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Conflicting Goal and its Impact on Level of Supply Chain Integration between Supply Chain Partners in the Automotive Industry
- From Manufacturing SME’s Perspective

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ABSTRACT

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Title: Conflicting Goal and its Impact on the Level of Supply Chain Integration between Supply Chain Partners in the Automotive Industry – From Manufacturing SME’s Perspective

Background: Supply chain integration assists SMEs to improve their operational performance, however the existing theories in supply chain integration are mostly from the LEs perspective. Therefore this thesis chose to focus on the level of supply chain integration from manufacturing SMEs perspective. Nevertheless supply chain integration is not simple due to conflicting goal, which exists between supply chain partners. Based on previous knowledge, the level of supply chain integration is affected by conflicting goal, which exits between supply chain partners. We believe that this is based on how the conflicting goal has been managed.

Purpose: The purpose of this thesis is to obtain an understanding if the level of integration in the automotive industry between the manufacturing SME and its customer is affected by how the conflicting has been managed.

Method: This thesis is a multiple case study and was conducted with a deductive approach. The empirical findings were gathered through qualitative interviews with semi-structured interview guides.

Conclusions: The conclusions of this thesis are that the level of supply chain integration, which exists between manufacturing SME and its customer, is low/medium. Furthermore, the conflicting goal, which exists between these partners, are that the demand of delivery and volume
flexibility, storage flexibility, demand of quality level and the relatively high manufacturing complexity as well as downstream complexity. Finally, the result of this thesis shows that the level of supply chain integration is affected by how the conflicting goal has been managed.

**Keywords:** Supply Chain Management, Supply Chain Integration, Information Integration, Organizational Integration, Conflicting Goal, Automotive Industry and Small and Medium Sized Enterprises
ABBREVIATIONS

CPFR - Collaborative Planning, Forecasting and Replenishment
CRM - Customer Relationship Management
EDI - Electronic Data Interchange
ERP - Enterprise Resource Planning
LEs - Large Enterprises
MRP II - Manufacturing Resource Planning
SCM - Supply Chain Management
SCP - Supply Chain Planning
SME - Small- and Medium sized Enterprise
VMI - Vendor Managed Inventory
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1. INTRODUCTION

This chapter aims at giving an overall understanding of the research area related to chosen topic. The background will describe supply chain management with the focus on supply chain integration. Thereafter a problem discussion will be presented with the purpose to emphasize the thesis research problem, which will lead to the thesis research questions and purpose. Finally, an illustration of the outline of the thesis will be presented.

1.1 BACKGROUND

1.1.1 Supply Chain Management

In the last decades markets have become global, which has intensified the competition. This in turn has led to more challenges for companies to produce and provide product and service at the right place, the right time and at the lowest costs (Li et al. 2006). Gelinas and Bigras (2004) indicate that the growing complexity of business environment has highlighted the importance of logistics. Logistic is defined by the Council of supply chain as:

“Logistic is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information form the point-of-origin to the point of consumption in order to meet customers’ requirements.” (Council of Supply Chain Management Professionals, 2013).

In other words, logistic activities include inbound and outbound transportation, warehousing, material handling, order fulfillment logistic network design, inventory and supply/demand planning (Council of Supply Chain Management Professionals, 2013). Historically, most companies have been focusing on the integration of logistic activities within the organization. Nevertheless, the increasing outsourcing and the complex customer demand has created challenges for companies. These challenges have made companies realize that only coordinating the internal processes is insufficient (Jayaram et al. 2010).
Lambert and Cooper (2000) indicate that companies no longer compete solely as independent entities with each other, but rather as supply chains. The term of supply chain management is developed from the concept of logistics. Supply chain management originally aimed at integrating logistic activities across the supply chain. Nowadays the concept also includes the integration and management of essential business processes across the supply chain. Tan (2001) emphasizes that the main objective of supply chain management is to manage the whole supply chain and its operations efficiently and effectively. Furthermore, Lummus and Vokurka (1999) indicate that supply chain management aims at creating a seamless process by coordinating and integrating all the activities that are executed by different departments and external partners in the supply chain. Therefore, Xu (2011) emphasizes the integration of different partners is an essential factor of a successful supply chain.

1.1.2 Supply Chain Integration
Up- and down-stream integration are the core of supply chain management. The term integration is referred to two firms together conducting and agreeing on activities in the supply chain (Forslund & Jonsson, 2009). In this thesis, the study object is the integration between manufacturing company and its most important customer. The term most important customer refers to the customer, which accounts the largest share of the company’s turnover. Moreover, the study of integration will be conducted from the perspective of the manufacturing company (see figure 1).

Bagchi and Skjoett-Larsen (2002) define supply chain integration as information and organizational integration. Moreover, the level of information and organizational integration are classified into three levels; high, medium and low. Information integration refers to the knowledge and information about the flow of material, product and services shared between partners. On the other hand, Pinsonneault and Barki (2012) refer the organizational integration to the extent of integration in organizational structure and relationship between partners. According to Bagchi and Skjoett-Larsen (2002), through the information and organizational integration partners will have a better collaboration in planning business activities and will behave as one unified entity. This definition of the supply chain integration will be used in this thesis.
Simatupang et al. (2002) point out that supply chain integration is viewed as the combination of a number of objects such as actions, objectives, decisions and information. These objectives aim at achieving the chain goals. According to Wong et al. (2011), good supply chain integration assists companies to achieve better operational performance. Nevertheless, Simatupang et al. (2002) suggest that poor supply chain integration can lead to dysfunctional operational performance, and has negative impact on the operational performance.

1.1.3 Conflicting Goal between Supply Chain Partners
Supply chain integration assists supply chain partners to improve its operational performance in terms of flexibility, quality and costs by establishing long-term relationships (Wong, et al. 2011; Zhao et al. 2008). However, supply chain partners operate independently and have own objectives, planning and resources, which leads to different interests and goals (Zhao et al. 2008). Zhou (2012) defines conflict as the behavior or target mismatch between two or more partners. Conflicts arise from the differences between the partners and the uncertainties that occur between them in their cooperation. Korsgaard et al. (2008) define conflicting goal as goals that are incompatible or in opposition among partners. In this thesis, goal refers to the independent goal set separately by the manufacturing company and its most important customer customers with the purpose to obtain the benefits of supply chain integration. The conflicting goal in this thesis refers therefore to the manufacturing company’s independent goal of maximizing own operational performance, which is in conflict with the other partner’s goal.
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1.1.4 Supply Chain in Automotive Industry

Companies operating in the automotive industry have focused on specific core competences in order to achieve higher efficiency (Chandra & Grabis, 2007). This phenomena have therefore led the automotive industry becoming one of most active industries in the development of supply chains (Habidin & Yusof, 2013). An “average” automobile consists of more than 15,000 components, which are provided by numerous of suppliers (Pereira et al. 2011; Xia & Tang, 2011). As a result supply chain management is an essential issue and a critical factor for the success or survival of companies in this industry (Xia & Tang, 2011).

Approximately 40 percent of components are seen as non-critical items, which are low cost customized items with basic technology (Pereira et al. 2011). Pereira et al. (2011) and Wynstra et al. (2010) point out that due to the characteristics of the non-critical items, many large sized enterprises have given the work to smaller companies that generally are manufacturing small and medium sized enterprises (SME). SMEs are defined by the European Commission (2003) as enterprises, which have no more than 250 employees. According to Wynstra et al. (2010) the share of the resources of total product development in the automotive industry from SMEs has increased notably over the last decades. The study object in this thesis is Swedish manufacturing SME, which operates in the automotive industry.

1.2 PROBLEM DISCUSSION

Supply chain management is an essential issue and a critical factor for the success or survival of companies in the automotive industry (Xia & Tang, 2011). SME manufacturers in the automotive industry, which supplies non-critical components to the automakers, play an essential role in the automotive supply chain (Pereira et al. 2011; Wynstra et al. 2010). However, Tan et al. (2006) indicate that the current supply chain management theories are mostly from the larger companies’ perspective.

Quayle (2003) suggests that the survival of SMEs will much depend on their ability to use less resources and provide/produce more products with fewer defects in less time and costs. These
prerequisites for the survival of SMEs can be achieved by applying supply chain integration. However, SMEs mostly do not implement supply chain integration as deeply as large enterprises (LEs). Furthermore, LEs are the main focus of the academic research of supply chain integration. Since, the level of integration will affect supply chain partners operational performance, it is therefore essential to study what level of supply chain integration manufacturing SMEs in the automotive industry apply.

The integrated supply chain partners need to work together in order to achieve better operational performances in terms of flexibility, quality as well as costs, which cannot be achieved at the same extent by operating alone (Wong et al. 2011; Zhao et al. 2011). However, as supply chain partners operate independently, they may sometimes follow their own interests. This in turn will hamper the other supply chain partner to fulfill their goal of maximizing own operational performance (Blackhurs, et al. 2008; Cao et.al. 2010; Kanda and Deshmukh, 2008). As a result, supply chain integration is not simple due to conflicting goal exists between supply chain partners. This due to that the conflicting goal exists between manufacturers and its customer hampers the partner’s ability to achieve greater benefit (Cao et al. 2010; Sahin, 2002). It is therefore important to study what conflicting goal exists in the automotive industry between manufacturing SME and its most important customer. Based on the existing theory, the pattern of that the level of supply chain integration is affected by conflicting goal can be seen. We believe that this effect is based on how the conflicting goal has been managed. Therefore it is in our opinion interesting to study if the level of supply chain integration is affected by how conflicting goal has been managed in the automotive industry between manufacturing SME and its most important customer.

1.3 RESEARCH QUESTION

As a result of the problem discussion, the importance of supply chain integration has been emphasized. Furthermore, the level of integration between the manufacturing SME and its customer may be affected by how conflicting goal has been managed. With this statement, the following research questions have been formulated:
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• What level of supply chain integration exists in the automotive industry between manufacturing SME and its customer?

• What conflicting goal exists in the automotive industry between manufacturing SME and its customer?

• How is the level of supply chain integration, in the automotive industry between manufacturing SME and its customer, affected by the way conflicting goal has been managed?

1.4 PURPOSE

The purpose of this thesis is to obtain an understanding if the level of integration, in the automotive industry between the manufacturing SME and its customer, is affected by how the conflicting has been managed. This understanding will be obtained by:

• Describe what level of supply chain integration exists in the automotive industry between manufacturing SME and its customer.

• Describe what conflicting goal exists in the automotive industry between manufacturing SME and its customer.

• Explore how the level of supply chain integration, in the automotive industry between manufacturing SME and its customer, is affected by the way conflicting goal has been managed.
INTRODUCTION

1.5 DISPOSITION

Figure 2 Disposition of this thesis (Hsu & Pacarizi, 2013)
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The methodological choices of the thesis will be explained in this chapter. It will start by describing the scientific perspective, scientific approach, research method, and continuing with describing the selection, data collection and data analysis. Thereafter, a description of the validity and reliability of the thesis will be made. Finally, the ethical principles of thesis will be presented.

2.1 SCIENTIFIC PERSPECTIVE

Denzin and Lincon (2011) define paradigm as a fundamental set of viewpoints that guides actions. The main paradigms and perspectives that structure and organize qualitative research are positivism and relativism.

**Positivism:**

Positivism assumes that there is a real world with defined characteristic and the aim of science is to model this world by relating it to theories (Ashworth, 2000). Walliman (2011) indicates that knowledge is based on sensory experience, which is obtained through experiments or competitive analysis. Positivism intends to develop the description of a chosen aspect of the world and this description will not be affected by individuals’ perceptions. With other words, knowledge in positivist approach is built on what is already known. Furthermore, Bryman and Bell (2007) indicate that positivism involves both deductive approach as well as inductive strategy and there is a clear distinction between theory and research. From the positivism points of view, the
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Purpose of research is to create hypotheses, which can be tested, and thus provide explanations of laws which should be assessed.

Relativism:
Relativism, on the other hand, views the world as a creation of the mind. In other words, the world can only be experienced personally through each individual perception, which is effected by their preconceptions, values and beliefs (Walliman, 2011). Due to the individual’s different perceptions of the world, multiple realities exist (Denzin & Lincon, 2011) and the relativism aims at uncovering the world, which is interpreted by the individual’s perception, rather than discovering universal laws (Walliman, 2011).

2.1.1 The Scientific Perspective of this Thesis
This thesis was based on the perspective of positivism, as the study objective was to explore how the level of supply chain integration in the automotive industry between manufacturing SME and its customer, is affected by the way conflicting goal has been managed. The existing theory of supply chain integration and conflicting goal were used in order to exam the current status of supply chain integration and conflicting goal exists between manufacturing SMEs and its most important customer. In other words, the description of level of supply chain integration and the conflicting goal exists are examined by the use of theory and it is not based on individual’s perceptions.

2.2 SCIENTIFIC APPROACH
Bryman and Bell (2007) point out there are two types of research approach: the deductive and inductive approach. These research approaches are used to explain the sequences of empirical data and theory.

The Deductive Approach:
Bryman and Bell (2007) interpret that deductive approach means that researchers deduce a hypothesis base on theoretical knowledge, which is related to the research domain. This hypothesis will then be examined by the empirical data gathered. The researchers need to specify
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how empirical data could be gathered in order to respond to the theoretical concepts, which the hypothesis is based on. Gray (2009) indicates that before gathering empirical data, the theoretical concepts need to be operationalized as by operationalizing these concepts, researchers can confirm that the observed concept have occurred.

Inductive Approach:
The inductive theory on the other hand means that researchers start by observing the empirical world and afterward draw generalizable inferences out of observation. The inductive approach views theory as the outcome of a research (Bryman & Bell, 2007). Gray (2009) indicates that the plan for data collection is made after that the researchers have observed that there is pattern that shows relationship between variables.

2.2.1 The Scientific Approach of this Thesis
This thesis was based on the deductive approach, as we inferred the hypotheses that the level of supply chain integration is affected by the way conflicting goal has been managed. Since, the subject of supply chain integration and the conflict goal are well studied in the supply chain literature, we saw that there is a connection between supply chain integration and conflicting goal. In order to capture how the level of supply chain integration is affected by conflicting goal, a further operationalization of the way conflicting goal can be managed has been done. This hypothesis had been examined by the empirical findings collected in this thesis. Furthermore, in order to ensure that the gathered empirical findings would correspond to the theoretical concepts of the hypothesis, the concepts of supply chain integration, conflicting goal as well as how conflicting goal can be managed had been operationalized.

2.3 RESEARCH METHOD

Bryman and Bell (2011) indicate that are two main research methods, which are quantitative research method and qualitative research method.
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The Quantitative Research Method:
The quantitative research method is defined as a distinctive research strategy. In other words, it has an objective notion of the social reality and it involves the collection of numerical data. The quantitative research method also demonstrates the relationship between theory and research as deductive (Bryman & Bell, 2007).

The Qualitative Research Method:
The qualitative research method, on the other hand, pursues to understand the social reality. The social reality is viewed as the outcome of the interactions between participants, and it can be captured by examining the participants’ perception of the world. In contrast to the quantitative research method, the qualitative research method demonstrates the relationship between theory and research as inductive (Bryman & Bell, 2007).

Gillham (2010) and Merriam (2009) point out that under qualitative research method, the researchers focus on how the individuals presents their perception of the world and how they interpret their experience. According to Gillham (2010) this enables researchers to understand a specific phenomenon, define specific issues and provide possible explanations. However, Björklund and Paulsson (2012) emphasize that the possibilities to generalize the result is lower compared to quantitative research method.

2.3.1 The Research Method of this Thesis
The qualitative research method allows researchers go deep into the research object by focusing on interpreting the phenomena studied. As the purpose of this thesis was to gain a deeper understanding of how supply chain integration is affected by the way conflicting goal has been managed. This involved different complex concepts that were difficult to be capture by using qualitative research methods. Additionally, as this thesis does not aim at generalizing the results, the qualitative research method was therefore more appropriate to apply in this thesis.
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2.4 RESEARCH STRATEGY

After research questions are set, researchers should decide which research strategy will be utilized in order to gather information. Survey, case study and experimentation are the most used research strategy (Bryman & Bell, 2010; Yin 2003).

Case Study:
Case study is a research strategy that is used in order to answer specific research questions by investigating an individual, a group or an organization (Gillham, 2008). The purpose of case study is to analyze the circumstance and process, which highlight the studied theoretical issues and to assist researchers in understanding organizational behavior (Cassell & Symon, 2004). Bhattacharyya (2006) points out that case study is generally a qualitative research method and it offers certain understandings on operational details.

There are three main weaknesses of case study. The first weakness is that information gathered by studied cases sometimes only offers rich description of events and readers are expected to make their own conclusion. The second weakness is that, case study sometimes only offers data that does not support theories or frameworks completely (Easton, 1995). Dubios and Gadde (2002) suggest that researchers need to build stronger reliance on theory and increase intellectual control of the case description in order to conquer these two weaknesses as well as to improve the explicatory power of case stud. Finally, due to the smaller number of samples and the characteristic of being situation specific, case study is therefore inappropriate for generalization (Dubois & Gadde, 2002; Easton, 1995).

Yin (2003) indicates that there are two main types of case study design, either single-case study or multiple-case study. Single-case study design is divided into three categories, which are critical case, extreme/unique case as well as represented/typical case. The critical case is appropriate to apply when the single case represents a critical case, which will be tested in a well-formulated theory. The extreme or unique case is a generally used in clinical studies. Moreover, the represented or typical case aims at exemplifying a daily situation or the form of an organization by studying a single case (Braman & Bell, 2007; Yin, 2003). Multiple-case study
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design, on the other hand, is referred to comparative design, as the purpose of this design is to compare different cases. Multiple-case study permits researchers to compare and contrast findings from different cases, which in turn allows researchers to understand what are the unique and common phenomena between the cases (Bryman & Bell, 2007). Furthermore, Yin (2007) point out that the selection of case companies is related to how the researchers have defined the initial research question.

2.4.1 The Research Strategy of this Thesis

In order to gather the information required for answering the research questions, the research strategy of case study was utilized in this thesis. The multiple-case study design was more appropriate since it allowed us as researchers to compare the results from different cases. Thereby obtaining an understanding of how the conflicting goal has been managed affects the level of integration, between the case companies.

We were aware of the weaknesses by applying case studies, which is mentioned by Easton (1998). However, we overcame these weaknesses by building a theoretical framework that was related to our research questions before gathering the empirical findings. This in turn assured that the empirical findings gathered from the case companies correspond to our theoretical framework. Furthermore, we were also aware of the fact the empirical findings gathered from case studies are not appropriate for generalization. As this thesis aimed at gaining a deeper understanding in the research domain, it therefore was not aiming at generalizing the results.

2.5 SELECTION

Bryman and Bell (2007) point out that after deciding the research question, the second stage is to select relevant organizations and interviewees. According to Merriam (2009), researchers need to select what, where, when and whom to interview. Ahrne and Svensson (2011) indicate that there are two steps in the selection process. The first step is to select the organization that is suitable for the research topic. Thereafter, the second step is to select the proper interviewees, who should be responsible for the domain that the researcher desires to study.
2.5.1 The Selection in this Thesis

The case companies had been selected through the information received from the member list provided by the Scandinavian organization called Fordonkomponents Grupper AB (FKG). FKG is an industrial organization for Scandinavian suppliers that operate in the automotive industry. Based on this member list, we had chosen to contact companies that are located in the south part of Sweden and have no more than 250 and not less than 40 employees. Regarding the possibilities for interviews, companies were contacted through telephone and email. Due to subject of this thesis, the senior managers that are responsible for the domain of logistics and production were contacted. The criteria for the selection was made in order to ensure that that the interviewees possess the relevant knowledge and information.

The case companies and the interviews selected for these theses are the following:

**Alfa**

Background: Since the case company chooses to be anonymous, this case company will therefore be referred to as “Alfa”. Moreover the interviewees will be given fictitious names as well. According to Alfa (2013), the company is one of the leading European suppliers in the automotive industry. The company produces refined sheet metal components with highly automated production lines which can handle both high and low volumes. According to Alla Bolag (2013), Alfa has approximately 200 employees with a turnover of nearly 300 million Swedish Kronor.

Interviewees: Jonsson (Production Manager) and Svensson (Logistic Manager) at Alfa.

**Bulten Sweden AB**

Background: Bulten Sweden AB is one of the largest suppliers of fasteners to the European Automotive market, which produces a wide range of metallic fasteners (Bulten, 2013). The company has 50 employees with a turnover of approximately 900 million Swedish Kroner (Alla Bolag, 2013) and is situated in Gothenburg, Sweden.

Interviewee: Patrick Fitzell (Supply Chain Manager) at Bulten Sweden AB.
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OGO AB:
Background: OGO produces so called chassis components to the automotive industry. The company has today 40 employees (Lewin, Logistics Manager, 203) with a turnover of approximately 122 million Swedish Kronor (Alla Bolag, 2013) and is situated in Kalmar, Sweden.

Interviewee: Tobias Lewin (Logistics Manager) at OGO AB.

Press Kogyo Sweden AB:
Background: Press Kogyo Sweden AB is a supplier for chassis and motor parts to heavy trucks and lift trucks (Press Kogyo, 2013). The company has today 150 employees with a turnover of nearly 300 million Swedish Kronor (Alla Bolag, 2013) and is located in Oskarshamn, Sweden.

Interviewee: Niclas Olsson (Logistics Manager) at Press Kogyo Sweden AB.

Trelleborg Sealing Solutions Kalmar AB
Background: Trelleborg Sealing Solutions Kalmar AB is a world leader in the production and development of brake noise and vibration damping solutions for automotive industry (Trelleborg Sealing Solutions, 2013). The company has approximately 250 employees with a turnover of nearly 750 million Swedish Kronor (Alla Bolag, 2013) and is situated in Kalmar, Sweden.

