift to a model that emphasis relations and partnerships. The authors further argue that this concerns all, and demand a total inclusion of all actors in the automotive industry to interact closely.

Cropper *et al.* (2009) argued that, by inspiration from Japanese practices, western companies have modified their relationships to suppliers by abandoning the traditional, transaction oriented perspective. This jargon of describing the trend of relations to suppliers is also narrated by Binder and Clegg (2010). The authors stated that the Japanese practice suggests a relational approach, whereas the contrasting, traditional approach refers to a contractual approach (often applied by U.S. corporations). However, even though it is pronounced that the trend leans toward the relational model, Binder and Clegg (2010) suggests that a hybrid European partnership model better describes the current state of the approach towards suppliers in the automotive industry, see table 1 below. However, the author adds that the boundaries between the different approaches are blurred, and instead, approaches and strategies towards suppliers should be seen as hybrids on the continuum.

Table 1. Comparison between U.S., European and Japanese governance models (Binder and Clegg, 2010).

Aspect	U.S. adversarial model	European partnership model	Japanese relational model
Sourcing strategy	Parallel sourcing with multiple partners Traditional commodity purchasing (contractual)	Dual / single sourcing Towards strategic sourcing	Sole / single sourcing Strategic sourcing (partnership)
Contracting	Short-term contracts Less formalised (flexible) Price focused	Towards longer-term contracts Less formalised based on Service Level Agreements Technology and innovation focused for critical components, price focused for standard parts	Long-term contracts Formalised (fixed) Quality and delivery focused
Supplier involvement	Low supplier involvement Constant search for new suppliers Involving suppliers as late as possible	High involvement of system and module suppliers Basic supply base and variation for peak volumes Increasingly involving suppliers at early product development stages	High supplier involvement Supplier chosen for vehicle lifetime Involving suppliers as early as possible
Supplier management	Arms length relationship Single functional interface (sales to purchasing) Self-centered focus on own manufacturing lines	Increasingly relational model Multiple functional interfaces Mainly self-centered with focus on some big system suppliers	Trusting partnership with financial stakes Multiple functional interfaces (R&D to R&D, R&D to sales, sales to purchasing, etc.) Holistic approach to entire business system including supplier
R&D collaboration	Minimal sharing of technical and cost information Sporadic and problem driven communication OEM determines product specifications	Intensive sharing of technical know-how but little cost information Mainly problem driven communication Joint product specification for parts with critical supplier know-how	Intensive sharing of technical and cost information Frequent and planned communication Joint product specification

2.3.3. The Role of Suppliers in New Product Development

In the automotive industry, suppliers play an important role when it comes to innovation and new technologies. Firms in the automotive industry cannot rely on their own capabilities to be innovative and there are numerous examples of innovations in the automotive industry that has been developed by suppliers, e.g. airbag, car seats and retractable roofs (van Weele, 2014). Thus, it is crucial for car manufacturers to address the issue of how innovations and technologies are to be mobilized from external actors. Furthermore, the author state that companies need to involve suppliers closer in product and process innovation to grasp all benefits from their suppliers. In research of Ragatz *et al*. (1997) they found that organizations tend to move towards an earlier and closer collaboration with suppliers in new product development to generate new ideas, improve quality, reduce cost, and reduce cycle time and to develop and apply new technologies. Though, van Weele (2014) argues that this does not occurs on its own and that it does not always lead to success.

Van Weele (2014) concluded that the benefits of collaborating with supplier can be categorized as giving short-term or long-term benefits. Short-term benefits include improved quality, reduce cost and reduce development time, mainly due to the access from product and technology expertise from the supplier. Long-term benefits are those that evolve from joint research programs on new technology, strategy alignment and roadmaps, and sharing gain and risk with the suppliers (van Echtelt, 2004). Involving suppliers in new product development is not a simple matter and it demands both systems and cultures from both parties involved in the collaboration to grasp the benefits to develop a successful collaboration. Such system is especially needed for organization acting in joint product development projects and represents a vital enabler for sharing technical information quickly and between the different organizations (van Weele, 2014).

2.3.3.1. Issues of Early Supplier Involvement

Even though the potential benefits of closer and earlier collaboration with suppliers in new product development cannot pass by unnoticed, its potential drawbacks and problems is important to discuss. Wynstra (1998) stated that involving suppliers in new product development represents a complex process. This process is complex as the required prerequisites for achieving technological exchange and a collaborative atmosphere are not present per se. Furthermore, van Echtelt (2004) stated that technological collaboration might cause resistance among both the focal firm's as well as the partnering firm's employees. The buying firm's internal R&D experts often resist collaborating with external actors as they might experience a risk of losing their jobs. If development and engineering responsibility increasingly are handed over to suppliers, what are then remaining for the internal R&D specialists? Research has also elucidated the issue of intellectual property rights related to R&D collaborations, e.g. Wynstra (1998) and van Echtelt (2004).

Van Weele (2014) elucidated other problems related to early supplier involvement. The author argued that there is great potential that the supplier might underestimate the resources required to develop the focal firm's (the buying firm's) request. Another important aspect to consider is that a professional and effective producer is not always the most suitable and best developer of a product. In that case, it might occur a resource demanding activity of transferring knowledge from the buying organization to the external developer, i.e. the supplier. Furthermore, van Weele (2014) elaborated upon the issue of rewarding its supplier for research and development activities. The author stated that he had witnessed occasions where the supplier had invested a great deal of effort and time on development activities, at their own expenses, to support and provide their employer with new and innovative ideas. Suddenly, the employer alters its behavior and takes a buyer position and asks for bids from different competitors. The author states that it does not foster a long-term sustainable relationship as the supplying organizations most likely experience betrayal from the focal firm. The relation between these two organizations would most likely not uphold a trustful, long-term relationship based on mutual respect according to van Weele (2014).

2.4. Defining Collaboration

When the notion *collaboration* is researched a plethora of definitions and interpretations - from different perspectives - of the activity are found (e.g. Huxham and Vangen, 2005; Thomson and Perry, 2006, Thomson et al., 2009). Both as it has different meanings in different contexts but also as no, or deficient, consistency of the word's usage is present. To provide the reader with sufficient understanding of the meaning of collaboration it is crucial to distinguishing its meaning from similar words, often used as synonyms to collaboration, i.e. cooperation and coordination. First, the authors of this reports defines collaboration as *"[...] any situation in which people are working across organizational boundaries toward some positive end"* (Huxham and Vangen, 2005, p.4). This definition has been found most suitable as the originators of the definition further delimits their definition from collaboration between individuals, and instead underlines that their definition is concerned with collaborative relationships between organizations. This definition is also deemed suitable for this report as it underlines the shared belief of

jointly reaching a positive end. Huxham and Vangen (2005) further explains that their definition concerns all types of inter-organizational collaboration, ranging from partnerships to alliances, joint ventures, networks, collaborative forms of contracting and outsourcing, joint working, and etcetera.

The definition of Huxham and Vangen provides a good guidance for how the authors of this paper views collaboration, though, its rather broad scope makes it hard to distinguish collaboration from similar activities such as cooperation and coordination. Therefore the definition by Thomson and Perry (2006), which is based on Thomson (2001), has been brought in to provide more depth of the concept of collaboration. The definition reads, *"[...] a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions"* (p.23). Thomson and Perry (2006) argues that this definition shows that collaboration holds a higher degree of collective action than coordination and cooperation, and thus differs in depth of interaction, integration, commitment, and complexity. However, collaboration could be said to occur in any inter-organizational relation as its definition involves a certain degree of interaction among (at least) two actors such as suppliers, customers, competitors, non-profit organizations, government organizations, universities among others (Shilling, 2013).

2.4.1. Defining Cooperation

Cooperation, on the other hand, is by Järrehult (2011) defined as *"… the process of working or acting together"* (p.1)*,* where the author argues that the participating actors usually have different goals but a need for a similar resource that they by sharing find commercial rewarding. Järrehult (2011) argues that cooperation between two or more actors is a temporary setting where the participants move separate ways after their respective goals are acquired. Furthermore, Järrehult (2011) states that cooperation does not need all too much trust to make it work. Instead he argues that fairness is a vital component, meaning that the participants in the cooperation need to be aware of the intention of other participants. Thomson (2001) argues that cooperation with a common goal leads to collaboration, and thus a major differentiating factor.

2.4.2. Defining Coordination

Lastly, coordination relates to formal relationships and understanding of compatible missions, where mechanisms such as planning, communications channels and division of roles are needed (Mattessich *et al*., 2001). Thus, coordination, in contrast to cooperation and collaboration, addresses more specific regulatory aspects related to the interplay among diverse entities of, for instance, organizations. Mattessich *et al*. (2001) further argues that during coordination arrangement the authority rests in the individual organization. In essence, the characteristics of collaborations involve, as argued by Thomson and Perry (2006), much more interaction, integration, commitment and complexity than coordination and cooperation. Furthermore, Gray (1989) argues that cooperation and coordination are much likely to occur in the process of collaboration but collaboration constitutes a longer-term process. Thus, various inter-organizational

arrangements are depicted in this report, though, not necessarily involving the characteristics of collaborative activities, but it provides the reader with a nuanced view of the phenomenon. Mattessich *et al.* (2001) described the essential elements of cooperation, coordination and collaboration in relation to; vision and relationships; structure, responsibilities and communication; authority and accountability; and resources and rewards. These are presented in table 2 below and are meant to better visualize and facilitate comparison between the three concepts presented above. It can be depicted in the figure below that collaboration includes a higher level of joint effort as well as cooperation posits the lowest level of joint effort.

Table 2 Table describing the elements of each term (Mattessich et al., 2001, p. 61)

Cooperation, Coordination, and Collaboration			
Essential elements	**Cooperation**	**Coordination**	**Collaboration**
Vision and relationships	Basis for cooperation is usually between individuals but many be mandated by a third party	Individual relationships are supported by the organizations they represent.	Commitment of the organizations and their leaders is fully behind their representatives.
	Organizational missions and goals are not taken into account.	Missions and goals of the individual organizations are reviewed for compatibility.	Common, new mission and goals are created.
	Interaction is on an as needed basis, may last indefinitely.	Interaction is usually around one specific project or task of definable length.	One or more projects are undertaken for longer-term results.
Structure, responsibilities, and communication	Relationships are informal; each organization functions separately.	Organizations involved take on needed roles, but function relatively independently of each other.	New organizational structure and/or clearly defined and interrelated roles that constitute a formal division of labor are created.
	No joint planning is required.	Some project-specific planning is required.	More comprehensive planning is required that includes developing joint strategies and measuring success in terms of impact on the needs of those served.
	Information is conveyed as needed	Communication roles are established and definite channels are created for interaction.	Beyond communication roles and channels for interaction, many "levels" of communication are created as clear information is a keystone in success.
Authority and accountability	Authority rests solely within individual organizations.	Authority rests with the individual organizations, but there is coordination among participants.	Authority is determined by the collaboration to balance ownership by the individual organizations with expediency to accomplish purpose.
	Leadership is unilateral and control is central.	Some sharing of leadership and control.	Leadership is dispersed, and control is shared and mutual.
	All authority and accountability rests with the individual organization which acts independently.	There is some shared risk, but most of the authority and accountability falls to the individual organizations.	Equal risk is shared by all organizations in the collaboration
Resources and Rewards	Resources (staff time, dollars, and capabilities) are separate, serving the individual organization's needs.	Resources are acknowledged and can be made available to others for a specific project.	Resources are pooled or jointly secured for a long-term effort that is managed by the collaborative structure.
		Rewards are mutually acknowledged.	Organizations share in the products; more is accomplished jointly than could have been individually.

2.5. Three Phases of Collaboration

To provide understanding and insight of collaboration a *preconditions-process-outcome* model has been used to structure theory on collaboration in this report. This model was initially developed by Wood and Gray (1991), when they mapped different perspectives of collaboration in their literature review. Wood and Gray (1991) argued that it is the *preconditions* that enables the collaboration to occur, namely, conditions that motivate and encourage stakeholders to participate in collaborative activities. Research addressing preconditions provide useful insight for scholars as well as practitioners of conditions leading to the construction of successful collaborations, and thus also helpful when making managerial decisions (Ring and Van de Ven, 1994). The *process*

represents the structure for how the collaborative activity practically is undertaken. Finally, the *outcome* perspective treats the desired outcome of the collaborative undertaking, see figure 8 below. Furthermore, Wood and Gray (1991) argued that most of the literature they reviewed leaped from preconditions to outcome, and stated that the interactive process of collaboration is less described by the literature. This leap left Wood and Gray (1991) with what they called a *black box.* This absence, or inconsistency, of relevant literature on practical implications for how the interactive process of collaboration should be managed is supported by Thomson and Perry (2006) and Thomson *et al*. (2007).

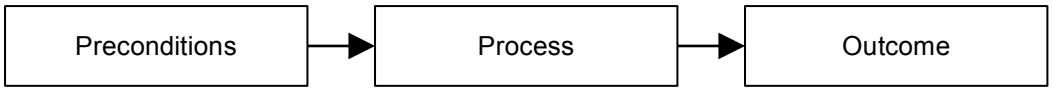


Figure 8 Critical issues of collaboration (Wood and Gray, 1991)

Ring and Van de Ven (1994) further argued that academics devote little attention on studying the process of inter-organizational relations, focus is rather placed on antecedents - or preconditions - for a collaboration. However, as a response to the lack of clearance of the collaborative process many scholars have addressed the issue of the black-box. Ring and Van de Ven (1994) admitted the usefulness of knowing the inputs, structure and desired outputs of a relationship when studying the collaborative structure. However, they constructed a conceptual framework to describe how external collaborations instead emerge, grow and dissolve over time. Furthermore, Thomson concluded in her paper from 2001 that the essence of the collaborative processes could be refined into five key dimensions. The three critical issues and the five dimensions of the collaborative process will be explained further in the sections below. They provide a picture of the process of collaboration and provide the report with a good structure.

2.5.1. Preconditions for Collaboration

Wood and Gray (1991) termed preceding conditions (or factors) '*antecedents'* and stated that resource scarcity and high levels of interdependence represents examples of preceding conditions for collaboration to occur. In the same way, Kaats and Opheij (2014, p.9) stated that *"... you do not always start collaborating",* and argued that collaboration must yield benefits, though these benefits differ across and between organizations, from partner to partner, etc. Wood and Gray (1991) stated that organizations should not initiate collaboration with an external organization without explicitly stating why they collaborate. Furthermore, Kaats and Opheij (2014) stated that one basic factor for collaborating is that you believe that joint efforts achieve the desired goals that neither of the parties could obtain on their own. The author also emphasizes that companies that is not big enough to achieve their goals by themselves are encouraged to participate in collaborative arrangements where each and every one concentrate on their core competence.

With respect to preconditions, Child *et al*. (2005) stated that there are a variety of organizational and economic considerations to take into account before any collaborative efforts are pursued. Child *et al.* (2005) argued that these aspects are important to pay attention to as inter-organizational arrangement's is formed after the strategic motives. These aspects might imply that the inter-organizational efforts are

conducted in an alliance, as the arrangement constitutes the best alternative. Child *et al.* (2005) further argued that the preceding motives might lead the parties to decide that a merger becomes too stiff for one of the parties or that market transactions are too uncertain. The authors further argue that the choice of inter-organizational arrangement is driven by different strategic motives. This is also true for the *choice of partner*, the *choice of arrangement*, the *toughness of negotiation*, and the *degree of dedication* of the parties in resolving problems and managing the alliance (Child *et al.,* 2005).

In their book, Kaats and Opheij (2014) complied numerous reasons for why collaborations are initiated, which are based on; Huxham and Vangen (2005); Child *et al*. (2005); and Cropper *et al*. (2009). These findings are stated in table 3 below. In this table they present the preconditions or motives for collaboration structured after four motives; *market development, cost advantages, knowledge development* and *external pressure.* These four motives for collaborating are also highlighted by Tidd *et al.* (2001).

Table 3 Overview of the substantive motives for collaborating (Kaats and Opheij, 2014)

Market development	Cost advantages	Knowledge development	External pressure
Developing joint market power	Realizing advantage of scale	Organizing joint innovation	Political pressure 'one face to citizens'
Improving and increasing distribution power	Establishing joint supporting services	Using partner complimentary competencies	Legal obligation of consultation
Gaining access to new markets	More efficient and rationalized production	Learning from partners' skills and knowledge	Moral appreals from society or politics
Protection against competition		Learning from partners' cultures	
Chain integration through better chain coordination		New partents as well as access to patented knowledge	

2.5.1.1. Market Development

Kaats and Opheij (2014) stated that market development represents a substantive motive for initiating inter-organizational collaborations. These motives are pursued when collaborating actors aim at developing joint market power, gaining access to new markets and integrating supply chains to achieve better chain coordination (Tidd *et al.* 2001). Furthermore, the motive of market development could also be pursued as an attempt to protect against competition, but also to improve and increase the organization's distribution power (Child *et al.,* 2005). Van Weele (2014) added that logistical aspects represent a motive for undertaking collaborative arrangements. Mainly

as insight into each other's organizations facilitates demand planning of products/components and could increase the service level.

2.5.1.2. Cost Advantages

Another motive for initiating collaborations suggested by Kaats and Opheij (2014) refers to obtaining cost advantages. This motive include the possibility of realizing economies of scale through joint efforts, overcoming investment obstacles, realizing joint supporting services, e.g. administration, facility management, and etcetera. Another aspect included in the motive *cost advantages* presented by Kaats and Opheij (2014) refers to more efficient and rationalized production. The aspect of streamlined production is a vital determinant when a component or product is to be outsourced. Mainly as it could generate great cost saving potential through economies of scale (Tidd *et al.,* 2005). Van Weele (2014) argued that the pursuit of reduced cost of product and supply chain cost are motives for undertaking collaborative efforts. This refers to a mutual understanding of both parties cost structures and a mean for jointly reducing underlying costs at the supplier.

2.5.1.3. Knowledge Development

Kaats and Opheij (2014) referred to knowledge development as a motive for collaborating. This motive could be argued to conform to Tidd *et al.* (2001) who argued that outsourcing often is an underlying factor for why companies collaborate. Outsourcing is said to occur as deep knowledge of specific technology often rests at an external organization. This motive is also supported by Child *et al.* (2005) as they stated that motives for collaborating stems from developing or gaining access to superior capabilities. The organization seeking to collaborate can thus get access to core competencies without internalizing them. Kaats and Opheij (2014) further stated that learning from partners' skills, knowledge and culture also constitutes common motives for why inter-organizational collaboration is pursued. These motives are also supported by Child *et al.* (2005). Van Weele (2014) argued that another motive for initiating close collaborations with suppliers through partnerships is improvement of product development. By doing this, the contractor could reduce its time-to-market and start-up cost by involving the supplier and utilize their knowledge and expertise early in the product development process.

2.5.1.4. External Pressure

A factor that Kaats and Opheij (2014) present as a substantive motive for undertaking collaborative activities is external pressure. This could include a political pressure such as 'one face to citizens', legal obligation of consultation, or moral appeals from society or politicians. Furthermore, another aspect in the motive of external pressure could be to circumvent government-mandated trade (Child *et al.,* 2005). Another consideration that could be said to originate in external pressure is the motive of spreading risk, but not at least the belief that an alliance could offer lower transaction cost compared to internal development or acquisition.

2.5.2. Collaboration as a Process

Thomson (2001) developed a theoretical model of collaboration as she identified a demand for a systematic approach for understanding the meaning and measurement of the collaborative process. This model aimed to fill the black box identified by Wood and Gray (1991). On a conceptual level, the theoretical model was developed from previous research on collaboration, inter-organizational relations and organizational behavior, where Thomson *et al.* (2007) identified support for an integrative view of collaboration as a process. The process framework has five key dimensions that characterize the nature of collaboration, see figure 9 below.

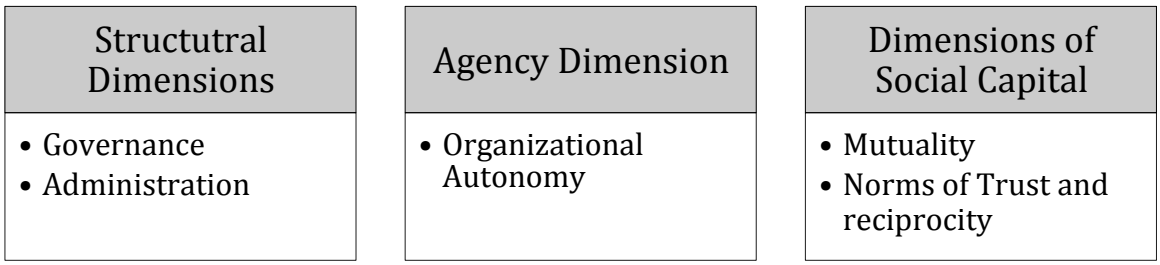


Figure 9 Dimensions of Collaboration

The governmental and administrative dimension refers to the structural dimension, mutuality and norms of trust are the dimensions of social capital, and organizational autonomy refers to the agency dimension, see figure 10 below.

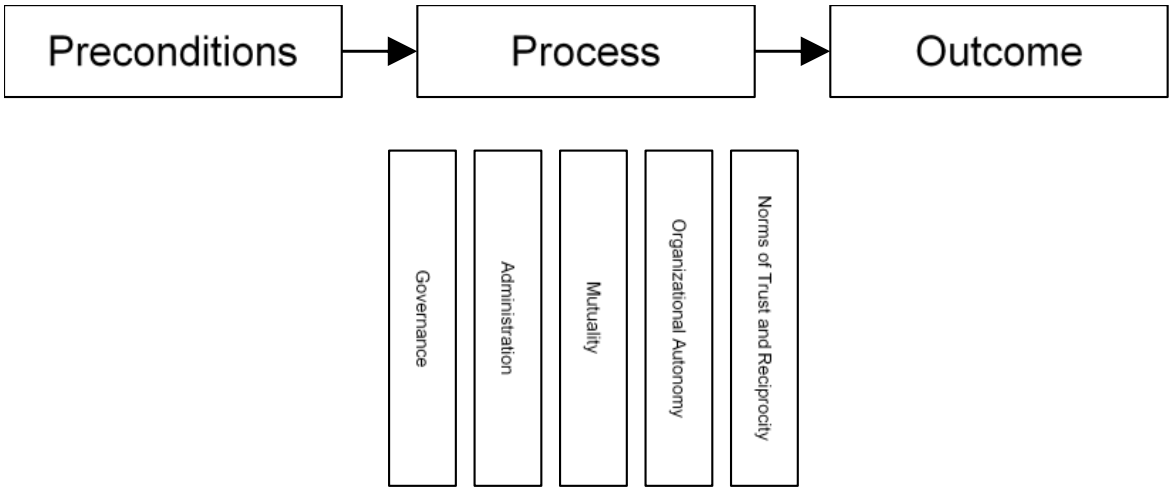


Figure 10 A process framework for collaboration (Thomson and Perry, 2006)

These dimensions can vary from low to high, but as the collaborative process is complex and uncertain, an optimal level of these five dimensions is difficult to specify. Rather than pursuing the highest level possible, the challenge is to seek balance among them by reciprocal modification and reasons for renegotiation (Thomson and Perry, 2006). Thomson and Perry (2006) pointed out that collaboration occurs over time as firms interact informally and formally in an iterative process of negotiation, assessment, commitment, re-assessment and implementation, which also is reflected in Ring and Van de Ven's (1994) process framework of collaboration. The meaning of each of the five dimensions will be depicted below.

2.5.2.1. Governance

Structure is an important element of collaboration, including rules for who is permitted to make decisions, what actions are allowed or not, the amount of information that is needed and how costs and benefits are distributed among the involved parties (Ostrom, 1990). According to Wallin and Von Krogh (2010) governance provide the involved parties in the collaboration with structure that enables them to better work together and benefit from the collaboration. According to Mattessich *et al.* (2001) collaboration involves managers and participants from different levels of an organization, therefore a successful collaboration need mechanisms to involve them in a successful manner. Furthermore, they also state that governance plays an important role in the transaction between firms. Mainly since it have a large impact on aspects of conflict, mutuality and order. Governance mitigates conflict in a transactional arrangement; expresses mutual gain for voluntary exchange and set order in a collaborative arrangement (Williamson, 2002).

According to Rossignoli and Ricciardi (2014) the literature present three different theoretical approaches that explain how inter-organizational relationships should be controlled and managed, namely; Transaction Costs Economics, Agency theory and Resource dependence approach. These three approaches share the same premise, which refer to that inter-organizational relationships are founded on opportunism and bounded rationality. These theories also state that organizations seek control to pursue their business goals (Rossignoli and Ricciardi, 2014). Contracts is a central issue of governance, these are referred to by Blomqvist *et al.* (2005) as formal, written contracts between two or more parties, where the contracts bind the involved parties and create obligations i.e. how to act. They further state that contracts enable the involved parties to achieve mutual goals, enable joint rules for the collaboration. They also state that the negotiation process of contracts helps the involved parties to avoid future disputes and in this way contracts enables cost and risk reduction.

2.5.2.2. Administration

According to Thomson and Perry (2006) collaborations does not administer themselves, there is a need for systems and administrative structures to move from governance to action. Mattessich *et al.* (2001) provide some factors that are related to administration, such as planning and monitoring of the collaborative effort. They further includes clarification of roles as an important part of collaboration, furthermore they suggest a letter of agreement that could include roles, responsibilities and procedures as an administrative facilitator in a collaboration. According to Thompson and Perry (2006), administrative capacity is not enough for successful collaboration, and to get things done there is also a need for balance between administration and social capacity to build relationships within the collaboration.

2.5.2.3. Organizational Autonomy

The third dimension Thomson and Perry (2006) refers to as descriptive for a collaborative endeavor is the fact that participants share a dual identity. Though, the authors emphasize that the participating organizations keeps their defined organizational identity and organizational autonomy in parallel with the collaborative activity. Cropper (2009) argues that power describes an autonomous organization's ability to influence,

resist, or control the behavior of others in inter-organizational activities. The author further argues that power is a necessity for describing inter-organizational relations as it by its definition involves two parties. Furthermore, Thomson and Perry (2006) states that the power and dual identity issue inherently creates tension between *self-interest* and *collective-interest.* Self-interest involves attaining organizational goals and maintaining the organization's own distinct identity from the collaborative arrangement. Collective-interest on the other hand, refers to the willingness of pursuing collective goals and liability towards the collaborative undertakings different participants (Wood and Gray, 1991).

With respect to inter-organizational relations, and more specifically in regard to power, Cropper (1990) states that the resource dependency theory becomes central. The resource dependency theory argues that the firm is not self-containing for fulfilling demands and requests (Pfeffer and Salancik, 2003). Furthermore, the resource dependency theory manifests that an organization is interdependent of other organizations in its environment. Therefore, it could be argued that power could be achieved through transactions with actors in the external environment (Pfeffer and Salancik, 1978). However, the power an organization potentially achieves by performing transactions with external actors could also place constraints on the organizations. In the resource dependency theory the presence of an external actor is argued to inhibit the organizational discretion - the organization's autonomy - and therefore negatively affect its profitability (Cropper *et al.*, 2009). The author stated that this problem would occur when the needs from the external actor and the organization were inconsistent. These constraints coincide with the issues of self-interest and collective-interest presented by Thomson and Perry (2006), i.e. the issue of dual identity. In this regard, Pfeffer and Salancik (1978) stated that organizations tend to respond to this issue by managing their environment. Cropper *et al.* (2009) stated that organization tend to manage their environment by seeking to cooperate, merge, or form an alliance with the external actor to modify the power balance.

