An investigation of the purchasing process within business intelligence at Volvo Group

Master's thesis in International Project Management

Viktor Lehtonen
Sophy Jonasson

Department of Architecture and Civil Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
Master's Thesis ACEX30-19-48
Gothenburg, Sweden 2019

MASTER'S THESIS ACEX30-19-48

An investigation of the purchasing process within business intelligence at Volvo Group

Master's Thesis in International project management

VIKTOR LEHTONEN
SOPHY JONASSON

Department of Architecture and Civil Engineering

CHALMERS UNIVERSITY OF TECHNOLOGY

Göteborg, Sweden 2019

Department of Architecture and Civil Engineering
CHALMERS UNIVERSITY OF TECHNOLOGY
Master's Thesis ACEX30-19-48
Gothenburg, Sweden 2019

An investigation of the purchasing process within business intelligence at Volvo Group

Master's Thesis in the Master's Programme Master's Programme Name

VIKTOR LEHTONEN

SOPHY JONASSON

Examensarbete ACEX30-19-48
Institutionen för arkitektur och samhällsbyggnadsteknik
Chalmers tekniska högskola, 2019

Department of Architecture and Civil Engineering
Chalmers University of Technology
SE-412 96 Göteborg
Sweden
Telephone: + 46 (0)31-772 1000

An investigation of the purchasing process within business intelligence at Volvo Group

Master's thesis in International project management

VIKTOR LEHTONEN

SOPHY JONASSON

Department of Architecture and Civil Engineering
Division of Division Name
Research Group Name
Chalmers University of Technology

ABSTRACT

Volvo Group has one of the largest purchasing departments in the world. In 2015 the organization spent approximately 200 BSEK on goods and services. That represents roughly 20% of Sweden's total expenditure limits. Today, the purchases of digital services are imperative for organizations due to the increasingly digitized business environment. The buyers must be able to negotiate viable contracts and consolidate the purchases for the organization. New emerging technologies, however, have made digital services more advanced, interconnected, and complex. These circumstances challenge the buyers and Volvo Group, which ultimately requires new purchasing strategies and solutions.

The thesis aims to investigate the purchasing process within business intelligence at Volvo Group. The study investigates suppliers and orders, and thereby support buyers to consolidate purchases, achieve a stronger bargaining position and obtain more purchasing power. Furthermore, it aims to highlight the challenges within the purchasing process and to recommend solutions.

The thesis is a qualitative study with an inductive approach. Data was collected from observations, databases in Volvo Group, nine interviews with internal Volvo Group employees and three interviews with external suppliers.

The study shows that Volvo Group consists of many entities that operate in different geographical locations. Many people are involved and interconnected with the purchases of business intelligence, and there is a lack of overview of the services. There are three means to purchase business intelligence today, and the purchasing systems provide inconsequent and insufficient descriptions of the services. The intangible feature of business intelligence makes it more challenging to evaluate and compare than other goods or services. The current purchasing systems are unable to provide enough structure, details and overview for the services and how they connect to Volvo Group.

In conclusion, the purchasing of business intelligence requires a new system that provides a better overview and more detailed descriptions of the services and gathers all orders in one system. Furthermore, Volvo Group should work closely with suppliers to develop solutions that make purchases more efficient for the whole organization. Lastly, Volvo Group should apply the strategic approach of category management to investigate, implement and improve the business intelligence segment

Keywords: Volvo Group, Business Intelligence, Purchasing process, IT systems, Category Management.

Contents

Acknowledgments

We want to take the opportunity to thank those who have helped and supported us writing this thesis in any way. Thank you to:

Viktoria Sundqvist, our supervisor who guided and supported us through the thesis with valuable insights and great conversations.

Volvo Group who gave the opportunity to write the thesis with them. This opportunity let us try our wings and got to know the organization.

Kina Aronsson, our contact person and mentor at Volvo Group, who aided us with the work at Volvo and supported us so throughout the whole journey.

The IPS team for the wonderful treatment, the good times at the office, and the continuous support from the first day to the last.

All our friends from class, teachers and family members who encouraged us and supported us during this fantastic period.

1 Introduction

This chapter introduces the thesis. First, the background is presented. Second, the aim of the study is presented. Third, research questions are presented, followed by limitations and a thesis outline that gives the readers a basic overview of the thesis.