Interviewee: Ulf Johansson (Plant Manager) at Trelleborg Sealing Solutions Kalmar AB.

2.6 DATA COLLECTION

There are two types of approaches when collecting data, either primary data collection or secondary data collection (Bryman & Bell, 2007).
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**Primary Data:**
Primary data is referred to specific data that is collected by the researchers themselves (Bryman & Bell, 2007; Merriam, 2009). Interviews are one of the most essential sources for primary data collection in the qualitative case research (Yin, 2003). The main reason to collect data through interviews is to obtain specific information (Merriam, 2000). There are different approaches, which can be used in order to register the data obtained through interviews. For instance, recording the interview through digital recorder and using notes. Moreover, there are three types of notes, which are metal notes, scratch notes and full notes (Bryman & Bell, 2007).

According to Bryman and Bell (2007), qualitative interviews can be structured in two ways, either unstructured or semi-structures. The unstructured interview, in comparison to the semi-structured interview, is more open and unrestricted. With an unstructured interview, interviewer usually has only one main question, this allows the interviewee to answer the questions in his/her own way. The interviewer will focus on leading questions based on the answer received from the first main question. Under the unstructured interview, it is the interviewer’s duty to value what parts deserves more interest. A semi-structure interview, on the contrary to unstructured interview, would have a more structured characteristic as a list of question is set up before the interview. The interviewee will be given the opportunity to choose his/her own way of answering these questions, but not in the same sense as an unstructured interview. With a semi-structured interview, the focus remains on having the main questions answered. Furthermore, Yin (2003) describes a third way of structuring interviews, which involves more structured questions. This type of interview can be considered as very close to survey, which can provide quantitative data of the case study.

**Secondary Data:**
Secondary data is referred to specific data, which has been collected by other researchers for other purposes (Bryman & Bell, 2007; Merriam, 2009). The purpose of using secondary data is to present additional and deeper analysis of the original data, as well as to apply new perception or focus to the original data (Gray, 2009). Panneerselvam (2006) indicates that secondary data can be gathered through internal and/or external sources. According to Walliman (2011) the internal sources can be organizational records and publications and the external resource, according to
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Panneerselvam (2006) can be government publications, journals and books.

2.6.1 The Data Collection in this Thesis

The data collected in this thesis is both through primary and secondary data. The primary data was gathered through qualitative interviews. Before the interviews, an interview guide (see appendix 1) was send to the interviewees so that the interviewees would have a better understanding of the content of the interview. Due to the sickness, the Logistics Manger at Alfa was not able to participant the interview at the scheduled day. We were therefore offered to interview the Production Manger at Alfa instead at the same day. Therefore, five of the six interviews were conducted in respective company and the length of the interviews was approximately one to one and a half hours each. A telephone interview with the Logistics Manager at Alfa for approximately one hour took place few days after the scheduled interview date. During all the interviews, digital recorder and scratch notes had been used in order to register the information. The interviews were semi-structured with the list of questions that had been made before the interview in order to ensure that the obtained information is correlated to our research questions. Moreover, contacts via e-mail were also conducted in order to collect additional data. The secondary data for this thesis have been gathered through literature, scientific articles from Linnaeus University’s library and database. The key words that were used are; Supply chain management, supply chain integration, information integration, organizational integration, conflicting goal, automotive industry and small and medium sized enterprises. The other secondary data have been gathered through case companies’ official websites.

2.7 DATA ANALYSIS

According to Yin (2012) there are two main techniques of analyzing data in qualitative research, which are pattern matching and explanation building.

Pattern matching:

When researchers define the research question, they have made some key assumptions and planned an analytic strategy or implication for the analysis. However, after the empirical data has been gathered, these initial plans need to be revised. A pattern matching logic will assist the
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researcher to compare the empirical based pattern with the initial plan. Through pattern matching logic, the analysis is examined and compared with theory and therefore can provide a detailed explanation of how and why the study object has been affected.

Explanation building:
Explanation building techniques is used when a case study started with an open-ended research question. In other words, the research is not started with a predicted pattern. The aim of the research is to build an explanation based on the case study.

2.7.1 The Data Analysis in this Thesis
In this thesis pattern matching has been used since we have planned an analytic strategy for the analysis. Heading 5.1 Level of supply chain integration in this thesis, corresponds to the first research question. The theory of supply chain integration and the gathered empirical findings regarding case companies’ supply chain integration status have been compared and analyzed. Heading 5.2 Conflicting Goal in this thesis, corresponds to the second research question. The theory-based operationalization of conflicting goal has been compared and analyzed with the respective empirical findings. Finally, heading 5.3 The correlation between the level the of supply chain integration and how conflicting goal has been managed in this thesis, corresponds to the third research question. The analysis in this section is based on the analysis and empirical findings from the first two research questions as well as the theory based operationalization of managing conflicting goal.

2.8 SCIENTIFIC CREDITABILITY IN QUALITATIVE RESEARCH

According to Merriam (2009), validity and reliability are two central concepts in methodological terms. These two concepts rely on the researcher's ethics, meaning if the case study is conducted in an ethical manner. Bryman and Bell (2007) indicate that validity refers to whether the researchers are observing, identifying or measuring what he/she claims. Furthermore, Yin (2003) emphasizes that four tests can be used in order to establish the quality of an empirical research. These four tests are: construct validity, internal validity, external validity as well as reliability.
Construct Validity:

“Construct validity: establishing correct operational measures for the concepts being studied” (Yin, 2003, p.34). Yin (2003) indicates that there are three approaches, which a researcher can use in order to increase construct validity. These three approaches are; firstly to use multiple sources of evidence in the data collection in order to receive a convergent and coherent survey form. Secondly, to establish chain of evidence, which is also relevant in the data collection process. Thirdly, to have key informants, which examines the draft case study report.

Internal Validity:

The internal validity is the determination of causality, meaning the determination of cause and effect between specific events (Yin, 2003). Furthermore, Bryman and Bell (2007) indicate that internal validity concerns whether there is a suitable match between the researchers observation and the theoretical ideas that they have developed.

External Validity:

External validity relates to the extent that the results of a study can be generalized (Bryman and Bell, 2007; Yin, 2003). In other words, it means that to which degree the results form one study can be used in another situation. However, there has been some criticism towards the external validity in case studies as single case study offers vague basis for generalization (Yin, 2003).

Reliability:

The degree, to which a study can be repeated, is referred as reliability of a study. If a researcher conducts the same study by repeating the procedures described by the previous researcher and reaches the same result, the study is reliable (Bryman & Bell, 2007; Yin, 2003). Yin (2003) points out that reliability aims at diminishing the errors in prejudices in a case study.

2.8.1 The Scientific Creditability of this Thesis

In order to ensure that the gathered empirical data matched with the research subject, an interview guide had been design based on the theoretical framework in this thesis. Due to the characteristics of case study, the research results cannot be generalized. However, in order to increase the external validity of this thesis, we had conducted five case studies. Moreover, in
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order to reach a higher reliability, we had been consistent when conducting the research in sequence of the thesis structure. Moreover, the same interview guide has been used for all the interviews.

2.9 ETHICAL PRINCIPLES

Ethical principles are divided into four main categories: harm to participants, lack of informed consent, invasion of privacy and deception. Harm to participants involves different aspects, such as harm to future employment, stress or participants self-esteem. Researchers need to be careful and minimize the possible harms to the participants. Lack of informed consent regards to that participant had not been given enough information, as it should be in order for them to decide whether or not to participate in this study. Moreover, the intentions of any study do not provide researchers the rights to interfere on the participant’s privacy or to be disrespectful to their values. The invasion of privacy regards to what degree the researchers intrude the participants privacy. Finally, deception means that the researchers gives false information about what the study is about to participants (Bryman & Bell, 2007).

2.9.1 The Ethical Principles of this Thesis

Before booking the interviews, we contacted the interviewees by telephone and emails where we presented our research subject. The interviews were aware of what type of information is needed before they decided whether to participate our study or not. Additionally, an interview guide was sent to the interviews before interviews thus the interviewees were fully aware of what the content of the interview. Before the interview started, all the interviewees were asked whether they wished to be anonymous. Moreover, during the interviews, only questions that are relevant to the study object were asked.
3. THEORETICAL FRAMEWORK

The theoretical framework is divided into four sections related to the thesis research questions. In the first section, theory related to the supply chain integration will be presented. Followed by the second section, which contains the theory of possible conflict goal that can occur between supply chain partners. Thereafter the third section presents theory regarding the characteristics of small and medium sized enterprises and its conditions in supply chain integration and finally, the last section presents the characteristics of the automotive industry. In the end of this chapter a theoretical synthesis will be presented.

![Figure 4 Disposition of theoretical framework (Hsu & Pacarizi, 2013)](image)

3.1 SUPPLY CHAIN INTEGRATION

The competitive environment triggers firms to integrate supply chain (Bagchi & Skjoett-Larsen, 2002). According to Bagchi and Skjoett-Larsen (2002) the integration of the supply chain generally demands coordination of different functions among the supply chain partners. Furthermore, supply chain integration is divided into information and organizational integration.

3.1.1 Information Integration

The term information is referred, according to Bagchi and Skjoett-Larsen (2002), as the information related to the forward and backward flow of material, product and service. Prajogo and Olhager (2012) indicate that information integration is to share essential information with supply chain partners with the help of information technology. Information integration aims at assisting supply chain decision making by achieving real-time transmission and processing required information. With other words, information integration contains, according to Bagchi
THEORETICAL FRAMEWORK

and Skjoett-Larsen (2002), knowledge and information sharing through design and development data, process management and planning control such as forecast and delivery schedule data between supply chain partners. Information integration creates a better environment for collaborative planning and costing, which enable inventory and production to become more visible among the chain members. Li and Lin (2006) indicate that the importance of information sharing depends on what information is shared, when and how it is shared and whom it is shared with. Simatupang et al. (2002) point out that the shared information should be able to increase the manufacturers’ understanding of the buyers’ demand. The information can be for instance, forecasting, inventory, shipping schedules, location, capacity lead-time as well as product specifications.

Furthermore, Bagchi and Skjoett-Larsen (2002) highlight a trustworthy communication infrastructure is essential for timely and efficient information exchange among supply chain partners. Technology sharing and adaption as well as resource and risk sharing are also involved in the knowledge and information sharing. Information integration between supply chain partners can be achieved by using information technologies (table 1).

<table>
<thead>
<tr>
<th>Supply Chain Integration</th>
<th>LOW Integration</th>
<th>MEDIUM Integration</th>
<th>HIGH Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transaction Systems</strong></td>
<td>MRP II Systems</td>
<td>ERP Systems</td>
<td>ERP and Supply Chain Planning (SCP) systems</td>
</tr>
<tr>
<td></td>
<td>Legacy Systems</td>
<td>• Intra-company</td>
<td>• Inter-company integration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Rigid interfaces</td>
<td>• Flexible interfaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Value: Mechanization of existing processes</td>
<td>Value: Process improvement</td>
</tr>
<tr>
<td><strong>Communication Systems, Internet/Extranet</strong></td>
<td>E-mail/Fax/Phone Internet/Extranet only used for limited purposes</td>
<td>Few EDI/Internet links to customers/suppliers Extranet</td>
<td>Extensive use of EDI/Internet/XML links within supply chain</td>
</tr>
<tr>
<td><strong>Bar-coding and Tract-and-trace Systems, Electronic POS (point-of-sale) Data Capture, Inventory Visibility</strong></td>
<td>Only bar-coding of finished products Tract-and-Trace and Electronic POS not used</td>
<td>More extensive bar-coding, automated e-mail updates and confirmations</td>
<td>Bar-coding from entry to dispatch Tract-and-trace throughout the SC Key suppliers and customers connected</td>
</tr>
</tbody>
</table>
THEORETICAL FRAMEWORK

<table>
<thead>
<tr>
<th>Vendor Managed Inventory (VMI)</th>
<th>Not used</th>
<th>Experimental stage with one or a few suppliers/customers</th>
<th>Strategic suppliers have access to production plans, materials requirements, sales forecasts and orders CPFR/VMI with key suppliers/customers CRM with key customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborate Planning, Forecasting and Replenishment (CPFR) Customer Relationship Management (CRM)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 Stages of information integration (Bagchi and Skojeott-Larsen, 2002, p.100)

Transaction Systems

Legacy system is referred to software systems that contain knowledge of organization and still functioning, which were built with older technologies and hardware. The legacy system comprises knowledge that organizations have accumulated and assist companies to handle their daily operations. Since the legacy system is built with older technology and hardware, it is costly, risk full and difficult for companies to modify the system when they have new requirements (Aw et al. 2005). Bagchi and Skojett-Larsen (2002) classify companies, which use legacy system as having low level of information integration.

Manufacturing resource planning (MRP II) is an extension of the manufacturing requirement planning system (Olhager, 2013; Tejeida-Padilla et al. 2009) The MRP II was created in order to detect new system capabilities (Olhager, 2013). Furthermore, MRP II is used to calculate material requirement, estimate the product supply as well as to calculate the capacity requirements of workers and machines (Kobayashi, 2003; Tejeida-Padilla et al. 2009). According to Olhager (2013) the MRP II system provides operations planning and control a wider structure. Bagchi and Skojett-Larsen (2002) classify companies, which use MRP II as having low level of information integration.

Enterprise resource planning (ERP) system is an information system that creates a seamless integration of information flow, which aims at providing automated interactions and a mutual source of data for a firm (Forslund, 2010; Karsak & Özogul, 2009). The ERP system is developed from the other two information technologies: material requirements planning (MRP) and manufacturing resource planning (MRP-II). The information that ERP system contains is
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associated with a company’s business involving customer, employee, financial data, supplier and product. In other words, all the business transactions such as accounting, customer order management, distribution, human resource management, inventory management as well as production planning and management should be included in the ERP system (Helo, 2008). There are different versions of ERP systems, such as Movex, Jeeves and Monitor (Forslund, 2010). Bagchi and Skojett-Larsen (2002) classify companies, which use ERP system as having medium level of information integration.

Supply chain planning (SCP) system involves the coordination and integration of core business activities, from the procurement of raw materials to the delivery of the product to the customers (Gupta & Maranas, 2003). Kobayashi (2003) indicate that SCP system is a software packages, which is used in order to share real-time business information and synchronize the business activities. By using the SCP system, companies can improve the production and sourcing plan by adapting to the changes in the business status as well as choosing the best types of action seen form the perspective of the whole supply chain. Bagchi and Skojett-Larsen (2002) classify companies, which use both ERP system and SCP system as having high level of information integration.

Communication Systems, Internet/Extranet

For improving the efficiency of production and logistics, supply chain partners need to exchange information with each other (Smith et al. 2010). An information and communication technology named electronic data interchange (EDI) has been developed in order to enhance the capability in conducting business-to-business information transactions (Adam et al. 2013; Narayanan et al. 2009). EDI is referred to a process of transferring business-to-business and computer-to-computer data in agreed standard format from one computer to another automatically without being interfered by human (Becker, 2012; Narayanan et al. 2009). EDI makes it possible for a company to share its information with multiple computer systems and the information is readable for these computers immediately. Furthermore, EDI decrease risk of human error and process time due the information is transferred in a standard format that can be read by every computer. The automatic purchasing, shipping and data transfer between companies has restructured the relationship between buyers and suppliers (Becker, 2012). However, the cost to adapt EDI system
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is high, which most of small companies cannot afford (Moran, 2007). Moreover, EDI system can also be used through HTML (Internet) or XML markup. Both EDI/Internet and EDI/XML are well-recognized platform-independent international standards applied for defining descriptions of electronic documents. The difference between XML and Internet markups is that XML markup is more flexible. This due to that EDI/Internet requires users to send data in agreed standard form otherwise the other computers might not be able to read the data while EDI/XML is extendable and more flexible (Becker, 2012; Moran, 2007; Narayanan et al. 2009). Bagchi and Skojett-Larsen (2002) classify companies, which only use E-mail and telephone as communication system, as having low level of information integration. Companies, which use EDI/Internet communication system regarded as having medium level of information integration. Furthermore, companies, which use EDI/HTML/XML, are referred as high level of information integration.

**Bar-coding and Track-and trace systems, Data capture, Inventory Visibility**

Data capture systems enable automatically identify, capture and transfer information about an object. Bar-coding system is known as the most used data capture system (Jonsson, 2008). Bar-coding systems is an identification system which is used to identify object automatically. The bar-coding can be used for various reasons, for instance to identify work description in production as well as batch notes and delivery notes in transportation (Jonsson, 2008). Furthermore, the use of bar coding system benefit companies to increase the inventory visibility (Zhang et al. 2011).

Mousavi et al. (2002) indicate that tracking system aims to capture timely and correct information about the movement of materials. According to Mendes (2011) track and trace system is a logistics IT systems, which enables companies to track delivery trucks and manage problems that may occur during the delivery process.

**Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management**

Collaborative planning, forecasting and replenishment and vendor managed inventory are the two most popular supply chain integration concepts, which are developed to encourage buyers to share information with its suppliers (Sari, 2008).
Vendor-managed inventory (VMI) is defined as partnership between a supplier and its customer whereby the supplier manages and replenishes its customer’s inventory (Kwak et al., 2009; Yao and Dresner, 2008; Yao et al. 2010). VMI integrates the operation between supplier and its customer by sharing information and reengineering business processes. When using VMI, buyers should share its sales and inventory information so that suppliers might be able to plan its production, deliveries, and manage order volumes and inventory levels on the behalf of the buyer. The potential benefits from utilizing VMI are reduced inventory costs and order cycle time as well as improved customer service (Yao et al. 2007). Szmerekovsky and Zhang (2008) point out that the inventory at the buyer’s side is owned by the supplier. Furthermore, the buyer does not have to pay for the products before they have sold them to its customer. As consequence, even though VMI may bring benefits for suppliers, the fear of opportunistic behavior might be an essential factor to keep suppliers from participating the program (Yao et al. 2010).

Collaborative planning, forecasting and replenishment (CPFR) regards information exchange between partners, which enables supply chain collaboration and visibility (Attaran & Attaran, 2007; Jonsson, 2008). Furthermore, CPFR provides company the opportunity to increase the supply chain effectiveness by applying demand planning, logistic planning, synchronized production scheduling as well as product design. The use of CPRF fore supply chain partners to create strong relationship with each other (Attaran & Attaran, 2007). Holweg et al. (2005) indicate that by synchronizing supply chains will lead to increased responsiveness of the partners and at the same time reduce inventory costs.

The relationship between supply chain partners can be managed by customer relationship management (CRM). CRM is refer to a comprehensive strategy and process, which aims at creating greater value for the company and customer by the process of retaining and acquiring customer as well as establishing long-term as well as profitable partnership with them. (Ngai et al. 2009). In other words, CRM involves customer ordering process, product support and customer service. In order to achieve the goal, customer data and interaction with customer via personnel and/or technology is required (Graf et al. 2013).
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Bagchi and Skjoett-Larsen (2002) refer low level of information integration to no use of VMI, CPFR or CRM. Medium level of information integration means that VMI, CPFR or CRM is used at an experimental stage. High level of information integration means intensive use of these tools with supply chain partners.

3.1.2 Organizational Integration

Organizational integration has a great impact on the success of the supply chain integration, since the integration requires numerous actors at different level of several organizations to collaborate in order to achieve common goal. It enables information sharing both within and among supply chain partners (Bagchi & Skjoett-Larsen, 2002). Furthermore, Pinsonneault and Barki (2012) point out that the organizational integration also assist companies to develop the information technology.

Organizational integration is defined as;

“The extent to which distinct and interdependent organizational components (i.e., organizational units, departments or partners and includes the business processes, people, and technology involved) constitute and behave as a unified whole.” (Pinsonneault & Barki, 2012 p.5187).

Furthermore, Pinsonneault and Barki (2012) point out that organizational integration constitutes the integrated structure as well as the relationship both within and between organizations. Bagchi and Skjoett-Larsen (2002) indicate that organization integration assists supply chain partners to collaborate and behave as one unified entity through sharing ideas, skills and cultures. In order to classify the level of organizational integration, the structural and relational characteristics of a focal company needs to be exam (Table 2).

<table>
<thead>
<tr>
<th>Organization Characteristics</th>
<th>LOW Integration</th>
<th>Medium Integration</th>
<th>HIGH Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of Logistics/SCM in the Organization</td>
<td>Logistics sub-function Not part of senior management team</td>
<td>Unified logistics function under one organizational entity</td>
<td>Logistics/SCM member of corporate management group</td>
</tr>
<tr>
<td>Degree of Integration</td>
<td>Fragmented logistics activities</td>
<td>Internal Integration across functions</td>
<td>Integrated across supply chain/process oriented</td>
</tr>
<tr>
<td>Importance of</td>
<td>Logistics not considered</td>
<td>Logistics considered a</td>
<td>Logistics/SCM</td>
</tr>
</tbody>
</table>
THEORETICAL FRAMEWORK

<table>
<thead>
<tr>
<th>Logistics</th>
<th>a core competence</th>
<th>critical activity</th>
<th>considered a core competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication across the Supply Chain</td>
<td>Few contact points between companies in the supply chain</td>
<td>Regular contact at top/senior levels-rare operational level contact</td>
<td>Multiple contact points at all management levels</td>
</tr>
<tr>
<td>Governance Structure</td>
<td>Arm’s length relationship-market-based</td>
<td>Partnership only at selected areas and levels-hybrid organization (semi-strong form)</td>
<td>Virtual integration-hybrid organization (strong form)</td>
</tr>
<tr>
<td>Formal Lateral Organizations</td>
<td>No cross-functional teams</td>
<td>Cross-functional teams in some areas Key account managers</td>
<td>Teams across the supply chain regular interaction</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>Measurement of delivery service and inventory levels in some parts of the supply chain</td>
<td>Measurement of order lead time, logistics costs and service levels Joint measurement in some interfaces</td>
<td>Measurement of performance of supply chain processes Performance data shared across the supply chain Focus on end-customer value</td>
</tr>
</tbody>
</table>

Table 2 Stages of organizational integration (Bagchi and Skjoett-Larsen, 2002, p.100)

Statues of Logistics/SCM in the Organization

Bagchi and Skjoett-Larsen (2002) describe the status of logistics/ SCM in the organization as the criteria for the integration level of logistics function in a company. The integration levels are divided into low, medium and high. Low level of integration refers to that logistics is a sub-function of the company, meaning that there is no senior manager that is set responsible for only logistics function. Medium level of integration refers to that there is a senior manager who is responsible for the logistics functions. High level of integration refers to that there is a logistic/SMC member involved in the corporate management group.