However, as identified by Cropper *et al.* (2009), most literature on power in inter-organizational relations is foremost derived and found in sub-topics, and thus, treats power issue in less depth. Moreover, Cropper *et al.* (2009) argues that organizations participating in collective activities need power to influence, access, and impact decisions regarding joint goals and the way they are carried out. Even though literature on power related issues is sparse, it could be argued that power in business related context, i.e. joint ventures and equity alliances, tend to be placed on achieving managerial advantage and control over the other parties by showing power advantage to maintain stability, e.g. Yan and Gray, 1994; Van Weele, 2014. It is important to address why different researchers argues that power could be used in different ways to modify the surrounding environment. However, those arguments could also be said to be the source to what Cropper *et al.* (2009) calls power asymmetry, imbalance, and inequality of power in inter-organizational collaborations. The author argues that there is consensus among researchers on inter-organizational relations. That equality of power among actors present in a relation cannot be expected and inter-organizational relations works more smoothly and efficient when the power balance is fairly divided.

Furthermore, for the parties involved in the collaborative endeavor, power struggle could potentially inhibit its effectiveness. Huxham (1996) discusses the issue for individuals involved in collaboration of not having the authority of make decisions without permission from their own organization. He depicted the picture of being a child and has to ask the parents for allowance. The author argues that this slows down progress and put the organizational representative in unpleasant situation, where he or she always has to ask for allowance. Huxham (1996) further refers to this phenomenon as collaborative inertia. He also argues that this issue is related to authority in hierarchies, where different levels in an organization are not obligated to take certain decisions.

2.5.2.4. Mutuality

Mutuality is defined as "... *values and beliefs about the inherent value of cooperating for mutual gains"* (Campbell, 1997, p.1), and is fundamental in various definitions of collaboration and inter-organizational relations, e.g. Huxham (1996). With respect to the definitions of cooperation and collaboration the participating actors should yield mutual benefits. This is supported by Powell (1990) as the author stated that collaboration must yield mutual benefits. He further argues that this benefit should be for either the collective interest or the individual interest. However, the interests should strive towards a shared goal. Mutual benefits are also supported by Ellram and Edis (1996) as a fundamental component in a successful collaboration. Furthermore, with regard to long-term relationships, Campbell (1997, p.1) stated that "... *mutuality norms presume that both parties recognize the ongoing value of maintaining the relationship in order to reap shared gains"*. Thereby, the author argues that mutuality is vital in long-term business relations.

Thomson and Perry (2006) state that there need to be a mutuality with respect to information sharing and gains from the outcome of the collaboration. Furthermore, they also stated that mutuality has its roots in interdependence. Mattessich *et al.* (2001) argued that mutual respect, understanding and trust are important elements in collaboration. They further state that members of a collaboration need to respect the organizational difference between each other's organization. These organizational differences includes how the other party operates, differences in culture (e.g. norms and values) as well as the limitations and expectations of the other party. Organizational limitations refer to organizational capacity, i.e. not enough resources. Expectations refer to the other party's expectation of the outcome, as one party might be more dependent than the other, of the outcome of the collaboration.

2.5.2.5. Norms of Trust & Reciprocity

Thomson *et al.* (2007) state that trust and reciprocity are closely related, and explains that in the offset of a collaboration, one party might be willing to take larger initial costs as they believe that it will even out in the end. They further explain that it is a notion of sense of duty towards each other. It is also argued that it is mentality based on perceived reciprocity (Thomson *et al.,* 2007). Furthermore, with regards to trust, Cummings and Bromiley (1996) defines trust as *"... individual's belief or common belief among a group of individuals that another individual or group (a) makes good-faith efforts to behave accordance with any commitments both explicit or implicit, (b) is honest in whatever negotiations preceded such commitments, and (c) does not take excessive*

advantage of another even when the opportunity is available" (p. 303). This definition indicates on how simple it should be to create trust in a collaboration, however, this is likely not the reality in practice. Mattessich *et al.* (2001) discusses the implication of relationships and the importance of history as they state that connections within organizations other than the collaborative group, provides a foundation of both communication and trust in the collaborative arrangement.

Dyer and Chu (2011) stated that trust in inter-organizational collaboration can be constructed by three components; reliability, fairness and goodwill. Reliability refers to the good faith decisions made by another party in accordance to the agreed commitments. Fairness relates to the adjustments made by the other party with regard to changed circumstances, and perceived as 'fair' by the other actors. Goodwill relates to *not taking advantage of the other party* even if an opportunity for it arises. According to Stuart *et al*. (2012), history affects the degree of trust between parties in buyer-supplier relations. The authors also state that trust is an important element in an inter-organizational collaboration. They further state that trust has positive effects on the collaboration, since it can act as a substitute for contract and reduce costly governance mechanisms. Furthermore, Cropper *et al.* (2009) adds to this as they state that trust and power can be seen as substitute for control mechanisms, i.e. governance. The authors further stated that power balance influence the likelihood of trust in a relationship, i.e. equally power in a relationship tends to foster more trust.

2.5.3. Outcome of Collaboration

The third theoretical perspective of collaboration identified by Wood and Gray (1991) refers to the outcomes toward which the collaboration is aimed. This perspective of collaboration was addressed in their literature review as an attempt to construct a general definition of collaboration. They identified that a definition aiming to cover all aspects of collaboration should leave the *"... consequences of collaborating unspecified and open to an empirical investigation"* (p.149). Mainly as the multitude of research they covered hade a diverse flora of possible outcomes from collaborative efforts. However, to give the reader better insight of what increased levels of collaboration and improved conditions for collaboration would lead to in the automotive industry, some positive and negative issues are addressed in the section below.

2.5.3.1. The Advantage of Mass Collaboration

Binder and Clegg (2010) elaborated upon the great revolutions in the past within the automotive industry and where the trend within the automotive industry is heading. The first revolution took place when the industry moved from craft-based to mass-production (e.g. Fordism). The second great revolution within the industry took place when the industry moved from mass-production towards mass-customization (e.g. Toyota-ism), whereas the authors argue that the third revolution takes place now. Binder and Clegg (2010) refers to the third revolution as the move from mass-customization towards mass-collaboration, which implies that today's customer needs are met through close collaboration with all sorts of actors within the industry. The third revolution is suggested to occur right now as a combination of the first two revolutions. To realize customer demands, i.e. low cost and high customization, actors within the industry have pursued mass-production and mass-customization. Though, these requests place conflicting

demands on organizational strategy and operational practicalities. Therefore, Binder and Clegg (2010) argue that tomorrow's customers are only contemplated if the industry pursues mass-collaboration.

In this regard, Binder and Clegg (2010) argue that to enable the shift, trust and foresight need to be improved so that the collaboration between OEMs and suppliers in the early phases of NPD is facilitated. The authors underline that it is the early phases of NPD, where strategic sourcing decisions and process innovation reside, improved sustainable supplier management has to be applied. Binder and Clegg (2010) argue that the previous economic crisis exposed the real face of today's OEMs. The cost cutting programs that were applied reveals that focus still are not placed on long-term sustainable supplier management. The authors argued that this behavior creates mistrust between OEMs and its suppliers as the OEM gained substantial cost savings at the cost of their suppliers. Binder and Clegg (2010) argue that increased collaboration between OEMs and suppliers in the early phases of the NPD process is required. Where supplier selection should be based on competence rather than cost. Finally, the authors argued that if a car manufacturer fail in obtaining sufficient degrees of collaboration, the outcome will be operating at a loss, struggling in the level of innovation and having over capacity.

2.5.3.2. Disadvantages and Risks with Collaboration

Intensive and extensive collaborative undertakings can yield substantial benefits. However, Kaats and Opheij (2014) stated that collaboration could be a hassle as *"... no two partnerships are exactly the same"* (p.29). The authors argued that there are various common collaborative issues that frequently occur in practice. One of these issues are the *lack of shared ambition*, which implies that the parties involved in the collaborative undertaking must share a higher common goal than just making money. Kaats and Opheij (2014) argue that if money is the only common objective, the interaction is in fact nothing more than a transaction between the participants. The authors further argue that it is common to experience disagreements and misunderstanding with respect to ambition among collaborating partners.

Another issue related to collaboration is the partnership dilemma. Manufacturing organizations move towards partnership with, especially, suppliers of numerous reasons. Example of these reason are the endeavor to achieve improvements in logistical, quality, product and supply chain, cost and product development (van Weele, 2014). Regardless of the underlying reasons for ingoing in partnership with suppliers within the automotive industry, the occurrence of partnerships is rare. By its definition, a partner refers to *"... a firm with whom your company has an on-going buyer-seller relationship, involving a commitment over an extended time-period, a mutual sharing of information and a sharing of risks and rewards resulting from the relationship"* (Van Weele, 2014, p.207). However, van Weele (2014) stated that research has shown that only 1% of supplier buyer relations were defined as partnership relations. Though, these suppliers are accountable for 12% of the investigated companies purchasing volumes.

Van Weele (2014) further refers to a report of DTI (1994) that was conducted in the British automotive industry. In their study they found that mutual trust between OEMs

and their supplier was absent, which originated in years of broken promises and misuse of trust. Unfortunately, Van Weele (2014) argued that the automotive industry still is highly competitive where the OEMs dictated the rule of the game for their suppliers. Furthermore, the authors stated that the few number of examples on successful partnerships is not a surprise, as it requires extensive internal cross-functional teamwork. Internal functional structures hamper internal co-operation, and thus, prevents close and effective relations with suppliers. However, van Weele (2014) stated that those successful examples of close and effective partnership collaboration between an OEM and a supplier stems from years of disappointment and persistent endurance. Developing partnership relations with suppliers takes time, and thus, the authors consider that partnerships with suppliers are the result of long-lasting efforts of an inter-organizational relation, rather than a technique that can be pursued in a short time. Furthermore, Spekman and Carraway (2006) empirically shown that in spite of all good intentions and good word, few buyers are willing to pursue closer connections to their base of suppliers due to the risk of becoming overly dependent of a small set of suppliers.

Binder and Clegg (2010) argue that another issue, or as they put it, 'a dark side' of collaboration is the possibility of opportunistic behavior of the parties involved. The concept of agency theory originates in studies of risk sharing between groups and individuals published during the 60s and 70s. From these studies, other scholars' research emanates which addresses the so-called agency dimension that arises when one individual or organization (principal) delegates work to another (agent) (Rossignoli and Ricciardi, 2014). The agency relationship is widespread and could be present in, for example, the relation between shareholders and managers of a firm, but also in various inter-organizational relations such as buyer-supplier relations, i.e. the agency theory is prevalent in all collaborative relations (Rossignoli and Ricciardi, 2014). The so-called agent, i.e. the obligated organization or individual, is attached to bounded rationality and opportunism (Cropper *et al*., 2009). Bounded rationality means that human agents intendedly are rational, but only to a limit. It is said that agents strive to anticipate and safeguard themselves against problems that are likely to arise. Though, they will be unable to do so as bounded rationality inhibits them to fully understand the present situation and ideally address coming situations. Whereas opportunism implies that agents are unable to always deliver their promises. The statement does not per se mean that all agents are deceptive, rather that it is hard in advance to predict if an agent act in good faith or not (Cropper *et al*., 2009).

Thereof, the degree of opportunism is not predictable, instead it could be presupposed to varying based on power of the social and legal control that typify the inter-organizational relation (Rossignoli and Ricciardi, 2014). Cropper *et al.* (2009) stated that opportunism in combination with bounded rationality constitutes transaction costs. If there were no such thing as opportunism, bounded rationality would not be a problem, as collaborating parties would refrain from abuse their counterpart's inability to safeguard themselves and foresee all eventualities. Agreements would be kept without opportunism, and therefore there would be no need for safeguards. On the other hand, if agents were not concerned to bounded rationality the agent would be capable of identifying abusive or not abusive traders in advance. Thus, agents would know the

preconditions and terms that maximize the organizations joint gains Cropper *et al.* (2009).

2.6. Key Theory and Frameworks for the Analysis

To focus and to construct a valid analysis that leads to the conclusion of this study, the theories that have been used in the analysis chapter to evaluate the findings from the empirical investigation are summarized below. The aim of this section is to clarify which theories in the theoretical background that are of importance for the analysis chapter and how frameworks are meant to be used and to guide the analysis chapter. This part will not only present the theories of importance, it will also simplify the reading process for the convenient reader. The analysis chapter is constructed so it focuses separately on each RQ, where the contribution of the analysis is discussed in the end of each sub-section. Therefore, this summarizing section is structured in the same manner and describes what frameworks and theories that have been used to analyze each of the RQs.

2.6.1. Characteristics of Inter-Organizational Collaborations

The thesis first RQ reads; *what characterizes inter-organizational collaborations between an OEM and external actors in the Swedish automotive industry?*

To answer the first RQ the following theories and frameworks will be used:

The definition of collaboration by Thomson and Perry (2006) has been used to compare the respondents' view of collaboration and if it conforms or not. This gives the authors of this report a nuanced view of how professionals working in inter-organizational efforts view collaboration compared to the definition. The definition reads; *"... a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions"* (p.23). As suggested by Wood and Gray (1991), literature on collaboration focuses either on the preconditions for collaborations to occur, the process of collaborating or the outcome of collaboration. Therefore, the incentives for initiating collaborative undertakings are analyzed as it have impact on the collaborations.

In table 3 by Kaats and Opheij (2014), multiple motives for why inter-organizational collaboration occurs have been presented. These motives have been used to evaluate how the respondents elaborate upon and discuss the reason behind inter-organizational undertakings. In this regard, the concept of *open innovation* has been used to interpret the respondents' answers. The concept of open innovation was in 2003 presented by Henry Chesbrough, where he argued that the *closed innovation* paradigm was contested of today's competitive landscape request for a rapid introduction of new technology. In this regard, the types of external actors present in inter-organizational collaborations are compared to Gassmann and Enkel's (2004) view of the outside in process of open innovation and the actors participating in such efforts.

Finally, the definition of collaboration - stated above - is also the foundation on which Thomson and Perry's (2006) framework of collaboration is built upon. The framework is meant to be used to analyze how the respondents refer to the five dimensions that form an inter-organizational collaboration. By doing this, the authors of this report are able to narrate how professional working in inter-organizational arrangements refers to the five different dimensions of collaborations. Furthermore, this framework will also be used to analyze how an OEM and a supplier collaborate in the second RQ, but the framework has also been used to structure the chapter where the empirical findings are presented.

2.6.2. Collaboration during NPD

The second RQ of the thesis reads; *how do an OEM and a first tier supplier collaborate during NPD within the Swedish automotive industry?*

To answer the second RQ the following theories and frameworks will be used:

As highlighted by Cropper *et al.* (2009), there exist a plethora of terms and concepts that flourishes in the field of inter-organizational relations. From this point of departure, the authors of this report aims at identifying under what circumstances and in what purpose inter-organizational collaborations takes place during NPD in the Swedish automotive industry. The analysis will not only focus on where and when collaboration take place, but also in what purpose collaboration is initiated. To evaluate and analyze the empirical findings for why inter-organizational collaborations take place, the authors have scrutinized literature on outsourcing within the field of *operations management* and *purchasing and supply chain management*, e.g. van Weele (2014) and Slack and Lewin (2011).

Based on the respondents' arguments for where and when they collaborate, the frameworks of Kaats and Opheij (2014) and Lorange and Roos (1992) are used to analyze and identify what kind of inter-organizational relations the respondents refer to. Furthermore, based on the definition provided in the subsequent section, an inter-organizational relation between an OEM and its supplier must not per se constitute a collaborative arrangement. Thus, the intention is to define an inter-organizational interaction where the characteristics of the relation reflect a collaborative arrangement based on the five dimensions collaboration suggested by Thomson and Perry (2006). These portrayals will thus enabling the authors of this report to describe how an OEM and a first tier supplier collaborate during NPD.

The structure presented above aims at supporting the authors in their attempt of concluding what characterizes inter-organizational collaboration in the automotive industry, as well as describing how an OEM and a first tier supplier collaborate during NPD. By focusing the analysis after key theories and two research questions, the researchers aims at arriving to a broader understanding of the subject of inter-organizational collaboration and what it means within the Swedish automotive industry. By achieving a broader understanding and answering the two research questions, the researchers aims at fulfilling the purpose of this report, which is; *to investigate what inter-organizational collaboration mean and analyze the collaborative environment between OEMs and its suppliers within the Swedish automotive industry.*

3. Research Methodology

In this chapter of the report the researchers aims at presenting how the purpose of this report practically has been fulfilled, and also how the researchers have arrived at its conclusions. The first parts of the methodology chapter presents what research design that has been pursued, followed by the research method chosen and other issues that the researchers have addressed to improve the validity of the study. The chapter is finalized with a discussion of the research method.

3.1. Research Strategy

In a research project a researcher can pursue different research strategies, e.g. a *deductive, inductive* or *abductive* connection to theory. A deductive research strategy refers to the generation of hypotheses through theory, which through data collection either are confirmed or rejected. Hypothesis testing is commonly used in quantitative research projects (Bryman and Bell, 2011). Furthermore, Merriam (2009) state that qualitative researchers emphasizes on an inductive approach as they gather data to build concepts, hypotheses, or theories rather than deductively testing hypotheses. Abduction is similar to induction as it investigates the differences between concepts and everyday language. However, the framework in abductive research is the main differentiator from inductive and deductive, as *"... the original framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process"* (Dubois and Gadde, 2012. p. 559).

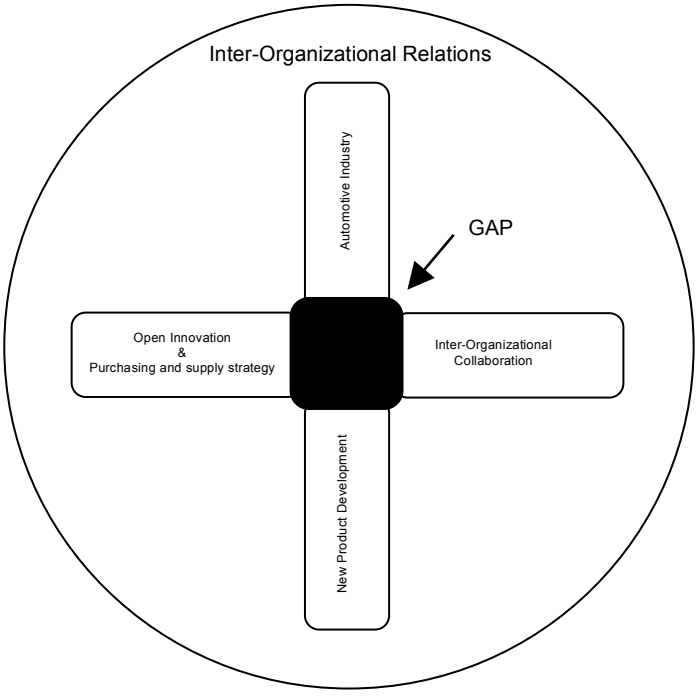


Figure 11 Theoretical orientation

However, research in the field of inter-organizational collaboration and inter-organizational relations are not consistent enough in the sense of definitions, and thus, the deductive approach of hypothesis testing is troublesome. On the contrary, almost no research is completely inductive as is could be argued that the researchers basic knowledge suggest that the research in some extent is deductive. However, the research strategy that best describes the methodology of this research is the abductive stance to theory. Mainly as the researchers initially conducted a literature screening to make the research focused, but also as the research project progressed both existing theory and empirical findings affected how the researchers saw their issue, i.e. the research-framework has transformed as time elapsed. Figure 11 characterizes theoretical orientation of this study and the theoretical gap that the authors aim at researching.

3.2. Research Design

The research design of this paper can be described as *multiple-case study* as the researchers intended to describe the phenomena of inter-organizational collaboration at more than one case, i.e. different organizations. A multiple case study is described as a study using more or less identical methods in two or more contrasting cases (Bryman and Bell, 2011; Merriam, 2009). Furthermore, cases are in this research referred to as organization, which also is suggested by Bryman and Bell (2011). Research design refers to the blueprint for data collection and analysis (Kothari, 2004). The research approach for this research is divided into three phases. The initial phase involved a literature review where the authors aimed at extending their current knowledge base within the topic of inter-organizational collaborations. The outcome from the literature review represented the base from which the authors aimed at constructing a frame of reference and an interview template.

During the second phase of the research the authors conducted eight semi-structured interviews with project managers and professionals working in external collaborations within the automotive industry. The interviewees were selected and contacted through the researchers' personal contacts, the authors also used snowball sampling to access new respondents. Snowball sampling refers to asking one respondent for other contacts, and subsequently those respondents are asked to provide other respondents, and so forth. The initial interviews were of an explorative nature where the researches aimed at gaining an overview of different forms of inter-organizational collaborations and how these are managed.

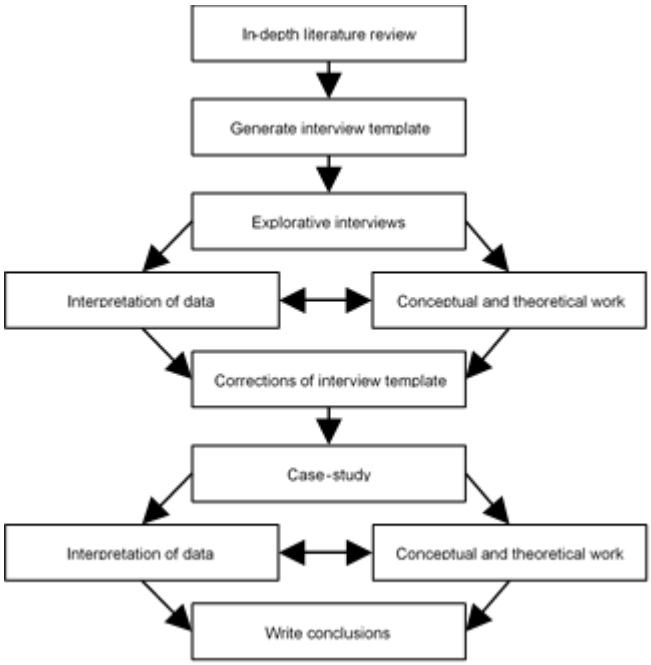


Figure 12 Research process

The third part of the study involved an in-depth study of a recent inter-organizational new product development project in the Swedish automotive industry. During this in-depth study, the authors investigated the inter-organizational collaboration between an OEM and a supplier, by interviewing three project members. Two from the buying organization (the OEM) and one from the supplying organization (the supplier). The in-depth interviews of a single case where chosen to gain more insight in the dynamics of an inter-organizational collaboration. This is also chosen as Cropper *et al.* (2009) suggest that the *one-to-one business relationships*, i.e. a dyad, refers to the analysis of inter-organizational relations, including aspects of *trust*, *mutuality, power-dependence,* etcetera. It also allows the authors to gain insight in how the different actors view the same collaboration. The researchers' goal of the case study is to contextualize the findings from the literature study and exploratory interviews. The research process is

illustrated in figure 12. Furthermore, a Gantt scheme outlining the progress of the research is found in appendix 1.

3.3. Literature Review

To provide a basic understanding of the subject and not reinvent the wheel, a literature study was conducted (Bryman & Bell, 2011). The literature study provided the author's with models and frameworks, and prevented the authors to make the same mistakes as other researchers in the same area (Bryman & Bell, 2011). According to Kothari (2004) a literature study should be conducted on literature connected to the defined research question. To access literature, search engines such as *Google Scholar* and *Summon* were used. Keywords such as *external collaboration, inter-organizational collaboration, open innovation, collaborative arrangements, external co-operations, and inter-organizational relations* were the main guiding keywords for the literature study. The authors also employed what is called the *snowball technique*, where literature used in a promising article is checked for further understanding in the subject. The main literature review was conducted in the offset of the research. However, the authors continuously scrutinized literature, as the empirical findings required the researchers to bring in new theories and concepts to interpret the data.

3.4. Data Collection

The qualitative data used in this research is collected through interviews with respondents from the Swedish automotive industry. Respondents were from an OEM, four different suppliers and an industry association, and interviewed between February and April 2016. A respondent summary is presented in the beginning of the empirical findings chapter. The choice of respondents enabled the authors to compare the responses from different perspectives of a collaboration, and thus, providing a nuanced perspective of the collaboration. The specific respondents were chosen as they currently are, or recently have worked in inter-organizational collaborations.

The interviews were of a semi-structured nature, meaning that the interviews were based on a fixed number of predetermined questions with room left for follow up questions (Bryman and Bell, 2011; Merriam, 2009). The frame of the semi-structured interview guide was based on a framework of collaboration suggested by Thomson and Perry (2006) and the three different theoretical perspectives of collaboration suggested by Wood and Gray (1991). This framework is discussed further in the theoretical background of this report, and the interview template is found in appendix 2. By employing semi-structured interviews the researchers were enabled to dig deeper and ask further questions when a respondent elucidated interesting issues. The researchers conducted all interviews and each interview was recorded. Being two researchers and by recording all interviews, the validity of the findings was improved. As all information was documented the researchers could go back and sort out questions. Furthermore, recording interviews is also preferred as the authors are able to improve their interview technique by analyzing the interview afterwards (Merriam 2009).

Parallel to the recording one of the author took notes while the other facilitates the interview. Furthermore, the authors devoted 15 minutes after each interview to discuss and interpret the interview-notes to ensure that these were correctly understood and to increase validity. This also enabled the authors to capture emotions, which would not be expressed during the transcribing of the interviews. Transcribing the interviews also allowed more thorough investigation of what the respondents actually answered to the questions (Bryman and Bell, 2011). The time requested for each interview was 45 minutes and permission for follow up questions per email was be requested during the interviews. The interviews were held on Swedish, mainly as it was the native language of the respondents. However, as the interviews was conducted in Swedish and the report is written in English, the researchers jointly interpreted and translated the interviewees answers that have been highlighted as results in this report. This also improved the trustworthiness of the findings as it was scrutinized twice.

3.5. Data Analysis

As the research project elapsed interviews were conducted, transcribed and coded. This was performed in an iterative fashion, as the process of collecting data and scrutinizing literature continuously took place. By applying this method the authors were able to get a glimpse of where the project was heading and what issues the respondents referred to. Bryman and Bell (2011) describes constant comparison as maintaining a close relationship with the data and the conceptualization, making sure that the connection between the data and the concept (theory) is not lost. It also refers to the constant comparison between the coded categories to enable emerging of a theory. However, the data analysis, i.e. comparing and analysis the patterns of codes and themes, was performed when the researchers considered their data somewhat saturated. As suggested by Merriam (2009) the first step of the data analysis included reading through the transcripts and highlighting interesting and potentially relevant data for the study. To facilitate the data analysis process the authors used NVIVO 2.0, which is a software tool for qualitative data analysis. This program was used to transcribe and code the recorded interviews. This process was done simultaneously by both authors to ensure consensus and validity of the analysis.