1.1 Background

In the current business environment, the amount of information organizations and people must process steadily increases. Business intelligence is commodity organizations use for analysis that gives a competitive market advantage and enables better decision making. The increasing amounts of data and the increasingly more complex digital landscape stress the importance of adequate digital systems and information technologies that are capable of facilitating the efficient transfer of knowledge. Business intelligence enables better leadership, decision-making, measurements, management, and provides a significant financial, competitive edge. The better a corporation is at gathering and using relevant information, the faster it will be able to reduce costs and increase profits (Burton et al., 2006). In order to make this process successful, large complex organizations require established channels for communication, coordination, and transferal of knowledge. With increased globalization and rapidly changing market conditions, the need for business intelligence has probably never been higher. (Volvo Group 2019)

Business intelligence is particularly important for large international organizations that consist of several corporations operating in different industries and markets worldwide. These conditions imply a rapidly changing global business environment where new threats, opportunities, and challenges continuously arise like new emerging technologies, materials, and legislation. Business intelligence enables these organizations to achieve their business objectives and stay ahead of competitors successfully. (Volvo Group 2019)

Volvo Group is an international company, with thousands of employees from different nationalities and backgrounds, consisting of several entities, each running its own business and having their organizational structure. These circumstances make communicating, cooperating, and coordinating difficult. Volvo Group operates across the globe and relies on suppliers for external services such as business intelligence. (Volvo Group 2019) Volvo Group uses over a hundred suppliers, which makes consolidating purchases, securing efficient knowledge distribution channels, communicating and coordinating with stakeholders an enormous task.

Business intelligence is a critical area for Volvo Group's strategy and overall performance. It is essential as the purchasing strategy and supplier base keep the organization ahead of competitors. If the new strategy is not implemented, Volvo

Group risk not having suppliers with master agreements in place, no performance follow up and not keeping up to date in the business intelligence market.

Volvo Group has buyers at the business intelligence segment that are responsible for business intelligence purchases within the organization and deal with hundreds of suppliers for different services. The organization is operating in several countries across the world and consist of numerous companies operating in different business areas. The buyers are, therefore spread out in different locations globally and do not always coordinate their purchases. Consequently, this together with the number of orders and complexity of the services have led to complications for the purchasers who have difficulties mapping and gathering sufficient data to make adequate analyses of what has been purchased, by whom and for what purpose.

A couple of years ago, Volvo Group discovered that the business intelligence segment strategy needed an update. Several entities within the Volvo Group were buying the same services from the same suppliers, without consolidating the purchases. As a whole, Volvo Group paid an unnecessarily extra sum for the same products and bought the same subscriptions several times. Moreover, this situation can result in losing purchasing power and credibility towards the supplier.

In 2016, the department of Indirect purchases initiated a plan to update the strategy for business intelligence. The strategy was developed by the segment owner, with input from the buyer network and stakeholders within Volvo Group. The purpose is to define a preferred supplier base due to changes in the market, to clarify work processes for business intelligence, and to secure master agreements with suppliers.

1.2 Aim of the thesis

The thesis aims to investigate the purchasing process of business intelligence within the Volvo Group. The study aims to review suppliers and services to ensure that Volvo receives the highest possible value from the suppliers at the best possible cost. Furthermore, it aims to display the challenges within the purchasing process and present solutions.

1.3 Research questions

Based on the problem, three research questions are identified for the study.

1. What are the challenges in Volvo Group's current purchasing process of business intelligence?
2. How can the Volvo Group improve the purchasing process of business intelligence?

3. How can the Volvo Group benefit from improving the purchasing process of business intelligence?

1.4 Limitations

Volvo Group uses over a hundred different suppliers within the business intelligence segment. However, due to the time frame of the thesis, there was only time to analyze and map the three largest suppliers. In order to map and structure the suppliers and their services, 12 interviews were conducted. More interviews would have been ideal for a more accurate result.

Due to the limited access to global information and databases in other geographical locations, the study was limited to organizations and suppliers in Sweden.

1.5 The outline of the thesis

The thesis uses the following structure:

Chapter 1
Introduces Volvo Group, the research topic and the aim of the thesis together with, the research questions and the limitations.

Chapter 2
The theoretical framework for the research is presented.