Degree of Integration

The degree of integration examines the integration level of logistics activities within the company. Low level of integration indicates that logistic activities are fragmented between supply chain partners, meaning that the logistic activities are performed separately by each supply chain partner (Bagchi & Skjoett-Larsen, 2002). On the other hand, medium level of integration means that logistic activities are to some extent involved in different business processes within as well as between organizations. Parker et al. (2008) point out that in order for an organization to adapt to the rapidly changing market, it is necessary to have closer and more thorough actions between departments, division as well as between companies. This in turn will
assist companies to coordinate their business activities, which are needed to develop, produce and deliver product and services. Finally, Bagchi and Skjoett-Larsen (2002) indicate that high level of integration means that logistic activities are highly integrated with supply chain partners’ business processes.

**Importance of Logistics**

The level of organization integration is also determined by the perceived importance of logistics in the company. Low level of integration means that logistics is not perceived as a core competence in the company. Medium level of integration means that the company perceives logistics as critical activity (Bagchi & Skjoett-Larsen, 2002). Critical activity refers to the business activity that has a greater impact on an organization’s ability to achieve competitive advantage through reduction of costs (Mclvor, 2005). High level of integration implies that logistic is a core competence of the company (Bagchi & Skjoett-Larsen, 2002). Core competence is referred as a specific element, which a company perceives as being central to how the company operates, or how its employees work. A business activity needs to fulfill three main criteria in order to be views as a core competence. These criteria are that the business activity needs to provide customer with benefits, it is difficult for competitors to copy and finally it can be utilized broadly to various products and markets. Moreover, core competence may be showed in different forms such as technical know-how and close relationship with customers (Kaklauskas et al., 2010).

**Communication across the Supply Chain**

The level of communication integration across the supply chain has also an affect of the organizational integration (Bagchi & Skjoett-Larsen, 2002). Communication is an important capability, which companies need to be able to have a successful integration with their customers (Teixeira et al. 2008). Rare communication with few contact points between companies in the supply chain is considered as low level of integration. Regular contact at only top/senior management level is considered as medium integration. Whereas the high level integration regards to the communications between supply chain partners take place between managers at all level (Bagchi & Skjoett-Larsen, 2002).
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Governance Structure
Arm’s length relationship refers to supply chain partners remain independent and pursue their own interest. In other words, the relationship between the partners is weak, and there is none or very low possibility of future cooperation (Lamb et al. 2008). Arm’s length integration between supply chain partners is viewed as low level of integration (Bagchi & Skjoett-Larsen, 2002). Hybrid organization, according to Picot et al. (2008) is characterized as an intensive relationship between partners where partners corporate with each other in order to execute and complete its tasks. However, these partners still stay legally and economically independent. Bagchi and Skjoett-Larsen (2002) indicate that if supply chain partners only have intensive relationship at specific areas and levels, the integration level is classified as medium. On the other hand, supply chain partners’ together form a complete hybrid organization is seen as high level of integration.

Formal Lateral Organizations
Cross-functional team involves members from different functional departments, such as manufacturing, engineering or marketing (Feng et al. 2010) this in order to ensure that the organizations goals are fulfill effectively (Holland et al. 2000). Furthermore, the cross-functional teams assists organizations to improve timing of technology development and coordination and integration, expand organizational boundaries as well as reduce level of uncertainty (Feng, et al. 2010). Bagchi and Skjoett-Larsen (2002) indicate that companies without cross-functional teams is considered as having low integration, whereas medium level of integration regards to companies that have cross functional times in certain areas. Companies that have cross-function teams that operate across organizational boundaries are characterized as having high level of integration (Bagchi & Skjoett-Larsen, 2002; Lambert & Cooper, 2000).

Performance Measurement
Performance measurement is essential in strategy formulation and communication since it measures and shows the actual results of organizational performance (Akyuz & Erkan, 2010). Performance measurement should correspond to organizational goals and accomplishment of these goals can be measured (Gunasekaran, et al. 2004). According to Bagchi and Skjoett-Larsen (2002) low level of integration represents companies that measure delivery service and inventory levels on some of its supply chain partners. Gunasekaran, et al. (2004) point out that on-time
delivery service is an important aspect of delivery performance, which reflects if a delivery executed as planned. There are several factors that affect the delivery service, such as frequency of delivery and location of depots. By increasing efficiency on these factors, the inventory level can in turn be improved. Bagchi and Skjoett-Larsen (2002) refer medium level of integration to companies that measure order lead-time, logistics costs as well as service level. Moreover, supply chain partners share joint measurement in some interfaces. Finally, companies that measure the performance of the entire supply chain processes and share the performance data across the chain are considered as having high level of integration.

3.2 CONFLICTING GOAL

Wong et al. (2011) point out that the goal of applying supply chain integration is to improve companies’ operational performance. Through supply chain integration, companies will have a better collaboration in planning business activities and will act as one unified entity (Bagchi & Skjoett-Larsen, 2002). Nevertheless, due to the fact that supply chain partners operate independent with own objectives, planning and resources, the goal that are set by each partners differs (Zhao et al. 2008). The conflict occurs due to that the goal of each chain partner is to maximize their own operational performance even though this in turn will interfere other partners’ operational performance (Ryu & Yücesan, 2010). This conflicting goal, according to Cao et al. (2010), may hamper supply chain partners’ ability to maximize each partners’ own benefits. The term operational performance involves performance of flexibility, product quality and production costs (Wong et al. 2011).

3.2.1 Flexibility

Flexibility describes a company’s ability to response to the environmental uncertainty with little time, effort, costs or performance. Besides, flexibility also regards as a proactive assign constructed into a system. With other words, flexibility is not a reactive behavior to the uncertainty, which in turn determine time, effort or costs (Gosling et al. 2010). Flexibility can be
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divided into three categories; delivery and volume flexibility, operational decision flexibility as well as storage flexibility (Schütz & Tomasmgard, 2011).

**Delivery and Volume Flexibility**
Delivery flexibility is the ability to adopt delivery in time and quantity as well to respond to customer’s changing requirements on a placed order (Jonsson, 2008; Schütz & Tomasgard, 2011). This ability is related to length of promised delivery times, throughput time, set up times, batch size as well as product changes to products that are already in production process in production (Jonsson, 2008). Furthermore, volume flexibility is referred to the ability of increase or decreases the production effectively in order to meet customer requirement on order volume (Oosterhuis et al. 2012). This ability is linked to delivery times of supplied items, the raw material stock size, the throughput time, batch size in production and the utilization of the capacity for the current plant (Jonsson, 2008).

As the characteristics of delivery and volume flexibility, manufacturers are required to have flexible production capacity in order to quickly respond to the changed customer order (Jonsson, 2008). Furthermore, Oosterhuis et al. (2012) and Zhao et al. (2013) indicate that changes in customer orders result in inefficiencies for the manufacturer since the manufacturer needs to reschedule the work as well as result in requirement of extra raw material and warehouses expenses.

**Operational Decision Flexibility**
Okongwu et al. (2012) indicate that the optimal situation is that customer orders are delivered as promised. However, in the reality it may occur operational disruption such as machine breakdowns as well as material shortage, which results in stock-out situations. The material shortage may result in declining customer orders and the machine breakdown may result in unfulfilled customer orders. According to Schütz and Tomasgard (2011), operational decision flexibility refers to the ability to respond to the disruptions by using different materials for producing the same product and assign the production volumes to another production facility. The operational flexibility generally increase production costs, whereas it might be necessary in order to satisfy customers demand.
Storage Flexibility
For responding to material shortage or unplanned order, inventory of finished goods and/or raw material is needed (Schütz & Tomasgard, 2011). With other words, the inventory is carried in order to satisfy unplanned customer demand (Lai et al. 2009). The ability to transfer finished goods or raw material in time with the help of inventory is referred as storage flexibility (Schütz & Tomasgard, 2011). Nevertheless, carrying inventories may involve risks as well. For instance inventory can lose value if it has been stored for too long. The risk of carrying inventory and reducing the tied-up capital, can be shared between supply chain partners. However, not every supply chain partner is willing to share the risk of carrying inventories and therefore transfer the risk to the other partner (Lai, et al. 2009).

3.2.2 Product Quality
Quality performance in the operational performance is defined as product quality (Wong et al. 2011). Product quality refers to how well the specification of a product is designed so that the product can fulfill its function. Furthermore, the product quality also refers to which extent the product meets the designed specifications (Nayak & Ray, 2012). Product quality is based on eight dimensions and conformance is the quality dimension that manufacturing companies focus mostly on (Sebastianelli & Tamimi, 2002).

Quality Conformance
Quality of conformance refers to the level that a product meets specific design standards. In other words, quality conformance is related to the extent the products performance characteristics meet the design specifications (Sebastianelli & Tamimi, 2002). Therefore quality conformance refers to the ability that the company possesses in order to produce product according the design specification (McNally et al. 2011). Furthermore, in order to improve product quality, information such as quality performance in term of defect rates needs to be shared (Carr & Kaynak, 2007; Xu, 2011; Zeng, et al. 2013).
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3.2.3 Production Costs
Cost in operational performance is refers as production costs (Wong et al. 2011). The drivers for production costs, according to Bozarth et al. (2009), are upstream complexity, internal complexity as well as downstream complexity.

Upstream Complexity
The upstream complexity is the level of how many activities a company outsources to suppliers. High upstream complexity leads to higher volume of purchasing items and increased material management activities and therefore increasing production costs. When outsourcing to suppliers, companies needs to take the uncertainty of suppliers lead times into consideration, which in turn will extend planning schedule as well as increase level the safety stock (Bozarth et al. 2009).

Internal Manufacturing Complexity
Internal manufacturing complexity is referred to the complexity and the mount of details that a manufacturing process is required in order to produce the products. With other words, the internal manufacturing complexity is related to the level of customization (Bozarth et al. 2009). Customization means that a company satisfies individual customer needs with specified products, which generally involves higher production costs (Blecker & Abdelkafi, 2006). The higher level of internal manufacturing complexity the higher the production costs will be (Bozarth et al. 2009). Mass customization is the solution for companies to produces customized products only at slightly higher production costs than producing standard products (Blecker & Abdelkafi, 2006).

Downstream Complexity
The downstream complexity refers to the degree of detail and dynamic complexity that are originated from the downstream market. The triggers of downstream complexity are the number of customer, the heterogeneity of customer needs, product cycle time as well as the demand variability (Bozarth et al. 2009). The number of customer and the heterogeneity of customer needs are triggers that are related to customer numbers. As the objective of this thesis is the SME manufacture and its most important customer, the first two triggers will therefore not be discussed. Krishnan and Gupta (2001) indicate that shorter product life cycles imply that the number of products that should be delivered of a given time frame will be increased. Moreover,
THEORETICAL FRAMEWORK

according to Bozarth et al. (2009), shorter life cycles also mean that customers’ demand on new product will be more frequent. As a result, shorter product life cycles will increase the complexity of producing products (Bozarth et al., 2009; Krishnan & Gupta, 2001). Higher demand variability affect the entire production process and has a negative impact on the daily production schedule (Shah and Ward, 2007). The demand variability may be reduced by sharing demand information between partners (Fang et al. 2013). As consequence, higher downstream complexity leads to higher production costs due to the size and scope of demand and order management activities will increase (Bozarth et al. 2009).

3.3 SMALL AND MEDIUM SIZED ENTERPRISES

SMEs are becoming more and more important in the global business network and participating in numerous supply chains (Hvolby & Trienekens, 2002). Supply chain integration is an essential key for the achievement of competitive supply chain (Vaaland & Heide, 2007). Palomero and Chalmet (2012) suggest that the trigger for SMEs to implement supply chain integration is the pressure from LEs as supply chain integration is a key for LEs to improve its efficiency. However, SMEs do not implement supply chain integration as deeply as LEs. The phenomenon is based on that SMEs does not possess the required knowledge, human and financial resources (Kobayashi et al., 2013; Palomero and Chalmet, 2012), SMEs are generally managed at arm’s length by larger buyers (Vaaland & Heide, 2007).

As the implement of supply chain integration requires considerable human resources and financial resources, which SMEs generally do no possess, the challenge of implementing supply chain integration is high (Kobayashi et al. 2003). Harland et al. (2007) indicate that information integration in supply chain is essential to achieve the benefits of supply chain integration. However, existing evidence shows that SMEs are less likely to use new information technology systems, since SMEs do not have enough resource and/or tend to be more uncertain of the benefits of adapting information technology. The limited information technology infrastructure may influence SMEs ability to plan its production effectively. This according to Vaaland and Heide (2007) leads to higher production costs and higher inventories.
THEORETICAL FRAMEWORK

Furthermore, due to that SMEs are viewed as easily replaceable, hence LEs are reluctant to establish deeper partnerships with them. Therefore, SMEs are often managed by arm’s length by LEs (Vaaland & Heide 2007). With other words, SMEs need to obey the requirement set by LEs if they wish to continue the business (Thakkar et al. 2008)

3.4 AUTOMOTIVE INDUSTRY

The automotive industry is economically important as well as technological complex industry (Chandra & Grabis, 2007). Due to the intensive competition in the automotive market, the primary issue for the automotive industry is to establish a demand-driven supply chain in order to quickly responds to changing customer demands (Sturgeon et al. 2009; Wiengarten et al. 2010). As a result supply chain management is an essential issue and a critical factor for the success or survival of companies in this industry (Xia & Tang, 2011). However, the difficulty to implement this strategy is high since the complexity of the automotive industry supply chain (Wiengarten et al. 2010).

The automotive industry has a relatively concentrated structure since the industry is determined largely by a small number of leading automakers. The imbalanced power enables these leading automakers to dominate the relationships with suppliers (Pavlinek & Zenka, 2011; Sturgeon et al. 2009) and to decide which suppliers will be selected. Price, quality and timeless of delivery are the three main criteria for these leading companies when choosing suppliers (Krause et al. 2007; Pavlinek & Zenka, 2011) Additional, the unbalanced power also enable these leading companies to create unique standards and specifications of components (Pavlinek & Zenka, 2011; Sturgeon et al. 2009). This phenomenon results in that most parts and components are extensive customized. Higher customization requires closer collaboration between partners and the costs for manufacturers will increase as well. As consequence, the imbalanced power creates a tough environment for smaller companies to improve their prospects by obtaining new customers or developing unique products and technologies (Sturgenon et al. 2009).
Theoretical Framework

Automotive industry is known for the efforts on improving the cost-efficiency by applying just-in-time (JIT) philosophy (Ambe & Badenhorst-Weiss, 2010; Thun and Hoenig, 2011). The benefits with JIT are reductions in inventory, lot sizes, waste, manufacturing costs, lead-times as well as improvement in quality, productivity and flexibility (Jayaram et al. 2008). The principle of JIT is to continuously eliminate waste in the production environment. Companies apply JIT purchase smaller quantities of goods, require for more frequent deliveries and do not carry inventory. Therefore it is essential that suppliers can supply products punctually in right time, quantity and quality (Aksoy & Öztürk, 2011). With other words, automakers are deeply relied on its suppliers (Krause et al. 2007) As a result, in order to successfully implement JIT, company needs to establish closer coloration with its suppliers.

3.5 Theoretical Synthesis

In order to obtain a better understanding of the chosen theories in this thesis, a theoretical synthesis will be developed. Supply chain integration is an important concept for the automotive industry due to the high supply chain complexity of the automotive industry (Chandra & Grabis, 2007; Xia and Tang, 2011). In this thesis, Bagchi and Skjoett-Larsen’s (2002) operationalization of supply chain integration have been utilized. The supply chain integration consists of two dimensions, which are information and organizational integration. These two dimensions are further classified into three levels, high, medium and low. The level of information integration refers to the type of information, which is shared through different information technologies (see table 1) between supply chain partners (Bagchi & Skjoett-Larsen, 2007). On the other hand, organizational integration is referred to the degree supply chain partners constitute and behave as one unified entity (Pinsonneault & Barki, 2012). The level of organizational integration can be examined by viewing different organizational characteristics (see table 2). Supply chain integration is an important factor for a competitive supply chain (Vaalnad & Heide, 2007). Nevertheless, SME generally do not implement supply chain integration as deeply as LES due to the characteristics of its organizational structure, short-term management perspective, arm’s-length relationship with customers as well as limited resources (Kabayashi et al. 2013, Palomero & Chalmet, 2012; Towers & Burnes, 2008; Vaalnad & Heide, 2007).
THEORETICAL FRAMEWORK

In the theoretical framework of this thesis, goal is referred to supply chain partners’ goal of maximize their own operational performance. Wong et al. (2011) indicate that operational performance consists of three main criteria related to operational performance, which are flexibility, product quality and production costs. Furthermore, the purpose of implementing supply chain integration is to improve the above-mentioned operational performances even though it will damage the other partner’s benefit (Cao et al. 2010; Wong et al. 2011). Therefore the term conflicting goal in this thesis is referred to the independent goal of maximizing own operational performance, which is in conflict with the other partner’s goal.

In order to capture if the level of supply chain integration is affected by conflicting goal from the empirical findings, a further operationalization of how conflicting goal can be managed needs to be made. As the further operationalization is missing in existing theories, and therefore variables such as obliging, compromising as well as dominating, which exist in conflict management theory will be used in this operationalization. According to Toms (2006) obliging refers to when one of the partners involved in the conflict has low concern for itself and priorities the other partner’s desires and objectives over its own. Compromising means that both partners reach a compromise. In other words, the solution for the conflict refers to a give and take method, which means that both partners only obtain part of what they desired. Finally, dominating signifies that when conflicts occur one of the partners has high concern for itself and prioritize its own desire and objective over the other partner’s. Since maximizing the operational performance is the goal of supply chain partners, the operational performance in terms of flexibility, product quality and production costs will therefore also be included in the operationalization of the how conflicting goal can be managed.

The following table (table 3) shows the operationalized of how conflicting goals can be managed.

<table>
<thead>
<tr>
<th>Operational Performance</th>
<th>How Conflicting Goal Can be Managed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obliging</td>
</tr>
<tr>
<td>Flexibility</td>
<td>When conflict in terms of flexibility occurs, the manufacturer is required to fulfill the customer</td>
</tr>
</tbody>
</table>
### THEORETICAL FRAMEWORK

<table>
<thead>
<tr>
<th></th>
<th>desire and objectives regardless</th>
<th>part of what they desire</th>
<th>desire and objectives regardless</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Quality</strong></td>
<td>When conflict in terms of product quality occurs, manufacturer is required to fulfill customer desire and objectives regardless</td>
<td>When conflict in terms of product quality occurs, both partners reach compromise and obtain part of what they desire</td>
<td>When conflict in terms of product quality occurs, manufacturer requires its customer to accept its desire and objectives</td>
</tr>
<tr>
<td><strong>Production Cost</strong></td>
<td>When conflict in terms of production cost occurs, manufacturer is required to fulfill customer desire and objective regardless</td>
<td>When conflict in terms of production cost occurs, both partners reach compromise and obtain part of what they desire</td>
<td>When conflict in terms of production cost occurs, manufacturer requires its customer to accept its desire and objectives</td>
</tr>
</tbody>
</table>

Table 3 Operationalization of how conflicting goal can be managed (Hsu & Pacarizi, 2013)

![Diagram of Level of Supply Chain Integration](image)

Figure 5 Theory model (Hsu & Pacarizi, 2013)
4. EMPIRICAL FINDINGS

The following chapter presents the gathered information from five case companies. The chapter is structured on company basis, with a background description of the company. Followed by data related to supply chain integration. Thereafter the conflicting goal between focal company and its most important customer will be presented.

4.1 ALFA

4.1.1 Introduction

Alfa produces highly refined sheet metal components. The company offers a complete process from product design to customized logistic services. It was established in year 1983 and has today approximately 200 employees (Jonsson, Production Manager, 2013), with a turnover of nearly 300 million Swedish Kronor (Allabolag, 2013). Alfa operates in the automotive industry and is a first tier supplier for large automakers.

The company’s vision is:

“...to be of the leading European suppliers in the automotive industry”. (Alfa’s webpage, 2013).

In order to achieve this vision, Alfa combines the most up to date production technology together with human knowledge. Furthermore, the company provides also cross-functional logistics work as well as a complete standard processing chain, which can produce both in high and low volume (Alfa’s webpage, 2013).
EMPIRICAL FINDINGS

One of the leading automakers (which further will be referred as “Car AB”) has been the most important customer since Alfa’s establishment (Jonsson, Production Manager, 2013). This customer stands for approximately 30 percent of Alfa’s turnover (Svensson, Logistics Manager, 2013).