The data analysis resulted in a total of 127 different codes. The authors also highlighted data that was referred to as ‘might be interesting’ to ensure that no relevant data was excluded. The first part of the coding process could be described as open coding, where no specific codes were predetermined (Bryman and Bell, 2011; Merriam, 2009). However, it could be argued that the researchers were affected of the framework used to structure the semi-structured interviews. Though, the initial coding process aimed at being as open and unstructured as possible to surface what the respondents actually referred to, and not what the researchers wanted them to refer to. The next step of the data analysis referred to a second order coding, which Bryman and Bell (2011) refers to as breaking down the codes to categories. In this process the authors applies a more selective categorization approach, as the structure of Thomson and Perry (2006) and Wood and Gray’s (1991) frameworks constituted the categories that the codes were allocated and structured around.

This meant that the researchers scrutinized all the codes and assigned them either to *preconditions, the process,* or *the outcome of collaboration.* However, codes that were not possible to assign to any of the categories stated above, but still deemed to be of interest was assigned to other, own generated themes and categories, e.g. collaborative arrangements, partner selection, etc. In this process the categories are linked through context, consequences, patterns of interaction and causes as suggested by Bryman and Bell (2011). When the interviews concerning the in-depth case study were analyzed, contextual factors were also highlighted to be able to describe descriptive characteristics of the inter-organizational project. The subsequent step was to select the core categories of the data, systematically relate these categories to other categories, validate the relationships and identify and categories that need further development (Bryman and Bell, 2011). Once all data is coded it is referred to as saturated and no other relationships can be developed. Theoretical saturation is also included in grounded theory as it is reached when additional data collection does not shed new light on the research.

3.6. Trustworthiness and Ethics

To ensure validity of the research and provide greater confidence in the findings the authors employed triangulation, which involves confirmation of the findings from more than one source of data and method (Bryman & Bell, 2011). The authors confirmed the empirical findings from the interviews by asking other respondents, i.e. subsequent interviews, if the interpretation of different interesting concepts were valid. By pursuing both an in-depth literature review, explorative interviews and an in-depth investigation of a single inter-organizational collaboration the authors improves validity of the research. The pre-stated questions and the results from the interviews provide the basis for the dependability of this research, referring to the ability to repeat the findings from the research (Bryman & Bell, 2011).

To even further increase dependability the researchers has provided what is called ‘thick description’, which gives the reader with a deeper understanding of the contextual factors in the particular case. This also holds true for the literature review as an extensive range of theories and concepts have been explained in the theoretical background. This gives both the reader an understanding of the topic as well as it proves that the researchers have researched the chosen field thoroughly. During the research the authors wrote down thoughts and assumptions, which allowed the researchers to go back and check assumptions, thus contributing to the dependability of the research. The authors also interviewed a respondent at the supplying organization to investigate if the collaboration between the OEM and the suppliers was experience in the same way. This reduced bias and gave the researchers a fairer picture of the inter-organizational relation.

As the aim of this research refers to investigating inter-organizational collaboration, the researchers are aware of that the respondents might not be able to reveal all information about collaborations, either due to confidentiality or as they potentially could harm relationships with external partners. Therefore, prior to the interview the authors stated that the respondent remain anonymous, which contributes to an atmosphere where the

respondent feel that they can speak freely. Prior to the interview the interviewee was informed that they could refrain to answer questions they are not comfortable or able to answer. The interviewees also had the choice to withdraw at any time during the interview if they felt that the discussion took an unanticipated turn. Any sensitive information or findings that the researchers have come across have been treated with care and not distributed without permission. The authors also informed the respondents of the intention of the research to ensure that the respondents were not misled.

3.7. Discussion of Methodology

In this section the authors aims at discussing how the choice of research method contribute to the overall conclusion of this research. Though, the section also aims at highlighting different drawback and deficiencies with the study. The multiple case study was chosen as it was considered to be the best choice of method for this kind of research. Several organizations were investigated during this research, which were motivated by giving a wider understanding of the situation during the explorative interviews. However, focus of the study has been on dyadic relations between organizations. The choice of researching inter-organizational collaboration from the *one-to-one business relationship* perspective has enabled the researcher to analyze and assess the *degree of trust,* understanding the *power-dependence balance,* how *committed an organization is to a relation,* as well as the aspect of *mutuality.* Cropper *et al.* (2009) referred to this as the third level of analysis in network research.

The second and first level of analysis refers to *inter-organizational chain* and *inter-organizational networks analysis,* respectively. The second level of analysis includes analysis of *value creation with value chain systems, transparency within them,* and *in what extent these are synchronized*. The first level of analysis refers to analyzing *networks positions, coordinating key actors, network structures, processes and evolution,* etcetera (Cropper *et al.,* 2009). Based on this logic, and as suggested by Cropper *et al.* (2009), it is important to view the dyadic relations as components of greater and comprehensive systems of relationships. Thus, the researchers are aware of that the specific scenario and the relations presented in this report most likely influenced of greater and more complex aspects that could not be identified by the research method chosen. Even though the authors investigated multiple organizations, not enough time and respondents were available to give a thorough investigation of the situation from each organization and the complexity behind the specific relations. The authors are also aware of the risk that the respondent might express their personal view, and thus not representing the collective view of the organization.

However, the authors consider that even if the respondent's view does not represent the whole view, it give the authors a collective view of the inter-organizational climate when comparing the interviewees' responses. If there were more time, the authors would have preferred a longitudinal research, where they could be present during actual inter-organizational collaboration and at several organizations. This would increase the validity of the research. Furthermore, the authors are also aware that the respondent might have been reluctant to reveal the problems with collaboration, as they were aware

that the authors would interview respondents in organizations that the concerned organization has relations with.

The authors also struggled to get respondents to participate in the research. Mainly as the researchers had limited personal contacts at the investigated organizations. Therefore, the authors had to rely on access of new respondents from the contacts of previous respondents, as described as the snowball technique. However, the authors ensured that the respondents had some experience of inter-organizational collaboration prior to the interviews. Furthermore, the authors did not manage to interview more than one respondent with insight in strategic decisions, which would be preferred during the explorative interviews. The other respondent were mainly senior engineers at an operational level, which according to the authors also impacted the responses during the interviews, as they mostly referred to the operational aspect of the process of collaborating.

The interview template was developed prior to the first interview and where decided not to be changed for the other interviews. However, some modification of how the authors asked the questions were done. Mainly as the researchers after the first interview felt that they were leading the interviewee too much and tried to explain what they meant by the questions and concept researched. During the latter interviews the researchers asked the question without leading the respondents through the meaning of the question, which ensured a more valid response. However, the researchers are aware that leading of the question might impact the interviewee's response, and the answers of how the respondents viewed inter-organizational collaboration might have been affected as the researchers encouraged the respondents to elaborate upon the five dimensions of collaboration. Thus, the respondents inevitably elaborated upon all dimensions of collaboration, which resulted in a very qualitative process of identifying how the respondents actually referred to the event of collaborating.

After the interviews were conducted, the researcher realized that some interviewees by mistake did not receive the interview template prior to the interview. However, the author consider that this mistake only has limited impact on the validity of the research, or most likely, none. Lastly, the ethical considerations could be discussed as the researchers, three times, missed to inform the participants that they had the choice to refrain to answer the question or at any time withdraw if they felt uncomfortable. Though, the researchers consider that this mistake had limited impact on the final results. However, it could argued that this possibly could entail harm to participants and therefore highly important to address. This mistake the authors sees as a lesson and an aspect they carefully will address in the future of their professional careers.

Discussing generalizability the authors consider the findings from this study likely to be generalizable to other contexts. However, the generalizability might be limited to the European automotive industry as market dynamics and the industry’s competitiveness are much likely to influence how organizations interact with its surroundings. Furthermore, as the automotive industry is a global industry it is likely that the purchasing approach and the characteristics of the Swedish automotive industry are reflected at other geographical locations. Discussing dependability, the research might be affected by the data analysis. The interview dates were stretched over seven weeks

and due to the limited time for the research, the first six interviews was transcribed and coded before all interviews where conducted and thereby formed the basis for the empirical structure. By doing this, the researchers got closer to the data and an idea of where the research was heading. Therefore, notes were instead taken during the interviews as well as recapture of the interviews by listening through the recordings during the coding. The coding made in this part was mostly manual and added to the existing empirical structure. However, this process might impact dependability of the research negatively, however, this process was conducted by both the authors and directly after each interview.

4. Empirical Investigation

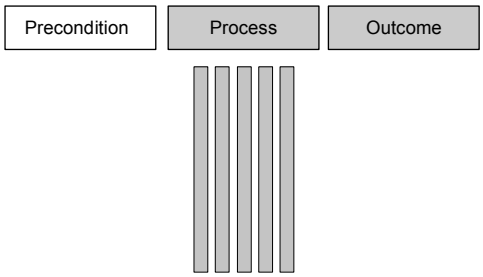
This chapter outlines the empirical data that have been conducted during this research. The chapter is divided into two sections. First the results from the explorative interviews are presented. These are structured after preconditions for collaboration, the process of collaborating, and the outcome of collaboration. The other section outlines the findings from the in-depth interviews, which are presented in the same manner. To orient the reader, a small indicative figure is found in each new subchapter, where the issue at hand is illuminated in the figure. This figure is based on figure 10.

4.1. Summary of Respondents

Table 4 Respondent summary

Company role	Size (2015)*		Position of interviewee	Interview identifier
	Number of employees	Revenue € milions		
Car Manufacturer (OEM)	28.485	17,664.5	Director New Technology	Senior Engineer, OEM (2016). Interview 2016-02-29
			Project Manager Seats	Senior Engineer, OEM (2016). Interview 2016-03-08
			Manager Vehicle Dynamics	Senior Engineer (A), OEM (2016). Interview 2016-03-11
			Head of Content Aquisition	Senior Engineer (B), OEM (2016). Interview 2016-03-11
			Project Manager Seats	Senior Engineer (C), OEM (2016). Interview 2016-04-19
			Implementation Leader	Senior Engineer (D), OEM (2016). Interview 2016-04-19
First tier supplier	10.004	1,020.1	Executive Vice President	Vice President, First tier supplier (2016). Interview 2016-03-04
First tier supplier	170.000	120,525	Program Manager	Program Manager, First tier supplier (2016). Interview 2016-03-16
First tier supplier	1000**	247.668**	Director Project & Engineering	Senior Engineer, First tier supplier (2016). Interview 2016-03-17
First tier supplier	32.000	2,837.86	Manager Project & Running Engineering	Senior Production Engineer, First tier supplier (2016). Interview 2016-03-18
Industry association	7	NA	Senior Advisor & Project Leader	Senior Project Leader, Industry association (2016). Interviewed 2016-04-08
				*Numbers from annual reports or company website
				** Numbers from 2014 retreived from annual report or company website

4.2. Preconditions for Inter-Organizational Collaborations



In this section the respondents' answer for why different inter-organizational collaborative activities are undertaken are presented. These underlying reasons contribute and/or facilitate the initiation of collaborative activities and represents the underlying reason for why an inter-organizational collaboration have been initiated. In the automotive industry, and with respect to R&D activities, numerous reasons for why external collaborations are undertaken have been identified during the empirical investigation. The question of making in-house or outsource have for long been an issue for decision-makers within the automotive industry, and also elaborated upon during this study. One senior engineer at the OEM added to this consideration by stating that it is risky and hard to manage if an OEM develops and produces all components and systems by themselves[2].

One senior engineer at the OEM stated that one reason for external collaboration to be initiated could be when a supplier approaches and expresses that they are looking for a development partner[3]. In that particular case the OEM was contacted as their product had front wheel drive. Furthermore, the OEM is one of *few* car manufacturers that produces cars with front wheel drive that utilizes and develops expensive technical solutions. These conditions gave the supplier the opportunity to test and verify its product under specific conditions, which was not possible to do on a rear wheel driven car. This scenario was according to the senior engineer quite common. Still this often occur on component level, in contrast to system level, where expertise and deep knowledge on component level often rests at suppliers. A collaboration like this often starts with an idea or concept that a supplier presents for the OEM. By offering the supplier the opportunity to jointly test and develop the idea (and sometimes even investing resources) the OEM gets the advantage of buying the end product to a superior price.

Another senior engineer[4] at the OEM, whose main work task involved software content acquisition, stated that novel and interesting features offered by suppliers are one of the main reasons for why external collaborations are initiated. The senior engineer also stated that the advanced technology and innovative services that the OEM's end-product have today would not be possible to realize without collaborating with external actors. The senior engineer stated that interaction with external actors occur in the very offset of the NPD process. The respondent stated that the initial interaction (with consideration to partners) most often concerns an interesting service, either as the external actor has contacted the OEM or the other way around. For the senior engineer's department the first interaction involves the development of a business case and to determine if the collaboration can result in something interesting. The next step involves a technical assessment and how and if the collaboration is going to be undertaken.

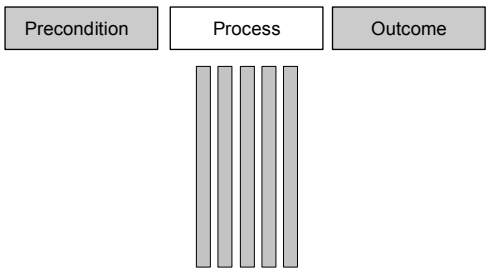
[2] Senior Engineer, OEM (2016). Interview 2016-02-29

[3] Senior Engineer (A), OEM (2016). Interview 2016-03-11

[4] Senior Engineer (B), OEM (2016). Interview 2016-03-11

A senior project leader at an industry association[5] argued that two strong driving forces to form collaborations are resources and knowledge. The respondent argued that by collaborating to in greater extent, results were achieved in more cost efficient manner. The other aspect, knowledge, was an increasingly important determinant for collaborations to be initiated. The respondent argued that trends such as 'internet of thing' (IoT), was factors that forced OEMs to seek for knowledge and expertise outside of their organizational boundaries. The senior project leader also argued that collaboration would increase in the future, mainly as they foreseen that members in the industry association would become fewer, though bigger. This argumentation stemmed from that their members interacted more they would become more and more dependent of each other and therefore more likely to become one entity, i.e. mergers.

4.3. The Process of Inter-Organizational Collaboration



At each interview the respondents were asked to share their first thoughts while they recalled to inter-organizational collaborations. The answers for this question ranged from technology screening to collaborative arrangements that were externally financed and even sometimes to intra-organizational collaborations. Thus, these initial answers and the authors' interpretation of the respondents' general perception of inter-organizational collaboration are presented below. One senior engineer[6] stated that the respondent's employer and colleagues (the OEM) never were satisfied with the word *inter-organizational collaboration* and that a further explanation of the activity was required to achieve consensus. To achieve consensus the senior engineer argued that goal-setting, purpose, and in what way external actors were meant to be included had to be articulated in further detail when external collaboration became relevant. The respondent further underlined that the OEM does not collaborate for the same sake each time, and thus, preconditions and goals changes, and corrections of the collaborative arrangement take place due to process improvements. The same senior engineer, whose work tasks included technology road mapping and outlining future strategic directions, initially referred inter-organizational collaborations to a rare activity that was not carried out on a day to day basis. These collaborations was according to the respondent carried out with universities and research institutes and usually governmentally financed.

This type of inter-organizational collaboration was also recalled to by the vice president of a first tier supplier[7], however it was not pronounced when the respondent was asked to retell his/hers first thoughts of external collaborations. The vice president argued that the same type of external collaboration as the senior engineer recalled to, was something that they were working with in greater extent now than 10 years ago. Though, the vice president stated that this type of inter-organizational collaboration, i.e. with

[5] Senior Project Leader, Industry association (2016). Interviewed 2016-04-08
[6] Senior Engineer, OEM (2016). Interview 2016-02-29
[7] Vice President, First tier supplier (2016). Interview 2016-03-04

research institutes and universities, only constitutes a fraction of all the supplier's external collaborative activities. The vice president further argued that it requires a big company to undertake collaborative activities like this and that they even had a full time employee working with facilitating the activity. The employee the respondent referred to worked with the process of applying for monetary funds from institutes that foster innovation and development, i.e. the European Union and the Swedish state. Except for the external collaborative activities with universities and research institutes outlined above, the interviewees almost exclusively related inter-organizational collaborative activities to interaction with suppliers. The senior engineer whom recalled to collaborations with universities and research institutes as a rare activity[8] did only do that in the very beginning of the interview and in the remaining part of the interview the respondent referred inter-organizational collaboration to business relations with suppliers. Furthermore, another senior engineer at the OEM referred to collaboration with universities and research institutions as always externally founded[9].

Another senior engineer[10] who was working as project leader related his/her first thoughts concerning inter-organizational collaboration to collaboration with suppliers. The respondent argued that the OEM is dependent of its suppliers and that all new products and technologies cannot come from the OEM. Furthermore, the respondent also related his/her thoughts to the importance of governance and control during inter-organizational collaboration. The senior engineer argued that to carry out a big project where external actors are involved; areas of responsibility, how day-to-day work is meant to be carried out, and how problems should be solved need to be explicitly pronounced. Another senior engineer[11] who also worked as a project leader, also referred to suppliers while the respondent was asked to elaborate upon his/her first thoughts regarding inter-organizational collaboration. The respondent argued that history of working together is important as the supplier will work more smoothly if they know the internal process and specific demands at the OEM. Furthermore, these two respondents did not refer the relation to the supplier as a business relation. Rather, the respondents saw their interaction with suppliers as a collaborative setting where they shared the same goals and interests.

Furthermore, when a senior project leader at an industry association was asked to elaborate upon inter-organizational collaborations an interesting view of how collaborations in the industry had evolved during the years was narrated[12]. The respondent argued that during some years two large OEMs in Sweden were owned by American corporations. During this period the OEMs adapted the American way of viewing the suppliers as *"... something the cat dragged in"*. The respondent argued that in some extent this view still exist, even though the OEMs are not owned by American organizations anymore. The respondent related this issue to behavioral change and that it takes time to change. In practice, the OEM viewed the supplier as a way of reducing cost and regardless of geographic location the cheapest supplier was preferred. During

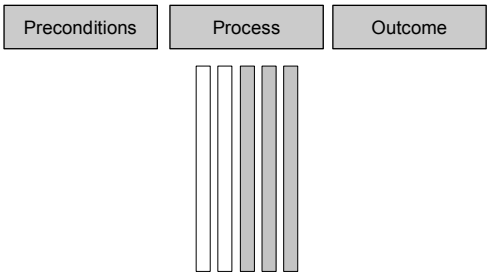
[8] Senior Engineer, OEM (2016). Interview 2016-02-29
[9] Senior Engineer (D), OEM (2016). Interview 2016-04-19
[10] Senior Engineer, OEM (2016). Interview 2016-03-08
[11] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[12] Senior Project Leader, Industry association (2016). Interviewed 2016-04-08

this time, when US corporations owned the OEMs, the suppliers struggled and some left business due to small margins while other expanded to be able to supply a greater, global buyer base. The respondent provided a contrasting and interesting view when the Swedish automobile environment was compared to German OEM's view of suppliers. The respondent argued that they have a more patriotic view on who they wish to collaborate with, i.e. they prefer suppliers from Germany and preferably from the same region. The respondent further argued that this view provide better means and atmosphere for collaborating in the automotive industry.

One respondent at the OEM referred to inter-organizational collaboration as a process of working together with a supplier and develop something together[13]. Though, this response was not the first thought that came to the respondent's mind. Still, this was the essence of the respondents arguing regarding inter-organizational collaboration, which also was the case in other respondents arguing. Furthermore, when the respondent was asked to elaborate upon the collaborative atmosphere in the region, a positive and forward thinking atmosphere were described. In conjunction to this question, the respondent stated that collaboration is especially important nowadays since development lead times need to get shorter. It was not only emphasized that collaboration becomes more important, but also the importance of trust between collaborating parties. Furthermore, the perception of collaboration stated by the previous respondent was supported by another senior engineer[14]. Where the senior engineer argued that collaboration referred to working towards a shared goal.

4.3.1. Structural Dimension of Inter-Organizational Collaboration

In this section the researchers aims at presenting how the respondents elaborated upon structural dimensions of collaborations. Initially the respondents' answers related to *governance* and *administrative* concerns are presented. Thereafter are other aspects of structural dimensions highlighted by the respondents presented.



4.3.1.1. Governance

The respondents interviewed during this research surfaced the importance of agreements and contracts to govern the interactive process of an inter-organizational relation. One senior engineer at the OEM stated that inter-organizational collaborations are regulated in detail to ensure transparency and in a consistent way of executing collaborations[15]. A senior engineer at the OEM stated that approximately 99 out of 100 concerns related to governance refers to control of cost[16]. Another senior engineer at the OEM stated that suppliers basically have to accept the terms and conditions dictated by

[13] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[14] Senior Engineer (D), OEM (2016). Interview 2016-04-19
[15] Senior Engineer, OEM (2016). Interview 2016-02-29
[16] Senior Engineer (A), OEM (2016). Interview 2016-03-11

the OEM[17]. Though, the respondent also stated that there is occasions where the OEM and the external party develop contracts on commonly dictated terms and conditions.

In this regard, the respondent further stated that commonly dictated terms and conditions is a time-consuming process, mainly as it is crucial to ensure that the contract are sufficient and comprehensive. To this problematic a senior engineer presented a scenario where an OEM complained upon an unpleasant noise from a suspension system. The responsible supplier in their turn argued that the defect in the system was outside their responsibility of the agreement and not related to their product[18]. Therefore a microphone was placed close to the noise source to proof and convince the supplier that the noise came from their component. The respondent stated that this scenario was common and the process of finding the responsible is time consuming, and this example elucidates the issue of roles and responsibility.

One senior engineer at the OEM argued that contracts are important to have when projects collapses[19]. The respondent exemplified a business contract with a prenup, when the marriage is good and both partners are happy no one care about contracts. But if something get messed up there is an agreement (a contract) that regulates the situation. The senior engineer argued that most of the external interactions the respondent are involved in assimilates a happy marriage. Furthermore, the respondent, among other respondents, also underlined the importance of non-disclosure agreements (NDA) before any deeper communication with an external actor are initiated. The respondent argued that the NDA agreement often follows their standard template or in some cases the other organization's contract. However, the respondent stated that it could occur a clash between the organizations attorneys as the OEM want to follow their own contracts and the other organization prefer to use their contracts, and thus, could pose an inert process.

The senior project leader at an industry association added to the consideration of NDA. The respondent argued that the OEMs in the Swedish automobile industry are afraid of sharing information, and therefore initiate all collaborations with signing a NDA[20]. The respondent argued that Swedish OEMs are afraid of leaking company secrets, which is different to German automotive incumbents. The respondent stated that German OEMs are more open and not as scared of sharing information with their suppliers. The respondent argued that openness and clarity in objectives impacts the collaboration positively. Furthermore, the senior project leader stated that the OEM's NDAs were framed and formulated to withstand a legal process.

The respondent from the industry association shed even further light on the dynamics of the buyer supplier relation. The respondent stated that the OEM had extended the time for payment to 90 days as a mean to reduce cost, and if the supplier wishes to reduce the time for payment they need to lower the component cost[21]. This have put large

[17] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[18] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[19] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[20] Senior Project Leader, Industry association (2016). Interview 2016-04-08
[21] Senior Project Engineer, Industry association (2016). Interviewed 2016-04-08

pressure on the suppliers and the respondent stated that in some cases the owners of small suppliers had to pawn their own house to solve liquidity crisis in their company. The respondent further stated that the OEM justifies this by stating that they are the customer and that they are able to use it as bargaining power. The respondent stated that this created an unhealthy collaborative atmosphere.

A senior engineer at the OEM stated that it is important to govern and control interactions with external actors closely[22]. This includes identifying areas of responsibility, structure for how the undertaking is supposed to be carried out, i.e. the daily work, and how problems are meant to be solved. The respondent underlined the importance of transparency, this is important as higher level managers are keen to get status updates of project progress and information about possible risks. This is as important for the higher level managers as for the project leader as corrective actions need to be taken as early as possible if a problem has been identified. To ensure that problems are identified early and to remedy the risk of delays the OEM makes follow-ups on its suppliers, e.g. controls and supervise that components have been test-produced in new tools and so forth. The respondent added that control and monitoring are key to achieve transparency.

Another aspect of governance that the vice president of a first tier supplier addressed was project governance[23]. The vice president stated that their customers almost always have a project plan, and in which the vice president's organization is placed inside. In that case the supplier reports to that project manager. In conjunction with external collaborations a steering committee is applied. The vice president and the director of purchasing at the OEM constitutes the central organ in this committee and to whom participants from the respective organizations reports. By doing this the organizations obtains a transparent snapchat of the project and if consensus between them persists.

4.3.1.2. Administration

A senior engineer at the OEM stated that interaction with external actors during project execution is well defined and executed in a rather formal manner[24]. However, the respondent further argued that the operational process is less formal, though, all procedures and actions are registered. These procedures are then compiled and disclosed to enable stakeholders to scrutinize what decisions that have been made and how the project has progressed. The vice president of a first tier supplier stated that there is several project management systems in place. These systems visualizes project gates and milestones, and thus, how the project is doing[25]. These systems was also generally described by other senior engineers. One respondent from the OEM stated that they have an IT system where they, as the employer, can update specifications, status and date for design release for different products and thereby easily inform other stakeholders[26].

[22] Senior Engineer, OEM (2016). Interview 2016-06-08
[23] Vice President, First tier supplier (2016). Interview 2016-03-04
[24] Senior Engineer, OEM (2016). Interview 2016-02-29
[25] Vice President, First tier supplier (2016). Interview 2016-03-04
[26] Senior Engineer, OEM (2016). Interview 2016-06-08

The administration dimension is during project execution with external actors well defined. One senior engineer at the OEM stated that there are thoroughly specified processes in place that are required to follow closely[27]. Furthermore, the respondent described a scenario where the OEM was supposed to execute a development project with a supplier. Before the project is initiated an internal project kick-off take place. At the event the project initiator need to prove that the development project holds potential and can provide financial returns to motivate why the development project should be given any further funds. After this initial procedures the project is officially launched with the external party. To control and ensure that the project delivers what it is supposed to a project plan with pre-specified dates for project review is constructed.

The senior engineer[28] stated that the delivery points are based on their needs and means process. The needs and means process is based on a number requirements and the requirements technical solutions. The senior engineer stated that his/her's team drive different innovations processes where they surface future product needs. These needs are thereafter answered with a mean, i.e. a technical solution, from a construction team. Further on, the project deliveries stated in the section above are during project reviews presented for higher managers at the OEM to ensure that all pre-specified requirements are fulfilled. Another senior engineer at the OEM added that technical meetings with suppliers take place both on predetermined dates and on short notice[29]. With respect to technical meetings on short notice a program manager at a first tier supplier elaborated upon the importance of closeness[30]. The program manager's site is located within 10 minutes' drive from the OEM's facilities. The same argument was stated by another senior engineer at a first tier supplier[31].