Chapter 3
The methodology illustrates how the theoretical framework developed during the process, and it presents the reliability, validity and ethical aspects of the paper.

Chapter 4
Presents the empirical enquiry which summarizes the result from observations and interviews.

Chapter 5
Contains the analysis and the solutions.

Chapter 6
Illustrates recommendations.

Chapter 7
Ends with conclusions, implications, and future research.

2 Methodology

This chapter presents the thesis methodology. First, the research process is presented. Second, the research strategies. Third, the quality of the study is presented.

2.1 Research process

The master thesis is the last major project before accomplishing the master education. Both authors appreciate the opportunity to apply our knowledge and learnings from the courses we have studied during the last two years and finally solve a real problem that is related to our education from Chalmers.

We are classmates from "International Project Management" where the education focuses on the initiation, monitoring, and delivering of international projects. After partnering up, the very first thing was discussing where our interests and passion lies. Since the master thesis is seen as a project, we desired a topic that motivates us and thereby delivering an optimal outcome. We both agreed that we wished to write the thesis in a company where we can bridge our academical knowledge with real work that is related to our future careers.

One of the last courses we studied was "Business marketing and purchasing," which fascinated both of us, and we understood the critical importance of the purchasing department in an organization. We applied to a thesis work advertisement at Volvo Group Purchasing, and we were called to an interview. It was during the preparation for the interview that we realized that the thesis topic was perfect for us. We have the academic knowledge from several courses that provide us with the analytical, communicating and presentation skills required. Moreover, the data collection process involved many interviews, and we enjoy socializing and networking with business professionals. Before the interview, we summarized all these arguments for why we were great candidates for the thesis in a professional presentation, and after the interview with Volvo Group, Volvo Group hired us for this project.

In January 2019, our Volvo journey started. We were allocated to the Indirect Purchasing Department, under our supervisor, Kina Aronson, who is the segment leader for business intelligence. She explained the current situation in the organization and highlighted the challenges the department was facing. After observing and investigating during the first weeks, we were able to decide upon the project scope, the time frame for each step, and the expected outcome with our supervisor. During the six months, we met our supervisor at Chalmers, Viktoria Sundqvist regularly to report and obtain feedback on the thesis. She gave clarification and inspiration, which helped us to proceed in the right direction and generally improve the thesis.

We consider us lucky to have two experienced supervisors offering us inputs from

both industrial and academic perspectives, which results in a practical case study with theoretical academic support. The leanings were tremendous. During the 6-month project, we worked as project managers from the initiation phase, designing phase to delivering the outcomes in the end. The whole process required critical thinking to challenge the current system and complex problem-solving skills to find solutions. We conducted 12 interviews and finished with a presentation at Volvo Group sharing our findings and inputs. The thesis was also presented at the thesis conference at Chalmers to the public. By completing the circle from theory and practice to reflection, we were able to deepen the understanding and broaden our experiences in the business world.

To summarize the research process, one could say that the study started with defining the problems and form research questions, then relevant theories were chosen as the theoretical framework and followed by the collection of relevant data and interpretation of data. Next step was the utilization of data to test the theories and then develop conceptual and theoretical work. The last step was writing discussion and conclusion. See Figure 1 for an outline of the research steps.

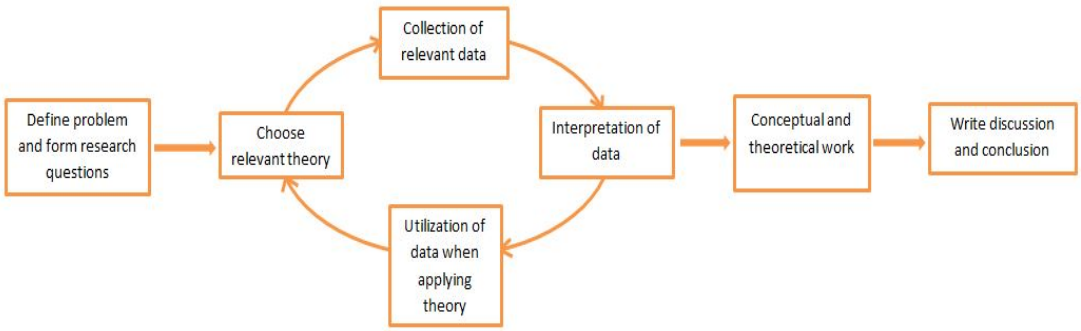

Figure 1 Research Steps

Note that step 2 to 5 is not a sequence process; it is a constant process involving the collection of data and selecting relevant theories that test the data.