4.1.2 Supply Chain Integration

4.1.2.1 Information Integration

Transaction Systems
Alfa applies a transaction system called “MONITOR”, which differs from the transaction systems that their most important customer utilizes (Jonsson, Production Manager, 2013; Svensson, Logistics manager, 2013). “Monitor” assists the company with all the business activities that are required in order to satisfy customer demand. With other words, the transaction system assists the company from ordering raw material, calculating order lead-time and through-put time as well as billing (Svensson, Logistics Manager, 2013).

Communication Systems
The daily communication with the Alfa’s most important customer is through telephone and email. Furthermore, the EDI system is also used in order to receive the delivery plan from the customer. The delivery plan contains a one-year demand prognosis, which the company receives on a daily basis. The production manager points out that the delivery plan is received automatically from the EDI system and then entered manually in the internal business system. The information in the delivery plan is used to plan the business activities such as human resource and material allocation, production plan and purchasing activities (Jonsson, Production manager, 2013).

Bar-coding and Track-and trace Systems, Data Capture and Inventory Visibility
Alfa uses neither Bar-coding nor track and trace system today. The products are instead registered manually. However, the production manager emphasizes that the company will start using the bar-coding system in September 2013. This in order to reduce the mistakes and time that occurs when registering the data manually (Jonsson, Production manager, 2013). The
company is not responsible for the transportation to the customer. The only responsibility that Alfa takes under the delivery is to notify Car AB when the goods have been loaded on the transportation mode, the track and trace system is therefore not needed (Svensson, Logistics Manager, 2013).

Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management

Alfa uses neither VMI nor CPFR. The Logistics Manager further explains that Alfa does not have access to Car AB’s production plan, material requirement or sales forecast. The only information that is exchanged between them is the delivery plan. However, Alfa and Car AB have had a long-term relationship for almost three decades, and Alfa aims at maintaining this long-term relationship (Jonsson, Production Manager 2013). The relationship is built on good collaboration and Alfa’s good performance in terms of delivery index and quality level. Furthermore, the relationship with Car AB is managed by Alfa’s business managers, project managers as well as technicians (Svensson, Logistics Manager, 2013).

<table>
<thead>
<tr>
<th>Information Integration</th>
<th>Alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction System</td>
<td>• Alfa applies transaction system named “MONITOR”</td>
</tr>
<tr>
<td></td>
<td>• “MONITOR” assists Alfa to plan all its business activities required in order to satisfy its customer</td>
</tr>
<tr>
<td>Communication Systems, Internet/Extranet</td>
<td>• Daily communication takes place through telephone and e-mail</td>
</tr>
<tr>
<td></td>
<td>• Delivery plan is received automatically via EDI system</td>
</tr>
<tr>
<td></td>
<td>• The delivery plan is transferred into Alfa’s transaction system manually</td>
</tr>
<tr>
<td>Bar-coding and Track-and-trace Systems, Data Capture, Inventory Visibility</td>
<td>• Neither bar-coding nor track-and-trace system is applied</td>
</tr>
<tr>
<td>Vendor Managed Inventory (VMI), Collaborate Planning, Forecasting and Replenishment (CPFR), Customer Relationship Management (CRM)</td>
<td>• Neither VMI nor CPFR is utilized between Alfa and Car AB</td>
</tr>
</tbody>
</table>

Table 4: Information integration between “Alfa” and its most important customer (Hsu & Pacarizi, 2013)

4.1.2.2 Organizational Integration

Statues of Logistics/SCM in the Organization
EMPIRICAL FINDINGS

The organizational structure of Alfa is divided into different departments. The company’s logistic activities are managed in the logistics department. Moreover, the logistic department is responsible for acquisition of materials, planning of the operation, in-and outbound logistics as well as the handling the inventory. However, the Logistics Manager is not part of the company’s corporate management group (Jonsson, Production Manager, 2013).

Degree of Integration
In order to handle the logistic activities, project teams are assigned to work across department boundaries. However, the logistic activities are only managed internally and therefore are not integrated with Car AB (Svensson, Logistics Manager, 2013).

Importance of Logistics
The logistic activities are an essential part of the company’s operation. Since the customers demand will be fulfilled by these activities, such as production and purchasing activities (Jonsson, Production Manager, 2013; Svensson, Logistic Manager, 2013). Since there are other competitors on the market that offer similar products, the logistic activities are crucial for the company. Through improving the efficiency of the logistic activities, the company can reduce costs as well as increase the competitive advantages (Svensson, Logistic Manager, 2013).

Communication across the Supply Chain
Alfa has a daily communication with Carr AB through Alfa’s customer service. The Production manger emphasizes that the communication between the top managers only takes place when there are serious quality and delivery issues (Jonsson, Production Manager, 2013; Svensson, Logistics Manager, 2013).

Governance Structure
Alfa is economically dependent on Car AB since it stands for approximately 30 percent of Alfås’ turnover. These two companies are legally independent from each other, which means that Alfa is not a part of Car AB (Jonsson, Production Manager, 2013; Svensson, Logistics Manager, 2013). However, the Logistics Manager at Alfa emphasizes Alfa and Car AB are dependent on each other (Svensson, Logistics Manager, 2013).
EMPIRICAL FINDINGS

Collaboration plays an essential role for Alfa in order to fulfill the common goals of quality and delivery service set up by the customer (Jonsson, Production Manager, 2013; Svensson, Logistics Manager, 2013). Moreover, Car AB provides both information and financial support to the company in order for it to achieve the common goals, which are 100% delivery precision as well as 0% defect rate (Jonsson, Production Manager, 2013).

**Formal Lateral Organizations**
There are several cross-functional activities both within and across the organizational boundaries (Jonsson, Production Manager, 2013). The internal cross-functional teams are important when it comes to planning of the business activities. The cross-functional teams are often assigned when developing and producing new products together with Car AB (Svensson, Logistics Manager, 2013). Furthermore, cross-functional teams can also be assigned in order to solve delivery delay and quality issues that occur at Car AB (Jonsson, Production Manager, 2013). However, Alfa does not have key account managers since the size of the firm is too small (Svensson, Logistics Manager, 2013).

**Performance Measurement**
Alfa has common performance measurements with Car AB in terms of delivery index and quality level. However, the two partners measure the performance separately (Jonsson, Production Manager, 2013; Svensson, Logistics Manager, 2013). Alfa measures the delivery precision once a month and the quality level once a week (Svensson, Logistics Manager, 2013).

<table>
<thead>
<tr>
<th>Organizational Integration</th>
<th>Alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of Logistics/SCM in the Organization</td>
<td>• The company has logistics department</td>
</tr>
<tr>
<td></td>
<td>• Logistics manger is not part of the corporate management group</td>
</tr>
<tr>
<td>Degree of Integration</td>
<td>• The logistic activities are integrated internally or externally</td>
</tr>
<tr>
<td>Importance of Logistics</td>
<td>• Logistic function is considered as an essential part of the company’s operation</td>
</tr>
<tr>
<td></td>
<td>• There are other competitors that offer similar products</td>
</tr>
<tr>
<td></td>
<td>• Improving the efficiency of the logistics activities will reduce the company’s costs</td>
</tr>
<tr>
<td>Communication Across the Supply Chain</td>
<td>• Daily and regular communication with Car AB is taking care by customer service</td>
</tr>
</tbody>
</table>
EMPIRICAL FINDINGS

| Governance Structure | • Communication between top managers or higher level only takes place when there are serious delivery or quality issues
| | • The common goal that Alfa and Car AB have are quality level and delivery precision
| | • Common goal are set by Car AB
| | • Car AB provides both financial and knowledge support fro Alfa to reach the goal
| | • Car AB stands for approximately 30 % of Alfa’s turnover
| | • The Logistics Manager perceives that Alfa and Car AB are dependent on each other
| Formal Lateral Organizations | • Cross-functional teams work both within and outside organizational boundaries (e.g R&D and customer relationship)
| | • No key account manager
| Performance Measurement | • No joint measurement
| | • Performance such as delivery precision as well as quality level are measured separately by both partners

Table 5 Organizational integration between “Alfa” and its most important customer (Hsu & Pacarizi, 2013)

4.1.3 Conflicting Goal

4.1.3.1 Flexibility

Delivery and Volume Flexibility
After the order has been placed, Car AB has the right to change the demand both in quantity and delivery times at latest three days before the delivery day. If, Car AB changes the order after this timeframe, they cannot expect that Alfa will be able to fulfill the changed demand fully. However, the Logistic Manger indicates that situation seldom occurs (Svensson, Logistics Manager, 2013).

Operational Decision Flexibility
If production downtime occurs, Alfa has the flexibility to change the choice of raw materials as well as the possibility to outsource their production to its own suppliers, this in order to fulfill customer demand (Svensson, Logistics Manager, 2013).
EMPIRICAL FINDINGS

Storage Flexibility
Alfa receives a delivery plan with a one-year prognosis every day from Car AB. The prognosis will be used to plan Alfa’s production related activities for ten weeks ahead and the inventory of raw material corresponds to ten weeks demand forecast. Moreover, the inventory of finished goods only corresponds to two days of demand forecast (Jonsson, Production Manager, 2013). Alfa stands for the risks and costs for the inventory of both raw materials and finished goods (Svensson, Logistics Manager, 2013).

4.1.3.2 Product Quality
Quality Conformance
The quality of Alfas products is measured in terms of defect rates and customer complaints. The internal goal of the quality level is to have maximum 200 defect parts per million products produce and maximum eight customer’ complains per month (Svensson, Logistics Manager, 2013). However, customer requirement for the quality level is 0 defect product received. Therefore, the company is responsible for replacing the defect products and stands for all the expenses to Carr AB (Jonsson, Production Manager, 2013).

4.1.3.3 Production Costs
Upstream Complexity
Alfa possesses most of the technologies required to produce their products. However, the work of enamel as well as stainless steel welding is outsourced to their suppliers (Svensson, Logistics Manager, 2013).

Internal Manufacturing Complexity
Alfa offers customized products after Car AB’s requirement. In order to produces these customized products, expensive tools and equipment are needed. Even though the products are customized, the production process is standardized. Nevertheless, Car AB finances these tools and equipment (Svensson, Logistics Manager, 2013).
EMPIRICAL FINDINGS

Downstream Complexity
The product cycle time of Alfa’s products varies from one year up to fifteen years depending on
the characteristics of the product. Moreover, even though the company receives a delivery plan,
which consists of one-year demand prognosis from customer at a weekly base, the production
manager emphasizes that delivery plan is seldom 100% accurate (Jonsson, Production Manager,
2013). This due to that the customer has the right to adjust the placed order at latest three days
before planned delivery day (Svensson, Logistics Manager, 2013).

<table>
<thead>
<tr>
<th>Conflicting goal</th>
<th>Alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLEXIBILITY</strong></td>
<td></td>
</tr>
<tr>
<td>Delivery and Volume Flexibility</td>
<td>Customer is allowed to change the placed order both in volume as well as delivery date at latest three days before the planned delivery date</td>
</tr>
</tbody>
</table>
| Operational Flexibility | • Alternative materials can be used in accordance with customer approval  
                            • There is possibility to outsource production activities to its suppliers if any accident occurs |
| Storage Flexibility    | • Inventory of raw material corresponds to ten weeks demand forecast  
                            • Inventory of finished goods corresponds to two days of demand forecast  
                            • Alfa stands for the risks and costs for the inventory of both raw materials and finished goods |
| **PRODUCT QUALITY**    |                                                                      |
| Quality Conformance   | • The quality of the products is measured in terms of defect rates and customer complaints  
                            • The internal goal of the quality level is to have 200 ppm/month and eight customer complaints per month at maximum  
                            • Customer requirement for the quality level is 0 defect product received  
                            • Alfa stands for all the cost to replace the defected products |
| **PRODUCTION COSTS**   |                                                                      |
| Upstream Complexity    | • Alfa possesses most of the technology required to produce the product  
                            • Only enamel as well as stainless steel welding are outsourced |
| Internal Complexity    | • Customized product with standardized production processes |
EMPIRICAL FINDINGS

| Downstream Complexity | • The product cycle-time varies from one year up to 15 years  
|                        | • The special tools and equipment’s required to produce the product are financed by Car AB  
|                        | • The delivery plan is seldom 100% accurate and Car AB has the right to change placed order three days before the delivery date at latest  
|                        | • The product cycle time of Alfa’s products varies from one year up to fifteen years depending on the characteristics of the product |

Table 6 Conflicting goal between Alfa and its most important customer (Hsu & Pacarizi, 2013)

4.2 BULTEN SWEDEN AB

4.2.1 Introduction

Bulten Sweden AB (Bulten) is one of the largest suppliers of fastener to the automotive industry in the European Market (Finnveden, 2013). The company develops and produces various types of metallic fasteners. The company is located in Göteborg, Sweden and has today 50 employees with a turnover of approximately 900 million Swedish kroner (Allabolag, 2013). The company was established in year 1873 and it is today a part of FinnvedenBulten AB (Fritzell, Supply Chain Manager, 2013).

Bulten’s business concept:

“Bulten AB shall be a leading business partner and supplier of fastens to the international automotive industry, and shall continuously develop its full service concept. Bulten shall actively launch innovations and services in the production area of fasteners in order to secure its position on the European market and increase its presence and growth markets.” (Finnveden, 2013).

The business concept can be fulfilled by providing full service from technical development, know-how of material and production as well as logistics services. Furthermore, the company’s
strategy is to develop new products and offer better solutions to automakers by continuously focus on research and development of innovation and technology (Finnveden, 2013).

The company is a first tier supplier to a leading automaker (which further will be referred as “Auto AB”). Auto AB has been a customer on a regular basis since 1970s and today it stands for approximately 40 percent of Bulten’s turnover (Fritzell, Supply Chain Manager, 2013).

4.2.2 Supply Chain Integration

4.2.2.1 Information Integration

Transaction Systems
The transaction system that Bulten applies differs form the transaction system that Auto AB utilizes. The system that Bulten applies is called “MOVEX M3”, while Auto AB’s system is called SAP R/3. The information of customer order is automatically transferred into the MOVEX M3 system (Fritzell, Supply Chain Manager, 2013).

Communication Systems
Bulten has daily contact with Auto AB through email and telephone. Furthermore, the communication of delivery plan as well as invoices occurs through the Internet based EDI system. Moreover, the delivery plan contains a one-year demand prognosis, which is received once a week (Fritzell, Supply Chain Manager, 2013).

Bar-coding and Track-and trace systems, Data Capture, Inventory Visibility
The company does not use track and trace system or internal bar-coding system. However, the company uses external bar-coding system, meaning that the system is used only for outbound deliveries. The bar-coding does not update and transfer the information automatically. The Supply Chain Manager states that the description of items as well as batch notes are registered manually (Fritzell, Supply Chain Manager, 2013).
EMPIRICAL FINDINGS

Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management

Bulten has a long-term relationship with Auto AB, which is based on trust and mutual respect. Frequent and regular meetings and dialogs are the main keys to maintain the relationship. However, the Vendor managed inventory system as well as collaborative planning, forecasting, and replenishment are not used between Bulten and Auto AB (Fritzell, Supply Chain Manager, 2013).

<table>
<thead>
<tr>
<th>Information Integration</th>
<th>Bulten Sweden AB</th>
</tr>
</thead>
</table>
| Transaction System      | • Bulten applies transaction system named “MOVEX M3”  
                          | • The information is automatically transferred |
| Communication Systems, Internet/Extranet | • Daily contact with Auto AB takes place through telephone and e-mail  
                                           | • Delivery plan is received automatically via EDI/INTERNET system |
| Bar-coding and Track-and-trace Systems, Data Capture, Inventory Visibility | • Bar-coding system is only used in outbound logistics  
                                                                          | • Track-and-trace system is not implemented |
| Vendor Managed Inventory (VMI), Collaborate Planning, Forecasting and Replenishment (CPFR), Customer Relationship Management (CRM) | • Neither VMI nor CPFR is utilized between Bulten and Auto AB |

Table 7 Information integration between Bulten and its most important customer (Hsu & Pacarizi, 2013)

4.2.2 Organizational Integration

Statues of Logistics/SCM in the Organization

Bulten has a logistic department, where all the logistic activities are gathered. Furthermore, the Logistics Manager is a part of the company corporate management group (Fritzell, Supply Chain Manager, 2013).

Degree of Integration

The logistic activities are gathered in the logistic department and therefore not integrated with the other departments. Moreover, the logistic activities are neither integrated with Auto AB. The Supply Chain Manager indicates that the only communication regarding the outbound logistics only takes place when the orders is placed from Auto AB and when the products are delivered to Auto AB (Fritzell, Supply Chain Manager, 2013).
EMPIRICAL FINDINGS

Importance of Logistics
The Supply Chain Manager emphasizes that the logistics activities play a very important role in the company. This due to that Bulten does not only produce the fasteners but also offers logistic services for Auto AB. Furthermore, the manger emphasizes that up to 50% of the company’s costs can be save by the logistic activities (Fritzell, Supply Chain Manager, 2013).

Communication across the Supply Chain
The communication with Auto AB is held in different levels. The daily communication is through the customer support, sales personnel and key account manager. Moreover, the top managers only communicate when there are issues that could not be solved (Fritzell, Supply Chain Manager, 2013).

Governance Structure
Auto AB stands for nearly 40% of Bulten’s turnover and therefore the company is dependent on this customer. The most important tasks for Bulten are to fulfill the common goal in terms of quality, price and delivery service requirement that are set by Auto AB. The supply chain manager emphasizes that Auto AB expects that Bulten should be able to reach the set requirement by themselves (Fritzell, Supply Chain Manager, 2013).

Formal Lateral Organizations
Bulten has cross-functional teams that operate both within and across the organizational boundaries. There are two types of cross-functional teams; quality teams as well as key account managers. The quality team operates across all the company’s departments and customer base in order to provide recommendations and give instructions for customer regarding the usage of the products. The key account manager at Bulten for Auto AB is responsible for planning material allocation, planning the delivery as well as communicating with the customer (Fritzell, Supply Chain Manager, 2013).
EMPIRICAL FINDINGS

Performance Measurement

Bulten measures the performance in terms of delivery precision, administrative reports, technology reports, logistics costs, service level as well as production lead-time. The delivery precision, administrative report as well as technological report are the joint performance measurement between Bulten and Auto AB. The delivery precision measures Bulten's ability to delivery the right products, in right quantity and right time. The administrative report contains the feedback information regarding whether the products are packed according to the instructions. Finally, the technological report provides the defect rate of the received product from Auto AB (Fritzell, Supply Chain Manager, 2013).

<table>
<thead>
<tr>
<th>Organizational Integration</th>
<th>Bulten Sweden AB</th>
</tr>
</thead>
</table>
| Status of Logistics/SCM in the Organization | • The logistics function are united under logistics department  
• The Supply Chain Manager is a member of corporate management group |
| Degree of Integration | • The logistic activates not integrated with other departments or customer |
| Importance of Logistics | • Logistic activities is seen as an important function of the company since logistics service is one part of Bulten’s offer to its customer  
• Up to 50% of the company’s costs can be saved by the logistics activities |
| Communication Across the Supply Chain | • Daily communication via customer support, sales personnel and key account manager  
• The communication between senior/top manger only takes place when there are issues that could not be solved |
| Governance Structure | • The common goal that Bulten and Auto AB have are quality level and delivery precision  
• The customer expects that Bulten should be able to reach the set requirement by themselves  
• Auto AB stands for 40% of the company’s turnover  
• The Supply Chain Manager indicates that the company is more dependent on Auto AB then Auto AB is on them |
| Formal Lateral Organizations | • Cross functional teams work both within and outside organizational boundaries  
• Key account manger is assigned to mange activities related to the Auto AB |
| Performance Measurement | • The company measure their performance in terms of delivery precision, administrative reports, technological |
EMPIRICAL FINDINGS

<table>
<thead>
<tr>
<th>reports, logistics costs, service level and production lead-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Joint measurement with auto AB in terms of delivery precision and quality level</td>
</tr>
</tbody>
</table>

Table 8 Organizational integration of Bulten and its most important customer (Hsu & Pacarizi, 2013)

4.2.3 Conflicting Goal

4.2.3.1 Flexibility

Delivery and Volume Flexibility

Bulten receives the delivery plan, which includes a one-year demand forecast made by Auto AB once a week. Bulten supplies 50 percent of all the fasteners that Auto AB purchases. Bulten’s delivery precision to Auto AB is 97.3 percent today. According to the contract between Bulten and Auto AB, Auto AB has the right to adjust their placed order for maximum 20 percent of the ordered volume a week and the changed volume should not exceed 40 percent a month. However, the changes both in quantity and delivery time should be made three days before the delivery day at latest. In other words, if Auto AB changes the placed order within three days they cannot expect Bulten to meet their changed requirements fully (Fritzell, Supply Chain Manager, 2013).

Besides the short-term one-year demand prognosis from Auto AB, Bulten also takes part of Auto AB’s long-term vision of production planning. The supply chain manger further explains that Bulten makes their own customer demand prognosis for Auto AB based on this long-term vision. This customer demand prognosis will in turn assists Bulten to adapt their production capacity better (Fritzell, Supply Chain Manager, 2013).

Operational Decision Flexibility

In order to prevent any accident that might occur, which will disable the company to supply Auto AB, Bulten has six different raw material suppliers and the company has access to different production facilities. The usage of multiple suppliers decreases the risks of material shortage for Bulten. Furthermore, by having different production facilities the company has the opportunity to move their production if current production facility it damaged (Fritzell, Supply Chain Manager, 2013).
EMPIRICAL FINDINGS

Storage Flexibility
The company holds inventory of finished goods, which corresponds to one or two days of demand forecast. Bulten is responsible for their own decisions regarding inventory level of finished goods as well as purchased raw materials. Nevertheless, Bulten uses the so-called vendor managed inventory system with its suppliers. Meaning that the suppliers are responsible for filling the stock of raw materials and stands for the risks as well as costs until Bulten uses these materials (Fritzell, Supply Chain Manager, 2013).