4.3.1.3. Inter-Organizational Collaborative Arrangements

A common way of how the respondents described the interplay between different actors and how the interactive process between them are arranged were not possible to distinguish in the respondents' answers. The respondents sporadically used terms such as *consortiums, alliances, partnerships, etc.,* but could not elaborate or discuss around these in any further detail. When the respondents at the OEM were asked if they had any definitions or any way of classifying different forms of inter-organizational collaborative arrangements, repeatedly the respondents referred to the purchasing department as likely to have classifications[32][33]. A senior engineer who was working with technology road mapping argued that it is, in as great extent as possible, sought to have pure business relation in external collaborations[34]. This was according to the respondent pursued as the OEM had pronounced that it should be avoided that a supplier achieved a unique position. The collaboration process in the business relation assimilates according to the respondents, a 'we and them' scenario, or a relation on an arm-length's

[27] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[28] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[29] Senior Engineer, OEM (2016). Interview 2016-02-29
[30] Program Manager, First tier supplier (2016). Interview 2016-03-16
[31] Senior Engineer, First tier supplier (2016). Interview 2016-03-17
[32] Senior Engineer, OEM (2016). Interview 2016-02-29
[33] Senior Engineer, OEM (2016). Interview 2016-03-08
[34] Senior Engineer, OEM (2016). Interview 2016-02-29

distance, where transaction occur based on price. The respondent further argued that collaborative arrangements that posed a win-win situation for the parties involved was to be distinguished from business relationships.

One senior engineer, whose main work task was content acquisition, described partnerships as the collaborative arrangement with external actors that is of interdependent interest for all parties involved[35]. Furthermore, it was by the senior engineer also expressed that it is important to maintain the relation if you want to achieve a good partnership. The respondent further argued that it is important to find the right people to work with and to ensure that both organizations obtains benefits from the collaborative activity. This was also supported by the senior engineer who was working with technology road mapping[36]. Furthermore, when a senior engineer[37] was asked to clarify and distinguish between different types of actors in inter-organizational collaborations, the respondent referred to suppliers and partners as external actors the senior engineer's organization interacted with. This respondent worked mainly with software content and had a different view of external actors, than the other respondents who worked with traditional, hardware development projects. The respondent referred to the relation with suppliers as market transaction oriented. While the relation to partners was based on interdependence and win-win.

However, the respondent believed that other types of actors would become central for him/her when, for instance, autonomous cars and connectivity become viable. The actors that the respondent referred to, which s/he argued other individuals and departments at the OEM's organization already was interacting with, were cities, governmental institutes and municipalities. Furthermore, this statement, that other industries and actors would become central suppliers for the automotive industry, was also emphasized by the senior project leader at an industry association[38]. The respondent stated that Ericsson, a global software infrastructure provider, nowadays had become a central supplier for the OEM and that other suppliers from a wide range of industries would become central as the automotive industry evolves. The respondent stated that this change impacts how actors in the automotive industry interact with each other and with whom they interact.

4.3.1.4. Actors in Collaborative Arrangements

During the interviews with professionals within the automotive industry the respondents were asked to discuss around what types of external actors they undertook collaborative activities with. The interviewees at the OEM firstly and foremost recalled to suppliers, both system suppliers and component suppliers, whereas the respondents just briefly and with few details recalled to different kind of engineering consultants and other actors. However, one respondent referred to other types of suppliers and partners, than the other respondents at the OEM. The senior engineer whose obligations was content acquisitions, exclusively software content, stated that partners were made up largely of

[35] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[36] Senior Engineer, OEM (2016). Interview 2016-02-29
[37] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[38] Senior Project Leader, Industry association (2016). Interviewed 2016-04-08

software platform providers, whereas suppliers in the respondents context comprised software content and service providers[39].

Three of the respondents interviewed during this research worked in traditional NPD projects (hardware) at the OEM, and when these were asked to discuss different types of external actors they mainly recalled to system suppliers and component suppliers. One senior engineer stated that their system and component suppliers represented one type of external actor the OEM collaborated with, whereas, for instance, external testing institutes were another[40]. The senior engineer further stated that collaborative activities with testing institutes occurred seldom and only when they did not have the infrastructure in-house. A senior engineer whose work-task included technology road mapping stated that the actor the OEM collaborated with most was the industry suppliers and to some extent engineering consultants that provide technology competence[41]. The senior engineer further stated that collaborative activities with other car manufacturers could take place, though, it had to be defined that the counterpart was not a direct competitor. A senior engineer that was working with vehicle dynamics stated that the OEM directly was working with tire and suspension suppliers to develop and tune the components to the OEM's end product, and to do applied science[42]. The senior engineer also related external actors to universities, but was unable to clarify anything else than those collaborative arrangements that were carried out on a research level.

In contrast to the answers from the OEM professionals, the respondents working at supplying organizations to the OEM mostly related external actors to tooling suppliers and to some extent consultants, which from the OEM's perspective represents second and third tier suppliers. One senior engineer stated that they, in general, worked with three different types of external parties, i.e. tooling and equipment suppliers; mold flow and calculation experts; and engineering consultants[43]. This answer was supported by another senior engineer[44] and a vice president[45], both working at first tier suppliers. The vice president of the first tier supplier stated another external actor that the senior engineers at the supplier organizations did not mention. The vice president, who has a broader and more strategic picture than the senior engineers, mentioned a Swedish innovation institute as an external actor the supplier also collaborated with. Lastly, the vice president stated that Renault, Nissan, Peugeot, Ford, GM, Geely, Fiat, Volvo and Chrysler were examples of different OEMs that the respondent's organization in different ways were supplying, i.e. first tier, second tier and so forth.

4.3.1.5. Selection and Role of Suppliers in NPD

As suppliers are said to be the most common actor in inter-organizational collaborations, the discussion around how a supplier is selected and its role are presented in the section below. From the OEM's perspective of the NPD process, different external actors are

[39] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[40] Senior Engineer, OEM (2016). Interview 2016-06-08
[41] Senior Engineer, OEM (2016). Interview 2016-02-29
[42] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[43] Senior Engineer, First tier supplier (2016). Interview 2016-03-17
[44] Senior Production Engineer, First tier supplier (2016). Interview 2016-03-18
[45] Vice President, First tier supplier (2016). Interview 2016-03-04

involved at different phases and in different length of time. One senior engineer who was working as project manager stated that the OEM worked internally to define features and preliminary content before any external actors were invited[46]. However, the senior engineer stated that the OEM is dependent on feedback from external actors quite early in the NPD process. Both as they need feedback on manufacturability and design choices, but also as competence might be missing. The respondent explained that the first interaction with a supplier involves *investigation development*, where the OEM clarifies for the supplier that they are invited to participate without promising anything else. It was by the vice president of a first tier supplier added that their participation concerned product specification development and feedback on manufacturability and design choices[47]. The vice president stated that development and/or production responsibility were not guaranteed by participating in this activity. This role of the supplier in early phases of NPD was also narrated by a senior engineer at the OEM[48].

The role of the supplier in the early phases involves helping the OEM developing a request for quotation (RFQ)[49]. In this process the OEM presents their initial thoughts, specifications of what they expect from the chosen supplier and to what price. The specified price refers to article and tooling price. The vice president stated that they cannot develop a RFQ that for other suppliers seems impossible and too expensive to fulfill, and thus, posing an advantageous situation for the vice president's organization. If it would occur the OEM's purchasing department requests a new RFQ[50]. The early involvement of a supplier is either without charge or charge on an ongoing basis[51] and according to the vice president different from time to time. The vice president stated that it was called request for information (RFI) when they charged the OEM continuously, and occurred when the OEM did not manage to initiate an extensive negotiation process. The vice president stated that the motive for the supplier to work without charging the OEM was that they might become a preferred choice when it is time to select the final supplier[52].

When the OEM consider the RFQ sufficiently detailed a final dialogue with the purchasing department is initiated. In this dialogue the purchasing department and the R&D department come to consensus regarding the choice of suppliers. If a supplier has a promising track record and demonstrates the ability to develop and/or produce the component with lower cost of quality, the supplier could be chosen prior the cheapest supplier. Thus, the supplier is not only chosen based on price. It was pronounced that if engineers at the R&D department believed that collaboration with a certain supplier would have a better outcome, their arguments would be considered. However the respondent added that the purchasing department always has the last saying when it comes to the selection of supplier[53]. Furthermore, in this interaction a number of suppliers possible to fulfill the RFQ is suggested to be contacted. The purchasing

[46] Senior Engineer, OEM (2016). Interview 2016-06-08
[47] Vice President, First tier supplier (2016). Interview 2016-03-04
[48] Senior Engineer, OEM (2016). Interview 2016-02-29
[49] Senior Engineer, OEM (2016). Interview 2016-03-08
[50] Vice President, First tier supplier (2016). Interview 2016-03-04
[51] Senior Project Engineer, Industry association (2016). Interviewed 2016-04-08
[52] Vice President, First tier supplier (2016). Interview 2016-03-04
[53] Senior Engineer (C), OEM (2016). Interview 2016-04-19

department adds expected volumes, different variants and where the component should be manufactured. The suppliers suggested to contact were by the senior project leader at the industry association referred to as the 'bidders list'. After this process is done the suggested candidates for the RFQ are contacted and the nomination phase is initiated[54]. A senior engineer at the OEM stated that there is a number of suppliers contacted in the beginning of the process, whereby one after another are rejected either based on price or on technical competence[55]. The respondent from the industry association stated that the OEM no longer only evaluate suppliers based on component cost but instead the landed cost, which includes all cost up to the port of destination. However, component cost is still the most crucial aspect in a purchasing decision, and by contacting a number of suppliers the OEM obtains competition among these, and thus, favorable prices[56].

During the *request for quotation phase* suppliers are invited to the OEM to get detailed information of what the OEM requests, but also to give the supplier an opportunity to ask questions. The vice president stated that they gave this opportunity substantial attention in order to understand what the OEM asks for, and as the vice president stated *"... and what they do not even know they needed"*[57]. The suppliers are given a timeframe for developing possible solutions and doing estimates. During this time the suppliers often suggests modifications on the concept and return to the OEM with comments on the specification[58]. If the OEM consider the supplier's input valid, the product specification is modified. With regard to *joint specification development* an example provided by the vice president of a supplier shed further light on the process. The vice president described a scenario where an OEM offered the supplier the opportunity to produce a product by handing over a finalized blueprint with specifications. The vice president stated that they did everything in their power to avoid that scenario as profitability is much lower if the OEM has developed the product and is fully aware of the technology[59]. The respondent explained that they try to convince the OEM that they can provide a solution that is better for the final product. The RFQ process is finalized by selecting a supplier who is given development and production responsibility.

The vice president of a first tier supplier stated that the process described above is extremely competitive and to stay in business the supplier need to be an attractive technology provider for the OEM's[60]. The respondent stated that they spend approximately 20% of their R&D budget before they even becomes nominated for a project. These resources were spent on research projects to develop new and exciting technologies that the supplier could offer the OEM during the nomination process. The vice president stated that the OEM nominate suppliers 18-24 months before start of production (SOP), but the suppliers technology research exploration starts 36-48 months before SOP.

[54] Senior Engineer, OEM (2016). Interview 2016-03-08
[55] Senior Engineer, OEM (2016). Interview 2016-03-08
[56] Senior Project Engineer, Industry association (2016). Interviewed 2016-04-08
[57] Vice President, First tier supplier (2016). Interview 2016-03-04
[58] Senior Engineer, OEM (2016). Interview 2016-03-08
[59] Vice President, First tier supplier (2016). Interview 2016-03-04
[60] Vice President, First tier supplier (2016). Interview 2016-03-04

4.3.1.6. Production and/or Development Responsibility

A central issue in the automotive industry that was addressed briefly in the offset of this chapter, was to which extent an OEM should produce and develop its components and systems themselves. Of course this differs from time to time, from component to component and depending on strategic importance etcetera. However, it was during the interviews with both professionals from an OEM, different first tier suppliers and an industry association distinguished between suppliers with development responsibility and production responsibility. Two of the first tier suppliers that were interviewed during this study had both development and production responsibility[61][62]. One supplier had production responsibility and engineering service responsibility, i.e. they was not included in the early phases of the product development process[63]. The fourth supplier had only production responsibility[64], and thus, none - or vague - interaction with the OEM during the early phases of the product development process.

A senior engineer at an OEM stated that production versus development responsibility could be a way of describing the relationship to a supplier[65]. The respondent from the industry association agreed that development versus production responsibility are a key determinant for the relation between an OEM and a supplier[66]. Furthermore, the respondent from the industry association argued that the level of responsibility could be used to describe the degree of collaboration between the two actors. The respondent further argued that the OEM and the supplier becomes interdependent of each other's technical expertise when the supplier has development responsibility. Furthermore, the respondent stated that the more the OEM values the supplier's expertise the more positive is the collaborative atmosphere. The supplier that pronounced that they had engineering service responsibility is thus between production and engineering responsibility. This statement for how organizations discusses and talks about external collaboration was supported by the vice president of a first tier supplier[67]. The vice president stated that the employees in the respondent's organization had a common way of talking around and distinguishing in between external collaborations, namely, how early they were involved into the product development process.

The degree of in-house development and/or production differs between car-component and system. One senior engineer stated that the degree of in-house engineering job differs between departments at the OEM. The department in which the senior engineer worked within (seat department) did less engineering in-house compared to, for instance, the cockpit department[68]. In the cockpit department the OEM develops, for instance, instrument panels and center consoles (one of the first tier suppliers interviewed during this research has production responsibility for some of the cockpit department's systems). Another senior engineer at the OEM, who was working at the

[61] Vice President, First tier supplier (2016). Interview 2016-03-04
[62] Program Manager, First tier supplier (2016). Interview 2016-03-16
[63] Senior Engineer, First tier supplier (2016). Interview 2016-03-17
[64] Senior Production Engineer, First tier supplier (2016). Interview 2016-03-18
[65] Senior Engineer, OEM (2016). Interview 2016-03-08
[66] Senior Project Engineer, Industry association (2016). Interviewed 2016-04-08
[67] Vice President, First tier supplier (2016). Interview 2016-03-04
[68] Senior Engineer, OEM (2016). Interview 2016-03-08

vehicle dynamics department, stated that it is extremely rare that they develop a complete system on their own[69].

The senior engineer[70] who was working at the seat department stated that the seats in the OEM's products in a great extent was developed by a supplier. The respondent stated that the supplier had development responsibility and that the OEM mostly acted as a system integrator during a recent seat development project. The respondent stated that their latest seat had a metal construction that could be added under the seat to obtain a higher driving position (SUV). The component was developed in-house but production-wise outsourced to a supplier, i.e. the supplier had production responsibility. The seating project will be thoroughly explained in the next part of the empirical investigation.

One senior engineer stated that if a component or system does not have any specific requirements and if the OEM are not going to develop and produce it in-house, a traditional market transaction is preferred[71]. The respondent further stated that this relation is pursued in as great extent as possible, as it is preferred to have a couple of supplier to choose between to achieve a bargaining position. The worst scenario possible would occur if one supplier achieved a unique position and the OEM became dependent of the supplier. One example that could be said to illustrate a classic market transaction was given by a senior engineer during one of the interviews[72]. The respondent presented a scenario where the OEM asked a supplier for a suspension solution and the supplier's suggestion was an existing solution that they had developed for another OEM. In that case the suspension solution was integrated in the OEM's product after some small adjustments and verification. After this process the price was negotiated, and the respondent argued that the interaction was rather market transaction oriented.

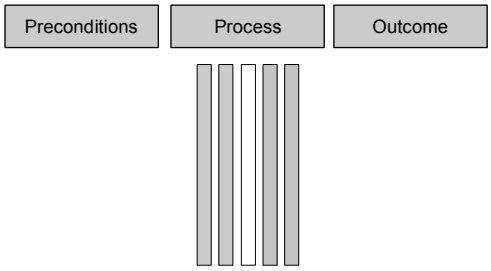
The same respondent also elaborated upon different degree of external collaborative activities. The respondent stated that an external actor might have an interesting idea and thus an incentive for a collaboration to be undertaken. The respondent argued that the external actor in those instances often lacks resources for finalizing the idea and therefore requests financial and technical support to integrate the idea into the product. The respondent stated that this process might take place during a few weeks and reach a phase where both parties need to evaluate the outcome and how and if the project should persist. The respondent argued that on this scale, from market transaction to joint development, the other extreme comprise the scenario where the OEM develops its products on their own. The respondent stated that it is extremely resource consuming and demanding to develop a whole system in-house, and thus, not common.

Furthermore, the vice president of a first tier supplier elaborated upon the difference between production and development responsibility. The vice president stated that when inter-organizational collaborative arrangements between a supplier and an OEM is of

[69] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[70] Senior Engineer, OEM (2016). Interview 2016-03-08
[71] Senior Engineer, OEM (2016). Interview 2016-02-29
[72] Senior Engineer (A), OEM (2016). Interview 2016-03-11

production responsibility character, interaction does not occur as early in the product development phase, compared to development responsibility. In this setting price and bargaining are of outmost importance for the OEM[73]. During the interview with a senior production engineer at the supplier with production responsibility for the instrument panel, the respondent argued that the supplier had none, or vague, interaction with the OEM in the early phases in the NPD process[74].

4.3.2. Agency Dimension of External Collaboration



When the respondents were asked to elaborate upon the issue of organizational autonomy during inter-organizational collaboration, some respondents recalled to residential engineering and others to freedom of action in projects. One respondent at the OEM and two respondents at first tier suppliers elaborated on residential engineering. The senior engineer at the OEM stated that it is possible to outsource a whole car program to a supplier, or on the other extreme, develop and produce a whole car-program in-house. Though, a more common scenario is that the OEM contracts professionals with key expertise and then brings them in-house, which defines residential engineers[75]. This argumentation was supported by a senior engineer at a first tier supplier. The respondent stated that their engineers temporarily could be co-located with engineers from the OEM at the OEM's site[76]. Additionally, the vice president of a first tier supplier stated that residential engineering was common a decade ago but nowadays only occurred occasionally[77].

Furthermore, a senior engineer at the OEM that was working with content acquisition stated that the members in his team, developers and product owner, were located at the OEM's site whereby the partner's (external actor) employees were located at their site[78]. The senior engineer further stated that the main sources for interaction were e-mail and videoconferences. Though, physical meeting took place but just occasionally. One factor that a senior engineer at the OEM emphasized as crucial for a collaboration to be successful is physical meeting[79], either by visiting the external actor or by inviting them. The respondent stated that when different organizations are discussing sensitive business it is hard to perform video- or telephone conferences. The respondent argued that during a phone conference you sometimes suspects that the receiver presses the 'mute-button' to discuss central and sensitive information with a colleague during the interview, i.e. by yourself you know others. The respondent further argued that this dilemma could be avoided by having physical meetings.

[73] Vice President, First tier supplier (2016). Interview 2016-03-04
[74] Senior Production Engineer, First tier supplier (2016). Interview 2016-03-18
[75] Senior Engineer, OEM (2016). Interview 2016-02-29
[76] Senior Engineer, First tier supplier. Interview 2016-03-17
[77] Vice President, First tier supplier (2016). Interview 2016-03-04
[78] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[79] Senior Engineer (A), OEM (2016). Interview 2016-03-11

The other stream of answers to the question on organizational autonomy was the degree of discretion in projects. Both senior engineers at the OEM and at its suppliers referred to the degree of discretion in projects when they were asked to elaborate upon organizational autonomy during collaboration. One senior engineer at the OEM stated that a decision that does not impact time, cost, or technology in a product, or has any impact on the OEM's or any other supplier's processes could be taken by the individual supplier[80]. Furthermore, the senior engineer stated that discretion and the approach to it differs between suppliers and their company culture. The senior engineer stated that German suppliers is much different from suppliers in Scandinavia, higher level managers participate in greater extent in the daily work, compared to Scandinavian suppliers. The senior engineer stated that suppliers in the United States are even more toward that end of the spectra, more structured, and even decisions on a very detailed level are approved by manager.

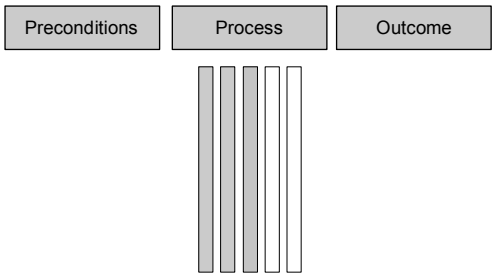
The vice president of a first tier supplier argued that they employed professionals locally, who knows the rule of the game in the specific culture. These locals gives suggestions on how they would manage different scenarios, but still, it is the vice president that takes the decisions, the respondent exemplified this by referring to China. Another senior engineer at the OEM[81] added to the aspect of discretion by giving a scenario where a friend is asked to go bowling but before answering the proposal the friend needs to ask his/her's partner for allowance.

Furthermore, as stated under the administrative dimension, the issue of location or co-location were addressed by numerous respondents. A senior engineer at the OEM stated that close collaboration is important, and that meetings occur frequently[82]. The respondent argued that close and frequent interaction foster transparency, thus location of the supplier do matter. The respondent did not particularly state that closeness is a must, though, the respondents stated that suppliers from Central Europe are obliged to visit the OEM at least once per month. The respondent exemplified the importance of physical meetings with a scenario where they bought a simulator of an Italian supplier. The respondent argued that the interaction with the supplier could be defined as collaboration as they developed the simulator together with the supplier. However, the supplier was extremely dedicated to the product and keen to develop the product further, though, the behavior resulted in unsatisfactory quality levels. The respondent stated that frequent meetings and physical interaction were cure for this behavior.

In the spirit of organizational discretion, several times it was stated that the degree of discretion is governed, or regulated, by the project description. One senior engineer at the OEM stated that if a product development effort concerns an existing platform or product, the boundaries of limitation is well known[83]. The project description informs the actors involved of the project boundaries and what actions that affect others. Within these boundaries it is argued that the project acts autonomous and that it is the projects participants by them self that takes decisions.

[80] Senior Engineer, OEM (2016). Interview 2016-06-08
[81] Senior Engineer, OEM (2016). Interview 2016-02-29
[82] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[83] Senior Engineer (A), OEM (2016). Interview 2016-03-11

4.3.3. Social Capital of Inter-Organizational Collaboration



In this section are the findings for how the respondents referred to the social dimensions of inter-organizational collaboration presented. One dimension of external collaborations that was given much attention by the respondents and consistent among the respondents' answers was the importance of openness and trust to make the collaboration successful. However, the dimension of mutuality was given much less attention and described in much less detail. Though, one of the senior engineers at the OEM and the vice president of a first tier supplier addressed the issue of mutuality.

4.3.3.1. Mutuality

When the vice president of a first tier supplier was asked to elaborate upon factors that the respondent considered important for a successful collaboration, the vice president mentioned the dimension of mutuality[84]. The respondent argued that it is important that a customer and supplier (tier one and OEM), in some way becomes dependent of each other, that there exists some kind of interdependence. The respondent stated that such a simple thing as realizing that there is more than one party in the collaborative activity that are in as much dependence of the other is important in a collaboration. The vice president stated that this is not the case for all customers. The respondent argued that the customer, the OEM, many times is praised and treated as a king and that the supplier is expected to adjust and fall into the line. However, the respondent further argued that this varies a lot in the global automotive industry.

The vice president argued that openness should be pursued in as great extent as possible, as the more the actors in a collaborative activity knows about each other the more they can influence each other. During this discussion the respondent referred to GM as a case in the opposite direction. During almost ten years GM pursued a strategy where they squeezed their suppliers to their breaking point, and claimed that all ideas and innovation that becomes patents goes to GM. The respondent stated that GM had left the controversial approach and nowadays pursued a more liberal relation to their suppliers. This was changed as suppliers did not chose to present their latest inventions for GM as they afterwards were not allowed to sell their ideas to other OEMs.

When a senior engineer at the OEM was asked to describe success factors for external collaborations the respondent immediately answered *"... win-win and fair money"*[85]*.* When the respondent was asked to elaborate upon the answer the respondents gave an example. The senior engineer argued that the interview for the master thesis could be seen as a win-win situation. The senior engineer was willing to participate in the interview as the respondent considered the interview interesting and rewarding, but also a great opportunity to generate positive marketing for the OEM. The senior engineer further argued that we, the authors of this report, got what we asked for, i.e. information

[84] Vice President, First tier supplier (2016). Interview 2016-03-04

[85] Senior Engineer, OEM (2016). Interview 2016-02-29

from the respondent. The senior engineer added that exchange of services are common, though, monetary exchange is the most common mean in terms of payment.

Furthermore, a senior engineer at the OEM elaborated upon the difference between a transaction and a collaboration. The respondent stated that much is about gut feelings, that one want to feel if the external actor 'lives' for their product or if they just are around to make money[86]. By 'living for the product' the respondent referred to a supplier who were deeply engaged and cared of the outcome of the joint effort, and thus, is said to represent a collaboration. The respondent was asked to elaborate upon what collaboration means in respect to transaction of a commodity product. The respondent stated that it is just a transaction and not a collaborative activity as the commodity product is not developed together. When the respondent was asked to explain what role openness play within the transaction of a commodity product, the respondent stated that it is not as important. What is important is that all requirements explicitly are specified.

4.3.3.2. Norms of Trust & Reciprocity

While discussing the dimension of 'norms of trust and reciprocity', numerous respondents emphasized the importance of trust. The vice president argue that it is important that the parties involved dare to tell the other party bad news if they encounter problems[87]. A senior engineer at the OEM stated that openness is of great importance, that participants in a collaborative activity are open with what problems that are likely to occur and what these might imply[88]. During the interviews the respondents were explicitly asked to elaborate upon trust and the respondents answers were all pointing in the same direction, i.e. towards openness. A senior engineer at the OEM stated that it is important that an external collaborative arrangement is seen as a collaboration, as the least collaborative atmosphere is obtained when an interaction with an external actor is transaction oriented[89]. One senior engineer[90] that had much experience from external collaborations as a project manager underlined the importance of transparency. The respondent presented two scenarios to explain the outcome of different behaviors. If, for example, a supplier identifies a problem during internal testing at the supplier site and on their own tries to solve the problem, it could get two different undesirable outcomes.

Case 1, a supplier encounters a problem with a component they are responsible for. Without noticing the OEM, the supplier works out a solution that afterwards are presents for the OEM. The problem with this approach is that the supplier missed the impact it would have on other components in the system, thereby wasted time for the whole project. This change might have impact on other components and make other suppliers progress during the past weeks unnecessary. Instead, if the supplier had presented the problem in an early phase other stakeholders could had been informed how the problem might impact them and how they could prepare while the supplier worked on a solution. The other scenario, case 2, the supplier identifies a problem during internal testing at their site and on their own tries to solve the problem. After a couple of weeks the

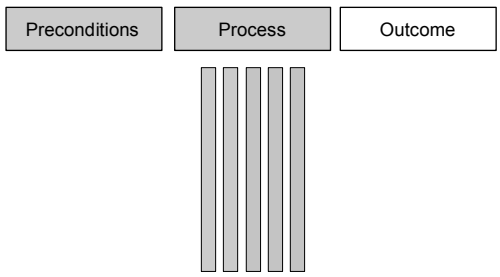
[86] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[87] Vice President, First tier supplier (2016). Interview 2016-03-04
[88] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[89] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[90] Senior Engineer, OEM (2016). Interview 2016-03-08

supplier contacts the OEM and reports that they got a problem a few weeks ago that they have not been able to solve.