2.2 Data Collection

We conducted nine interviews with internal employees from the Volvo Group and three interviews with external suppliers. Every interview was semi-structured and scheduled for around 30 minutes. The spoken language during the interviews was English. Adjustments were made to the interview questions according to the interviewees' roles in the purchasing process. The internal interviewees were asked to describe the current process and to share their opinions regarding the current process. Moreover, we asked the internal stakeholders if they agree that there is a need for optimizing the purchasing process within the business intelligence segment and asked

for their input in that regard. External suppliers were interviewed about the services they provide, their interaction with Volvo Group, and what can be improved.

Interview Questions are:

1. Are you the approval/ request person for service x from supplier x.
2. Why did you choose this supplier for this service? Are there any alternative suppliers?
3. What service do you buy from this supplier?
4. How do you use the service?
5. How many employees in your department have access to the service and how many uses it?
6. What is the current process for you to find the service and request it?
7. What do you think of the current purchasing process?
8. Are you aware if Volvo Group has already purchased this service?
9. Do you think everyone is registering their purchases in EBD?
10. Do you feel there is a need to reorganizing or optimize the purchase process within Volvo Group?

We conducted 12 interviews in total, with nine internal stakeholders from Volvo Group at different roles and three external suppliers. See Table 1 for the information of interviews.

Table 1. Table of Interviews

Date	Job Title	Company	Role
18 March	Operational Buyer, Segment leader	AB Volvo	Approver
22 March	Executive Assistant	AB Volvo	Requester
22 March	Buyer	Volvo Construction	Requester
27 March	Senior Commodity Buyer	AB Volvo	User
29 March	Purchase Analyst,	Consultant working for Volvo Group	Approver
3 April	Employee Advocacy and Influencer Manager in communication	AB Volvo	User
5 April	Director of Innovation Communication	AB Volvo	User
8 April	SVP Media relations,	AB Volvo	User
16 April	Key Account Manager	Meltwater	Supplier
24 April	Key Account Manager	Retriever	Supplier
25 April	Key Account manager and director	Meltwater	Supplier
9 May	Senior Advisor	E-space	Supplier

The interviews were semi-structured and partially navigated by us. Therefore, we were under the impression that we steered the answers in a certain direction at a few occasions.

2.3 Research strategy

Research approach, strategy and methods will be presented.

2.3.1 Research approach

This study follows an inductive approach mixed with traits of an abductive process. The research approach describes the relationship between research and theory. There are three research approaches, inductive, deductive and abductive, respectively. The outcome can be very different since each approach has its logic. In an inductive approach, the theory is systematically produced from gathered data with a set of research questions for limitation and analytical tools for assistance. (Blaikie, 2007). Abductive approach means that one may use an approach that alternates between using and creating theory (Dubois and Gadde, 2002). The inductive approach is chosen for this paper as the project starts with a real case; thus, relevant existing theories are chosen to solve the problem. There are specific steps with abductive characteristics. After working in the organization and observing for a while, a series of hypothesis and theories are selected to be applied in practice. However, during the process of data collection, discoveries often occur together with new insights that create the need for construction of new sets of theory to support the findings, followed by more interviews and data collection to test the new theory. It is a constant back and forth working process. Thus, this research uses the inductive approach with an abductive process.

2.3.2 Research strategy

This study applies qualitative as the research strategy. Many writers distinguish between quantitative and qualitative research based on the fact that quantitative researchers use measurement while qualitative researchers do not (Bryman and Bell, 2011) Yet, according to Bryman and Bell (2011) there are more distinct features other than the utilization of measurement as illustrated in table 2.

Table 2: Fundamental differences between quantitative and qualitative research strategies (Bryman and Bell, 2011, p27)

Orientations	**Quantitative**	**Qualitative**
Principal Orientation to the role of theory about research	Deductive; Testing of Theory	Inductive, generation of theory
Epistemological Orientation	Natural Science model, in particular positivism	Interpretivism
Ontological Orientation	Objectivism	Constructionism

Qualitative research can be explained as a research strategy that focuses on words rather than quantification of data collection and analysis. When it comes to the relationship between theory and research, the theory is generated through practice in qualitative research which makes the inductive approach more accessible, while the deductive approach is more often used in quantitative research to test a theory.