4.2.3.2 Product Quality

Quality Conformance
Bulten measures the quality of their products in terms of defect rates. The internal goal of maximum defect rates is 30 parts per million products produced in a period of six months. Today the defect rates is 25 part per million, which is below the internal goal. Nevertheless, Auto AB requires defect free products. If the products that Auto AB receives are defective, Bulten stands for all the costs to replace the defected products. The Supply Chain Manager points out that 0 percent defect rate requires too much resources and it is impossible to achieve (Fritzell, Supply Chain Manager, 2013).

4.2.3.3 Production Costs

Upstream Complexity
The fasteners need to be treated in different processes until they can be delivered to the customers. Bulten possesses most of the technology that is required to produce these products. However, the company needs to purchase raw materials and outsource a part of the surface treatment (Fritzell, Supply Chain Manager, 2013).

Internal Manufacturing Complexity
The fasteners that are delivered to Auto AB are in different shapes, sizes, materials and they are customized to Auto AB. However, the Supply Chain Manager states that Bulten puts much effort on reducing the number of fasteners. In other words, Bulten works on developing fasteners that can be used in multiple ways so the number of the articles will be reduced and the production
volume will be increased. This in turn will benefit both Bulten and Auto AB by reducing production cost and purchase price (Fritzell, Supply Chain Manager, 2013).

**Downstream Complexity**
The product cycle time of different fasteners differs. The cycle time depends on the cycle time of the car model, which the fastener is produced for. Furthermore, when the customer decides to stop producing one car model, the company is required to deliver spare parts for fifteen years to the aftermarket (Fritzell, Supply Chain Manager, 2013).

As mentioned above, Bulten receives a delivery plan, which contains a one-year demand prognosis made by Auto AB. This prognosis is used by Bulten to plan the production related activities and the Supply Chain Manager emphasizes this prognosis is 98 percent accurate (Fritzell, Supply Chain Manager, 2013).

<table>
<thead>
<tr>
<th>FLEXIBILITY</th>
<th>Bulten Sweden AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery and Volume Flexibility</td>
<td>• Auto AB is allowed to change the placed order both in volume as well as delivery date at latest three days before the planned delivery date</td>
</tr>
<tr>
<td></td>
<td>• Auto AB has the right to adjust their placed order for maximum 20 percent of the ordered volume a week and the changed volume should not exceed 40 percent a moth</td>
</tr>
<tr>
<td>Operational Flexibility</td>
<td>• Bulten has six different raw material suppliers to prevent shortage of material occurring.</td>
</tr>
<tr>
<td></td>
<td>• There is possibility for Bulten to move its production activities to another facility.</td>
</tr>
<tr>
<td>Storage Flexibility</td>
<td>• Inventory of finished goods only corresponds to two days of demand forecast</td>
</tr>
<tr>
<td></td>
<td>• None inventory of raw materials, risk and costs is transferred to its suppliers</td>
</tr>
<tr>
<td></td>
<td>• Bulten stands for the risks and costs for inventory of finished goods</td>
</tr>
<tr>
<td>PRODUCT QUALITY</td>
<td>Quality Conformance</td>
</tr>
<tr>
<td></td>
<td>• The quality of the products is measured in terms of defect rates</td>
</tr>
<tr>
<td></td>
<td>• The internal goal of maximum defect rates is 30 ppm/ 6 months</td>
</tr>
<tr>
<td></td>
<td>• Customer requirement for the quality level</td>
</tr>
</tbody>
</table>
EMPIRICAL FINDINGS

<table>
<thead>
<tr>
<th>PRODUCTION COSTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream Complexity</strong></td>
<td>• Bulten outsources a part of the surface treatment to suppliers</td>
</tr>
<tr>
<td><strong>Internal Complexity</strong></td>
<td>• The fasteners are customized but the production processes are standardized</td>
</tr>
</tbody>
</table>
| **Downstream Complexity** | • The delivery plan from Auto AB is 98% accurate  
• The product cycle time differs from product to product.  
• The company is required to deliver spare parts for 15 years to the aftermarket |

Table 9 Conflicting goal between Bulten and its most important customer (Hsu & Pacarizi, 2013)

4.3 OGO AB

4.3.1 Introduction

OGO AB (OGO) is a Swedish supplier that is located in Kalmar and produces so called chassi components to the automotive industry. The company possesses technology in laser cutting, pressing, bending, welding as well as fixture manufacturing. OGO was established in year 1959 and has been part of Prestando Holding AB since year 2005. Today the company has 40 employees (Lewin, Logistics Manager, 2013), with a turnover of approximately 122 million Swedish Kronor (Allaboalg, 2013).

OGO’s vision is:

“To grow together with its customer and supplier in order to become an established business partner to the customer.” (Lewin, Logistics Manager, 2013-05-15).

The company is a first tier supplier to a leading automaker (which will be referred as Fordon AB). Fordon AB has been a customer over 50 years and today it stands for approximately 60 percent of OGO’s turnover (Lewin, Logistics Manager, 2013).
EMPIRICAL FINDINGS

4.3.2 Supply Chain Integration

4.3.2.1 Information Integration

Transaction Systems
The transaction system that OGO applies is a DOS-based transaction system which is called “2000”. This transaction system assists the company with their daily operation such as billing, ordering materials as well as notifications of deliveries. The company does not use the same transaction system as Fordon AB. The information of customer order is received by the EDI system and then automatically transferred to the transaction system “2000”. Due to that the current transaction system is seen as obsolete, the company plans to implement a new transaction system called “SWELOG” (Lewin, Logistics Manager, 2013).

Communication Systems
OGO communicates with Fordon AB in a daily basis through telephone and e-mail. Furthermore, the delivery plan, which contains a one-year demand prognosis, from Fordon AB is received daily through the Internet based EDI system (Lewin, Logistics Manager, 2013).

Bar-coding and Track-and trace systems, Data Capture, Inventory Visibility
Neither bar-coding nor track and trace system is utilized by OGO (Lewin, Logistics Manager, 2013).

Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management
OGO and Fordon AB have had a long-term relationship for more than 50 years. OGO desire to implement VMI with this most important customer, nevertheless this is not approved by the customer. Therefore, neither VMI nor CPFR is used between OGO and Fordon AB (Lewin, Logistics Manager, 2013).
EMPIRICAL FINDINGS

<table>
<thead>
<tr>
<th>Information Integration</th>
<th>OGO AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction System</td>
<td>• The transaction system that OGO implements is called “2000”</td>
</tr>
<tr>
<td>Communication Systems, Internet/Extranet</td>
<td>• Daily communication by e-mail and telephone</td>
</tr>
<tr>
<td></td>
<td>• Delivery plan is received via Internet based EDI system</td>
</tr>
<tr>
<td>Bar-coding and Track-and-trace Systems, Data Capture, Inventory Visibility</td>
<td>• Neither bar-coding nor track-and-trace systems is implemented</td>
</tr>
<tr>
<td>Vendor Managed Inventory (VMI), Collaborate Planning, Forecasting and Replenishment (CPFR), Customer Relationship Management (CRM)</td>
<td>• Neither VMI nor CPFR is used between OGO and Fordon AB</td>
</tr>
</tbody>
</table>

Table 10 Information integration between OGO and its most important customer (Hsu & Pacarizi, 2013)

4.3.2.2 Organizational Integration

Statues of Logistics/SCM in the Organization

The organizational structure of OGO is functional and the company has a logistic department where all the logistic activities are gathered. Moreover the Logistics Manager is a member of the company’s corporate management group (Lewin, Logistics Manager, 2013).

Degree of Integration

The logistics activities are not integrated neither with the other department within the organization nor with Fordon AB (Lewin, Logistics Manager, 2013).

Importance of Logistics

Logistics Manager at OGO perceives the logistic activities as the most important function of the company especially when there are numerous of competitors, which can produce similar products. The manager further explains that logistic activities affect OGO’s ability in reducing costs (Lewin, Logistics Manager, 2013).

Communication across the Supply Chain

The communication with Fordon AB is held generally at the operational level. The communication between top managers only occurs when there are serious issues in delivery precision or quality level (Lewin, Logistics Manager, 2013).
EMPIRICAL FINDINGS

Governance Structure
Logistics Manager at OGO perceives that both partners are dependent on each other. However, as been pointed out previously, Fordon AB stands for approximately 60 percent of OGO’s turnover and therefore, OGO is largely dependent on this customer. Delivery precision and quality level, which is set by Fordon AB, is referred as the common goals between these two partners. Moreover, Fordon AB assists the company to achieve these goals and if OGO is not able to fulfill these goals, the partners will find a common solution (Lewin, Logistics Manager, 2013).

Formal Lateral Organizations
There are no cross-functional teams are assigned in OGO (Lewin, Logistics Manager, 2013).

Performance Measurement
OGO measure the performance in terms of delivery precision, quality level, production lead-time, and throughput time as well as inventory level. Furthermore, the Logistics Manager indicates that Fordon AB measure the company’s performance by measuring delivery precision as well as quality level. However, the delivery precision and quality level are measured separately by both partners (Lewin, Logistics Manager, 2013).

<table>
<thead>
<tr>
<th>Organizational Integration</th>
<th>OGO AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of Logistics/SCM in the Organization</td>
<td>• The logistic activities are gathered under logistic department</td>
</tr>
<tr>
<td></td>
<td>• Logistics Manager is a member of the company’s corporate management group</td>
</tr>
<tr>
<td>Degree of Integration</td>
<td>• The logistic function is not integrated within or outside the company</td>
</tr>
<tr>
<td>Importance of Logistics</td>
<td>• The logistic function is considered as the most important function of the company</td>
</tr>
<tr>
<td></td>
<td>• Logistic activities affect OGO’s ability in reducing costs.</td>
</tr>
<tr>
<td>Communication Across the Supply Chain</td>
<td>• The communication is generally held at the operational level</td>
</tr>
<tr>
<td></td>
<td>• The communication between top managers only take place when there is serious delivery or quality issues</td>
</tr>
<tr>
<td>Governance Structure</td>
<td>• Delivery precision as well as quality level is referred as the common goals</td>
</tr>
<tr>
<td></td>
<td>• The common goals are set by Fordon AB</td>
</tr>
<tr>
<td></td>
<td>• Fordon AB assists the company to achieve these goals</td>
</tr>
</tbody>
</table>
EMPIRICAL FINDINGS

<table>
<thead>
<tr>
<th>Formal Lateral Organizations</th>
<th>Performance Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No cross-functional teams</td>
<td>• OGO measure the performance in terms of delivery precision, quality level, production lead-time, and throughput time as well as inventory level</td>
</tr>
<tr>
<td></td>
<td>• No joint performance measurements between OGO and Fordon AB</td>
</tr>
<tr>
<td></td>
<td>• Delivery precision and quality level are measure separately by both partners.</td>
</tr>
</tbody>
</table>

Table 11 Organizational integration between OGO and its most important customer (Hsu & Pacarizi, 2013)

4.3.3 Conflicting Goal

4.3.3.1 Flexibility

Delivery and Volume Flexibility
A delivery plan, which contains a one-year demand forecast made by Fordon AB, is received on a daily basis. Fordon AB has the right to adjust the placed order both in volume and delivery date at latest three to four days before the planned delivery day. OGO’s ambition is to adapt to the changes as good as they possibly can (Lewin, Logistics Manager, 2013).

Operational Decision Flexibility
In order to prevent accidents in forms of production brake-down and material shortage, OGO has back-up plans. If production brake-down occurs, the company can outsource the production activity to their suppliers. Moreover, if there is material shortage, the company has the flexibility alternative materials in accordance to customer approval (Lewin, Logistics Manager, 2013).

Storage Flexibility
The Logistics Manger at OGO points out that the company desires to carry as little inventory as possible. However, in order to respond to the changed requirements, carrying inventory of finished goods and raw materials is needed. OGO is fully responsible for the risk and costs for the inventory of finished goods. Whereas the company implements consignment stock with its supplier, the risk and cost for carrying inventory of raw material is therefore transferred to their supplier (Lewin, Logistics Manager, 2013).
EMPIRICAL FINDINGS

4.3.3.2 Product Quality

Quality Conformance
The quality of the products at OGO is measured in terms of customer complaints. The current quality level is eleven customer complaints from January to April 2013. However, Fordon AB requires that none of the received products from OGO is defective. If the products that Fordon AB receives are defective, OGO is responsible for all the costs that occur in order to replace the defected products (Lewin, Logistics Manager, 2013).

4.3.3.3 Production Costs

Upstream Complexity
OGO possesses most of the technology that are required in order to produce the products. The only production activity that is outsourced is the surface treatment. In order to reduce the risk caused by their suppliers’ lead-time, OGO carry higher inventory of finished goods that needs to have a surface treatment (Lewin, Logistics Manager, 2013).

Internal Manufacturing Complexity
The products that OGO delivers to Fordon AB are customized after the customer’s requirement. Even though these products are customized, the Logistics Manager at OGO does not experience that the production costs are higher than producing standardized product. This due to that the production processes is standardized, the production volume is high and the special tools and equipment are owned by Fordon AB (Lewin, Logistics Manager, 2013).

Downstream Complexity
Logistics Manager at OGO emphasizes that OGO produces numerous of articles and therefore the product cycle-time differ from article to article, depending on the characteristics of the product (Lewin, Logistics Manager, 2013).

The received delivery plan from Fordon AB is mostly in consistent with the actual order. There are only minor deviations, which will not have significant affect on OGO’s production plan (Lewin, Logistics Manager, 2013).
EMPIRICAL FINDINGS

<table>
<thead>
<tr>
<th>FLEXIBILITY</th>
<th>OGO AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery and Volume Flexibility</td>
<td>• Fordon AB has the right to change placed orders at latest three to four days before the planned delivery date</td>
</tr>
<tr>
<td>Operational Flexibility</td>
<td>• Alternative materials can be used in accordance with Fordon AB’s approval</td>
</tr>
<tr>
<td></td>
<td>• There is possibility for OGO to outsource its production activities to its suppliers if any accident occurs</td>
</tr>
<tr>
<td>Storage Flexibility</td>
<td>• OGO stands for all the risk and costs for carrying inventory of finished goods</td>
</tr>
<tr>
<td></td>
<td>• The inventory level of finished goods differ from article to article</td>
</tr>
<tr>
<td></td>
<td>• The risk and costs for carrying inventory of raw materials is transferred to OGG’s suppliers</td>
</tr>
</tbody>
</table>

| PRODUCT QUALITY | |
| Quality Conformance | • Quality is measured in terms of customer complaints |
| | • The current quality level is 11 customer complaints in the past four months this year |
| | • Customer requirement for quality level I defect free |
| | • OGO stands for all the cost to replace the defected products |

| PRODUCTION COSTS | |
| Upstream Complexity | • Only the surface treatment is outsourced |
| Internal Complexity | • Customized products with standardized production process and high production volume |
| | • The special tools and equipment’s required to produce the product are owned by Fordon AB |
| Downstream Complexity | • Product cycle times differ from article to article |
| | • The delivery plan received from Fordon AB is mostly in consistent with the actual order |

Table 12 Conflicting goal between OGO and its most important customer (Hsu & Pacarizzi, 2013)

4.4 PRESS KOGYO SWEDEN AB

4.4.1 Introduction

Press Kogyo Sweden AB (Press Kogyo) offers high technology in laser cutting, hydraulic press as well as welding. It is specialized in construction and detail work on sheet metal, which is used on producing chassis-and motor parts for heavy trucks and lift trucks (Press Kogyo Sweden, 2013). The company is located in Oskarshamn, Sweden and has today 150 employees with a turnover of approximately 300 million Swedish Kronor. It was established in year 1945 and has
EMPIRICAL FINDINGS

been part of the Japanese Company named Press Kogyo Co. Ltd group since year 2007 (Olsson, Logistics Manager, 2013).

The company’s vision and goal are:

“...to be a leading press and sheet metal company within Scandinavian and to create a clear and added value for our customers.” (Press Kogyo Sweden, 2013)

The vision and goal can be fulfilled through the high competence in laser cutting, hydraulic pressing and welding as well as close cooperation with their customers in process-and product development. Moreover, the high competence and close cooperation with the customer assist the company to achieve cost effective solution with high quality and durable products (Press Kogyo Sweden, 2013).

The company is a first tier supplier for a leading automaker (which further will be referred as “Bil AB”), and supplies so called transmission sheet, which is used between the engine and gearbox of trucks. Moreover, Bil AB has been a customer since year 1962 and today it stands for approximately 40 percent of Press Kogyo’s turnover (Olsson, Logistics Manager, 2013).

4.4.2 Supply Chain Integration

4.4.2.1 Information Integration

Transaction Systems

Press Kogyo uses an independent transaction system, which means that the company does not share the same transaction system together with Bil AB. The transaction system, which Press Kogyo applies, is called “JEEVES”. Through this transaction system, the company processes the information that contains in the delivery plan from Bil AB. The information assists the company to plan their production and purchase activities with the help of “JEEVES” (Olsson, Logistics Manager, 2013).

Communication Systems

The daily communication with Bil AB is through email, telephone by the key account manager.
EMPIRICAL FINDINGS

Moreover, the company receives a delivery plan from Bil AB automatically via EDI system. The delivery plan contains a one-year demand prognosis, which Press Kogyo receives at least once a week. Furthermore, the delivery plan from Bil AB will be forwarded to the company’s own suppliers (Olsson, Logistics Manager, 2013).

Bar-coding and Track-and trace Systems, Data Capture, Inventory Visibility
Press Kogyo does not use any bar-coding or track- and trace system. However the company has tested the bar-coding system internally and is discussing whether the company should utilize the system or not. Today, the data of raw materials and finished goods are captured through its own system. The Production Manager points out that the production department reports to the internal material control system when they produces products. The material used will be automatically withdrawn from the stock balance (Olsson, Logistics Manager, 2013).

Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management
Press Kogyo has access to the inventory level, order requirements and forecasts of only a few units within Bil AB. The company manages and replenishes Bil ’s inventory in these units and the inventory is owned by Bil AB. The cooperation with Bil AB is managed by Press Kogyo’s Key Account Manager. The Key Account Manager is responsible for supervising the business activities that are related to Bil AB (Olsson, Logistics Manager, 2013). The thorough cooperation and long-term relationship is essential in order to create a win-win situation for both parties (Press Kogyo Sweden, 2013)

<table>
<thead>
<tr>
<th>Information Integration using</th>
<th>Press Kogyo Sweden AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction System</td>
<td>Press Kogyo utilizes transaction system named “JEEVES”</td>
</tr>
</tbody>
</table>
| Communication Systems, Internet/Extranet | Daily communication through e-mail and telephone  
Delivery plan is received via EDI system |
| Bar-coding and Track-and-trace Systems, Data Capture, Inventory Visibility | Neither Bar-coding nor Trace-and-trace system is used |
| Vendor Managed Inventory (VMI), Collaborate Planning, Forecasting and Replenishment (CPFR), Customer Relationship Management (CRM) | VMI is used in a limited extend with Bil AB  
The inventory at the customer’s side is owned by customer |

Table 13 Information integration between Press Kogyo and its most important customer (Hsu & Pacarizi, 2013)
4.4.2.2 Organizational Integration

Statues of Logistics/SCM in the Organization
Logistics activities in the company are gathered in the logistic department. Furthermore the Logistics Manager is a member of the company’s corporate management group (Olsson, Logistics Manager, 2013).

Degree of Integration
The logistics activities are only performed by the logistic department and therefore are not integrated with the other department or its most important customer (Olsson, Logistics Manager, 2013).

Importance of Logistics
There are several competitors offering similar products, and the logistic activities are therefore an important competence. The logistic activities play an essential role in order for the company to satisfy customers’ needs as well as reducing costs and increase flexibility (Olsson, Logistics Manager, 2013).

Communication across the Supply Chain
The company has a daily and regular contact with Bil AB on the operative level. Furthermore, Press Kogyo’s Key Account Manager who is responsible for managing the relationship with Bil AB has weekly contact with Bil AB’s material planners. The communication between top managers takes place when there are serious mistakes in quality or delivery precision (Olsson, Logistics Manager, 2013).

Governance Structure
Press Kogyo has an intensive relationship with Bil AB when it comes to quality control and delivery precision. The common goal that both partners have is to achieve 100 percent delivery precision and 0 percent defect rate. As pointed out previous, Bil AB stands for approximately 40 percent of Press Kogyo’s turnover and therefore is a very important customer. However, the
EMPIRICAL FINDINGS

logistics manager perceives that both partners are dependent on each other (Olsson, Logistics manager, 2013).

**Formal Lateral Organizations**
The company has a functional structure. However, the company also has cross-functional teams working across the company’s boundaries. Furthermore, a key account manager is assigned to handle all the activities with the most important customer (Olsson, Logistics manager, 2013).

**Performance Measurement**
Press Kogyo measures their performance on fulfilling Bil’s requirements by measuring the delivery precision, the defected products delivered to Bil AB as well as the complaints from Bil AB. These performance measurements are measured separately by both partners and therefore Press Kogyo does not share common performance measurement together with Bil AB (Olsson, logistics Manager, 2013).