Even though case 1 illustrates bad behavior in terms of transparency, the senior engineer described the solution oriented mindset as a good characteristic for a supplier. The case example above addresses a joint development effort of a product, and not the transactional relation depicted earlier. Therefore it was by one senior engineer argued that to make external collaborative activities successful one has to see the interaction between the actors involved as a collaboration and not as a market transaction[91]. This also holds true when the statement of a senior engineer at an OEM is considered. The senior engineer stated that the most important feature of a collaboration is to carefully address monetary issues in the collaboration and to realize benefits for all parties involved[92]. The main message of the case example is supported by the vice president of a first tier supplier. The respondent argued that it is of outmost importance to see the other party as equivalent and respect each other's needs[93].

The senior engineer who worked with content acquisition[94], who previously elaborated upon the difference between partners and suppliers was asked to elaborate upon the difference in trust between them. The respondent stated that collaboration in partnership is easier as they are interested in developing a product, whereas suppliers' main focus is to make money. The respondent further stated that trust does not play an important role in the supplier relation, though, these relations is rather governed by contracts and agreements.

4.4. Outcome of Inter-Organizational Collaboration



There are several outcomes from collaborating in the automotive industry and there are both successful and unsuccessful outcomes of collaborations. One Senior Engineer at the OEM stated that there are some suppliers who have ended on a black list and are therefore not welcome to participate in any further collaborations[95]. The senior engineer referred to a scenario where a development team at the chassis department needed a control system. The development team did not have extensive knowledge in control systems as their components and systems historically were not computerized. However, to get the control system the development team asked some colleagues for orientation where they were encouraged to use supplier X for it. When the development team later on presented the idea for the transmission department and who was supposed to supply the control system they got dead halt. This was due to an unsuccessful collaboration in the past, supplier X had apparently acted in bad faith and mismanaged its obligations.

[91] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[92] Senior Engineer, OEM (2016). Interview 2016-02-29
[93] Vice President, First tier supplier (2016). Interview 2016-03-04
[94] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[95] Senior Engineer (A), OEM (2016). Interview 2016-03-11

Another Senior Engineer stated that without collaborating the OEM would not manage to access services for their infotainment system. The Senior Engineer stated that if they would develop these services themselves, no one would appreciate their efforts[96]. One Senior Engineer[97] stated that when a development project is finished it is handed over to another team who is responsible for the production phase, this is the same for the OEM and the suppliers. Therefore it is extremely important to transfer knowledge, experience, problems and risks from one team to another. It is also important to state the responsibilities for the involved parties in this process. Furthermore, one respondent stated that this team works in the production process and may encounter problems as late as six months in full scale production. Therefore the collaboration does not end when the production starts, since they still need to be able to work together and solve problems fast. Another interesting statement of a senior engineer at the OEM was the answer to the question for what characterizes a successful collaboration. The senior engineer answered that he did not know, and the respondent argued that they were bad at following up and evaluate how successful a collaboration really was.

4.4.1. Issues Related to Inter-organizational Collaborations

Even though openness and transparency were recurring characteristics of successful external collaborations respondents also addressed issues related to openness. One senior engineer[98] gave an example of a scenario where a supplier had contacted an OEM and presented a breakthrough innovation in good faith, though, the OEM showed opportunistic behavior and before the supplier knew it the OEM had applied for patent for their innovation. The respondent further explained, not surprisingly, that this behavior kills collaborative relationships. One respondent[99] at the OEM explains that what differ from a good and a bad supplier is their capability to solve the right problem and their competence related to their part of the product. For example, some suppliers jump into conclusions and are careless in their root cause analysis when they encounter a problem. This lead to engineers from the OEM might need to step in and help the supplier with a thoroughly investigation of the problem to find the root cause. This is necessary since they are interdependent of each other and time is a scarce resource in the development process within the automotive industry. Another bad behavior that was reoccurring during collaborative activities with external actors was wishful-thinking. One senior engineer elaborated upon the problem where a supplier initially promises and loudly talks about everything they can do. But when one scratches the surface there is nothing underneath.

4.5. Findings from In-depth Interviews

In this section the empirical findings from the in-depth interviews concerning a recent product development project are presented. The project concerned a seat development project for the OEM´s latest product model. This in-depth investigation focuses on the

[96] Senior Engineer (B), OEM (2016). Interview 2016-03-11
[97] Senior Engineer, OEM (2016). Interview 2016-03-08
[98] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[99] Senior Engineer, OEM (2016). Interview 2016-03-08

interaction between the OEM and one of the suppliers involved in the seat project. In this case the supplier is first tier and has both development and production responsibility. The first-tier supplier also assemble the complete seat and deliver just-in-time to the OEM's final assembly line. The in-depth interviews have been focused on the interaction and perceptions of the relation between the first tier supplier and the OEM. Initially the background to the project is stated, followed of a description of the preconditions, the process, and the outcome of the inter-organizational project.

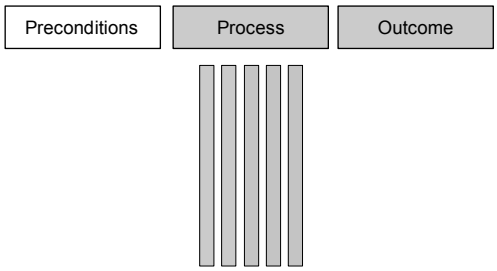
4.5.1. Background to the Seat Project

The seat project was initiated five years before the planned start of production[100]. During this time a whole new platform development project was initiate by the OEM. The platform was developed to be scaled for a large number of future automotive models. This platform included development of a large amount of new components, which had to be compatible with the new models. During this time the automotive manufacturer started a journey to move towards a more high-end customer segment. This journey put large pressure on the organization, they had to be innovative and increase the customer experience in sense of a high end-product. This also put pressure on sub-products that are vital for the customer experience. One of these vital components is the car's seats. The front seat is especially vital as it always sits a customer in it and for obvious reasons an important part for the customer experience in the system as a whole. A seat is a complex product that includes a large variety of parameters such as; comfort, safety and appearance[101].

Furthermore, the front seat had whole new functions, new seat structure, new upholstery and a new foam for filling the seat, it also included functions for adjusting the seat and a massage function[102]. One project leader added that this was a unique development project in terms of size. A regular internal project team for this department includes five employees, whereas this project included twenty to twenty-five employees[103]. Furthermore, one of the seat project's leaders argued that this was the largest and most complex project for their department so far. This complexity concerned both product and organizational issues. It was a challenge to lead and control the large amount of people, even though two project leaders was assigned to the project. Furthermore, in the investigated supplier's organization approximately twenty to twenty-five engineers were involved in the projects, as well as three additional suppliers[104].

[100] Senior Engineer, OEM (2016). Interview 2016-03-08
[101] Program Manager, First tier supplier (2016). Interview 2016-03-16
[102] Senior Engineer, OEM (2016). Interview 2016-03-08
[103] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[104] Senior Engineer (C), OEM (2016). Interview 2016-04-19

4.5.2. Preconditions for Inter-Organizational Collaboration



The respondent from the OEM stated that usually they do not manufacture any components themselves in the seats department. Some products are too complex and require special knowledge and therefore they collaborate with suppliers who can satisfy their need[105]. However, the respondent stated that depending on the specific component, different degrees of internal development is done by the OEM. This includes components of strategic importance that the OEM have large internal knowledge about, and thus, an object for internal development. During the project one component was developed in-house by the OEM, where no interaction with suppliers during the development process took place. However, this component was later outsourced to a supplier for manufacturing. The main reason for not collaborating during the development of this component can be traced back to access of internal competence. But also the fact that if the component would be developed in collaboration with a supplier the price would increase and they would also put unnecessary pressure on their supplier who already had enough to do. One important aspect of the choice of develop the component themselves was the simple interface and the low risk of affecting other components in the front seat[106].

As stated above, the initial development of the seat project started five years before production, mainly as the new generation of seats included a whole new seat structure, which entails long lead time. Furthermore, the program manager stated that steal components such as the seat structure have long lead time by nature[107]. During this early part of the process the specifications for the seats had to be decided, this was an extensive process since it includes design and safety demands for five to ten years in the future. This part of the process also includes what functions to include, this is done before any external actor is contacted for participating in the development. Furthermore, the OEM are not able to invest too much time in internal research since they are depending on the competence of their suppliers for idea generation[108]. The next part of the process, that is the first stage of a collaborative agreement, concerns an 'investigating development' in conjunction with a supplier. In this stage, the suppliers are asked to develop a concept of what they could bring to the final product.

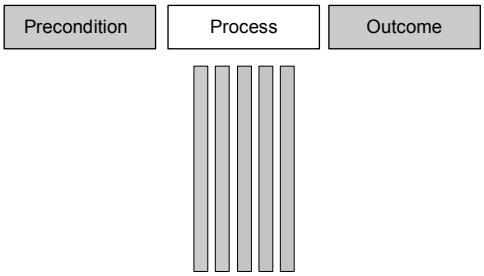
In the investigating development phase the supplier is aware that they are not guaranteed a final offer from the OEM, still if they perform well they may win the development project[109]. A program manager at the first tier supplier explains this process as an initial development that is used as a benchmarking criterion in the design competition for selecting the final supplier. In this phase the supplier can both get paid and not get paid. In the seat development project the supplier got paid in the

[105] Senior Engineer, OEM (2016). Interview 2016-03-08
[106] Senior Engineer, OEM (2016). Interview 2016-03-08
[107] Senior Engineer, OEM (2016). Interview 2016-03-08
[108] Senior Engineer, OEM (2016). Interview 2016-03-08
[109] Senior Engineer, OEM (2016). Interview 2016-03-08

investigation development phase, but in other cases suppliers can work without getting paid by the OEM. In those cases voluntary work gets righteously as the OEM states that sacrifices might lead to a pole position in the design competition[110]. When the bidding process starts the offer usually goes out to three to five different suppliers, and the one with the best solution and price wins the deal. Further on, both the OEM and the first tier supplier agree that history is an important aspect for the choice of a supplier[111]. The first tier supplier who won the final development and the assembly of the seat state that they have an advantage in the collaboration since they are located ten minutes from the OEM and a long history of working together[112]. This was also supported by a senior engineer at the OEM, where the respondent state that they have history of working with the supplier and a good relationship with the involved individuals at this supplier[113].

The respondent also stated that there is two levels to consider in a collaboration. One is the organizational, tactical aspect where different organizations have their own agendas and a need to make good business, and the other is the operational inter-personal aspect. It could be a clash between the organizations on a tactical level that might affect the collaborative environment between the parties, as one organization might feel that they are forced to make a less profitable deal[114]. However, the respondent stated that even though this inter-organizational interest-conflict might affect the collaboration in the beginning, once the collaboration is initiated all involved actors on a lower level move past this interest conflict and work together towards a shared goal. Furthermore, the respondent also acknowledge the difference between how a supplier act to win a contract and how they act when the have won the contract. The respondent argued that the supplier are more keen to meet the OEM's expectations before any contract is signed, and once the contract and the cost is discussed they are more restricted in their efforts. The senior engineer argued that this affect the outcome, since he/she expected that the outcome could be more favorable without the cost focus on the product.

4.5.3. Development Process



The seat can be seen as a system of components with complex interactions and a large amount of different parameters that need careful handling. The seat included four suppliers in total, since one supplier did not have core competence for all parts of a seat. Furthermore, the program manager at the first tier supplier explains that one of the problems for the OEM was to align all the involved suppliers. The respondent also stated that this is a common problem when the development project involves many suppliers, and result in a large amount of issues to be solved. Furthermore, to facilitate a good collaboration they adjust their development process to fit with the stages in the OEMs development process. This

[110] Program Manager, First tier supplier (2016). Interview 2016-03-16
[111] Program Manager, First tier supplier (2016). Interview 2016-03-16
[112] Program Manager, First tier supplier (2016). Interview 2016-03-16
[113] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[114] Senior Engineer (C), OEM (2016). Interview 2016-04-19

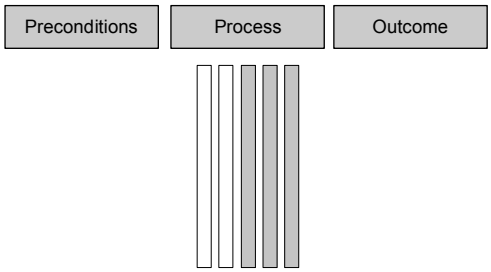
is not an extensive process since they use the same international standard for the development process[115].

The respondent also explained that some problems that occurred during the development process could be traced back to changes of the product in late stages. This occurs when a large amount of suppliers are involved and the development team is not aligned. To deal with the issue of late changes and to prevent it from occurring in the future, the organizations are obligated to improve the development and collaborative process or at least, come with suggestions for improvement. One respondent also stated that the project was very stressful[116]. The stress arose from the complexity of the project, the need for success and staffing issues. With regards to the staffing issues, it can be traced back to a high turnover of employees during the project, both at the OEM and the supplier organization. This slowed down the development process since knowledge and experiences were lost when a member quit the project. This resulted in recurring delays as new members had to learn and grasp previous progress. During the whole project, the OEM was responsible for the coordination of all the involved suppliers and they can be seen as the focal point of the collaboration[117].

Moreover, the senior engineer at the OEM elaborated upon the issue of contract negotiation and supplier selection and how it affected the seat project[118]. The respondent stated that the supplier selection process and the extensive contractual process lead to late involvement of suppliers. The late involvement resulted in changes of the product that could have been avoided if the suppliers were involved earlier or at least at the same time. Furthermore, the detailed and demanding phase of finding suppliers that are capable of delivering the right content to the right price, was the main reason for why both the seat project other projects gets delayed[119]. This does not only create frustration and stress among the team members but it also (initially) created a bad mood between the supply organizations employee and the OEM. Furthermore, in those cases, where the supplier feels that they have been unfairly treated and where too much focus has been on cost, late design changes or any changes could be denied by the supplier as a response to the substandard treatment in the initial phases. However the respondent added that this could be avoided if the OEM would not focus so much on getting the right competence to the best price.

4.5.4. Structural Dimension

One way to govern a collaboration that is a standard procedure in the automotive industry is to set up a contract of collaboration with the suppliers and the OEM. The OEM further explains that the contracts usually is based on previous contracts, where new requirements are included and none relevant are excluded. They



[115] Program Manager, First tier supplier (2016). Interview 2016-03-16
[116] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[117] Program Manager, First tier supplier (2016). Interview 2016-03-16
[118] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[119] Senior Engineer (C), OEM (2016). Interview 2016-04-19

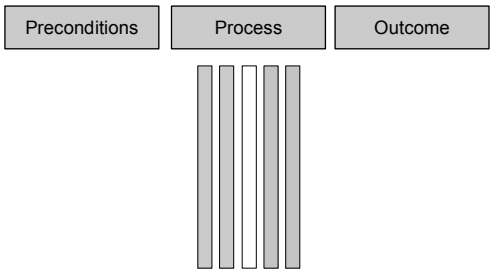
update their contracts in collaboration with the involved suppliers. These contracts are handed to the supplier once the OEM have decided upon who they want to collaborate with. Usually this is an iterative process, where the OEM get back the contract with remarks from the supplier with paragraphs of what they do not want to be responsible for. They can also come with technical improvements of the original idea and start negotiating on the price of their effort. These contracts includes specific costs such as; tooling cost, development cost and article price.

This negotiating process continues until both parties agrees upon the payment and the requirement specification. The OEM described the comprehensiveness of contracts and legal obligation by visualizing a ten centimeter thick binder containing all the documents for the collaboration[120]. The first tier supplier further confirm this by stating that the contracts are based on the same standard one for the customers and one for the suppliers[121]. They further state that with regard to the OEM, they have the same structure for all projects with respect to how the responsibility is shared between the project leaders, system developer and engineers. Nevertheless the responsibility and the structure difference between projects with regard to the extent of the project. Furthermore the respondent explains that the standard for the project setup with regard to the milestones are basically the same for all product models and constructions[122].

The OEM have systems for administrative task, where both the supplier and the OEM report the progress of the project[123] [124]. The OEM further explains that the system is sophisticated, and that the project initiator continuously updates the status of the project. This system also download information from other systems, such as status of articles including timeframe and progress for each stage. The suppliers involved in the project are also able to upload information to this system. Thereby all the information available for the project is collected and can be monitored on the same place. The program manager further states that they have a team member stationed in the OEMs facilities to facilitate electronic communication[125]. Furthermore, they state that they have weekly meetings with the OEM, and since they are located ten minutes from the OEM they are co-located during these meetings. The meeting can be both reconciliation meetings and 'working meetings' that can last a few days. They further state that their location is a great advantage where they are able to meet face to face on a regular basis and this is an important aspect since it facilitates greater communication. One senior engineer at the OEM, who was the project leader for the seats, stated that meetings were the single most important mechanism for governance and control[126].

[120] Senior Engineer, OEM (2016). Interview 2016-03-08
[121] Program Manager, First tier supplier (2016). Interview 2016-03-16
[122] Program Manager, First tier supplier (2016). Interview 2016-03-16
[123] Program Manager, First tier supplier (2016). Interview 2016-03-16
[124] Senior Engineer, OEM (2016). Interview 2016-03-08
[125] Program Manager, First tier supplier (2016). Interview 2016-03-16
[126] Senior Engineer (C), OEM (2016). Interview 2016-04-19

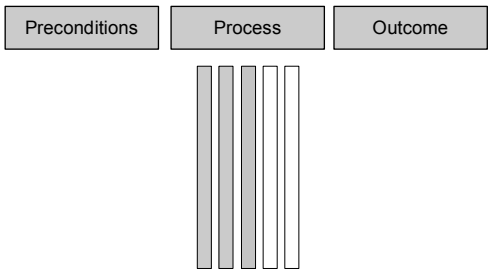
4.5.5. Organizational Autonomy



During any project and with no exception to the seat project, organizational autonomy can be framed into the impact on time, cost, or technique[127]. In general terms, if a decision does not have any impact on time, cost and technique the involved parties are free to make any decision about the part they are responsible for. However, it is important to ensure that the change does not impact components of other suppliers or the OEM's manufacturing process[128]. The first tier supplier stated that they make a judgment from case to case if they can make a change and if it concern another actor in the project. If it concerns another actor, they inform the involved parties and come to a solution together. They also state if the changes does not have impact on these aspects the individual team members are free to make their own judgement[129].

Those changes or decisions affecting any of the parameters stated above, need to be communicated to the OEM and depending on the issues it is lifted in the hierarchy in the organization for a decision. This process occurs since they want to avoid any changes that can have a large impact on the final product in a negative way[130]. One senior engineer at the OEM elaborated upon the issue of power balance. The respondent stated that the OEM have the final saying in any decision, however they still want the suppliers to act and decide some parts on their own. One respondent from the OEM also stated that organizational autonomy depends on the individual project leader. A project leader with more experience and with more contacts within the organization has greater ability to influence the inter-organizational project[131].

4.5.6. Social Dimensions



In this section the social dimensions of the inter-organizational seat development project are stated, i.e. how the respondents referred to mutuality and trust of norms. Important aspects in all development projects are openness and honesty against problems occurring during the process. One senior engineer at the OEM stated that some suppliers try to hide problems and reveal the problem only when it is solved, which can be an issue since the solution can have impact on other components. Therefore, it is important to create a culture during the collaboration that encourages suppliers to come forward with their issues and not punishing anyone for doing so[132]. Furthermore, the OEM expressed the importance

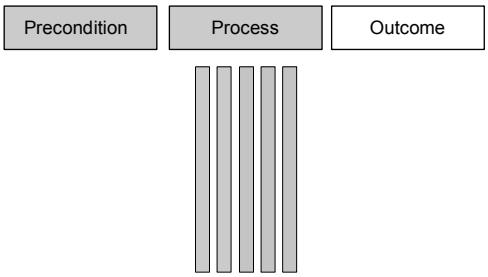
[127] Senior Engineer, OEM (2016). Interview 2016-03-08
[128] Senior Engineer, OEM (2016). Interview 2016-03-08
[129] Program Manager, First tier supplier (2016). Interview 2016-03-16
[130] Senior Engineer, OEM (2016). Interview 2016-03-08
[131] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[132] Senior Engineer, OEM (2016). Interview 2016-03-08

of transparency, since the projects in the automotive industry are characterized by time scarcity and no room for errors and time waste. The program manager at the first tier supplier stated that successful collaborations includes clear expectations, clear communication, clear requirements and clearly stating the need from the initiator in specific phases. The respondent also stated that it is important for a supplier to understand what is going on behind the curtains of the OEM and at the same time the OEM should know what is going on at the supplier. Otherwise this create frustration and conflicts during the collaboration[133]. One senior engineer at the OEM stated that previous experience in collaboration is an important factor, as there is no *guide-book* for how to act or for how the OEM's processes looks like. Therefore, suppliers who have a long history of working with the OEM has an advantage as they know how to act[134].

The senior engineer at the OEM stated that cultural differences have substantial impact on inter-organizational relations[135]. Some countries, such as China, need a different approach as the OEM's and the Chinese organizational differences are large. Thus, those relations need to be managed more carefully as language barriers and other cultural barriers have great impact on the collaboration's outcome. However, the differences is not so large between the first tier supplier and the OEM. A senior engineer at the OEM stated that they are same-same but different[136]. The respondent further stated that there is a great need during collaboration with an external organizations to be open, clear and flexible in how to approach cultural differences. Finally, openness was expressed by both parties as the most important aspect for a collaboration to be successful. Mutuality and openness are important aspects of successful collaboration, but at the same time trust is also an important aspect. Trust is according to the senior engineer at the OEM to be honest and take responsibility of what you are responsible for. The senior engineer further argued that you need to be honest, and take responsibility when you make a mistake. It is important that you do not have a hidden agenda and trying to deceive the other party[137]. Closely related to mutuality is the issue of interdependence. In the case of the first tier supplier and the OEM's relation it could be said that they are exclusively interdependent of each other. One senior engineer at the OEM stated that the supplier's production and development expertise as well as closeness of the factory are valued by the OEM[138]. The respondent further stated that the OEM is dependent of the supplier as they are the only one of its kind in the local area, since a competitor left the market a couple of years ago. The supplier on the other hand, is highly dependent of the OEM as they comprise a large fraction of the supplier's sales.

[133] Program Manager, First tier supplier (2016). Interview 2016-03-16
[134] Senior Engineer (C), OEM (2016). Interview 2016-04-19
[135] Senior Engineer, OEM (2016). Interview 2016-03-08
[136] Senior Engineer, OEM (2016). Interview 2016-03-08
[137] Senior Engineer, OEM (2016). Interview 2016-03-08
[138] Senior Engineer (C), OEM (2016). Interview 2016-04-19

4.5.7. Outcome of the Collaboration



One of the biggest challenges for the seat project was to slim the seat, i.e. making it as thin as possible but still include new functions such as; safety solutions, massage and seat extension. One of these functions was to develop a deformation element in the bottom of the seat. The final deformation element was proven to reduce back injuries up to 30% in case the driver drive off the road. Furthermore, the seat project as a whole can be seen as successful as the project and its members were awarded "*the technical award of the year*" by the OEM[139]. As the OEM was able to develop the slimed seats luxury models could be offered with rear seat in the same execution as in the front, and thus, including all functions for the passenger as for the driver. The responded also explained that the technical expert that was responsible for the front seat participated in seat conventions within the automotive industry. When he presented the seat at conventions he was regarded as a "rock star". He got this reputation since his team managed to make their seat much more slimed than their competitors and also better in numerous ways. The respondent explained that all other competitors clustered around him, and had become a common scenario when he attended conventions. Further on, the seat success has created a "buzz" around him and given him the opportunity to be the head-speaker at conventions all over the world[140].

[139] Senior Engineer, OEM (2016). Interview 2016-03-08

[140] Senior Engineer, OEM (2016). Interview 2016-03-08

5. Analysis and Discussion

This chapter aims at presenting the analysis and discussion of the empirical findings in relation to the theoretical framework constructed for this report. To focus the report and to keep the reader oriented, the purpose and research questions will be restated. The analysis will be divided into two sub-chapters and structured after the research question where each sub-chapter will be summarized with a short discussion.

5.1. Restated Purpose and RQs

The aim of this study is to investigate what inter-organizational collaboration means and analyze the collaborative environment between OEMs and external actors within the Swedish automotive industry. To answer the purpose stated above, the authors have formulated two research questions (RQ).

- *RQ1: What characterizes inter-organizational collaborations between an OEM and external actors in the Swedish automotive industry?*

- *RQ2: How do an OEM and a first tier supplier collaborate during NPD within the Swedish automotive industry?*

5.2. Characteristics of Inter-Organizational Collaborations

By analyzing the characteristics of inter-organizational collaborations, the authors aim at describing a comprehensive picture of the collaborative environment in the Swedish automotive industry. This section is structured as following, initially the respondents' answers to the question of their first thoughts and their general perception of inter-organizational collaborations are analyzed. Thereafter are the respondents' arguments for why and with whom inter-organizational collaboration take place presented, and lastly, the respondents' perception of the five dimensions of collaboration is analyzed.

5.2.1. General Thoughts of Inter-Organizational Collaborations

During the empirical investigation the respondents were asked to elaborate upon their first thoughts related to inter-organizational collaboration during NPD. Initially these answers are analyzed independent of each other and thereafter compiled in a concluding paragraph. To begin, a senior engineer at the OEM answered as following to the question *"... a company that can build an interesting service to our customers"*[141]. The respondent's answer could be argued to relate to preconditions for collaboration, which Wood and Gray (1991) presented as one of the theoretical perspectives on collaboration within the literature. The respondent's answer was rather focused on what the senior engineer wanted to achieve by using an actor outside the organization's boundaries. The idea of relying on external actors for delivering resources (knowledge and expertise) is a central proposition in the resource dependency theory, and thus in line with Pfeffer and Salancik (2003). This implies and highlights that relations and links

[141] Senior Engineer (B), OEM (2016). Interview 2016-03-11

to suppliers are necessary to create value and maintain the firm's competitiveness, as suggested by Van Weele (2014).

Another senior engineer at the OEM responded to the question by referring to inter-organizational collaboration as something abnormal and something that does not occur in daily activities[142]. The inter-organizational collaborations the respondent referred to were governmentally financed and carried out together with universities and research institutions. The respondent stated that *"... external collaboration is an activity that is meant to be beneficial for all parties involved, and not necessarily only the automotive industry".* In this regard Un *et al*. (2010) stated that collaboration with universities and research institutes have a long-term positive impact on innovation. Furthermore, it is interesting that the respondent recalled to this setup in the very beginning of the interview but in the remainder solely related answers to what the respondent called 'business relations'. However, if the citation above is analyzed in further detail it can be noted that the respondent emphasized the dimension of mutuality while referring to inter-organizational collaboration, i.e. beneficial for all parties involved. This is consistent with Thomson and Perry (2006) who argued that mutuality, or cooperation with a common goal, leads to collaboration, and thus a major differentiating factor for collaboration.