Another aspect of the differences is that in qualitative research the writer observes the social reality as a constant shifting of individual creativity as opposed to external and objective reality as in quantitative researches (Bryman and Bell, 2011).

This study is a qualitative study. Firstly, an inductive approach was used since the thesis started as a practical problem followed by the generation of theories aimed to solve the problem. The primary purpose is not to test a theory and prove a point but rather to select existing theories to fix a real business case. Secondly, the outcome of the thesis is the interpretation of the authors. The data collection process is conducted in the form of interviews and observations. Although the questions are prepared before the interviews, the answers from the interviews can cover a broader topic or touch upon new areas. The outcome depends on the way the authors interpret the interviewee's thoughts and words. Lastly, the whole process is based on constructivism, meaning that the authors formed and built the research following their logic flow, in contrast to objectivism, which is the main feature in quantitative research.

2.3.3 Research methods

Interviews, observation, and databases are the methods used for collecting data in this thesis.

Nine internal stakeholders and three external suppliers were interviewed. The sample of the participants is considerately selected that those are the people involved; therefore, they have first-hand input. Interviews are semi-structured as an interview guide, and a set of questions are prepared yet in practice, it allows flexibility in the asking of questions to seek out more data and insights.

Data were also collected by observing, interacting with, and learning from employees at the purchasing department. Stakeholders express the concerns and confusion regarding this specific topic. Additional data is collected while chatting with stakeholders not only during meetings but also in lunchrooms and in corridors conversing about work life and ask them to share the insights which enable rich data collection in a more natural setting.

The access to the purchasing database of Volvo group makes it easy to see all the orders in the past, which is the base to map the overlap and to have an understanding of the current process.

2.4 Research quality

This chapter present the study’s research quality and discuss its reliability, validity and ethical considerations.

2.4.1 Reliability

Reliability and validity in researches, according to Mason (1996) are "whether you are observing, identifying, or measuring what you say you are. "(Mason, 1996, p24)

Reliability is about whether, there are more than one observer, or members of the research teams agree about what they see and hear (Lecompte and Goetz, 1982). This report is written by two authors that conducted the research together, which collected and analysed data and came to a mutual understanding and conclusions during the study. Besides, four external readers have reviewed the study, including two supervisors involved in the entire process of the project (see Table 3) who verified the logic flow.

Table 3. Table of Reviewers

Reviewer	**Role during the study**
University supervisor, Senior Lecturer of Civil engineering	One of the two supervisors on this project and has a role in each step; bridging the business case and academic requirements
Company supervisor Operational Buyer	One of the two supervisors on this project and has a role in each step, initiator of the project, and has the most practical knowledge on the research issue. Supporting the study with data and ensuring no errors or misunderstanding of interpreting
Opponents, M.Sc. students	Two master's students review the report as part of their examination, to point out flaws in the report and critically exam each part.
Family member,	The "Fresh eyes" help the authors to edit and improve the report be understandable for readers outside the research area, and also gives honest and thorough criticism.

2.4.2 Validity

Validity considers the degree of the finding can be generalized across social settings (Lecompte and Goetz, 1982). It is believed that this study can be served to aid any large organization with similar situation and desire to change within the research areas. Many problems brought up in this thesis are believed to be universal for large companies, and the analysis and insights can be applied elsewhere.

2.4.3 Ethics

The study is conducted under the same ethics and confidentiality, as stated in the contracts signed by the authors and Volvo group. At the beginning of the interviews, the purpose is clarified to the interviewees.

Inevitably, there are a few situations where the confidentiality being questionable regarding names of suppliers, buyers, purchasing orders, cost of purchased items, and so on. The authors aim to disguise that information yet not lower the quality of the outcome. Data collected during the project is only for the specified purpose of the thesis.

The owner of this project is Kina Aronsson, segment leader of business intelligence, at Volvo Group. The project owner has approved the use of company internal figures and the publication of the information contained in this report. The authors take full responsibility for what is stated in this report.

3 Theory

The following chapter provides the theoretical framework. It serves to justify the choices of research questions, provide the background information needed to understand the study, establish the importance of the topic and add strength and credibility to the claims made later in the thesis by displaying the extensive research conducted.