<table>
<thead>
<tr>
<th>Organizational Integration characteristics</th>
<th>Press Kogyo Sweden AB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status of Logistics/SCM in the Organization</strong></td>
<td>* The logistics function are united under logistics department</td>
</tr>
<tr>
<td></td>
<td>* Logistics Manager is a member of corporate management group</td>
</tr>
<tr>
<td><strong>Degree of Integration</strong></td>
<td>* The logistics activities are not integrated internally or externally</td>
</tr>
<tr>
<td><strong>Importance of Logistics</strong></td>
<td>* The logistics function is considered as a core competence</td>
</tr>
<tr>
<td></td>
<td>* The logistic activities play an essential role in order to satisfy customers’ needs as well as reducing costs and increase flexibility.</td>
</tr>
<tr>
<td></td>
<td>* There are several competitors which offers similar products</td>
</tr>
<tr>
<td><strong>Communication Across the Supply Chain</strong></td>
<td>* Daily communication takes place between key account manger and customer’s material planners</td>
</tr>
<tr>
<td></td>
<td>* Communication between top mangers or higher level only takes place when there are serious delivery or quality issues</td>
</tr>
<tr>
<td><strong>Governance Structure</strong></td>
<td>* Logistics manger refers the common goal that Press Kogyo and Bil AB have are quality level and delivery precision</td>
</tr>
<tr>
<td></td>
<td>* Bil AB stands for approximately 40% of Press Kogyo’s turnover</td>
</tr>
<tr>
<td></td>
<td>* The Logistics Manager indicates that Press Kogyo</td>
</tr>
</tbody>
</table>
EMPIRICAL FINDINGS

and Bil AB are dependent on each other

| Formal Lateral Organizations | • There are cross functional teams that work both within and outside organizational boundaries  
|                            | • Key account manger is assigned to mange activities related to Bil AB |
| Performance Measurement     | • No joint measurement  
|                            | • Performance such as delivery precision as well as quality level are measured separately by both partners |

Table 14 Organizational integration between Press Kogyo and its most important customer (Hsu & Pacarizi, 2013)

4.4.3 Conflicting Goal

4.4.3.1 Flexibility

Delivery and Volume Flexibility

Press Kogyo receives a delivery plan from Bil AB, which contains one-year demand forecast at least once a week. Based on this forecast, the company plans its production and purchase activities for six weeks ahead. The Logistics Manager emphasizes the most important customer is allowed to change the placed order both in volume as well as delivery date at latest three days before the planned delivery date. Within this timeframe, Bil AB has the right to change the placed orders and Press Kogyo is required to respond to these changes (Olsson, Logistics Manager, 2013).

Operational Decision Flexibility

If any accident occurs, which leads to the production downtime, Press Kogyo has the possibility to move the production to other suppliers that have the same equipment as them. Nevertheless, if there is material shortage, the company does not always have the flexibility to use alternative materials and it is therefore essential to have safety stock of raw materials (Olsson, Logistics Manager, 2013).

Storage Flexibility

The delivery precision is a very important issue for Bil AB. The internal goal of delivery precision for Press Kogyo is 98 percent. However, Bil AB requires 100% delivery precision. If deliveries are delayed, which in turn hamper customer’s production schedule, Press Kogyo is
required to pay a penalty fee. As consequence, in order to respond to the changed demand quickly, the company holds inventories for finished goods. The inventory of finished goods corresponds to five to ten days’ production volume and Press Kogyo takes full responsibility and risk for the inventory of finished goods. However, the inventory of raw material is owned by Press Kogyo’s supplier and therefore the company does not stand for the risk and cost for holding inventory of raw materials (Olsson, Logistics Manager, 2013).

4.4.3.2 Product Quality
Quality Conformance
Press Kogyo measures the quality of their products in terms of customer complaints. The Logistics Manager indicates that the internal goal of quality level is to receive maximum four customer complaints a month. However, the company does not always reach this internal quality goal. Nevertheless, the company does not measure how many defected products received by customers. On the other hand, Bil AB requires that the supplied products should be defect free and meet quality requirements. If the quality of the supplied products does not meet Bil AB’s requirements, the company has to replace the defected products and pays for additional costs, which incurred (Olsson, Logistics Manager, 2013).

4.4.3.3 Production Costs
Upstream Complexity
As been pointed out previously, Press Kogyo deliver transmission sheets in metal to Bil AB. In order to produce these products, the metal sheets needs to be cut in laser, hydraulic pressed, welded, and finally have a surface treatment. The company possesses the first three technologies. However, the surface treatment is outsourced to supplier since the company does not possess this competence (Olsson, Logistics Manager, 2013).

Internal Manufacturing Complexity
The transmission sheets that Press Kogyo produces are customized after Bil AB’s design and therefore the finished goods couldn’t be sold to other customers. Specific tools and fixtures that are required to produce these customized products are owned by Bil AB. Nevertheless, the changed demand from Bil AB is usually in smaller quantity (Olsson, Logistics Manager, 2013).
EMPIRICAL FINDINGS

**Downstream Complexity**
The product cycle times differ from product to product, depending on its characteristics. If the product can be used in more than one car model, the product cycle times for these products are often longer. With other words, if the products is only for one specific car model, the life-cycle time is often much shorter (Olsson, Logistic Manager, 2013).

The manager further emphasizes the changed requirement of larger quantities is often planned 6 moth before. Moreover, the order for general products that Bil AB orders regularly is seldom changed. On the other hand, the order for special products that Bil AB does not order regularly has higher possibilities to be changed (Olsson, Logistics Manager, 2013).

<table>
<thead>
<tr>
<th>FLEXIBILITY</th>
<th>Press Koygo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery and Volume Flexibility</td>
<td>• Bil AB is allowed to change the placed order both in volume as well as delivery date at latest three days before the planned delivery date</td>
</tr>
<tr>
<td>Operational Flexibility</td>
<td>• There is possibility for Press Kogyo to outsource its production activities to its suppliers if any accident occurs</td>
</tr>
<tr>
<td></td>
<td>• Press Kogyo has safety stock of raw materials to prevent material shortage</td>
</tr>
<tr>
<td>Storage Flexibility</td>
<td>• Inventory of finished goods corresponds to 5 to 10 days demand forecast based on the delivery plan received from customer</td>
</tr>
<tr>
<td></td>
<td>• No inventory of raw material, the risks and costs are transferred to its suppliers</td>
</tr>
<tr>
<td></td>
<td>• Press Kogyo takes full responsibility and risks for the inventories</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRODUCT QUALITY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Conformance</td>
<td>• Quality is measured in terms of customer complaints internally</td>
</tr>
<tr>
<td></td>
<td>• The internal goal of quality level is 4 customer compliant a month at maximum. However the company does not always achieve this goal</td>
</tr>
<tr>
<td></td>
<td>• Bil AB’s requirement for the quality level is 0 product received</td>
</tr>
<tr>
<td></td>
<td>• Press Kogyo stands for all the cost to replace the defected products</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRODUCTION COSTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream Complexity</td>
<td>• Press Kogyo only has to outsource the work of surface treatment</td>
</tr>
<tr>
<td>Internal Complexity</td>
<td>• Customized products</td>
</tr>
<tr>
<td></td>
<td>• The special tools and equipment’s required to produce</td>
</tr>
</tbody>
</table>

69
<table>
<thead>
<tr>
<th>Downstream Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The demand variability is small, especially for general products</td>
</tr>
<tr>
<td>• Greater demand variability is often planned 6 months ahead</td>
</tr>
<tr>
<td>• The product cycle-times differ from product to product</td>
</tr>
</tbody>
</table>

Table 15 Conflicting goal between Press Kogyo and its most important customer (Hsu & Pacarizi, 2013)

### 4.5 TRELLEBORG SEALING SOLUTIONS KALMAR AB

#### 4.5.1 Introduction

Trelleborg Sealing Solutions Kalmar AB (Trelleborg Sealing Solutions) supplies sound absorbent components to the automotive industry. Trelleborg Sealing Solutions was founded year 1988 in Kalmar, Sweden. Today the company has approximately 250 employees (Trelleborg Sealing Solutions, 2013), with a turnover of nearly 750 million Swedish Kronor in year 2012 (Allabolag, 2013). The sound absorbent components are made of the combination of laminates, steel vulcanized with rubber and adhesives and used mainly on brake parts with the purpose to endure extreme mechanical stress, salt, water and oil. Since each brake system requires specific sound absorbent components, Trelleborg Sealing Solutions assists its customer to choose a correct noise damping solution by continually testing the new generation of brake parts that are provided by the customers (Trelleborg Sealing Solutions, 2013).

Trelleborg Sealing Solutions’ mission is;

“... *be the supply partner of first choice within our choice market, working globally through our local teams.*” (Trelleborg Sealing Solutions, 2013).

This mission will be fulfilled by building long-term relationships with the company’s customers as well as suppliers by providing leading technology and superior service (Trelleborg Sealing Solutions, 2013).
EMPIRICAL FINDINGS

Trelleborg Sealing Solutions is a second tier supplier for the automakers. The company’s most important customer (which will referred as Vehicle AB further on) is a first tier supplier, which supplies brake parts for automakers. Vehicle AB has been an important customer for the company its establishment (Johansson, Plant Manager, 2013).

4.5.2 Supply Chain Integration

4.5.2.1 Information Integration

Transaction Systems
The transaction system, which Trelleborg Sealing Solutions utilizes the so-called “MOVEX” system. This system assists the company to plan its business activities, such as planning production and purchasing activities as well as billing. The information is transferred manually to MOVEX (Johansson, Plant Manager, 2013).

Communication Systems
The daily communication with Vehicle AB is through email and telephone by customer service personnel. Furthermore, the customer order as well as delivery plan are through developed EDI system, both Internet-based as well as extranet-based EDI system (Johansson, Plant Manager, 2013).

Bar-coding and Track-and trace Systems, Data Capture, Inventory Visibility
Trelleborg Sealing Solutions only utilizes the bar-coding system on the products that will be delivered to customers, meaning that bar-coding is only used externally. Furthermore, the company does not apply track and trance system (Johansson, Plant Manager, 2013).

Vendor-managed Inventory, Collaborative Planning, Forecasting and Replenishment, Customer Relationship Management
As mentioned above, Vehicle AB has been an important customer for Trelleborg Sealing Solutions for 25 years. The relationship with Vehicle AB is maintained by sales managers, which is located close to the customer. However, the sales manager does not only serve Vehicle AB but also other customers. However, both vendor managed inventory as well as collaborative
planning, forecasting and replenishment is not utilized between Trelleborg Sealing Solutions and Vehicle AB. Nevertheless, the Plant Manager points out that instead of these two business models, the company utilizes the so-called consignment stock with its customer. In other words, Trelleborg Sealing Solutions is responsible of fulfilling customer’s inventory with agreed volume and time. Trelleborg Sealing Solutions owns the stock placed at the customer side and ownership of the stock is transferred when the customer uses it (Johansson, Plant Manager, 2013).

<table>
<thead>
<tr>
<th>Information Integration</th>
<th>Trelleborg Sealing Solutions Kalmar AB</th>
</tr>
</thead>
</table>
| Transaction System      | • Trelleborg Sealing Solutions utilizes transaction system named “MOVEX”  
                          | • The information is manually transferred into the transaction system |
| Communication Systems,  | • Daily communication through e-mail and telephone  
                          | Internet/Extranet                                           |
| Internet/Extranet       | • Delivery plan is received via EDI/INTERNET and EDI/XML system |
| Bar-coding and Track-and-trace Systems,  | • Bar-coding system is only used in outbound logistics  
                          | Data Capture, Inventory Visibility                       |
| Data Capture, Inventory Visibility | • Track-and Trace system is not applied |
| Vendor Managed Inventory (VMI), Collaborate Planning, Forecasting and Replenishment (CPFR), Customer Relationship Management (CRM) | • Neither VMI nor CPFR is utilized between Trelleborg Sealing Solutions and Vehicle AB |

**Table 16 Information integration between Trelleborg Sealing Solutions and its most important customer (Hsu & Pacarizi, 2013)**

**4.5.2.2 Organizational Integration**

**Statues of Logistics/SCM in the Organization**

The logistics function is divided into customer service unit as well as planning units. The customer service unit have direct contact with the customer and handle the customer orders and put the information in the company’s transaction system, as well as delivery and billing to customers. The Plant Manager indicates that after receiving the customer quotation, the customer service unit needs to confirm with the planning unit regarding the order delivery lead-time. The plant manger further points out that the logistics manager is not part of the company’s corporate management group (Johansson, Plant Manager, 2013).
EMPIRICAL FINDINGS

Degree of Integration
The organizational structure of Trelleborg Sealing Solution is process based, meaning that the organization is not divided into different department. Instead, the business activities are integrated into different business processes. However, the logistic activities are only integrated internally and therefore are not integrated with Vehicle AB (Johansson, Plant Manager, 2013).

Importance of Logistics
The logistic activities are a critical aspect of the company, since the logistic activities have great impact on the effectiveness of the company. However, the Plant Manager does not perceive logistics activities as the main competitive advantages that the company possesses. Moreover, there are several competitors that offer similar products. The main competitive advantage, which the Trelleborg Sealing Solutions possesses, is its close geographical location to the customer (Johansson, Plant Manager, 2013).

Communication across the Supply Chain
The communication with Vehicle AB is mainly through the customer service unit and the sales managers, which is on a daily basis. The communication at top manager level is infrequent and is not on a regular basis (Johansson, Plant Manager, 2013).

Governance Structure
Vehicle AB stands for approximately 15% of the company’s turnover and is an important customer for the company. Trelleborg Sealing Solutions has common goal with Vehicle AB in terms of delivery precision as well as quality level. Furthermore, these goals are set by the Vehicle AB. The Plant Manager emphasizes that Trelleborg Sealing Solutions is a world-leading supplier of high quality sound absorbent components, which makes the brakes quieter. The company is therefore not heavily dependent on Vehicle AB. The Plant Manager even perceives that Vehicle AB is more dependent on them (Johansson, Plant Manager, 2013).

Formal Lateral Organizations
The company is process-based and therefore has cross-functional teams such as customer service unit, both within and across the organizational boundaries. However, the plant manager indicates
that Trelleborg Sealing Solutions does not have key account manger (Johansson, Plant Manager, 2013).

**Performance Measurement**

Trelleborg Sealing Solutions and the customer measure the company’s performance in terms of quality level as well as delivery precision. However, the quality level as well as delivery precision are separately measured by the partners (Johansson, Plant Manager, 2013)

<table>
<thead>
<tr>
<th>Organizational Integration</th>
<th>Trelleborg Sealing Solutions Kalmar AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of Logistics/SCM in the Organization</td>
<td>• Logistics manager is part of the senior management team but not corporate management group</td>
</tr>
<tr>
<td></td>
<td>• Logistic activities are unified under customer service and planning units</td>
</tr>
<tr>
<td>Degree of Integration</td>
<td>• The logistic activities are integrated in different business processes within the company</td>
</tr>
<tr>
<td>Importance of Logistics</td>
<td>• Logistics activities is referred as a critical function of the company</td>
</tr>
<tr>
<td></td>
<td>• Logistics activities is not seen as the main competitive advantage</td>
</tr>
<tr>
<td></td>
<td>• There are several competitors that offer similar products</td>
</tr>
<tr>
<td>Communication Across the Supply Chain</td>
<td>• Daily and regular communication with Vehicle AB is taking care by customer service and sales managers</td>
</tr>
<tr>
<td></td>
<td>• The communication at top manager level is infrequent and is not on a regular basis</td>
</tr>
<tr>
<td>Governance Structure</td>
<td>• The common goals that Trelleborg Sealing Solutions and Vehicle AB have are quality level and delivery precision</td>
</tr>
<tr>
<td></td>
<td>• Vehicle Ab expects that Trelleborg Sealing Solutions should be able to reach the set requirement by themselves</td>
</tr>
<tr>
<td></td>
<td>• Vehicle AB stands for 15% of the company’s turnover</td>
</tr>
<tr>
<td></td>
<td>• The plant manager perceives that Vehicle AB is more dependent on the company than the company is dependent on them</td>
</tr>
<tr>
<td>Formal Lateral Organizations</td>
<td>• Cross-functional teams work both within and outside organizational boundaries</td>
</tr>
<tr>
<td></td>
<td>• No key account manager</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>• No joint measurement</td>
</tr>
<tr>
<td></td>
<td>• Performance such as delivery precision as well as quality level are measured separately by both partners</td>
</tr>
</tbody>
</table>

Table 17 Organizational integration between Trelleborg Sealing Solution and its most important customer (Hsu & Pacarizi, 2013)
EMPIRICAL FINDINGS

4.5.3 Conflicting Goal

4.5.3.1 Flexibility

**Delivery and Volume Flexibility**
Trelleborg Sealing Solutions receives a delivery plan, which contains a four to six weeks demand forecast made by Vehicle AB. However, the Plant Manager emphasizes that the demand forecast is not inconsistent with the placed orders. Therefore, the placed order often differs significantly from the demand forecast in both volume and delivery time. Moreover, the Plant Manager indicates that the Vehicle AB has the right to adjust the placed order both in quantity and delivery time at latest three days before the delivery day (Johansson, Plant Manager, 2013).

**Operational Decision Flexibility**
When accident occurs which hamper the production activities, Trelleborg Sealing Solutions could use other materials or to move the production line to be able to produce customer orders. However, the change of material needs to approve by the customer (Johansson, Plant Manager, 2013).

**Storage Flexibility**
When the customer changes its placed order within the limited time frame, Trelleborg Sealing Solutions is required to fulfill the customer’s demand. Due to these reasons, the company must hold a higher inventory both in raw material as well as finished goods in order satisfy customer demands. The inventory of raw material corresponds at least one moth of demand forecast and the inventory of finished goods corresponds to at least one and an half weeks of demand forecast. Moreover, the company stands for the risks and costs for keeping inventory for both raw materials as well as finished goods. With other words, the customer is only responsible for the products, which they have ordered (Johansson, Plant Manager, 2013).

4.3.5.2 Product Quality

**Quality Conformance**
The quality of the product is measured in terms of defect rates as well as customer complaints. The internal goal of quality is to have maximum 30 defect parts per million products produced
EMPIRICAL FINDINGS

and maximum 55 customer complaints in a period of one year. These internal goals are fulfilled this year. However, the quality levels that Vehicle AB requires is 0 percent defect rate. If the products that Vehicle AB receives are defective, Trelleborg Sealing Solutions is responsible for all the costs that occur in order to replace the defected products (Johansson, Plant Manager, 2013).

4.3.5.3 Production Costs

Upstream Complexity
The company processes most of the technologies required for producing the sound absorbent components and only five percent of the work is outsourced (Johansson, Plant Manager, 2013).

Internal Manufacturing Complexity
The shape and combination of layers of the sound absorbent components are customized. The Plant Manager indicates that even though that the products are customized, they can be produced by the same production device (Johansson, Plant Manager, 2013).

Downstream Complexity
The product cycle time of the products varies from one to fifteen years. However, the average product cycle time is five years. Even though the delivery plan, which contains a four to six weeks demand prognosis from Vehicle AB, is received weekly, the Plant Manager emphasizes that the prognosis often is only 50% accurate (Johansson, Plant Manager, 2013).

<table>
<thead>
<tr>
<th>FLEXIBILITY</th>
<th>Trelleborg Sealing Solutions Kalmar AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery and Volume</td>
<td>• Vehicle AB is allowed to change the placed order both in volume as well as delivery date at latest</td>
</tr>
<tr>
<td>Flexibility</td>
<td>three days before the planned delivery date</td>
</tr>
<tr>
<td>Operational Flexibility</td>
<td>• Alternative materials can be used in accordance with customer approval</td>
</tr>
<tr>
<td></td>
<td>• There is possibility for Trelleborg Sealing Solutions to move its production activities to another</td>
</tr>
<tr>
<td></td>
<td>facility</td>
</tr>
<tr>
<td>Storage Flexibility</td>
<td>• The inventory of raw material corresponds at least one month of demand forecast</td>
</tr>
<tr>
<td></td>
<td>• The inventory of finished goods corresponds to at</td>
</tr>
</tbody>
</table>
EMPIRICAL FINDINGS

least one and a half weeks of demand forecast.
- The company stands for the risks and costs for keeping inventory for both raw materials as well as finished goods

PRODUCT QUALITY

<table>
<thead>
<tr>
<th>Quality Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The quality of the products is measured in terms of defect rates and customer complaints</td>
</tr>
<tr>
<td>• The internal quality level is 30 ppm and 55 customer complaints in a period of one year at maximum</td>
</tr>
<tr>
<td>• Vehicle AB’s requirement for the quality level is 0 defect product received</td>
</tr>
<tr>
<td>• Trelleborg Sealing Solutions stands for all the costs to replace the defected products</td>
</tr>
</tbody>
</table>

PRODUCTION COSTS

<table>
<thead>
<tr>
<th>Upstream Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Less than 5 percent of the production activity is outsourced</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Customized product with standardized production processes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Downstream Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The product cycle time varies from one to fifteen years</td>
</tr>
<tr>
<td>• The delivery plan from Vehicle AB is only 50% accurate</td>
</tr>
</tbody>
</table>

Table 18 Conflicting goal between Trelleborg Sealing Solutions and its most important customer (Hsu & Pacarizi, 2013)
5. ANALYSIS & DISCUSSION

In the following chapter an analysis and discussion will be presented based on the selected theory and gathered empirical findings. Furthermore, this chapter will be divided after the research questions.