To the same question a senior engineer at the OEM stated that two aspects are central in respect to inter-organizational collaboration. Firstly, *"... we are mutually interdependent of each other, i.e. we the OEM and our suppliers"*[143], and that the OEM cannot develop the latest technology without collaborating with external actors. Secondly, the respondent emphasized that a collaboration need to be sufficiently managed, that the parties involved are aware of its areas of responsibility, how the daily collaborative work is meant to be carried out and how problems should be treated. Also this respondent referred to the importance of mutuality in inter-organizational collaborations, but also elucidated the governmental and administrative dimensions of collaboration. The structural dimensions of collaboration are by Wallin and Von Krogh (2010) underlined as important aspects of collaborations. The authors stated that governance give the parties involved structure and enables them to work efficiently.

Furthermore, the vice president of a first tier supplier related his/her thoughts to the early phases of procurement. The vice president stated *"... before we becomes supplier for an OEM, or rather, before we received a nomination there is a lot of work"*[144]. The respondent referred to the close and dense process of identifying specifications and project goals together with the employer, i.e. the OEM. The respondent saw the interactive process of jointly constructing a specification of requirements as inter-organizational collaboration. Even though it could be said that the early phases of the nomination process upholds the defining characteristics of collaboration, it is the balance among them that tells the degree of collaboration, as suggested by Thomson and Perry (2006). What could be said about the nomination process employed by the OEM is that it hampers the mutuality dimension of collaboration as it appreciates cost, and obscure vital dimensions of collaboration.

[142] Senior Engineer, OEM (2016). Interview 2016-02-29

[143] Senior Engineer, OEM (2016). Interview 2016-03-08

[144] Vice President, First tier supplier (2016). Interview 2016-03-04

The idea of working towards a shared goal as defining characteristics for collaboration was also highlighted by a senior engineer at a first tier supplier. The senior engineer stated, *"... in a collaboration we shall all achieve the same goal"*[145]. Thus, the mutuality dimension of collaboration was again referred to in relation to inter-organizational collaboration. Furthermore, during one of the initial interviews a senior engineer at the OEM stated that *"... inter-organizational collaboration does not give a sufficient explanation of an activity, the concept need to be contextualized and explained in further detail to make sense within the organization"*[146]. Even though the respondents were asked to relate inter-organizational collaboration to the product development process (an attempt to contextualize), the respondents' answers did not exhibit any consistency. Though, it can be argued that the dimension of mutuality in some way was emphasized in the respondent's answers. In the sections above, the respondents' answers range from incentives for collaborating to the different dimensions of the process of collaboration suggested by Thomson and Perry (2006), and demonstrates a fuzzy picture of what inter-organizational collaboration means for professionals within the automotive industry. Though, it could be argued that the centrality in the respondents' answers refers to the dimension of mutuality, which by Thomson and Perry (2006) is stated as vital for collaboration.

Furthermore, it is interesting to further analyze the answer by a senior engineer stated above. The statement was read *"... external collaboration is an activity that is meant to be beneficial for all parties involved, and not necessarily only the automotive industry".* External collaboration was by the senior engineer also referred to as something rare, something that they did not do often. This in contrast to the answer of another senior engineer at the OEM makes it interesting. The senior engineer who stated that the OEM cannot develop the latest kind of technology on their own, referred external actors to first tier suppliers. The importance of first tier suppliers as a source for innovation is supported by various authors, e.g. Van Weele (2014), and surfaced during various interviews. However, the respondent who stated that external collaboration was a rare activity underlined the importance of suppliers. Though, the way in which the respondent described the relations to supplier, i.e. business relation, does not uphold the elements of collaboration. The business relationship could be argued to assimilate the arm's length relation to a supplier, which Dyer and Chu (2011) described as a bidding process where past experience with a specific supplier does not influence the selection.

Furthermore, while asking the OEM respondents about their first thoughts it is interesting to note that the respondents explicitly and congruent did not directly refer to their most occurring external interaction, i.e. the relation to suppliers, as collaboration. What could be concluded from the respondents first thoughts in relation to inter-organizational collaboration is that they relate to a whole different story than what their actions tell. For instance, a senior engineer at the OEM stated that *"... it is crucial to supervise the interaction with a supplier closely"*[147]. This statement is just an example of the great

[145] Senior Engineer, First tier supplier (2016). Interview 2016-03-17
[146] Senior Engineer, OEM (2016). Interview 2016-02-29
[147] Senior Engineer, OEM (2016). Interview 2016-06-08

attention the OEM respondents placed on the structural dimension of collaboration, rather than the dimension of social capital that they initially referred to.

5.2.2. Preconditions for Inter-Organizational Collaboration

There are numerous reasons for why inter-organizational collaborations in the automotive industry are undertaken. The reasons for collaborating identified during this study are analyzed in the section below and its implications are summarized in a concluding paragraph. The main reason for collaborating expressed by several respondents were access to external knowledge and competence. From the perspective of the OEM, a central issue related to initiating inter-organizational collaboration is the decision to outsource or produce in-house. Two senior engineers at the OEM highlighted this consideration when they were asked to elaborate upon incentives for collaborating with an actor outside the organizational boundaries. In regard to this, a senior engineer at the OEM it was stated that it is all too risky and resource demanding to produce all components and systems in-house. This statement coincide with the literature on open innovation, e.g. Chesbrough (2003), mainly as the statements could be said to characterize the first step towards a more open approach of the firm's research and development function (Gassmann et al., 2010).

Another senior engineer at the OEM added to this consideration by stating that the OEM would not offer the services they do today without collaborating with external actors. The respondent stated *"... that we, the OEM, should start to develop an own music service? That would be ridiculous"*[148]*.* This statement elucidates the growing need for interacting and collaborating with actors both within the automotive industry as well as outside. Respondents both at the OEM and the respondent from the industry association argued that new actors, not historically connected to the industry, would become central in the nearby future. By referring to the music service statement, the role of suppliers from other industries becomes more important than ever before. To satisfy this growing need the OEM have to collaborate with organizations that can offer music streaming services, IoT-service providers[149], GPS service providers and so forth. A senior engineer stated that *"... our customers would not like if we developed our own features for the infotainment system, it is not in our core business and the result would not be satisfying"*[150]*.* This statement is in line with Tidd *et al.* (2001), who argued that one reason for collaborating with external organizations are access to their core competence. The senior engineer, who was responsible for content acquisition for the infotainment system, elaborated on inter-organizational collaborations in relation to partnerships. In this kind of collaborations the involved actors share the cost of the project and sees the shared outcome of the activity as brand exposure in a cross-industry fashion. Further on, this converges with Kaats and Opheij (2014) incentive for undertaking a collaborative activity, i.e. developing joint market power.

Furthermore, another example for why a collaboration with an external actor is undertaken was stated by a senior engineer at the OEM. The respondent stated that an;

[148] Senior Engineer (B), OEM (2016). Interview 2016-03-11

[149] IoT refers to "internet of things", a trend in the spirit of digitalization

[150] Senior Engineer (B), OEM (2016). Interview 2016-03-11

"*... external collaboration could be initiated when a supplier contacts us and expresses that they are looking for a development partner*"[151]. In this case it is the supplier who initiates and pose the incentive for the collaboration to be undertaken. Huizingh (2011) elucidated that inter-organizational collaboration do not always have to be initiated by the focal firm, and thus congruent with the statement by the senior engineer. Furthermore, from a supplier point of view there are numerous reasons for collaborating with external actors. The most obvious reason for collaborating is that it is in their core business, either to develop and produce components or only produce components to an OEM. Nevertheless, even if their core business includes interaction with an OEM it does not automatically mean that they are in a collaboration, which also holds true for the OEM. Furthermore, the vice president from a first tier supplier also referred to inter-organizational collaboration as collaboration with universities and research institutes[152]. The main reasons for this kind of collaboration can be traced back to access of new research, knowledge and competence, and the need for a supplier to stay competitive and be able to provide interesting solutions to the OEMs. This coincides with Kaats and Opheij (2014) who stated that knowledge development, access to new knowledge and organizing joint innovation were incentives for collaborating.

Another respondent from the OEM added that the main reason for collaborating, or contact external actors, is that they are not able to do everything themselves. The respondent stated; *"... it is not possible to do everything by yourself, and it is not smart either"*[153]. The statement can also refer to cost advantages, which has been identified in the literature as a reason for initiating collaborative activities. Kaats and Opheij (2014) concluded that motives for cost advantages refer to; realizing advantages of scale, overcoming investment impediments and more efficient and rationalized production. This argument can be traced back to both access of knowledge and need for capacity. To conclude, there are several reasons for inter-organizational collaboration in the automotive industry, these reasons differ depending on setting, department and if the respondent belongs to the OEM or a supplier. Nevertheless, the reasons can be narrowed down to access to knowledge, competence, capacity and/or new research. Even though the respondents referred to these inter-organizational interactions as collaboration, the authors of this thesis would argue that not all of the inter-organizational interactions the respondents referred to fulfill the criterion in the definition of collaboration.

5.2.3. Actors in Inter-Organizational Collaborative Arrangements

There are numerous actors involved in collaborative arrangements within the Swedish automotive industry. A number of these have been highlighted during this study and therefore analyzed further in the section below. However, focus are placed on suppliers as the respondents first and foremost referred to these. Several respondents referred to universities, suppliers, research institution and competitors. Both respondents at the OEM and the different suppliers referred to universities and research institutions as important sources for new technology and innovation. A respondent at the OEM argued

[151] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[152] Vice President, First tier supplier (2016). Interview 2016-03-04
[153] Senior Engineer, OEM (2016). Interview 2016-03-08

that these interactions almost exclusively was subsidized by the Swedish state[154]. Furthermore, the vice president of a first tier supplier also depicted these inter-organizational constellations, which often were externally funded. The respondent even stated that their organization had a full time employee working with applying and administering this process. Furthermore, one respondent stated that they also collaborated with competitors, but only if it is determined that they are not directly competing with each other. Furthermore, Un *et al*. (2010) stated that both suppliers and universities are important sources for innovation and provide organizations with long-term effects, while collaboration with competitors have a short-term negative effect on innovation. Clark (1989) also supports the relationship with suppliers as an important source for innovation in product development in the automotive industry.

The different types of actors highlighted of the respondents are supported in the literature, and important assets for generating innovations during NPD (e.g. Ili *et al*., 2010; Un *et al*., 2010). Furthermore, Ili *et al*. (2010) claimed that customers, competitors, supplier and lawmakers are important sources for generating new ideas and innovation. However, neither customers nor lawmakers were mention during the interviews. This could be explain by the focus on new product development during the interviews and thus regarded by the respondents as a non-collaborative arrangement. However, the respondents referred to collaboration with suppliers as the most common collaborative arrangement during NPD. Furthermore, it can be argued that this kind of collaborative arrangement is the most common as the OEM seldom develops a product all by themselves, and thus, reliant of interacting with suppliers. As suppliers was the external actor the respondents referred to most frequent, compared to e.g. research institutes and customers, the OEM-supplier relation will be analyzed in more depth in the coming sections.

To even further highlight why it is chosen to investigate the collaborative atmosphere between an OEM and a first tier suppliers and why suppliers is vital for today's car-manufacturers, a statement from the vice president at a first tier suppliers is analyzed. The respondent stated that they spent 20% of their research and development budget before they even become nominated for a development project. Furthermore, it was by the vice president stated that they invest this great amount of resources on research and development to increase their chances of winning the OEMs' bidding process. This makes the first tier supplier highly attractive as they can apply their highly developed skills, both through their collaboration with research institutes as well as their extensive experience with the sub system.

Furthermore, the vice president added that they had increased their number of engineers over the last decade. Mainly as more and more development responsibility rest on the suppliers. The respondent from the industry association also supported this. The respondent recalled to the period when US firms owned automotive manufacturers in Sweden. The competitive climate during this period became tougher and many small suppliers had to leave the automotive industry due to lower margins. Those who invested in expansion to supply a global customer base and provided more competitive solutions i.e. internal research and development activities, held a viable position in the

[154] Senior Engineer (D), OEM (2016). Interview 2016-04-19

automotive industry. This implies that OEMs, who are working with suppliers that are striving for being in the technology forefront, would have access to two long-term positive effects on innovation. Therefore, these suppliers are important to appreciate and should be seen as a long-term collaborative partner, and someone that mutually harvest the possible yield from the joint effort, which is suggested by Clark (1989).

With respect to geography and the approach towards supplier governance, it could be argued that the way in which different respondents have elaborated during the interview coincide with Binder and Clegg (2010). Binder and Clegg (2010) discuss around three different approaches to inter-organizational relationship governance within the global automotive industry. One is the *U.S. adversarial model*, which in general advocates a purchasing oriented approach towards the relationship, and thus, aligned with the industry association respondent's argument presented above. Another argumentation that supports that the respondents' discussion relates to the different governance models presented by Binder and Clegg (2010), was provided by the vice president of a first tier supplier. The vice president emphasized the intensive sharing of technological knowledge and joint efforts in developing product specifications for systems and components with critical supplier knowledge. This relates to the way R&D collaboration is suggested the European approach presented in Binder and Clegg's (2010) model for approaches toward inter-organizational relations. Furthermore, the vice president also elaborated upon the "pickpocketing" concerning sharing of cost information. The respondent argued that they puts great efforts in convincing OEMs of using their technical solution rather than their own, mainly as it results in less insights by the OEM into the cost structure for the technical solution. This approach is also suggested in the European approach towards inter-organizational R&D collaboration.

5.2.4. Dimensions of Collaboration in the Automotive Industry

During the interviews the respondents were asked to elaborate upon the five different dimensions of collaboration. This provides the report with a nuanced view of how professionals experience the collaborative atmosphere in the Swedish automotive industry. A selection of these answers are highlighted and analyzed in the section below. Initially, the structural dimensions of collaboration are analyzed, followed by the dimension of organizational autonomy, and finalized by analyzing the social dimension of collaboration.

5.2.4.1. Structural Dimension of Collaboration

In this section the respondents' answers concerning governance and administration during inter-organizational collaborations are analyzed. When the respondents were asked to elaborate upon governance they exclusively referred to contracts and agreements. In this regard, a respondent who was responsible for content acquisition at the OEM stated that *"... before any deeper interaction with an external actor take place, or rather, before we discuss anything, we sign a nondisclosure agreement"*[155]. The respondent also underlined that both parties in these arrangement are equally concerned of any information leak. In one way the response from the senior engineer coincide with Thomson and Perry's (2006) perception of the structural dimensions.

[155] Senior Engineer (B), OEM (2016). Interview 2016-03-11

However, the respondent's answer addresses contracts and agreements as a mean to foster trust. The same respondent stated that NDAs are a necessity for openness in a collaboration. This statement becomes contradictory as immediately after the NDA is signed openness could be argued to be hampered, as only the parties involved are allowed to discuss the issue at hand.

Furthermore, the respondents' answers to governance in collaboration could be argued to be from an outsourcing perspective and very purchasing oriented. This could be stated as one senior engineer at the OEM stated that *"... it would become devastating if a supplier achieved a unique position"*[156]. The purchasing oriented mindset of collaboration was exhibited in various occasions. For example, when the respondents at the OEM were asked if they had any common terminology for talking about suppliers, the respondents referred to the purchasing department as likely to have information about it. However, that purchasing should have a central role in inter-organizational relations is supported and encouraged in the literature, e.g. Van Weele (2014). Though it could be said that the cost/purchasing-oriented mindset might obscure the mutuality dimension of collaboration and foster an unfavorable condition for a collaborative atmosphere.

One senior engineer at the OEM argued that contracts ensure transparency and a consistent way of executing collaborations[157]. Furthermore, another senior engineer at the OEM stated that the contracts are a mean of controlling costs in collaborative arrangements[158]. Contracts also provide safety for the OEM and a senior engineer at the OEM compared these contracts with a prenup. If anything gets messed up, these contracts regulate the situation. In the same spirit, the respondent from the industry association stated that contracts and NDAs are used as OEMs are afraid of sharing information and reveal company secrets. These statements elucidate how the researchers experienced the overemphasis on the structural dimensions of collaboration. The overemphasis on contracts creates an adversarial atmosphere for collaboration as focus in the inter-organizational relation is placed on surveillance rather than creating a mutually beneficial collaboration. Which in the definition by Thomson and Perry (2006) is an important component in collaboration.

During a collaboration, there are several systems in place for tracking the progress and administer a project. Findings from the in-depth interviews show that both the supplier and the OEM refer to a system where they could upload the status of their progress. This system facilitates monitoring and administration of the collaborative process. In this project the suppliers uploaded information in a system at the OEM. The program manager at the supplier stated, *"I can log in on my computer and access the OEM's system and check the project status"*[159]. One respondent from another first tier supplier also indicated on they used IT management systems to monitor the progress of an inter-organizational projects[160]. For obvious reasons, a project need systems to monitor the

[156] Senior Engineer, OEM (2016). Interview 2016-02-29
[157] Senior Engineer, OEM (2016). Interview 2016-02-29
[158] Senior Engineer (A), OEM (2016). Interview 2016-03-11
[159] Program Manager, First tier supplier (2016). Interview 2016-03-16
[160] Vice President, First tier supplier (2016). Interview 2016-03-04

progress, especially if external parties are involved, as suggested by Van Weele (2014). Nevertheless, a well-functioning system for administration, planning and monitoring have higher functional demands when different organizations are involved. In the investigated case, there is clear evidence that these kinds of systems are in place. Having systems for administer an inter-organizational collaboration are congruent with Thomson *et al*. (2007) and Mattessich *et al*. (2001). Administrative mechanisms represent a mean for moving from governance to action and constitute one of the dimensions of collaboration.

The way the respondents described the structural dimensions of collaboration are consistent with Ostrom (1990), mainly as the respondents referred to governance as a mean for controlling elements of a collaboration. All respondents at the OEM referred to the purchasing department as responsible for contracts and the negotiating process, which is interesting. By entitling the purchasing department the mandate of regulating the interactive process of a collaboration, those involved in the actual collaborative arrangements are not the ones with the greatest influence in setting the scene. Thus, the most optimal conditions for collaboration to thrive are not achieved. Another interesting finding is that the contracts mentioned by the respondents are very focused on cost, safety for the OEM and the participating actors' responsibility. How this affect trust is another issue as trust is expressed in literature as a mean for decreasing the need for governance in a collaboration, and consistent with Stuart *et al*. (2012).

5.2.4.2. Organizational Autonomy

In this section is the respondents' answer for how they perceive organizational autonomy analyzed. During the interviews the respondents were asked to elaborate upon organizational autonomy and the respondents' answers ranged from residential engineering to freedom of action in a project. With residential engineering they referred to co-location during projects, which can be seen as a low degree of organizational autonomy. As co-location can lead to monitoring of progress and then be perceived as a lower degree of autonomy. One respondent from a first tier supplier elaborated upon this and stated; *"... it was common a decade ago, and nowadays it only occurs occasionally"*[161]*.* However, one could argue that residential engineering has a positive impact on collaboration, mainly as they would interact more frequently if they were co-located. Still this is not common nowadays, which could be a result of better means of communicating by video/phone conference and email. Though, one respondent elaborated on the advantages of physical meetings, and stated that physical meetings facilitates communication and the counterparts are not able to hide behind technology, i.e. pressing mute button during telephone conference. Furthermore, one could argue that physical meetings are a way of monitoring and govern the other party. A senior engineer who argued that physical meeting are a mean for ensuring satisfying quality levels also supports this[162]. Still, physical meetings have a positive impact on collaborations since it also facilitates personal relations, and coincide with Mattessich et al. (2001).

However, during some interviews the respondents brought their thoughts towards project discretion, which thus coincide with Cropper's (2009) description of organizational

[161] Vice President, First tier supplier (2016). Interview 2016-03-04

[162] Senior Engineer (A), OEM (2016). Interview 2016-03-11

autonomy. These respondents described the degree of organizational autonomy in inter-organizational collaborations as bounded to cost, time and technology. These three parameters were described as the guiding principles for what decisions that could be made without surfacing the issue in a larger forum. If a change would not impact any of the three parameters the change could be executed within the autonomous team, i.e. one of the engineers. Thus, time, cost and technology could be said to characterize the degree of power, which according to Cropper (2009) represents an autonomous organization's ability to influence, resist, or control the behavior of others in inter-organizational activities. Furthermore, this can be seen as a rule of the game, where managers make sure that no unexpected changes are made that could have a negative impact on the final product. Therefore some organizational autonomy occurs during a project, even though it is obvious that a successful development project need to follow some structure to secure a successful end result. In respect to organizational autonomy, the respondents stated that cultural differences had impact on how and where decisions are made. One respondent argued that decisions within US automotive industry, in contrast to Sweden, tend to be made higher up in the organizational hierarchy. This could be explained by the flat organizational structure in Swedish industries compared to US firms.

5.2.4.3. Social Dimension of Collaboration

As surfaced in the section where the respondents' first thoughts and general perception of collaboration were analyzed, the dimension of mutuality in collaboration was highlighted multiple times. When the vice president of a first tier supplier was asked to elaborate upon factors the respondent considered characterizing successful inter-organizational collaborations, the vice president stated *"... it is important that the parties in the collaborative activity becomes interdependent of each other"* [163]. The respondent argues that this does not always characterize relations the first tier supplier has with OEMs. The respondent stated that there are occasions where the OEM is treated as a king and the supplier is assumed to fall into line. In a recent report by Automotive Sweden it was also highlighted that the OEM researched in this master thesis many times are described as too dominant and non-reciprocal. In the report it was also argued that the OEM enters inter-organizational collaborations with a detailed idea of what they want to get out of the project, and other participants are assumed to adapt to the automotive manufacturer's agenda and purpose of the project (Automotive Sweden, 2012).

The reality portrayed in the recent report by Automotive Sweden is much likely to be true, and it is therefore interesting why the vice president saw their relation to the OEM as one of their most reciprocal OEM relations. However, the vice president's organization is in the forefront of research and development in its area, and therefore a valued asset for the OEM. As stated in the previous chapter the vice president's organization spends 20% of its R&D budget before they even have been nominated for a project. This, in relation to the statement by the respondent from the industry association, i.e. *"... the more the OEM values the supplier's expertise the more positive is the collaborative atmosphere becomes"*[164]. Thus, it could be argued that the OEM

[163] Vice President, First tier supplier (2016). Interview 2016-03-04

[164] Senior Project Engineer, Industry association (2016). Interviewed 2016-04-08

investigated in this report exhibits a dominant role when a supplier's service is not rare. This coincides with other findings in Automotive Sweden (2012). To further support that the mutuality dimension is varying another statement by the respondent from the industry association is highlighted. The respondent stated that the OEM had extended the timeframe for payment to 90 days and forces their supplier to decrease component prices if they prefer a shorter timeframe for payment to get paid faster. Thus, the mutuality dimension, and the collaborative atmosphere in the buyer supplier relation in the western Swedish automotive cluster are infected.

The discussion above is interesting, as multiple respondents have highlighted the dimension of mutuality and its importance in successful collaborations. The respondents have also stated that trust is a vital component for collaboration to thrive. While asking the respondents to elaborate upon what role trust play in inter-organizational collaborations, the majority of the respondents referred to openness. One respondent at the OEM exemplified the importance of openness, and thus trust, by portraying two different behaviors and how these impact project success. Even though openness is highlighted as the key ingredient for project success, the OEM could be said to construct trust and protect them by hiding behind contracts and NDAs. This was supported by a senior engineer at the OEM, and was read *"... trust does not play as important role in the buyer supplier relation, though, these relations are rather governed by contracts and agreements"*[165]. The respondent from the industry association also confirmed this behavior. The respondent stated that Swedish OEMs (including truck manufacturers) are afraid of sharing information and leaking secrets to an external actor.

Furthermore, the vice president of a first tier supplier stated that *"... the more open you are in a collaboration, the more you can influence each other"*[166], which also is supported by Cropper (2009). From this statement it could be argued that the respondent advocated a high degree of openness in a collaboration. Several other respondents also expressed this during the interviews. However, the reality might be different; one senior engineer at the OEM states: *"... during a phone conference you sometimes suspects that the receiver presses the 'mute-button' to discuss central and sensitive information with a colleague during the interview"*[167]. Furthermore, to this statement the respondent added, *"... by yourself you know others".* Thereby one could argue about how much they really trust each other and if contracts are a substitute for trust. The dominant behavior by the OEM is not unlikely to pervade the collaborative atmosphere in the region. Stated in the previous chapter, a senior engineer at the OEM described a scenario where an OEM (no longer in business) more or less stole an invention from a supplier by patenting the idea directly after the supplier had presented the product at the OEM's site. Even though, these actions refers to the past, behavior and trust takes time to build, this coincide with Stuart *et al.* (2012) as they state that trust is affected by history. Therefore, actions similar the example described above are likely to have had significant impact on trust and give an idea of past behavior in the industry. Even though an example of openness and the importance of trust is depicted in the previous chapter, contracts and cost are appreciated higher than mutuality and trust.

[165] Senior Engineer (B), OEM (2016). Interview 2016-03-11

[166] Vice President, First tier supplier (2016). Interview 2016-03-04

[167] Senior Engineer (A), OEM (2016). Interview 2016-03-11

5.2.5. Discussion

In this section the authors aim at further enlighten how the empirical findings and the subsequent analysis contribute to answer the overall purpose and RQs. The initial parts of both the empirical findings and analysis aimed at contributing to the question; *what characterizes inter-organizational collaborations between an OEM and external actors in the Swedish automotive industry?* Thus, the discussion provides the reader and the report with understanding for how the findings contribute to an extended base of knowledge in the field of inter-organizational collaborations. Inter-organizational collaboration as well as the term collaboration, have numerous definitions in literature, e.g. Huxham and Vangen, 2005; Thomson and Perry, 2006; Mattessich *et al*., 2001; Kaats and Opheij, 2014. Further on, this is also true for how practitioners within the Swedish automotive industry relate to inter-organizational collaborations. During an interview at the OEM a respondent stated that they never are satisfied with the word collaboration, instead practical implications are required to convey what the word and the activity implies.

Therefore, implications for collaborations differ from time to time and from case to case, and could thus explain why there is no consistency in the respondents' answers. Furthermore, Cropper *et al.* (2009) presented an extensive literature review in the topic of inter-organizational relations. In the review no less than 16 names for inter-organizational entities, including the term collaborations was presented. Further on, 14 words as descriptors, including both *collaborative* and *inter-organizational*, for inter-organizational entities was presented. Binder and Clegg (2010) presented a similar research. Therefore, it is reasonable to suggest a contingency approach to the concept and research of inter-organizational collaboration. Though, Thomson and Perry's (2006) definition is still deemed appropriate for distinguishing collaboration from, for instance, cooperation and coordination.