3.1 The purchasing processes

Purchasing is "the process of acquiring resources and capabilities for the firm from outside providers." (Anderson et al., 2009, p.96) Purchasing is a series of activities which are connected and dependent on each other, yet there is a process of those activities, which is the purchasing process. (van Weele, 2010)

In this study, a six-phase process suggested by van Weele (2010) to build a foundation for further discussion of the purchasing process. Van Weele (2010) states that a purchasing model can be used to aid managers to structure the process. The result of the application of the model is better decision-making and operations, reduced overall costs, and increased productivity for the organization (van Weele, 2010). He further emphasizes the importance and necessity of defining interfaces between the phases, as the activities of each phase can be tracked and traced. The activities should take place after the previous one is finished correctly, as in sequential order.

Companies often have a manual explaining purchasing procedure together with documentation to structure the decision-making process and to avoid potential problems (van Weele, 2010)

Phase 1 Specification
Purchasers start with specifying the requirements of the purchase, and this makes the first stage, specification. According to van Weele (2010), specifications are divided into two parts, functional specifications and technical specifications. The functional specification is essential for service purchases, yet it applies to products since it describes the functionality of the purchase (Baily et al., 1998). The functional specifications give suppliers a clear picture of specified details to use their full expertise, and it motivates innovation. Moreover, it sets one standard which all supplier proposals are evaluated upon (van Weele, 2010).

Phase 2 Supplier selection and assessment
Quality, price, terms, delivery, service, and performance on previous purchase are the common factors to investigate when choosing suppliers. (Baily et al.,1998). According to Baily et al. (1998), a typical right supplier is that who delivers on time,

provides consistent quality, has a solid background, provides an excellent service backup, and is responsive to the buyer's needs. The chosen suppliers are then evaluated on their capabilities. Facts and methods considered in supplier assessment are the past performance, reputation, visit and appraisal, third-party certification, and sample product. (Baily et al.,1998)

Phase3 Negotiation and contracting
Negotiation and the contract can differ a lot depending on the line of business and purchase (van Weele, 2010) The importance of preparation is often underestimated. Make sure that all persons involved in the negotiation together have agreed upon the limits and strategies to use, before meeting the suppliers. (Baily et al., 1998; Woodside and Samuel, 1981) Depends on the aims and intentions negotiations, negotiation can be done in many ways for the buyer and supplier agreeing on terms and conditions and hopefully at the end of the negotiation there will be an agreement, which should summarize the negotiations and record all the details. Data shows that the majority of savings can be achieved on the pre-contract phase:10%-25% on specification, 5%-10% on supplier selection, respectively. 2-5% during negotiation. This, together with preparing contracts, ensuring the commitment with people involved, and ensuring that the agreement is implemented, constitute the third and last phase of negotiation, the post-negotiation phase. (Xideas and Moschuris, 1998; Baily et al., 1998)

Phase 4 Ordering and expediting
Purchase related information is passed to the supplier at this phase. It can be an order number, a short description of the product, unit price, number of units ordered, delivery date, delivery, and invoicing address (van Weele, 2010). Meanwhile, a supplier should provide a purchase confirmation for each order. Products should be monitored to ensure that they meet the specification stated in the order (van Weele, 2010).

Phase 5 Follow-up and Evaluation
After the purchased product is delivered and put into use, there are still jobs to do such as warranty claims, invoice administration, update and sort purchasing and supplier files, evaluations of the supplier (van Weele, 2010). It is essential to have a current record of suppliers for future purchases and the ratings of suppliers' capabilities, quality, and deliverables (van Weele, 2010).

According to van Weele (2010), variables that can affect the buying process can be characteristics of the products that decisions about different products can differ due to economic importance, the technical complexity, and the supplier risk. The strategic importance of the purchase has an impact as well. The higher the importance of the product, the more involvement of management will be in the decision process. As the amount of money involved increase, the role of the management grows. Characteristics of the purchasing market also play a role in the process. Approaches to

suppliers depend on the freedom of the purchasing markets. Other variables are the degree of the risk related to the purchase, role of the purchasing department in the organization. Lastly, as the purchased product requires adjustment in the internal routines or needs training and education, more complex the decision will be, and longer time will be expected.