5.1 LEVEL OF SUPPLY CHAIN INTEGRATION

Supply chain integration is divided into information and organizational integration by Bagchi and Skjoett-Larsen (2002). Information integration aims at assisting supply chain partners in decision-making by sharing essential information through different information technology between these partners (Parajogo & Olhager, 2012). Bagchi and Skojett-Larsen (2002) view organizational integration as one important factor of supply chain integration due to that it enables information sharing between supply chain partners. Pinsonneault and Barki (2012) define organizational integration as the extent of integration in organizational structure and relationship between partners. Therefore, in this thesis, the evaluation on the level of information and organizational integration will be based on how and what information is exchanged between the SME manufacturers and their customers as well the extent the organizational structure between them are unified.
5.1.1 Information integration

Transaction systems

There are different types of transaction system. Bagchi and Skjoett-Larsen (2002) selected Legacy, MRP II, ERP and Supply Chain Planning systems to exam the level of information integration. According to the empirical data four of the five case companies apply ERP systems as Forslund (2010) indicates that Moves, Jeevex and Monitor are different versions of the ERP system. The logistics Manager of OGO (2013) points out that the transactions system OGO applies is called 2000. 2000 is an obsolete and a DOS-based transaction system. This obsolete transaction system can be viewed as a form of Legacy system since the legacy system, according to Aw et al. (2005), is build on older technology and hardware. Comparing the empirical data with the theory, Alfa, Bulten, Press Kogyo as well as Trelleborg Sealing Solutions are classified as having medium integration in the category of transaction systems. On the other hand, OGO is classified as having low integration in this category.

Communication Systems, Internet/Extranet

In order to improve the efficiency of logistics and production, information needs to be exchanged between supply chain partners. The information is exchanged through different communication system (Smith et al. 2010). The level of information integration is classified by which communication system the company uses and if the communication system is liked to its customer, supplier or the whole supply chain partners (Bagchi & Skjoett-Larsen, 2002). The empirical data shows that all of the case companies use e-mail and telephone for daily communication with their most important customer. Furthermore, the delivery plans that all the case companies receive from their most important customer are transferred automatically through EDI system. However, there is no empirical evidence, which indicates that these case companies link their EDI system with other supply chain partners. As a result, all the case firms are classified as having medium integration in this category.

Bar-Coding & Track-and trace system, Data capture and Inventory visibility

The information about an object, such as finished goods, articles and raw materials, can be identified and captured through the use of data capture system (Jonsson, 2008). Bar-coding and track-and trace system are data capture systems used by Bagchi and Skjoett-Larsen (2002) as
indicators of classifying the level of information integration. The extent these systems are used and the degree they are linked with supply chain partners determine the companies’ level of the information integration in this category. Through the empirical findings, it can be identified that none of the five case companies apply track-and-trace system. Moreover, three of the case companies, which are Alfa, OGO and Press Kogyo, do not utilize bar-coding either. However, Bulten as well as Trelleborg Sealing Solutions apply bar-coding only on finished goods that will be delivered to their customers. All of the case companies can be considered as having low integration in this category, due to the fact that track and trace system is not used and the bar-coding system is only used by two companies in a very limited extent.

**Vendor-Managed Inventory, Collaborate Planning, Forecasting and Replenishment and Customer Relationship Management**

VMI and CPFR are the two supply integration concepts used by Bagchi and Skjoett-Larsen (2002) in classifying the information integration in this category. These two supply chain integration concepts are developed to encourage customer to share information, such as inventory sales, logistics planning and production scheduling, with its suppliers (Attaran & Attaran, 2007; Sari, 2008; Yao et al. 2007). By sharing this information companies can benefit by decreasing inventory costs, order cycle-time and increasing customer service level (Holweg et al. 2005; Yao et al. 2007). However, none of the case companies uses CPFR and among these case companies, only Press Kogyo uses VMI. The Logistics Manager at Press Kogyo (Olsson, Logistics Manager, 2013) points out that VMI is only implemented with a few units of their most important customer. Therefore, the assumption can be made that the usage of VMI between these two partners is at experimental stage. Combining the empirical findings and the theory, Alfa, Bulten, OGO and Trelleborg Sealing Solutions are classified as having low integration in this category, whereas Press Kogyo is placed at the medium integration.

<table>
<thead>
<tr>
<th>Supply Chain Integration Using</th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction System</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>
5.1.2 Organizational integration

**Status of Logistics/ SCM in the Organization**

Bagchi and Skojett- Larsen (2002) classify the level of organizational integration in this category by examining how the logistic function is organized in an organization. According to the empirical findings all the five case companies have unified logistics functions under one department as well as logistics managers. However, only Bulten, OGO and Press Kogyo’s logistics manager are a member of respective company’s corporate management group. The description of the statues of logistics/SCM in these three companies is in accordance with Bagchi and Skojett-Larsen’s (2002) definition of high integration of this category. On the other hand, comparing the empirical findings with theory, Alfa and Trelleborg Sealing Solutions is viewed as having medium integration.

**Degree of Integration**

The integration level of logistic activities within and between organizations is the criteria for classifying the level of organizational integration in this category (Bagchi & Skojett-Larsen, 2002). The empirical findings show that all the five case companies’ logistic activities are integrated internally, since their logistic activities are gathered in one unified department. Nevertheless, all the interviewees point out that their company performs the logistic activities independently without integrating with their most important customer. Comparing the empirical
findings with Bagchi and Skojett-Larsen’s (2002) theory, all the case companies are considered as having low integration in this category.

**Importance of Logistics**

The level of integration in this category is determined by the perceived importance of logistic activities in a company (Bagchi & Skojett-Larsen, 2002). In order to be identified as a critical competence, logistic activities need to have a great impact on a company’s ability to achieve competitive advantage by reducing costs (McIvor, 2005). The Logistics Managers at Alfa points out that the logistics activities are an essential part of the company’s operation. By improving the efficiency of these activities Alfa can reduce costs as well as increase competitive advantages (Svensson, Logistics Manager, 2013). The Supply Chain Manager at Bulten and the Logistics Manager at OGO both perceive logistic activities are a very important function of their companies as these activities are essential factors for their companies to reduce costs (Lewin, Logistics Manager, 2013; Fritzell, Supply Chain Manager, 2013). Therefore the assumption can be made that logistics can be seen as critical activities for these three case companies. As a result, Alfa, Bulten and OGO have medium integration in this category. The Plant Manager at Trelleborg Sealing Solutions indicates that logistics are perceived as critical activities for the company. However, the Plant Manager does not view logistics as the main factor for reducing costs and increasing competitive advantages (Johansson, Plant Manager, 2013). The importance of logistics in Trelleborg Sealing Solutions is therefore not fulfilling the criteria, which is defined by McIvor (2005), of being a critical activity. As a consequence, Trelleborg Sealing Solutions can be considered as having low integration. The Logistics Manager at Press Kogyo indicates that logistics is considered as a core competence of the company (Olsson, Logistics Manager, 2013). Kaklauskas et al. (2010) suggest that business activity needs to fulfill three criteria, which are to provide customer with benefits, difficult to copy by competitors as well as can be utilized on various products and markets, in order to be identified as core competence. However, the empirical findings indicate that there are several competitors that can produce similar products and therefore the logistic activities do not fulfill the criteria of being a core competence in Press Kogyo. Nevertheless, The Logistics Manager at Press Kogyo points out that the by improving logistic activities the company can reduce costs and increase flexibility. Therefore it can be
assumed that the logistics function is viewed as a critical activity of Press Kogyo and therefore have medium integration.

**Communication across the Supply Chain**

Communication is an important capability for the company to have a successful integration with their customers (Teixeira et al. 2008). Bagchi and Skojett-Larsen (2002) categorize the level of integration by viewing how many contact points and on which level the communication takes place. The empirical findings show that the regular communication between all the case companies and their most important customers takes place only on the operational level. Furthermore, the communication between top managers only takes places when serious issues occur. Comparing the empirical data with the theory, the five case companies can be defined as having low integration in this category.

**Governance Structure**

There are different types of governance structure between supply chain partners. Bagchi and Skojett-Larsen (2002) categorized the level of integration in this category by examining how the relationship between supply chain partners is managed. As all the case companies have been supplying their most important customers for several decades and the interviews all indicate that their companies aim at maintain long-term relationship with their most important customers. Therefore, the assumption can be made that the relationship between the partners is not arm’s length since there are high possibilities of future cooperation between these partners. Bagchi and Skojett-Larsen (2002) refer medium integration to supply chain partners that only have intensive relationship at specific areas. Picot et al. (2008) further explain that an intensive relationship is when supply chain partners cooperate with each other in order to execute and complete its tasks. According to the empirical data, Alfa and OGO can be considered as having medium integration due to that both companies received assistance from their most important customer in order to reach the common goals. Nevertheless, there is no empirical findings, which shows that Bulten, Press Kogyo as well as Trelleborg Sealing Solutions cooperate or receive assistance from their most important customer to reach the common goals. Hence, these three case companies can neither be categorized as having low nor medium integration. As a consequence, these companies will be categorized as having low/medium integration.
Formal Lateral Organizations
The existence of cross functional team within and/or across organizational boundaries is the criteria for defining the level of integration in this category (Bagchi & Skojett-Larsen, 2013). The Logistics Manager at OGO states that there is no cross-functional team in the company (Lewin, Logistics Manager, 2013). Thus, OGO is classified as having low integration. On the other hand, the other four case companies all have cross-functional team operating both within and outside the companies’ boundaries. Nevertheless, among those four companies only Bulten and Press Kogyo have so called key account manager who is responsible for their most important customers. As a result, Bulten and Press Kogyo are corresponding to Bagchi and Skojett-Larsen’s (2002) description of medium integration. Alfa as well as Trelleborg Sealing Solutions are categorized as having low/medium integration, this due to that these companies do not have key account managers.

Performance Measurement
Performance measurement assists company to obtain a better understanding on the company’s performance (Akyuz & Erkan, 2010). How performance are measured as well as who measure this performance are the factors which determine the level of integration in this category (Bagchi & Skojett-Larsen, 2002). Alfa, Press Kogyo as well as Trelleborg Sealing Solutions are classified as having low integration due that the delivery precision and quality level are measured independently by the companies’ and their most important customers. OGO fulfills the criteria of low integration and the company measures production lead-time and throughput time additionally. However, there is no joint performance measurement between the company and its important customer. Hence, OGO is viewed as having low/medium integration. On the other hand, Bulten is classified as having medium integration. This due to that the company does not only measures delivery service level, quality level, production lead-time and logistics costs, but also has joint measurement in some areas with its most important customer.
5.2 CONFLICTING GOAL

Conflicting goal in this thesis is referred to the independent goal of maximizing own operational performance, which is in conflict with other partner’s interest. The term operational performance, according to Wong et al. (2011) involves performance of flexibility, product quality and production costs.

5.2.1 Flexibility

Delivery & Volume Flexibility

Delivery and volume flexibility refers to a company’s ability in fast adapting delivery to the customers both in time and quantity. This implies that the company is required to have flexible production capacity to be able to respond to the changed customer demand (Jonsson, 2008; Schütz & Tomaszgard, 2011). All the case companies receive a delivery plan from their most important customers. However, these delivery plans are not guaranteed to be 100 percent accurate and the most important customers have the right to change their order at latest three days before the planned delivery date. As a consequence, all the case companies needs to adapt their production activities within a short period of time in order to stay flexible in both delivery and

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<table>
<thead>
<tr>
<th>Organization Characteristics</th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Status of Logistics/SCM in the Organization</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Degree of Integration</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Importance of Logistics</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Communication Across the Supply Chain</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Governance Structure</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
</tr>
<tr>
<td>Formal Lateral Organizations</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Low/Medium</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>Low</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Overall Evaluation</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
</tr>
</tbody>
</table>

Table 20 Level of organizational integration (Hsu & Pacarizi, 2013)
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volume. Therefore it can be assumed that in order for the companies to respond to the changing customer demand, safety stock of raw material and finished goods needs to be kept. The empirical findings reflect that the five case companies’ most important customers are not willing to share this risks and costs of having safety stock. The risks and costs of holding safety stock of finished goods are therefore only carried by all case companies. However, the risks and costs of holding safety stock of raw material are only carried by Alfa and Trelleborg Sealing Solutions. The safety stock of raw materials are owned by Bulten, OGO and Press Kogyo’s suppliers and these companies do not need to pay for the raw materials before they use it. According to Ooserhuis et al. (2012) and Zhao et al. (2013) keeping safety stock will lead to inefficiencies of the company’s operations. Moreover, rescheduling the production work in order to respond to the changed customer demand will also have a negative impact on the company’s operational efficiency. As result, the assumption can be made that the requirement from the most important customer of being flexible in both delivery and volume is in conflict with all the case companies’ goal of maximizing their own operational performance.

Operational Decision Flexibility
Okongwu et al. (2012) indicate that operational disruption may occur in forms of machine brake-downs or material shortage. These operational disruptions will lead to that the company may not be able to fulfill customer orders. All the case companies emphasize that delivery precision is a very important factor for their most important customer. This factor is a general requirement in the automotive industry since the JIT philosophy is broadly implemented (Ambe & Badenhorst-Weisses, 2010; Thung & Hoenig, 2011). One of the characteristics of JIT philosophy is that companies do no carry any inventory (Aksoy & Öztürk, 2011). Therefore the assumption can be made that it is important for the all the case companies in this thesis to guarantee that they have the ability to deliver on time even though operational disruption occurs. The empirical findings show that all the case companies have so called back-up plans in order to respond to the possible material shortage or machine brake-down. According to the interviewees from Alfa, OGO and Trelleborg Sealing Solutions, their companies have the possibility to use alternative materials, which are approved by their most important customers (Lewin, Logistics Manager, 2013; Johansson, Plant Manager, 2013; Svensson, Logistics Manager, 2013). The Supply Chain Manager at Bulten point out that the company prevents material shortage by using six different
raw material suppliers (Fritzell, Supply Chain Manager, 2013). Moreover, Press Kogyo ensures that the company has sufficient raw material by keeping safety stock (Olsson, Logistics Manager, 2013). The empirical findings reflect that the action these companies take in order to prevent material shortage, consume more resource. For instance, it can be assumed that keeping safety stock require bigger warehouses, using alternative material requires extra administrative work to receive approval from the most important customers and having more than two raw material suppliers requires more time and personnel in managing the supplier relationship. If machine brake-down occurs, Alfa, OGO as well as Press Kogyo can outsource their production activities to their suppliers, whereas Bulten and Trelleborg Sealing Solutions can move their production activities to another production facility. The empirical findings also reflect that the actions these companies take consume more resources. For instance, the companies need to supervise the suppliers, which requires more resources and extra production facility requires extra financial resources. The material and facility flexibilities, according to Schütz and Tomasgard (2011), are referred to operational flexibility. Even though obtaining operational flexibility requires more resources, it assists the companies to stay flexible and improve the operational performance when accidents occur. The assumption can therefore be made that obtaining operational flexibility is not in conflict with company’s goal in maximizing operational performance.

Storage Flexibility
Inventory of finished goods and raw material are needed with the purpose to respond to unplanned orders (Schütz and Tomasgard, 2011). The empirical data indicates that all the five case companies receive a delivery plan from their most important customers, which assist the companies to plan their business operation better so that the inventory level can be reduced. The delivery plan that Alfa, Bulten OGO and Press Kogyo receive contains a one-year demand prognosis made by their most important customers, which all the interviewees from these companies conformed is very precise. These interviewees also emphasize that their most important customers seldom place unplanned orders. If unplanned orders occur, they are only in smaller quantities, which will not have a significant impact on their companies. It can be assumed that the requirement of having storage flexibility is relatively low and therefore not in conflict with these companies goal of maximizing own operational performance. According to the Plant Manager at Trelleborg Sealing Solutions, the delivery plan that the company receives from its
most important customer, contains only four to six weeks demand prognosis. Additionally, the demand prognosis is only 50 percent accurate (Johansson, Plant Manager, 2013). The inferences can be made that unplanned orders occur more frequent from the company’s most important customer as the customer demand varies significantly. Hence, Trelleborg Sealing Solution needs to hold relatively high inventory in order to respond to unplanned customer order. As holding inventory will increase the tied-up capital (Lai, et al. 2009), it will therefore be in conflict with the company’s goal of maximizing own operational performance.

The differences in the requirement of storage flexibility can be based on the most important customer ability to provide an accurate demand prognosis. The empirical findings indicate that Alfa, Bulten, OGO and Press Kogyo, which are first-tier suppliers to large automakers, receive more accurate demand prognosis. This in contrast to Trelleborg Sealing Solutions, which is a second tier supplier to large automaker, receives less accurate demand prognosis. The assumption can be made that the automakers have the ability to provide more accurate demand prognosis since they are closer to the market. Therefore it can be inferred that the conflicts in terms of storage flexibility are lower between first tier manufacturer and its most important customer than second tier supplier and its most important customer.

5.2.2 Product Quality

Quality conformance

Quality conformance is referred to the level that a product meets specific design standards so it can fulfill its function (Sebastianelli & Tamimi, 2002). The empirical findings show that all the case companies are required to deliver defect free products. If the most important customers receive defected products, all the case companies are required to replace them and stand for all the costs that occurs. Defect free quality is very difficult to obtain and it requires resources. Moreover, replacing defected products demands extra administrative work and labor hours. Even though all the case companies’ quality level is relatively close to defect free, however they cannot fully satisfy customer requirements. Therefore the assumption can be made that the resources needed to fulfill the quality requirements is in conflict with the case companies’ goal of maximizing own operational performance.
5.2.3 Production costs

Upstream Complexity

Upstream complexity refers to the amount of production activities that a company needs to outsource to suppliers (Bozarth et al. 2009). Based on the empirical findings, the interference can be made that all the case companies outsource their production activity only to a very limited extent. This due to that Alfa, Bulten, OGO and Press Kogyo outsource only the surface treatment of their products. Moreover, the Plant Manager at Trelleborg Sealing Solutions points out that less than five percent of its production acidity it outsourced. High upstream complexity is in conflict with the company’s goal in maximizing their own operational performance, since Bozarth et al. (2009) indicate that it will extend the planning schedule as well as increase the level of safety stock. Nevertheless, as all the case companies have relatively low upstream complexity it can therefore be inferred that conflicting goal between these companies and their most important customers in this category is not significant.

Internal Manufacturing Complexity

Customization means that the company fulfills its customers’ requirement by offering specific products, which cannot be sold to other customers (Blecker & Abdelkafi, 2006). Customization is an essential factor that determines the internal manufacturing complexity (Bozarth et al. 2009). The empirical findings show that all the five case companies offer highly customized products to their most important customers. This in turn result in higher production costs (Bozarth et al. 2009). As a result, the high internal manufacturing complexity leads to higher production costs, which is in conflict with all the case companies’ goal of maximizing operational performance.

Downstream Complexity

The degree of downstream complexity is related to the product cycle time and demand variability (Bozarth et al. 2009). According to the empirical findings, the product cycle time differs from product to product for all the case companies, depending on the characteristics of the products. New models of automobiles are produced every year, and Sturgenon et al. (2009) point out that the components for each model are unique and extensive customized. This means that the case companies need to produce not only current customized products but also adapt to new product specifications frequently. There is no clear evidence that shows the product cycle time is
generally short or long for all the case companies. However, the product specifications change relatively frequently and according to Bozarth et al. (2009) and Krishnan and Gupta (2011), this will increase the complexity of producing the products. It can therefore be assumed that the frequent demand of new products is in conflict with the company’s goal of maximizing own operational performance.

As been mentioned above, Alfa, Bulten, OGO and Press Kogyo receive one-year demand prognosis, which corresponds well to the placed order. However, as the most important customer has the right to change placed orders at latest three days before the planed delivery day, the demand can therefore varies. The demand variability is much higher for Trelleborg Sealing Solutions since the demand prognosis made by their most important customer is only 50 percent accurate. Shaha and Ward (2007) point out that demand variability has a negative impact on the production schedule, which in turn according to Bozarth et al. (2007) will result in higher production costs. Hence, all the case companies are affected by demand variability, which is in conflict with the companies’ goal of maximizing own operational performance.

<table>
<thead>
<tr>
<th>Conflicting Goal</th>
<th>Case Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alfa</td>
</tr>
<tr>
<td>FLEXIBILITY</td>
<td></td>
</tr>
<tr>
<td>Delivery and Volume Flexibility</td>
<td></td>
</tr>
<tr>
<td>• Higher inventory level</td>
<td></td>
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<tr>
<td>• Changing production schedule</td>
<td></td>
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<tr>
<td>Operational Flexibility</td>
<td></td>
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<tr>
<td>Storage Flexibility</td>
<td></td>
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<tr>
<td>PRODUCTION QUALITY</td>
<td></td>
</tr>
<tr>
<td>Quality Conformance</td>
<td></td>
</tr>
<tr>
<td>• More resources are required</td>
<td></td>
</tr>
<tr>
<td>PRODUCTION COSTS</td>
<td></td>
</tr>
<tr>
<td>Upstream Complexity</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Internal Complexity</th>
<th>Customized product</th>
<th>Customized product</th>
<th>Customized product</th>
<th>Customized product</th>
<th>Customized product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downstream Complexity</td>
<td>Higher production process complexity</td>
<td>Higher production process complexity</td>
<td>Higher production process complexity</td>
<td>Higher production process complexity</td>
<td>Higher production process complexity</td>
</tr>
<tr>
<td></td>
<td>Changing production schedule</td>
<td>Changing production schedule</td>
<td>Changing production schedule</td>
<td>Changing production schedule</td>
<td>Changing production schedule</td>
</tr>
</tbody>
</table>

Table 21 Conflicting goal between case companies and their most important customers (Hsu & Pacarizi, 2013)

5.3 THE CORRELATION BETWEEN THE LEVEL OF SUPPLY CHAIN INTEGRATION AND HOW CONFLICTING GOAL HAS BEEN MANAGED

In order to capture how the level of supply chain integration has been affected by conflicting goal from the empirical findings, a further operationalization by including how conflicting goal can be managed has been done. How conflicting goal can be managed is divided into three categories, which are obliging, compromising as well as dominating (see table 22).