Furthermore, there are numerous reasons why a firm within the automotive industry collaborates outside their organizational boundaries. Though, during this research the main reason identified for why inter-organizational activities are undertaken, with respect to NPD, is lack of knowledge. Inter-organizational collaboration to acquire knowledge is found in Kaats and Opheij (2014) who compiled numerous reasons for why a firm collaborate with external actors based on; Camps *et al*. (2004); Contractor and Lorange (1988); Huxham and Vangen (2005); Child *et al*. (2005); and Cropper *et al*. (2008). Furthermore, consistency between the empirical findings and the literature for initiating inter-organizational collaborations were found in market development, cost advantages and knowledge development.

However, no respondent referred directly to external pressure as an incentive for initiating inter-organizational collaborations. However, one can expect that external pressure is a valid reason for collaborating with external actors, especially within the automotive industry. The reason why the respondents did not mention this can be due to the selection of respondents as well as the semi structured interviews. The findings also indicate on consistency with what Tidd *et al.* (2001) referred to as reasons for collaboration. They separated between technological, market and organizational reasons. Where technological reasons was the most central in the response from the

interviews. This includes; make or buy and access of other organizations core competencies.

During the interviews the respondents were asked to elaborate upon different actors likely to participate in inter-organizational collaborations. The respondents referred to suppliers, research institutions, universities, and competitors as possible collaborative participants in the Swedish automotive industry. These actors coincide with the actors suggested in the literature and represents external actors that are likely to participate during an inter-organizational collaboration (Un *et al.,* 2010; Clark, 1989; Ili *et al.,* 2010; Huizingh, 2011; van Weele, 2014). Suppliers and universities provide organizations with long-term positive effects on innovation, which also could act as an incentive for inter-organizational collaborations to be undertaken (Un *et al*. 2010). Van Echtelt (2004) stated that collaboration with suppliers have various positive benefits, e.g. improved quality, reduced cost and reduced development time. Interesting to note is that collaboration with competitors provides a short-term negative effect on innovation (Un *et al.* 2010).

With regard to the five dimensions of a collaboration, the respondents referred to all five, mainly since the questions during the interviews was focused on finding contrast in how the respondents view the process of collaboration. Thomson (2001) developed this conceptual framework in an attempt to fill out the black box of collaboration that was addressed by Wood and Gray (1991). In later studies, Thomson and Perry (2006) stated that instead of seeking the highest level for each dimension, organizations should strive to have a balance in between the five dimensions. If the collaboration is unbalanced in between the five dimensions, it is an issue for reciprocal modification and renegotiation. It can be argued that the respondents' answers to the question of their first thoughts mainly were focused on the social dimension of collaborations. Which is interesting as these are the factors that distinguish collaboration from lower levels of inter-organizational relations (Järrehult, 2011; Mattessich *et al*., 2001). Furthermore, Cropper's *et al.* (2009) interpretation supports this view of collaboration as they distinguished *collaboration* from other inter-organizational relations, mainly as it is based on mutual interest.

By overemphasizing one dimension it could be argued that the collaborative environment is unfavorable, thus unbalanced. However, as suggested by Spekman and Carraway (2006), good words and intentions might not reflect the reality. In the Swedish automotive industry, it is rather the overemphasis on the structural dimension that negatively impacts the collaborative environment. During interviews with employees from the OEM, the respondents constantly referred to the purchasing department for initiating collaborations. These findings are especially interesting, as the purchasing department does not have a central role in the actual collaboration. However, various literature in the field of operation and supply chain management advocates a central role of the purchasing department, e.g. Slack and Lewin, 2011; van Weele, 2014. Though, it could be argued that this should not be pursued when the inter-organizational interaction concern strategically important products. The impact of the structural dimension on the social dimensions are not well known, however one can assume that the social dimensions suffer from strict structural dimensions. However, the impact of social dimensions on structural dimension is more known. Stuart *et al*. (2012) state that high-

level trust can be a substitute for contracts and decrease the cost of governance mechanisms.

5.3. Inter-Organizational Collaboration during NPD

By having analyzed and discussed what inter-organizational collaboration means, both in relation to theory as well as in the context of the Swedish automotive industry, this section aims at describing under what conditions collaboration occur during NPD in the Swedish automotive industry. In the first part of this section the relation between an OEM and first tier suppliers analyzed, thereafter, the process of collaborating between an OEM and a first tier supplier with development responsibility is analyzed. Finally, this section is concluded with a discussion.

5.3.1. Inter-Organizational Collaboration during NPD

During interviews with respondents in different positions within the value-chain in the Swedish automotive industry, various answers for how they defined inter-organizational collaboration and whom they collaborated with during NPD were depicted. Though, the centrality in the respondents' answers, with respect to inter-organizational collaboration, could be argued to originate in literature on purchasing and supply strategy, and the issue of outsourcing to suppliers. Furthermore, it could be argued that the essence of the respondents' answers reflected the strategic characteristics of the outsourcing process, which is reflected in van Weele (2014). The reason for why a single component is outsourced has not been within the scope of this study, but a component's characteristics have great influence on the inter-organizational relationship with an external supplier. The focal firm's competence relative suppliers and the strategic importance of the product are the determining factors in van Weele's (2014) outsourcing matrix for determining the nature of an outsourcing decision. The respondent who gave the most detailed input to the authors' understanding of the supplier's role in the OEM's NPD process was working in the seat department. Therefore, the seat's characteristics combined with the findings from the in-depth interviews have had great influence over the following analysis.

The senior engineer stated that the seat is of great importance for the OEM as it has great influence on the user experience. Furthermore, it could also be argued that the seat department's level of competitiveness (relative suppliers) is low, which could be argued as the OEM have chosen to outsource the development of the seat to suppliers. But also as two respondents at the OEM explicitly stated that the seat-supplier had tacit knowledge for the activity, which the OEM is dependent upon. Van Weele (2014) also supports. When a component is of strategic importance and the competitiveness (relative to suppliers) is low, the component is suitable to outsource. Though, under these specific conditions the focal company is advised to seek and exploit opportunities through long-term collaborative arrangements in alliances, joint ventures, licensing, and etcetera. The respondents interviewed during this study did not state any, or had any knowledge of the specific name of the arrangement they had with a supplier.

However, when the question was surfaced during the interviews, respondents at the OEM referred to the purchasing department as likely to have information about

definitions of different arrangements. Though, no respondents were from the purchasing or procurement department at the OEM. However, the vice president at one of the first tier suppliers interviewed, who had 30 years' experience within the automotive industry, did not highlight or refer to any specific form of inter-organizational arrangements. Though, the vice president stated that their organization used the time-aspect of how early they were involved in the OEM's NPD process as a differentiating factor between inter-organizational forms of collaboration i.e. the earlier the more collaborative. This way of distinguishing between suppliers and different forms of inter-organizational collaboration was supported by both respondents at the OEM as well as at the first tier suppliers. The respondents referred to and distinguished between suppliers with development responsibility and/or production responsibility.

Furthermore, it could be argued that the respondents' anecdotes to what was called 'the supplier nomination process', gave even more substance to the argument of an outsourcing-oriented standpoint in the respondents' answers. The supplier nomination process assimilates the first two phases in Momme and Hvolby's (2002) four-phase strategic outsourcing model. Thus, much of the answers could be argued to relate to the issue of outsourcing. However, to guide the reader and to focus the analysis an illustrative picture of the authors' interpretation of the empirical findings has been constructed, see figure 13 below. The intention of the figure is to give the reader an idea of how and when external actors are included in the OEM's NPD process. The main focus in the remainder of the report will be on the characteristics of development and production responsibility. Though, before these different forms of inter-organizational arrangements are described in further detail, the basic elements of the supplier nomination process will be analyzed.

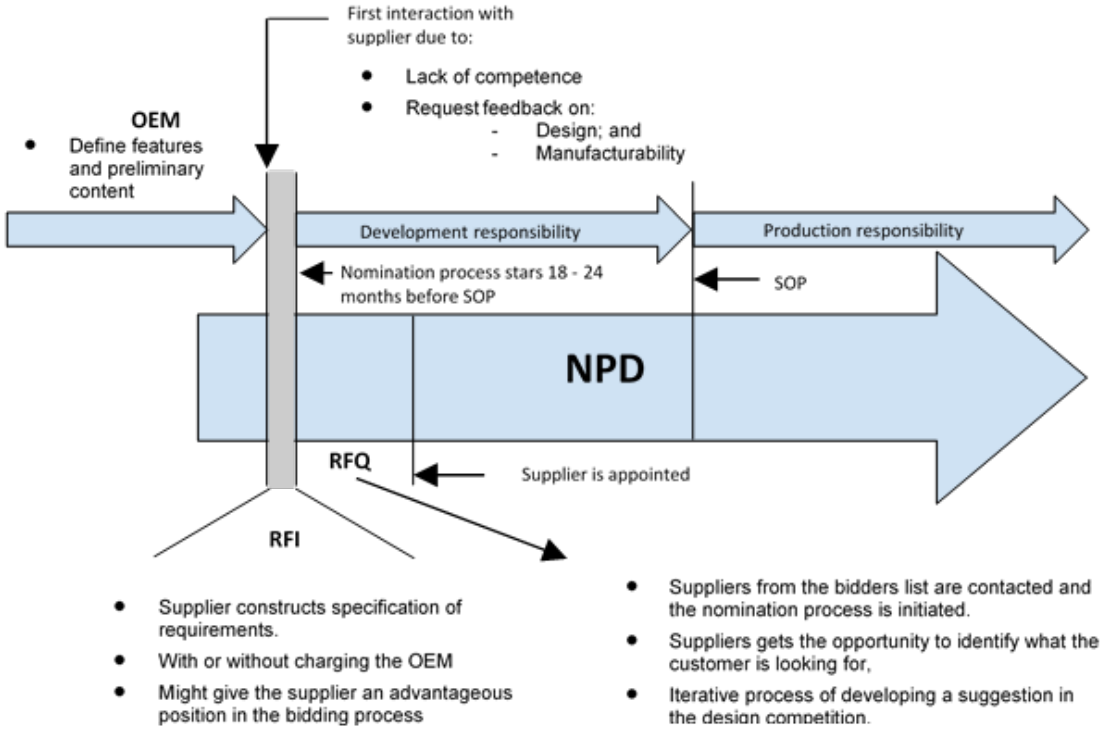


Figure 13 Illustration of inter-organizational interactions during NPD

5.3.1.1. Supplier Nomination Process

It was by a senior engineer at the OEM stated that when a NPD project is initiated, it will not take long before the OEM becomes dependent of input from suppliers. At this very first interaction, input concerns design and technology questions. Thus, it could be argued that there exist interdependence between the OEM and suppliers with development responsibility. Further on, the first inter-organizational interaction during the NPD process refers to the RFI procedure. The selection of a supplier for the RFI procedure is not as comprehending as the selection of supplier for development responsibility. Instead the selection of supplier for the RFI procedure is based on expertise and to some extent convenience. Respondents from both the OEM and the first tier suppliers stated that the supplier either can get paid or not get paid during the RFI-process.

Without hesitating, this move can be said to have great negative impact on an inter-organizational collaborative arrangement. Knowing that there is a possibility of not getting paid, and that your volunteer efforts only might give you an advantageous position in the bidding process, the dimension of trust and reciprocity gets undermined. Van Weele (2014) also supports this argument. Thomson *et al.* (2007) stated that one party initially might be willing to carry a larger cost, as they believe that it will even out in the end. However, volunteer work during the RFI process does not withstand this argument as the OEM take excessive advantage over the situation. Thus, it could be argued that this creates unbalance between the dimensions of collaboration and negatively impacts the subsequent collaborative activity. Neither the dimension of mutuality thrives under these conditions, especially with respect to Clark (1989) who argue that collaborative undertakings with suppliers need to be mutually beneficial.

Furthermore, when the OEM considers the supplier's efforts of constructing the specifications sufficiently detailed a final discussion with the purchasing department take place. Thereafter, approximately 5 suppliers are nominated for participating in the bidding process. During the bidding process the suppliers compete to offer the OEM the most price competitive and innovative solution after their requirements. In the bidding process the suppliers work extremely hard according to a senior engineer at the OEM[168]. All honor to that, though, the respondent also stated that this outstanding effort and devotion to the obligation are unfortunately not the reality during project execution. However, this behavior could be argued to indicate that the OEM and the supplier does not share the same agenda. Furthermore, the scenario described above could be argued to assimilate the tension between self-interest and collective-interest described by Thomson and Perry (2006).

Wood and Gray (1991) stated that collective-interest refers to the willingness of pursuing collective goals, which assimilates the appearance of the relation between the two organizations during the RFQ procedure. The interaction during the RFQ procedure between the OEM and a first tier suppliers share traits of collaboration was also stated by the vice president at a first tier supplier. The vice president referred to the nomination phase as highly interactive and collaborative. Self-interest, on the other hand, refers to

[168] Senior Engineer (C), OEM (2016). Interview 2016-04-19

achieving separate organizational goals and maintaining the organization's identity from the inter-organizational arrangement. With respect to self-interest, the senior engineer who stated that dedication decreased when the RFQ procedure was over, said that there is occasions during the NPD process where the supplier could be obstinate. The respondent stated that when a supplier experienced that they have been badly and unfairly treated during the bidding process, a request from the OEM on a smaller change in the specification could be refused by the supplier as a response to the initial treatment. In the section above, the nomination and selection of suppliers have been analyzed to highlight the purchasing and outsourcing oriented standpoint in the respondents' answers. In the next section are distinctions between two different relations to suppliers during NPD depicted.

5.3.1.2. Production versus Development Responsibility

As mentioned above, a product or component's characteristics are vital determinants for how a company should address strategic decisions, e.g. develop in-house or not, produce in-house or not. These decisions have direct impact on the relation with external suppliers and at what point in time they are included in the NPD process, i.e. late involvement if development responsibility is kept in-house and vice versa. However, as the reason behind single outsourcing decisions has been left out of scope, strategic aspects of outsourcing decisions are disregarded. Instead, focus in the subsequent part of the analysis is placed on to what extent development and production responsibility exhibit the traits of collaboration. Henceforth, two contrasting categories of suppliers were identified during the interviews. These were referred to by the respondents as suppliers with production and/or development responsibility. Production responsibility is referred to as outsourced production of a component or a system to a supplier, whereas development responsibility refers to outsourcing of R&D activities to a supplier. To describe the differences from a theoretical perspective, the two categories of suppliers are depicted in figure 14 below.

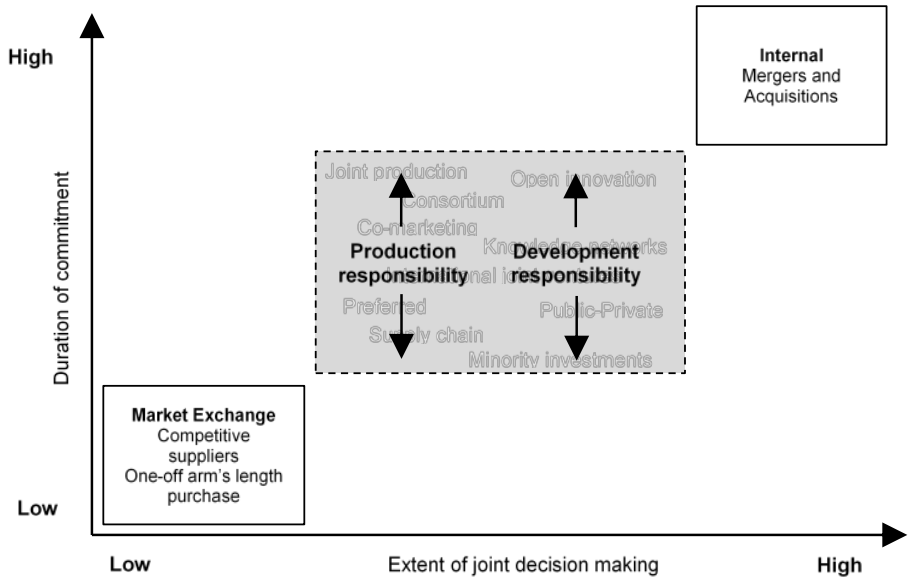


Figure 14 Product and development responsibility (adapted from Kaats and Opheij, 2014)

With respect to the duration of commitment, production and development responsibility could be argued to last in equal length time. The two categories of suppliers have therefore been given the same value on the vertical axis. However, the duration of an inter-organizational relation to a supplier with development responsibility is in figure 13 stated to be 18 - 24 months, whereas the other relation is unspecified. However, even though time is a vital component in relation to trust, and thus, central in the definition of this report, it has not been in focus and elaborated upon in any further extent. Therefore, two black vertical arrows indicates that the two categories' vertical positions are not fixed. Further on, in their original figure Kaats and Opheij (2014) argued that the inter-organizational interaction during *open innovation* efforts was long lasting, whereas relations with *preferred suppliers* was said to be rather short. Therefore, it is reasonable to suppose that development and production responsibility are found somewhere in between them.

Furthermore, it is interesting to analyze the two categories of suppliers based on the degree of joint decision-making. This element of collaboration coincides with the dimension of organizational autonomy, as suggested in Thomson and Perry's (2006) definition of collaboration. When depicted in Kaats and Opheij's (2014) illustrative model, it could be argued that the two categories differ in terms of joint decision-making. The most obvious reason for why this statement is done can be explained in figure 13 above, where inter-organizational interactions during NPD are depicted. With respect to NPD it is illustrated how suppliers with development responsibility gets involved in a much earlier stage than suppliers with production responsibility. However, it could be argued that actors of importance in the later stages of the value chain also participate in the early phases of the NPD process, i.e. concurrent engineering, as suggested by Wheelwright and Clark (1992). Though, this is not likely the case as a senior production engineer at a first tier supplier with production responsibility stated; *"... we have no, or vague, interaction with the OEM in the early phases of the NPD process"*[169].

Furthermore, the low degree of joint decision-making during the relation to a supplier with production responsibility could also be said to be supported by Kaats and Opheij (2014). The authors stated that inter-organizational relations to both preferred suppliers and different actors in the supply chain involves lower degree of joint decision-making than, for instance, relations during open innovation efforts. Furthermore, the authors' interpretation of the OEM's inclusion of external actors with development responsibility could be argued to retell and assimilate Gassmann and Enkel's (2004) description of the outside-in process of open innovation. Thus, it is reasonable to claim that the relation to suppliers with development responsibility involves a higher degree of joint decision-making. Furthermore, the argument that the relation to suppliers with development responsibility involves a higher degree of joint decision-making only as it assimilates open innovation efforts, is not the only reason. Various respondents emphasized the importance of interaction with suppliers early in the NPD process, not at least the senior engineer who stated; *"... very early in the NPD process we need input from suppliers on design and manufacturability"*[170].

[169] Senior Production Engineer, First tier supplier (2016). Interview 2016-03-18

[170] Senior Engineer, OEM (2016). Interview 2016-06-08

To summarize, the distinction between development and production responsibility depicted in Kaats and Opheij's (2014) figure of inter-organizational relations (figure 14), indicates that the relation to a supplier with development responsibility is more towards the hierarchically end on the spectrum of alliances. The relation to a supplier with production responsibility, on the other hand, is found on the opposite end of the spectra, and thus, more market transaction oriented. Based on this argumentation, Lorange and Roos (1992) suggestion for how a strategic alliance could be analyzed and described based on its degree of vertical integration will be depict below. Lorange and Roos (1992) defined a strategic alliance as any venture on a scale between pure market transactions to internal hierarchical structures, see figure 15 below. This conceptualization of different inter-organizational arrangements could be adapted to elaborate upon the inter-organizational arrangements of production and development responsibility and further illustrate how the traits of collaboration differ between them.

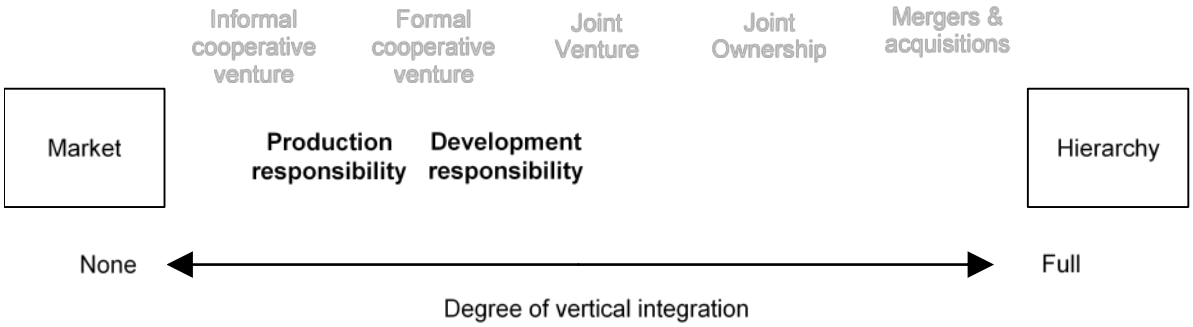


Figure 15 Collaborative arrangements based on the degree of vertical integration (adapted from Lorange and Roos, 1992)

Hence, it can be argued that both the relation to a supplier with production responsibility and the relation to a supplier with development responsibility are present on the left side of the continuum, i.e. between joint ventures and market transactions (see figure 15 above). This statement is valid as neither of the inter-organizational arrangements implies equity ownership of the supplier. Furthermore, it can be argued that the relation to a supplier with production responsibility is present closer to market transaction mainly as less interaction with the OEM takes place. The degree of interaction between an OEM and a first tier supplier with production responsibility was described by the vice president of a first tier supplier, and was read *"... the interaction does not occur as early as when we are offered development responsibility"*[171]. By stating that the inter-organizational arrangement between an OEM and a supplier with production responsibility rather assimilates the inter-organizational interaction during a pure market transaction, the dimensions of social capital are obscured. Mutuality and trust are in Thomson and Perry's (2006) definition of collaboration emphasized as fundamental for an interaction to fulfill the definition of collaboration. Thus, it could be argued that the relation to a supplier with production responsibility does not fulfill the definition of collaboration in the same extent as the relation to a supplier with development responsibility.

Further on, Powell (1990) underlined that price represents an important ingredient of the information during market transactions. To this a respondent added *"... price and*

[171] Vice President, First tier supplier (2016). Interview 2016-03-04

bargaining are for the OEM of utmost importance while production responsibility are negotiated"[172]. The same respondent stated that they try to avoid pure production responsibility as it implies less organizational autonomy and lower margins. Thus, power distribution and mutuality could be said to be uneven. Furthermore, price and bargaining were also given great attention when the respondents elaborated upon development responsibility. Not at least as numerous respondents were unaware and referred to the purchasing department to get further details of the relationship, i.e. the purchasing department was central in the respondents' answers.

However, one could argue that development responsibility is less price driven than production responsibility. Mainly as this relation could be seen as more even in terms of power distribution, and thus, focus is relocated from price and instead focused on the dimension mutuality. The respondent from the industry association added to this consideration and stated that *"... an OEM and a supplier with development responsibility becomes interdependent of each other's technical expertise",* and thus, it could be said that the activity includes a higher degree of mutuality. The responded also added that the higher the OEM values the supplier's expertise the better the collaborative atmosphere. The argumentation above coincides with Thomson and Perry (2006) as the authors argued that mutuality has its roots in interdependence. Furthermore, comprehensive technical expertise give a supplier increased power, thus, the suppliers enhance its ability to influence and access decisions in the collaborative activity, as supported by Cropper (2009).

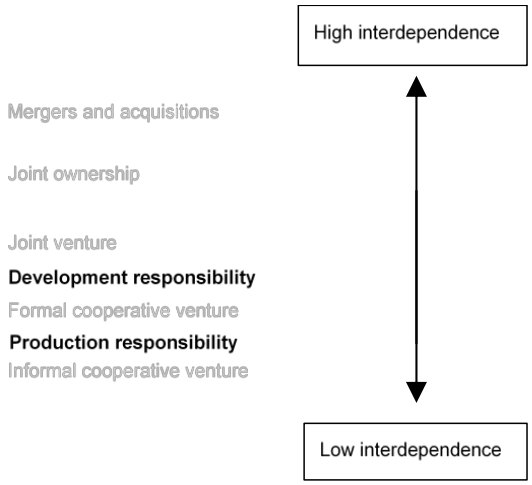


Figure 16 Inter-organizational arrangements based on interdependence (adapted from Lorange and Roos, 1992)

The two different OEM-supplier relations during NPD are depicted in figure 16 above, as Lorange and Roos (1992) suggested that the degree of interdependence could be used to distinguishing in between different forms of inter-organizational arrangements. Furthermore, one could argue that both the relation between an OEM and a supplier with development responsibility and the relation between an OEM and a supplier with production responsibility can be described as formal ventures. To this conceptualization a statement by a senior engineer can be added *"... the interaction with suppliers is well*

[172] Vice President, First tier supplier (2016). Interview 2016-03-04

defined and executed in a formal manner"[173]. Furthermore, the two different relations do not reach as high interdependence as joint ventures as there is no equity ownership. Moreover, with respect to interdependence, and hence mutuality, Thomson and Perry (2006) stated that there has to be mutuality in information sharing and gains.

Thus, by comparing the two different organizational arrangements, one can argue that there are higher levels of information sharing and gains in the relation between an OEM and a supplier with development responsibility. However, when comparing the degree of interdependence, i.e. how dependent each party are of the other's business (in both of the relations), it could be argued that they are almost equally dependent of each other. This is argued mainly as the OEM and the suppliers investigated during this study are located close to each other, and thus, enables short, unplanned meetings, and especially the possibility adopt production philosophies such as *just-in-time.* The inter-organizational relations between an OEM and a supplier with development responsibility, as well as the relation between an OEM and a supplier with production responsibility are depicted in figure 17 below. The two different forms of inter-organizational arrangements are depicted based on both the degree of interdependence and degree of vertical integration. In this figure the estimated position of production and development responsibility is illustrated.