Generally, as van Weele (van Weele 2010; Robinson et al., 1967) distinguish, there are three types of purchasing situations. The new-task situation, the modified rebuy, and the straight rebuy.

The new task situations occur when there is a new need, the previous purchasing experience is almost none, and very much information is needed. This means new specification has to be set, which implies high risk and uncertainty, plus suppliers are unknown. The decision-making process for new task situations usually takes longer time and demands problem-solving. (van Weele, 2010; Robinson et al., 1967)

A modified rebuy situation happens when either the product or the suppliers are new, yet there is a need to reduce cost or improve quality. (van Weele, 2010; Robinson et al., 1967). Internal facts like an emergency or marketing adjustment can also lead to a modified rebuy. This situation requires limited problem solving, yet additional information is needed. The risk is lower since both the function and the supplier are known (van Weele, 2010; Robinson et al., 1967). This situation covers only the last four steps in the model.

However, the most common situation is the straight rebuy that both product and supplier are known. As the negotiation is completed and previous purchases set the contract, products can be ordered straight away on routine. None or little new information is needed as suppliers are on an accepted list. The straight rebuy only requires the last three steps of the purchasing process model (van Weele, 2010; Robinson et al., 1967).

3.2 Organizational purchasing

Organizational buying behaviour is different in each company; more specifically, the buying process within a global company is significantly different from the one in a small local business. The buying processes are not always ideal, especially in giant corporations where more substantial changes take time and mean a huge global investment for the corporation. The same goes for data, information and knowledge storage systems, even though the organization is very much aware of the issues they face and the ideal solution for the problem, implementing and changing the structure or process remain an enormous task (Rajala and Tidström, 2017).

3.3 Organizational Alignment

The concept of organizational alignment is the alignment of strategic, cultural, processes, people, management, systems, and rewards that accomplish the best results. It occurs when strategic goals are supported and where each part of the organization is linked and compatible with each other. An active organization works to have a secure link between purpose, strategy, processes, structure, culture, and people (Harrington and Voehl, 2012).

Organizational Alignment considers organizational strategy, structure, and culture. It creates an environment that facilitates the achievement of organizational objectives and the development of high-performance work organizations. Well-aligned organizations have systematic agreement among goals, tactics, reward systems, and culture (Harrington and Voehl, 2012).

An important outcome and advantage of organizational alignment are that the process generates new synergies. These synergies aid in promoting creativity and help facilitate effective and rapid change which generates new synergies, opportunities, and energy within the organization. Often, suppliers have information, research, and new technology that can help the organization. Currently, many organizations have only one-way dialogues with their suppliers. Opening a two-way dialogue provides new ideas for change, and the dynamic exchange of information improves productivity (Harrington and Voehl, 2012).

3.4 Centralized and decentralized organizations

Organizations have continuously over the years, restructured their procurement strategies to interact with the ever-changing supply environment efficiently, and achieve the company's goals. More accurately, history has shown how organizations have juxtaposed between centralized and decentralized purchasing processes because of the benefits and drawbacks in each. The centralized organization centers its purchases in one place, typically at the headquarters or purchasing unit. The decentralized organization devolves purchasing activities to local facilities (Donociková, 2014).

Donociková (2014) argues that centralized buying occurs in a majority of companies where it is possible to combine purchasing volumes and thus gain a stronger negotiation position. Consequently, a decentralized purchasing process means more considerable influence with the supplier along with buying effort being duplicated across the organization. Furthermore, information, knowledge and purchasing data becomes scattered across the organization which results in analyses of the purchasing process and supplier evaluation becoming more challenging since the critical information, knowledge, and data are scattered in many places and difficult to compile.

According to Corey (1978), several factors push towards a more centralized organization, and these factors fall into four categories. "(1) coping with supply shortages and assuring long-term availability of needed resources, (2) responding effectively to a changing business environment, (3) seeking improved profit performance through reduced costs of materials, components, supply items, and other purchased products, and (4) responding to a need for increased professional development in procurement, and for a more efficient use of scarce talent in its several functions." Other authors such as Donociková (2014) argue that centralized buying enables organizations to combine purchasing volumes and thus have a stronger standpoint in negotiations, form a basis to gain a stronger bargaining foundation and simplifies purchasing procedures.