<table>
<thead>
<tr>
<th>Operational Performance</th>
<th>How Conflicting Goal can be Managed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obliging</td>
</tr>
<tr>
<td>Flexibility</td>
<td>• Adapt to changed customer orders regardless</td>
</tr>
<tr>
<td></td>
<td>• Alternative material or production facility is not allowed.</td>
</tr>
<tr>
<td></td>
<td>• Focal company stands for costs and risk for holding inventory</td>
</tr>
<tr>
<td>Product Quality</td>
<td>• Defect free, not exceptions are allowed</td>
</tr>
</tbody>
</table>
5.3.1 How Conflicting Goal has been Managed

How Conflicting Goal in Flexibility has been Managed

Flexibility in thesis is divided into delivery and volume flexibility, operational decision flexibility and storage flexibility. According to the empirical findings, Alfa, Bulten, OGO and Press Kogyo are only required to be flexible in delivery and volume, which is in conflict with their goal of maximizing own operational performance. These companies and their most important customers’ compromise on that the placed orders only can be changed at latest three days before the planned delivery day. This is in accordance to Toms (2006) description of compromising. Therefore, the conflicting goal has been managed in flexibility for Alfa, Bulten, OGO and Press Kogyo, by compromising. Trelleborg Sealing Solutions and its most important customer also compromise on that changes of an order should take within limited timeframe. However, the company is required to have higher storage flexibility and stands for all the risks and costs for having storage in order to respond to unplanned orders from its most important customer. This corresponds to Toms (2006) definition of obliging. Therefore, conflicting goal in flexibility for Trelleborg Sealing Solutions has been managed by obliging/compromising.

How Conflicting Goal in Product Quality has been Managed

The empirical findings indicates that all five case companies are required to only delivery none defective products to their most important customers. However, none of the case companies can fulfill this requirement. The quality issue is solved by the case companies being responsible for replacing the defected products and standing for all the costs that occur. Based on the empirical

<table>
<thead>
<tr>
<th>Production Cost</th>
<th></th>
<th>Production Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short product cycle time</td>
<td></td>
<td>Customized products with standardized production</td>
</tr>
<tr>
<td>Fully customized products</td>
<td></td>
<td>The delivery plan should correspond to the actual order well</td>
</tr>
<tr>
<td>Acceptance of larger deviations in received delivery plan</td>
<td></td>
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</table>

Table 22 How Conflicting Goal can be Managed (Hsu & Pacarizi, 2013)
data it can be assumed that all the case companies and their most important customers compromise on the quality issues since the most important customer are willing to give the case companies a chance to make up for their mistakes.

**How Conflicting Goal in Production Costs has been Managed**

According to the empirical findings, all the five case companies have relatively low upstream complexity, which does not increase the production costs significantly. Hence, the upstream complexity is not in conflict with the case companies goal of maximizing own operational performance. Moreover, all the case companies are required to produce highly customized product. Nevertheless, the production processes are standardized and the companies’ most important customers own the required specific tools and equipment. The risks and costs are shared between all the case companies and their most important customers, which corresponds to Toms (2006) definition of compromising that both partners get a part of what the desire. Therefore the conflicting goal for all the case companies in internal manufacturing flexibility is managed by compromising. The product specifications change relatively frequent, and all the case the companies does not have the power to influence their most important customers’ decision in changing product specifications. Among these five case companies, only Trelleborg Sealing Solutions is suffering from higher demand variability since the demand prognosis is only 50 percent accurate. In order to respond to this large demand variability, the company needs to keep extra inventory and stands for all the risks and costs. This corresponds to Toms (2006) definition of obliging, which is characterized as one partner has low concern for itself when conflicts occurs. Thus conflicting goal in production costs are managed by obliging/compromise.

<table>
<thead>
<tr>
<th></th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational Performance</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Flexibility</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Obliging/Compromising</td>
</tr>
<tr>
<td>Product Quality</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
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<tr>
<td>Production Costs</td>
<td>Compromising</td>
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<td>Compromising</td>
<td>Compromising</td>
<td>Obliging/Compromising</td>
</tr>
<tr>
<td>Overall Evaluation</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Compromising</td>
<td>Obliging/Compromising</td>
</tr>
</tbody>
</table>
Table 23 How conflicting goal between case companies and their most important customers has been managed (Hsu & Pacarizi, 2013)

5.3.2 Level of Supply chain Integration and How Conflicting Goal has been Managed

5.3.2.1 Information Integration and How Conflicting Goal has been Managed

The level of information integration does not differ significantly under the different categories, this analysis will therefore be based on the overall evaluation of the level of information integration. The level of information integration at Alfa, Bulten and Trelleborg Sealing Solutions are evaluated as having low/medium level of information integration (see table 19). Among these three case companies, Alfa and Bulten have managed the conflicting goal that occurred between them and their most important customers by compromising. Trelleborg Sealing Solutions has also managed their conflicting goal in terms of product quality by compromising. Nevertheless, the conflicting goal in terms of flexibility and production costs by obliging/compromising (see table 23). Moreover, OGO is evaluated as having low level of information integration while Press Kogyo is evaluated as having medium level of information integration (see table 19). However, these two companies have both managed the conflicting goal that occurred between them and their most important customers by compromising (see table 23).

According to the evaluation, Alfa, Bulten, OGO and Press Kogyo have managed their conflicting goal by compromising. Relating to the empirical findings, these four case companies have common prerequisites. These common prerequisites are that they are SME and are first tier suppliers producing non-critical products for the automotive industry and they are all dependent on their most import customers, which they have had long-term relationships with. According to Pavlinek and Zenka (2011) and Sturgeon et al. (2009), the automotive industry is determined largely by small number of leading automakers. As the automakers have greater power over their suppliers, the relationship between them is therefore dominated by the automakers. Nevertheless, the theory does not correspond to the gathered empirical findings. It can be assumed that in order to cooperate on a long-term base, both partners need to benefit from the cooperation. As a consequence, the relationship cannot be only dominated by one partner and thus requires both
partners to compromise. Therefore it is reasonable to infer that the deviation between theory and empirical findings is based on the long-term relationships between Alfa, Bulten, OGO, Press Kogyo and their most important customers. On the other hand, Trelleborg Sealing Solutions have managed its conflicting goal by obliging/compromising. As the only prerequisite that differs between Trelleborg Sealing Solutions and the other four case companies, is that Trelleborg Sealing Solution is a second tier supplier, whereas Alfa, Bulten, OGO and Press Kogyo are first tier suppliers. Therefore the assumption can be made that these differences in managing conflicting goal are based on this prerequisite. Nevertheless, as Chart 1 demonstrates, there is a pattern, which shows that when companies managed conflicting goal by obliging/compromising or by compromising, the level of information integration corresponds to low or low/medium.

![Chart 1 Correlation between level of information and how the conflicting goal has been managed (Hsu & Pacarizi, 2013)](chart)

5.3.2.2 Organizational Integration and How Conflicting Goal has been Managed

The level of organizational integration does not differ significantly under the different categories, this analysis will therefore be based on the overall evaluation of the level of organizational integration. The level of organizational integration, Alfa, OGO, Press Kogyo and Trelleborg Sealing Solutions are evaluated as having low/medium level of organizational integration. Among these four case companies, Alfa, OGO and Press Kogyo have managed the conflicting
goal that occurred between them and their most important customers by compromising. On the other hand, Trelleborg Sealing Solution has managed the conflicting goal in terms of flexibility and production by obliging/compromising. Moreover, Bulten is evaluated as having medium level of organizational integration and the conflicting goal that occur between the company and its most important customer has been managed by compromising (see table 23). In other words, all the case companies except Trelleborg Sealing Solutions have managed conflicting goal by compromising. As been analyzed above (under heading 5.3.2.1) the difference of managing conflicting goal between Alfa, Bulten, OGO, Press Kogyo and Trelleborg Sealing Solution is due to that Trelleborg Sealing Solution is a second tier suppliers, whereas the other four case companies are first-tier suppliers. As Chart 2 demonstrates, there is a pattern that shows when companies manage the conflicting goal by obliging/compromising and compromising the level of supply chain integration is low/medium and medium.

![Chart 2 Correlation between level of organizational integration and how conflicting goal has been managed (Hsu & Pacarizi, 2013)](chart2)
6. CONCLUSION

In this chapter the research questions will be answered based on the analysis. Furthermore, reflection and recommendation of further research will be presented in the field on supply chain integration.

6.1 ANSWER TO RESEARCH QUESTION 1

As the first research question aims to describe what level of supply chain integration exists in the automotive industry between manufacturing SME and its customer, an evaluation of the level of supply chain integration between the selected case companies and their most important customers have been done. Since, the case companies’ supply chain integration level have been examined though information integration and organizational integration, the evaluation on the overall level of supply chain integration is based on how and what information is exchanged between the partners as well the extent the organizational structure between partners are unified.

The empirical data indicates that all the case companies except OGO uses relatively developed transactions and communications systems. However, the information that is exchanged between the case companies and their most important customers is poor as none of the data capture system, VMI or CPFR is used between the partners, except Press Kogyo which applies VMI to a limited extent. The empirical data in turn implies that this information is not shared between Alfa, Bulten, OGO or Trelleborg Sealing Solutions and their most important customers. These case companies’ production and delivery planning are only relied on the delivery plan from their most important customer.

According to the analysis, the level of information integration between Alfa, Bulten, Trelleborg Sealing Solutions and their most important customer have been evaluated as low/medium. On the other hand, the level of information integration between OGO and its most important customer has been evaluated as low. The only case company that is evaluated as having medium level of
CONCLUSION

information integration is Press Kogyo since the VMI is utilized between the company and its most important customer (see table 24).

<table>
<thead>
<tr>
<th></th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Information Integration</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Low/Medium</td>
</tr>
</tbody>
</table>

Table 24 Evaluation of level of information integration (Hsu & Pacarizi, 2013)

The logistic function is integrated within all the case companies and it is seen as critical activity for four of the five case companies except Trelleborg Sealing Solutions. All these companies have long-term relationship with their most important customers, however the logistic function is relatively low integrated between all the case companies and their most important customers, except Bulten. This because that the logistics function at Alfa, OGO, Press Kogyo as well as Trelleborg Sealing Solutions is not integrated with their most important customers. Moreover, there is no joint performance measurement and the regular contact only takes place at the operative level between these case companies and their most important customer. On the other hand, Bulten has relatively higher organizational integration as the company has key account manager as well as joint performance measurements with its most important customer.

According to the analysis, Alfa, OGO, Press Kogyo as well as Trelleborg Sealing Solution have been evaluated as having low/medium level of organizational integration with their most important customers. Among the five case companies, Bulten is the only company that has been evaluated as having medium organizational integration with its most important customer (see table 25).

<table>
<thead>
<tr>
<th></th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Organizational Integration</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
<td>Low/Medium</td>
</tr>
</tbody>
</table>

Table 25 Evaluation of organizational integration (Hsu & Pacarizi, 2013)
Table 24 and 25 demonstrate that the level of information as well as organizational integration varies from low to medium between case companies. There is no empirical finding that support the level of supply chain integration is high between these case companies and their most important customers. Hence, the answer to the first research question is that the level of supply chain integration, which exists between manufacturing SME and its customers, is low/medium and medium.

6.2 ANSWER TO RESEARCH QUESTION 2

The second research question aims at describing what conflicting goal exists in the automotive industry between manufacturing SME and its customer. The conflicting goal has been operationalized as the independent goal of maximizing own operational performance, which is in conflict with the other partner’s goal. Furthermore, the operational performance is divided into three categories, which are flexibility, product quality as well as production costs.

The empirical findings indicate conflicting goal in terms of delivery and volume flexibility exist among all the case companies and their most important customers. This due to that higher safety stock is needed in order to respond to the changes in delivery date and volume, which is based on that the most important customers’ have the right to change the order at latest three days before the planned delivery day. Among all the case companies, only Trelleborg Sealing Solutions has conflicting goal in terms of storage flexibility with the company’s most important customer. Based on the analysis this difference is based on the most important customers’ ability in providing an accurate demand prognosis. The empirical findings show that the automakers have better ability to provide more accurate demand prognosis. As the other four case companies are first tier supplier, they receive a more accurate demand prognosis. Therefore the conflicting goal in storage flexibility only occurs between Trelleborg Sealing Solutions and its most important customer.

The conflicting goal in terms of product quality exists between all the case companies and their most important customers. The empirical findings show that all the case companies are required to deliver defect free products, which is difficult to achieve. Moreover, if defected products are
delivered to the customers, these case companies stands for all the cost of replacing them. The requirement from the most important customers of defect free products is therefore in conflict with the case companies of maximizing on operational performance.

Internal manufacturing complexity and downstream complexity also result in conflicts between all the case companies and their most important customers. This due to that the highly customized product, the relatively frequent change of product specifications as well as the demand variability from the most important customer increases the production costs for all the case companies.

In conclusion, the answer for this research question is that conflicting goals exist in the automotive industry between manufacturing SME and its customer are the demand of delivery and volume as well as storage flexibility, demand of quality level and the relatively high internal manufacturing complexity as well as downstream complexity (see table 26).

<table>
<thead>
<tr>
<th>Flexibility</th>
<th>Alfa</th>
<th>Bulten</th>
<th>OGO</th>
<th>Press Kogyo</th>
<th>Trelleborg Sealing Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Delivery and volume flexibility</td>
<td>• Delivery &amp; volume flexibility</td>
<td>• Delivery &amp; volume flexibility</td>
<td>• Delivery &amp; volume flexibility</td>
<td>• Delivery &amp; volume flexibility</td>
</tr>
<tr>
<td>Product Quality</td>
<td>• Demand of quality level</td>
<td>• Demand of quality level</td>
<td>• Demand of quality level</td>
<td>• Demand of quality level</td>
<td>• Demand of quality level</td>
</tr>
<tr>
<td>Production Costs</td>
<td>• Internal manufacturing complexity</td>
<td>• Internal manufacturing complexity</td>
<td>• Internal manufacturing complexity</td>
<td>• Internal manufacturing complexity</td>
<td>• Internal manufacturing complexity</td>
</tr>
<tr>
<td></td>
<td>• Downstream complexity</td>
<td>• Downstream complexity</td>
<td>• Downstream complexity</td>
<td>• Downstream complexity</td>
<td>• Downstream complexity</td>
</tr>
</tbody>
</table>

Table 26 Conflicting goal exists between case companies and their most important customers

6.3 ANSWER TO RESEARCH QUESTION 3

The third research question aims at exploring how the level of supply chain integration, in the automotive industry between manufacturing SME and its customer, is affected by the way conflicting goal has been managed. In order to answer this research question, a further
operativealization, which includes how conflicting goal can be managed, has been done. Based on the analysis, Alfa, Bulten, OGO and Press Kogyo have managed the conflicting goal, which occur between them and their most important customer by compromising. On the other hand, Trelleborg Sealing Solutions has managed the conflicting goal, which occurs between the company and its most important customer by obliging/ compromising. The difference in managing conflicting goal is based on the fact that Alfa, Bulten, OGO and Press Kogyo is first tier suppliers, while Trelleborg Sealing Solutions is second tier supplier.

Based on the analysis, there is a correlation between the level of supply chain integration and the way conflicting goal has been managed. This due to that the companies which managed conflicting goal by obliging/compromising or compromising, has from low to medium level of information and organizational integration (see figure 8). Moreover, the result shows that manufacturing SME in the automotive industry does not manage conflicting goal by dominating. This can be based on the characteristics of the automotive industry or based on the fact that these manufacturing companies are SME and therefore does not have the possibility of dominating. In conclusion, the answer for this research question is that the level of supply chain integration, in the automotive industry between manufacturing SME and its customer, is according the result of this thesis, affected by the way conflicting goal has been managed. Nevertheless, as the level of supply chain integration and the way of managing conflicting goal do not differ significantly between the companies, there may therefore be some other prerequisite, which affect the level of supply chain integration.
6.4 REFLECTION

At the beginning of the thesis it was difficult to operationalize the concepts of supply chain integration and conflicting goal. This due to that there is several definition of supply chain integration and conflicting goal. In the past ten weeks most of time was spent reading scientific articles and journals in order to operationalize these concepts. With the advice from the examiner, existing operationalization of supply chain integration was chosen. Furthermore, an existing operationalization of conflicting goal was used after reading numerous scientific articles. However, as there is lack of operationalization of managing conflicting goal between supply chain partners we therefore made an own operationalization of this concept.

Due to the characteristics of this thesis, an evaluation of the level of supply chain integration and the conflicting goal exists, between the case companies and their most important customer had to be made. We did not perceive difficulties in evaluating these case companies since the empirical findings matched the theory. The evaluation showed that all the case companies did not have significant differences in level of supply chain integration and how the way conflicting goal has
CONCLUSION

been managed. In order to see a clearer pattern that the level of supply chain integration is affected by the way conflicting goal has been managed, more case companies can be involved.

6.5 FURTHER RESEARCH

A recommendation for further research is to extend this research by conducting a quantitative research method, examining different industries and/or conducting the research form a dyadic perspective. With richer empirical findings from different perspectives and industries, we believe that the pattern of whether the level of supply chain integration by the way conflicting goal have been managed can be clearer. In this thesis conflicting goal involves three dimensions, flexibility, product quality and production costs. We would suggest a deeper study involving only one dimension of conflicting goal in order to exam whether a specific dimension has greater impact on the level of supply chain integration than the others.
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Interviewees


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23. Created by Hsu, Y-H. & Pacarizi, D.
24. Created by Hsu, Y-H. & Pacarizi, D.
25. Created by Hsu, Y-H. & Pacarizi, D.
26. Created by Hsu, Y-H. & Pacarizi, D.

Chart

1. Created by Hsu, Y-H. & Pacarizi, D.
2. Created by Hsu, Y-H. & Pacarizi, D.
Appendix 1

Interview guide

Background
1. Interviewee's name:
2. Position in the company:
3. How many years have you been working in the company:
4. Can you briefly describe the company? (For instance, number of employees, core business, industry et cetera.)

Please answer the following questions only considering your most important customer in the automotive industry.

Supply chain integration

Information integration:
5. What product does the company supply to the most important customer?

6. Which transaction system does the company use with the most important customer? (For instance, Legacy system, MRP, MRP II, ERP, SCP or other transaction system?)
   a. Does the company use the same transaction system as the most important customer?

7. Which communication system does the company use for communicating with your most important customer? (For instance, email, telephone, EDI, EDI/HTML, EDI/XML)
   a. Is the information shared automatically or manually?

8. Does the company use Bar-coding and Track and Trace system?
   a. If yes, on which products that are delivered to the most important customer do the company use bar-coding? (raw material or finished products?)
   b. Does the bar-coding system automatically or manually update and confirm information?
c. Does the company’s most important customer also uses bar-coding system so the company can share the data provided by bar-coding system with them?

9. Does the company use vendor management inventory and/or collaborate planning, forecasting and replenishment?
   a. If so, how long time has the company used it with the most important customer?
   b. Does the company have access to production plans, material requirement, sales and forecast from the most important customer?

10. Does the company receive a delivery plan from the most important customer?
    a. What is the timeframe for the delivery plan? How often does the company receive delivery plans?
    b. Does the company make a forecast on customer demands? If so, how does the company make the forecast?

11. How does the company manage the relationship with the most important customer?
    a. Does the company plan to have a long or short-term relationship with the most important customer?
    b. How many years has the company worked with the most important customer?

Organizational integration:

12. Does the company have a logistic manger?
    a. If so, is the logistic manager involved in the corporate management group?

13. Does the company have a logistic department?
    a. If no, is the logistic activities spread over different departments?
    b. If yes, is the logistic activities integrated with the most important customers? (For instance, does the company share warehouse with the most important customer?)
14. How important is logistic function for the company?
   a. Does the company consider logistic as a critical activity in the company?
   b. Does the company consider logistic as a core competence in the company?

15. How often does the company communicate with the most important customer?
   a. On which level does the communication between the company and the most important customer take place? (e.g. between top managers level or/and at operational level?)

16. Does the company work together with the most important customer in order to achieve common goals?
   a. If so, in which area and levels does the company work together with the most important customer?

17. Does the company have cross-functional teams?
   a. If so, does the team operate across organizational boundaries?

18. Does the company use common performance measurement with the most important customer?
   a. If yes, which measurements are used? (e.g. delivery service and/ or inventory level, order lead-time, logistic costs, service level and et cetera.

Conflicting action:

19. What is the company’s view on adapting deliveries to customers changing requirements in terms of delivery frequency and delivery time?
   a. Does the most important customer require the company to adapt delivery to their changing requirement in terms of delivery frequency and delivery time?
   b. If there are differences, how have they been handled? (by integration, compromising, avoiding, obliging, dominating)
20. What is the company’s view on adapting production volume and delivery volume to customer fluctuating requirements?
   a. Does the most important customer require the company to adapt the delivery to their fluctuating requirements in terms of production volume and delivery volume?

21. What is the company’s response to accident, which disable the company to produce the required orders from the most important customer?
   a. What is the most important customer’s response to the company’s inability caused by the accident to delivery the agreed products?

22. What is the company’s view on keeping inventory of raw materials, components or finished products for the most important customer?
   a. Does the most important customer ever place unplanned orders?
   b. If so, how often?
   c. Is on time delivery an important issue for the customer’s most important customer?

23. What is the company’s view on the division of risk and responsibility in terms of purchasing materials and keeping inventory in order to fulfill the delivery plan between the company and the most important customers?
   a. What is the most important customer’s requirement on the division of mentioned risk and responsibility?

24. What is the company’s internal goal when it comes to product quality to the most important customer in terms of maximum defect rates?
   a. How high defect rates does the company’s most important customer accept?
25. Does the company prefer the most important customer to order standardized components or customized products?
   a. Which products, standardized or customized, does the most important customer requires.