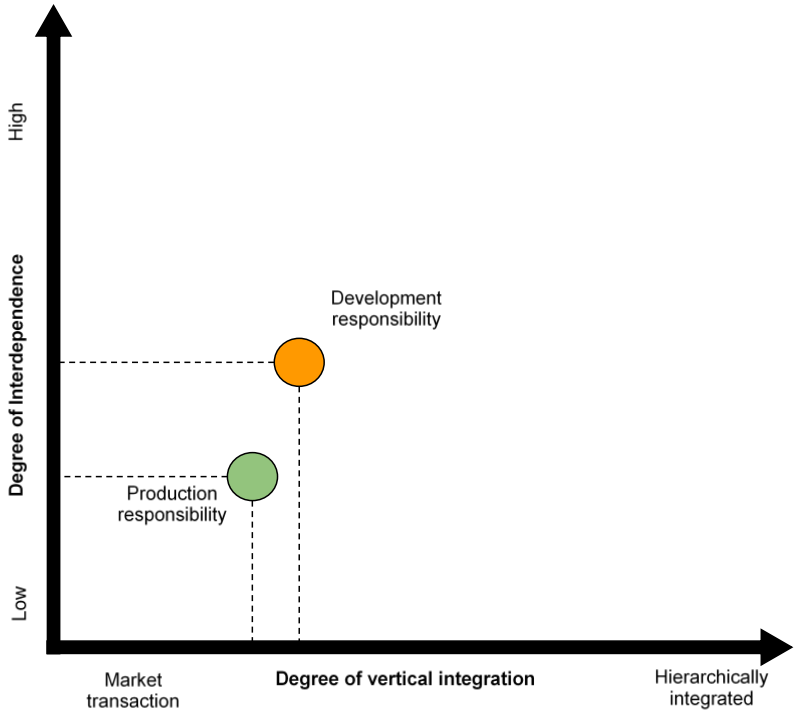


Figure 17 Illustration of two forms of inter-organizational arrangements during NPD (based on Lorange and Roos, 1992)

Trust represents an important ingredient of a collaborative arrangement. With respect to both the relation to a supplier with development responsibility and the relation to a supplier with production responsibility, the governmental dimension of collaboration could be said to obscure the dimension of trust. The belief that the other party acted in good faith was emphasized as fundamental in Cummings and Bromiley (1996) definition of trust. Though, the respondent from the industry association argued that Swedish

[173] Senior Engineer, OEM (2016). Interview 2016-02-29

OEMs are afraid of sharing information, and therefore initiate all collaborative activities by signing NDAs. Both of the two different relations could be argued to not fulfilling the definition of inter-organizational collaboration. This is stated as it coincides with Cropper (2009), who argued that trust and power can be seen as substitutes for governance, though, the Swedish automotive industry exhibits the contrary, i.e. governance foster trust. Nevertheless, the relation to a supplier with production responsibility could be argued to assimilate the definition of cooperation, i.e. a formal relationship where understanding of compatible missions, mechanisms such as planning, communications channels and division of roles are needed (Mattessich *et al*., 2001). Furthermore, as the relation to a supplier with development responsibility could be argued to better assimilates the definition of collaboration, the final part of the analysis concerns an analysis of the five different dimensions of collaboration during a NPD project.

5.3.2. Dimensions of Collaboration in NPD

The case investigated during this research concerned the relation between an OEM and a first tier supplier within the Swedish automotive industry during a NPD project. The supplier in the case investigation had both development and production responsibility of the new generation of seats. Though, focus in this section is to describe a relationship that has and exhibit the conditions to be defined as an inter-organizational collaboration. The relation between the OEM and the supplier has been analyzed based on the five dimensions of collaboration, as suggested by Thomson and Perry (2006). The framework provides a systematic approach for understanding the meaning and measurement of a collaborative process.

5.3.2.1. Structural Dimension

During the in-depth interviews the respondents were asked to relate to the governance and administrative dimensions of collaboration while they recalled to the seat project. The respondents related to the process of negotiating contracts, contracts and meetings as the main mechanisms for governance during the seat project. During the contract negotiation process the parties involved negotiates terms and conditions of the collaboration. With respect to contracts, an interesting consideration was added by one respondent from the OEM working as project manager for the seat project; *"... the supplier is more innovative and keener to satisfy our need before they sign a contract"*[174]*.* However, it could be argued that there is a possibility that suppliers exaggerate and promises more than they are capable of delivering, with respect to quality standards. Then, this could be troublesome as a senior engineer stated that; *"... we do not include new technologies in our products that are not fully tested, since they might cause problems later on".* Even though this initial dedication is present, the same satisfactory attitude is not present during the project execution. An explanation for this could be the common theme and central issue of cost that has been elucidated during the interviews at the OEM. One can expect that the suppliers are not willing to go the extra mile, since the OEM is reducing the profit margin for their suppliers. Basically, it would not be economically justifiable for a supplier to put in more effort than agreed.

[174] Senior Engineer (C), OEM (2016). Interview 2016-04-19

However, the respondents' view of governance coincides with what Ostrom (1990) refer to as the structural dimension, including roles, responsibility and costs. Even though they put a large emphasis on contracts during the interviews, one respondent also referred to meetings as the best and most efficient way of governing a collaboration. Furthermore, with regard to contract as a governance mechanism on organizational level, one could argue that contracts hamper the collaboration on a higher organizational level, but still, the collaborative climate on the operational level seem to thrive. This is interesting as a respondent[175] added that contracts affected the collaborative environment, and the mood can be bad in the beginning of the collaboration if the supplier feel that they have been treated unfairly during the negotiation phase. The respondent also added that this only is temporary on the operational level, since everyone want to achieve a good end result of the project. Furthermore, both the respondents from the OEM and the supplier expressed that they experienced a good collaboration during the seat project.

The respondents also referred to the administrative dimension in the same way as the literature. Thomson and Perry (2006) stated that administration takes the collaboration from governance to action, and the mechanism that administered the seat project was mostly referred to as a system for govern the progress of the project. The structural dimensions were the two dimensions that were given the greatest attention during the in-depth interviews. It could be argued that this was the case as the structural dimensions always is present in inter-organizational interactions and relations, and thus, easy to relate to.

5.3.2.2. Dimension of Organizational Autonomy

The respondents from the in-depth interviews referred to cost, time and technique as governance of organizational autonomy. However it is rather obvious that there is a struggle between organizational autonomy and at the same time ensure a successful project. Even though one could argue that the simple rule of *if no impact on time, 'cost or technique, the individuals are free to act as they please'*, could ensure maximum organizational autonomy and at the same time ensure a successful project. This can also be described as a mechanism for power, as Cropper (2009) argues that power describes an autonomous organization's ability to influence, resist, or control the behavior of others in inter-organizational activities. Furthermore, one respondent from the OEM also added "... *the OEM always have the last saying in a matter"*, still the respondent also added that they do not want to control too much, since then they would not benefit from outsourcing. However, one could argue that the OEM set the scene and as they see themselves as the customer as well as initiator, and therefore possess more power. One could argue that the power is unbalanced with favor to the OEM; still, during the project one could expect that the degree of organizational autonomy is rather high since the OEM does not want to control everything.

[175] Senior Engineer (C), OEM (2016). Interview 2016-04-19

5.3.2.3. Dimension of Social Capital

Openness was expressed as an important component of a successful collaboration from several respondents. One of the project managers for the seat project[176] referred to openness as a supplier coming forward with issues and do not hide a problem until it is too late. However one could argue that openness is closely related to trust, as if you trust someone you tend to be more honest. This coincides with another statement, as one respondent[177] at the OEM argued that suppliers with history of working with the OEM have an advantage, since they know how to act. Further on, one could argue that this also relates to trust, as Stuart *et al*. (2012) stated that history have impact on the degree of trust in a buyer-supplier relation. Furthermore, mutuality is closely related to interdependence and as a respondent from the OEM stated about the seat-supplier *"... we are rather dependent on this supplier, since they are the only one in our surroundings with that competence"*[178]. Further on, this would indicate on a rather high degree of mutuality between the OEM and the supplier, as they are mutually dependent on each other's business. However, one could argue if that is reflected in reality, as the OEM often takes a dominant role towards their suppliers. Furthermore, trust and mutuality are important elements in a collaboration. Stuart *et al.* (2012) and Cropper *et al.* (2009) support this as trust can act as a substitute for governance. Since there is much emphasis on governance in all levels of the inter-organizational collaboration, it would be interesting to view what the effect of increased emphasis on trust between organizational boundaries would have on a collaboration.

5.3.3. Discussion

In this section the authors aim at further enlighten how the empirical findings and the subsequent analysis contribute to answer the overall purpose and RQs. The later parts in both the empirical findings and analysis aimed at contributing to the question; *how do an OEM and a first tier supplier collaborate during NPD within the Swedish automotive industry?* While the initial sections aimed at clarifying what characterizes inter-organizational collaboration, and thus, answering the first RQ. From this point of departure the authors attempted to identify what collaborative activities implies during NPD. As a first call, the respondents were asked to describe how they title different inter-organizational collaborations during NPD. These answers narrated much of the confusion around the topic of inter-organizational relations, which also is supported in Sydow *et al.* (2015) and Cropper *et al.* (2009). The respondents sporadically used terms such as *consortiums, alliances, partnerships, etc.* Though, the respondents could not develop these any further or what collaboration implies in relation to them. Even though some respondents elaborated upon these and gave a glance of what they might include, no consistency between the respondents' answers was possible to identify.

However, the wide base of respondents could explain why the respondents' answers were so diverse, i.e. from vice president to senior production engineer. This could thus imply that some respondents did not have sufficient knowledge in the field. On the other hand, it could be argued that the authors could have counteracted this. Though, the

[176] Senior Engineer, OEM (2016). Interview 2016-03-08

[177] Senior Engineer (C), OEM (2016). Interview 2016-04-19

[178] Senior Engineer (C), OEM (2016). Interview 2016-04-19

authors struggled to get the 11 interviews that were conducted during this study, so it was no cherry picking in terms of respondents. Another possible source of error could be the authors' gradual knowledge-development in the topic. The first interview was conducted five weeks into the master thesis work, and the knowledge difference until today is substantial. As underlined of, for instance, Binder and Clegg (2010), the topic of inter-organizational relations have been studied from multiple angles. Thus, the authors have examined a multitude of concepts before arriving to the current state of knowledge.

Even though the respondents struggled to depict different forms of inter-organizational collaborative arrangements during NPD, the respondents had a common way of distinguishing between different suppliers. As stated by Cropper *et al.* (2009), the respondents elaborated upon different forms of inter-organizational arrangements rather than the actual relationship between the actors. Thus, the authors of this report struggled to answers the RQ of *how* they collaborate as they could not say *where* or in *what* appearance their relation resemble a collaboration during NPD. However, the way in which the respondents distinguished between different suppliers was in between suppliers with development responsibility or production responsibility. From this finding, based on previous work by Lorange and Roos (1992) and Thomson and Perry (2006), the authors have analyzed to what extent the relation to a supplier with development or production responsibility narrates an inter-organizational collaboration. In the analysis it has been argued that the relation between an OEM and a supplier with development responsibility exhibit characteristics to accommodate a rather good collaborative atmosphere. However, it cannot be rejected that the relation between an OEM and a supplier with production responsibility does not imply a collaborative interaction.

The clarity and consistency in between the respondents' answers, as well as its congruence to literature, e.g. van Weele (2014), makes the authors confident of distinguishing in between the two different types of suppliers. However, it is possible to argue that there are multiple other actors present in inter-organizational collaborations during NPD, though, as presented in the introduction of this report, the relation between an OEM and system supplier has been in focus. Henceforth, as it could be argued that the relationship to a supplier with development responsibility exhibits the characteristics of an inter-organizational collaboration, the purpose and aim of the second RQ could be investigated in further detail, i.e. how they collaborate. The inter-organizational arrangement between an OEM and a supplier with development responsibility occur early in the NPD process, which also is supported by van Weele (2014). It has been identified that an OEM has to involve and collaborate with its suppliers early as they need consultancy to construct the product specification, which by Kaats and Opheij (2014) has been stated as motives for initiating a collaboration. The subsequent part of the collaboration concerns a process where the OEM and the supplier develop the product after specification. These points of interaction are visualized in a previous section. In general, it could be argued that the relation between an OEM and its suppliers within the Swedish automotive industry correspond to how R&D collaborations are described in the European partnership model. Collaboration refers to *joint production specification for parts with critical supplier expertise, emphasis on problem driven communication,* and *intensive sharing of technology know how but less sharing of cost information* (Binder and Clegg, 2010).

To further discuss how the collaboration between an OEM and a supplier are shaped, the five dimensions of collaboration in relation to the seat project are discussed below. During the seat project, large emphasis was put on governance mechanisms such as contracts and meetings. This coincides with what Ostrom (1990) referred to as structural dimension. Contracts are an important part of the collaboration as it enables the involved parties to agree and achieve mutual goals as well as ensure that the involved parties fulfill their obligations (Blomqvist *et al.* 2005). Furthermore, meetings also function as a way of controlling the collaboration and ensure a progress in the right direction, as one respondent referred to meetings as the most important governance mechanism on operational level. Furthermore, administrative systems to govern the progress are also in place as suggested by van Weele (2014). The essence of the dimension of organizational autonomy was during the study boiled down to impact on cost, technology and time. These factors were described as setting the boundaries for the degree of discretion; it can also be argued that these three factors are institutionalized to govern project progress. In some extent these factors corresponds to how Cropper *et al.* (2009) described power as an autonom organization's ability to influence others in an inter-organizational relation. By having this policy, that the project is entitled to make decisions if the factors are not affected, the phenomena of collaborative inertia could be reduced. The project participants can act and make the calls to carry out the project in an efficient manner. Huxham (1996) referred to the phenomena of collaborative inertia as paralysis in the inter-organizational relation.

Furthermore, several respondents expressed openness as a success factor of inter-organizational collaboration. However, openness was referred to as the other party revealing problems and not having a hidden agenda. Thus, close related to ensuring that the project delivers to the set specifications and avoid time-consuming changes of the product. One could argue that the level of trust in the collaboration affects openness. Since a high degree of trust would ensure that individuals are more likely to come forward with problems, and thus, perceived as more open. Furthermore, the degree of trust is difficult to evaluate in this collaboration, as no observation of the actual collaboration have been possible. Still, the degree of trust between the OEM and the first-tier supplier can be perceived as rather high as the two parties have a history of working together. This coincides with Stuart *et al*. (2012), as they state that trust is affected by the history in buyer-supplier relationships. However, the overall degree of trust in the collaboration is not possible to evaluate, since the complete history of the relation between the OEM and the supplier was not investigated.

6. Conclusion and Future Research

The aim of this chapter is to present the conclusion of the study. Initially, the answers to the two research questions will be presented. Thereafter are managerial implications and areas possible for future research presented.

6.1. Conclusion

The aim of this study was to investigate what inter-organizational collaboration means and analyze the collaborative environment between OEMs and external actors within the Swedish automotive industry. Therefore, the following questions were constructed to answer the purpose;

> *RQ1: What characterizes inter-organizational collaborations between an OEM and external actors in the Swedish automotive industry?*

There is no common definition of inter-organizational collaboration within the Swedish automotive industry; how practitioners define collaboration depends on the situation and the context. However, the importance of mutuality in inter-organizational collaborations was recurring and frequently highlighted in the respondents' answers. With respect to contextual factors, it was during the study identified that market development, cost advantages and knowledge development were reasons for why inter-organizational collaborations are undertaken. These reasons are closely related the choice of collaborating actor, which during the study have been identified as competitors, universities and research institutes. Though, the respondents' main focus has been placed on the interaction between OEMs and first tier suppliers.

Furthermore, when investigating the collaborative environment on a general level, and with the five dimensions of collaboration suggested by Thomson (2001) as an analyzing tool. It was found that professionals working in inter-organizational collaborations within the Swedish automotive industry referred to all dimension of the framework in a similar way. As mentioned above, mutuality was commonly referred to as an important aspect in inter-organizational collaborations. This is interesting as the social dimensions include the factors that distinguish collaboration from lower levels of inter-organizational relations. However, the actual collaborative environment tends to contradict these general thoughts, as more emphasis is placed upon the structural rather than social dimensions. This is mainly argued as the purchasing department has as central role when an inter-organizational collaboration is initiated, and advocates a cost-oriented approach. Furthermore, much evidence point out that the OEM is dominant during inter-organizational collaborations, which could be a result from the purchasing orientation. Therefore, in the actual collaboration there is an unbalance between the five dimensions, where it can be argued that collaborations suffer from too much focus on the structural dimensions.

RQ2: How do an OEM and a first tier supplier collaborate during NPD within the Swedish automotive industry?

The way in which practitioners within the Swedish automotive industry elaborated upon different terms for inter-organizational arrangements narrates much confusion. However, the most common distinction when speaking of the relation to suppliers is the distinction between production and development responsibility. The inter-organizational relation between an OEM and a supplier with production responsibility could fulfill all the dimensions of collaboration. However, as the OEM exhibits a dominant role in the relationship, the dimension of mutuality is somewhat obscured. Furthermore, referring to the definition of collaboration, the inter-organizational relation to a supplier with development responsibility exhibits all of the dimensions of collaboration. Thus, posing a higher degree of collaboration. Furthermore, this kind of inter-organizational collaboration was examined further during the in-depth case investigation. This case contextualizes how an inter-organizational relation between an OEM and a first tier supplier are arranged when it represents an inter-organizational collaboration during NPD.

During the in-depth interviews, several respondents expressed openness as an important element in a successful inter-organizational collaboration. Furthermore, the degree of organizational autonomy is expressed as rather high, as individuals are free to act as long as it does not impact on time, cost or technique. However, these factors can also be seen as governance mechanisms, as they are a way of controlling the collaboration. In general, much attention is placed on governance, where both meetings and contracts act as a way of controlling the collaboration. Therefore, it could be argued that the structural dimensions tend to be over-emphasized during inter-organizational collaborations during NPD. It can be concluded that *how* an OEM and a suppliers with development responsibility collaborate during NPD coincide with how the European partnership model portrays R&D collaborations. This model suggests that the collaboration exhibits high degree of technological knowledge sharing, jointly developing product specification when the product involves vital supplier expertise, and problem driven interaction.

6.2. Managerial Implications and Future Research

This section aims at providing the reader and practitioners with insight and implications for how this report can contribute to an improved collaborative atmosphere in the automotive industry. The section also aims at highlighting areas interesting for future research. Henceforth, managers should strive to have a balance between the five dimensions of collaboration rather than achieve a high level of each element. During the study it was found that most emphasis is on the structural dimension i.e. controlling of the collaboration. However, the collaborative process within the Swedish automotive industry is complex with many actors and complex products, which implies a need to control the collaboration to ensure a successful project. However, as multiple authors state, trust can act as a substitute for expensive and time-consuming governance mechanisms. Therefore, increased trust could have a positive effect on the collaboration

in more than one sense. This could be improved by employing more long-term relations where parties experience a more sustainable situation.

Furthermore, increase trust is not straightforward, mainly as history also impacts the degree of trust in a collaboration. However, only increasing trust is not enough, as managers should strive to achieve balance in the five dimensions. According to the definitions of inter-organizational collaboration, mutuality is also an important element. However, increase the mutuality is complex as it implies that the OEM's culture of how they view and value its suppliers needs to change. This view and value of suppliers could be a result from high emphasis on purchasing within the automotive industry. In this regard, OEMs is encouraged to jointly develop goals with its suppliers to ensure long-term and mutually beneficial gains from the collaborative undertaking. Furthermore, as purchasing plays an important part in the initiation of inter-organizational collaboration, further research is needed to investigate how their strategies and values affect the collaborative environment in the Swedish automotive industry.

Another interesting insight was revealed during the interviews. The respondents at the OEM experienced that suppliers perform better, deliver more innovative solutions, and appear to be more dedicated to their obligations before any contract is signed. Once the contract is signed, the suppliers are not as keen to satisfy the needs of the OEM as during pre-contract signing. The bidding process most likely drives this behavior, and when a supplier have signed a contract and closed the deal an awareness security might appear. Furthermore, a respondent also stated that if the supplier feels that they have made a less good deal, it affects the collaboration on an operational level in the beginning. However, once the collaboration is undergoing, the participants move past this and the collaborative environment is better. One can argue that there is a separation between the involved actors in a collaboration on a higher organizational level, which seem to affect the collaboration on an operational level at least to some extent.

It is not said that the security that appear when a deal is closed implies that the supplier is experienced as lazy, only that measures to counteract this behavior should be institutionalized. Therefore, it is interesting to further investigate how another approach to the supplier selection process might impact the overall collaborative environment in the automotive industry. More research are also needed in this area to understand how decisions on a higher, organizational level affect the collaborative environment on the operational level and the outcome from collaborations within the Swedish automotive industry. Cropper *et al.* (2009) suggested this way of studying inter-organizational relations, and stated that inter-organizational relations research concerns relations at different levels in between organizations.

Another consideration that is worth highlighting in this section is how various respondents elaborated upon the future of the automotive industry and how other, not currently considered, as an actor in the automotive industry would become central to the industry. The recent years' trend of digitalization and emphasis on concepts, such as big data and IoT, have made different actors in the automotive industry reliant on new actors, normally considered to belong to other industries. These actors are various software providers, ICT experts, actors providing substitutes to combustion engines, governments, legal institutions, etc. As this already is happening, and as few arguments

speak against its rapid progress, inter-organizational collaborations are and will become more central and important than ever before. As found during the empirical investigation, the OEM could develop all activities internally, though their customers would not appreciate it. Thus, a change in attitude towards external actors, in regard to the perspective of an OEM, has to take place. Stated in the literature, the concept of mass collaboration constitutes a viable and necessary step for the automotive industry. Mainly as it is reasonable to argue that OEMs not much longer can dictate conditions and presuppose a central role within the automotive industry. Henceforth, these studies sheds light on an interesting question, are *other actors entering the automotive industry, or are the automotive industry diffusing into other industries?*

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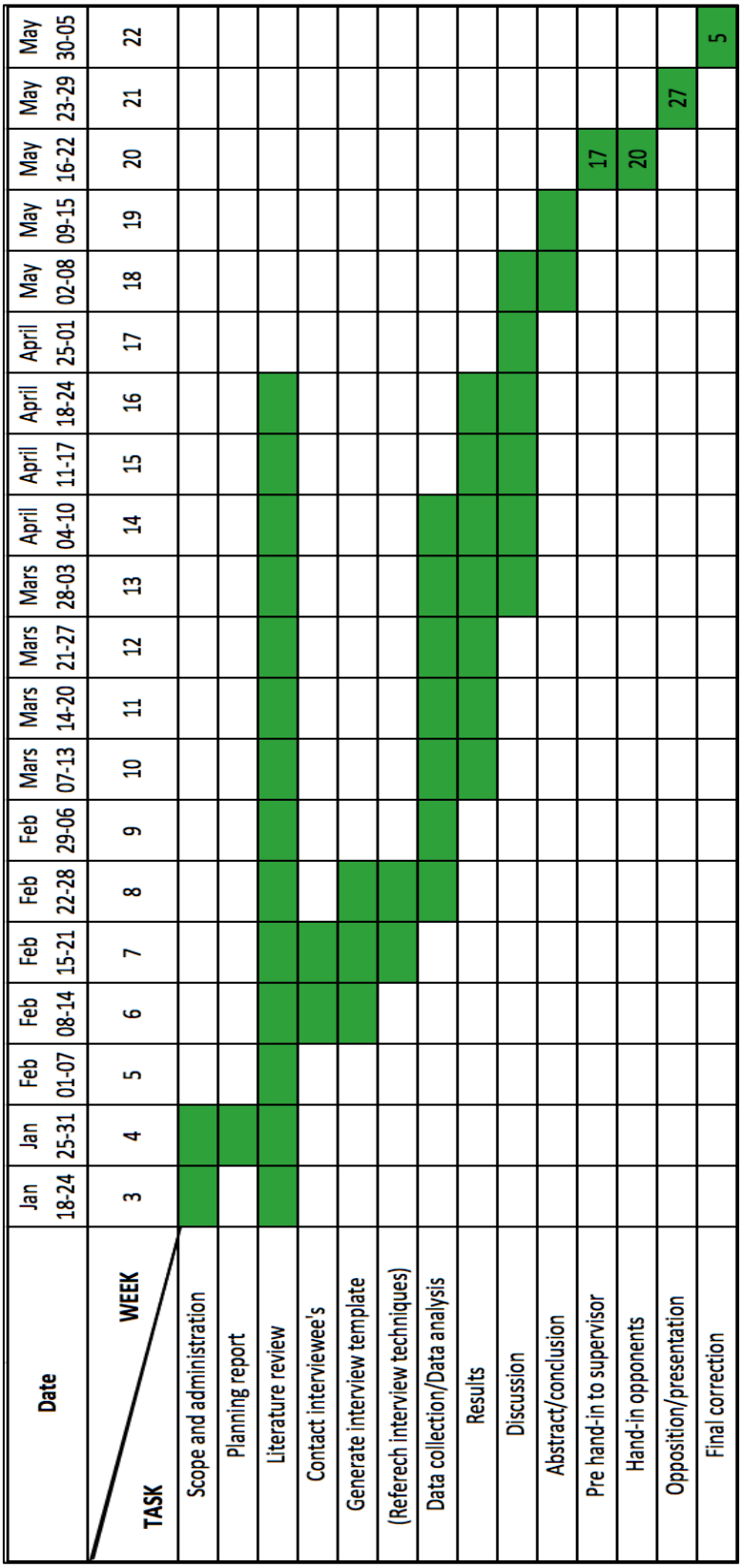
8. Appendices

Appendix 1 - Work phases/time plan



Date	Jan 18-24	Jan 25-31	Feb 01-07	Feb 08-14	Feb 15-21	Feb 22-28	Feb 29-06	Mars 07-13	Mars 14-20	Mars 21-27	Mars 28-03	April 04-10	April 11-17	April 18-24	April 25-01	May 02-08	May 09-15	May 16-22	May 23-29	May 30-05
WEEK / TASK	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Scope and administration																				
Planning report																				
Literature review																				
Contact interviewee's																				
Generate interview template																				
(Referech interview techniques)																				
Data collection/Data analysis																				
Results																				
Discussion																				
Abstract/conclusion																				
Pre hand-in to supervisor																		17		
Hand-in opponents																		20		
Opposition/presentation																			27	
Final correction																				5

(1) Introduction of the Master Thesis

- Presentation of the authors and the thesis
- Purpose of the study
- How the information will be used
    - Underline that the respondent are anonymous
- Permission to record interview
- Ask about timeframe for the interview

(2) Background of the Respondent

- Background about the interviewee?
    - Academic background?
    - Industry background?
- Information about his/her current position?
- Information about his/her current work tasks?

State that before we will give our definition and ideas of inter-organizational collaborations we would like to hear the respondents view and definition of the concept.

(3) Preconditions for Collaborating (Request example where it is possible)
***NPD=New product development**

- Describe your first thoughts when we mention *External Collaborations* in NPD*?*

- In this context, how would you define external collaborations in NPD?

- In general, what types of external actors does your company collaborate with (in NPD)?

- With respect to the different actors mentioned previously, how does the purpose differ for why you choose to collaborate with the different actors?

- In which phase are external actors involved in NPD?
    - Are external actors involved in the “early phases”? I.e. project definition phase
    - How often does it occur? (if it occurs)
    - What happens then?

- In general terms, how differs the extent of collaborations?
    - Time
    - Money
    - Resources

- What factors characterizes a successful collaboration?

- Does your organization have any definitions (or classifications) of types/forms of external collaborations? (ask if we can get access to any organizational documents?)

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(4) Definition of inter-organizational collaborations; (Discuss the definition)

"[...] a process in which autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions"

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(5) Process of collaboration (Nature)
(In this chapter; relate to examples previously mentioned, ask for examples)

- **Governance** - can you describe how a collaboration is controlled?
    - Can you describe a contract that is established during a collaboration?

- **Administration** - How is a collaboration handled from an administrative point of view?

- **Organizational autonomy** - How is decision making handled in a collaboration?

- **Mutuality** - How do your organization handle organizational differences?

- **Norms and trust** - what is trust in a collaboration?

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(6) Outcome of Collaboration

- In general terms, what is the greatest advantage for your organization to collaboration beyond organizational boundaries?
- What procedures does your organization have when expected outcome differ from the realized outcome? (absorption capacity)

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(7) Closing

- Ask the interviewee if s/he has any other questions
- Ask for permission to ask clarifying and follow-up questions via e-mail
- Invite the respondent to the thesis presentation (27 May)