Schuh et al. (2017) elaborate on the concept to combine purchasing volumes and refers to it as volume bundling and explains that the concept is well known, but it is often forgotten how much a company can save. Volume bundling encompasses two methods, and the first is called suppliers consolidation, which entails bundling similar products from one competitive supplier and cutting out the others. The second is product line bundling, and it refers to bundling similar parts or items for all product lines together, which creates a bargaining advantage.

Corey (1978) highlights a case where lack of coordination within a company caused unnecessary costs. In one instance, the company returned 3000 pounds of zinc of which the buyer had paid 30 cents a pound for a while at another division in the same company. Buyers paid as much as 60 cents per pound for zinc to the same supplier. This case describes not only the issue of faulty coordination but unnecessary competition within the company for the same resources. Volume bundling would have been highly useful for this particular case mitigating both issues.

In supplier-buyer relations, organizations always depend, to varying extent, on their trading partner. Marjolein and Gelderman (2005) explain the connection between interdependence and power by stating that the buyer's dependence on the supplier results in a source of power for the supplier, and vice versa. Meaning, the more one party depends on the other, the more power is given to the other party. Buchanan (1992) means that the most independent party dominates the exchange. Furthermore, he states that balanced relationships exist when neither party is dominant, and interdependence is equal.

3.5 Organizing the Purchasing Process

The following chapters present the theories as to the references for organising the purchasing process.

3.5.1 Indirect procurement

Indirect procurement is defined as the purchasing of all goods and services that enable various activities performed by the firm (Jayaram and Curkovic, 2018). In other words, indirect goods and services are purchased for internal consumption that supplies a company uses in its day-to-day operations rather than the external customers or clients, in contrast with direct goods that are the materials used in the production of manufactured goods (Kim and Shunk, 2004). Indirect procurement categories include office supplies and equipment, MRO (maintenance, repair, and operation), computers, software and other IT equipment, marketing kits and services, travel reservations and other services, as well as capital goods.

Kim and Shunk (2004) point out that indirect procurement is receiving far less attention compared to direct procurement, whereas more efforts have been made to structure the purchasing process to increase efficiency. Jayaram and Curkovic (2018) share a similar opinion quoting a commodity manager for a U.S.-based medical equipment manufacturer during the interview: "There was no focus on indirect spend. As a result, organizations learned to fend for themselves in the indirect spend categories, and everybody was doing their idea of what they thought sourcing was.''

Through Ayarm and Curkovic (2018)'s research towards the current state of indirect procurement, they had discussions with many indirect procurement executives, and the standard answers can be summarized into three points:

First, indirect procurement is often performed by a variety of different departments within the organization. Second, few well-defined processes and fewer outcome-based metrics are set for indirect procurement. Third, the lack of guidelines or standards for indirect procurement.

3.5.2 Kralic portfolio matrix

Kraljic portfolio matrix is one of the most common recognized tools for companies across industries that wants a portfolio to develop purchasing strategies, and it has become a standard in the field purchasing and supply management. (Gelderman & van Weele, 2003; 2005) The basic idea of Kraljic's portfolio mode it depends on the importance and interests of the suppliers, companies need different strategies towards the supply market which implies that the power balance between the company and the suppliers concerning the purchasing items determines the different strategies. (Gelderman and van Weele, 2003)

Kraljic (1983) illustrates that there are two facts companies should consider when deciding on a strategy. One of them is the strategic importance of the purchase; the cost and value of the purchase, the impact on profitability. The more money involved in purchasing, the more significant the impact on the bottom line of the company. The

other fact is supper risk, which depends on the complexity of the supply market. Product availability, supplier availability, supplier changing costs, market structure, materials or items alternatives, entry barriers to the market, logistics costs, etc. all impact the supplier risk (Kraljic,1983). Van Weele (2010) explains the criteria to consider when using Kraljic's Matrix. For evaluation of strategic importance, the criteria can be purchasing volume, products share in overall cost price, contribution to total company margin, price elasticity. Meanwhile, the supply risk is determined by the availability of substitutes, supplier's share in buyer's purchasing turnover, market structure and situation, and switching costs.

By investigating the impact on the financial result and the supply risk, items are grouped into four categories in a two-dimensional matrix, namely strategic, bottleneck, leverage, and non-critical (see Figure 2).

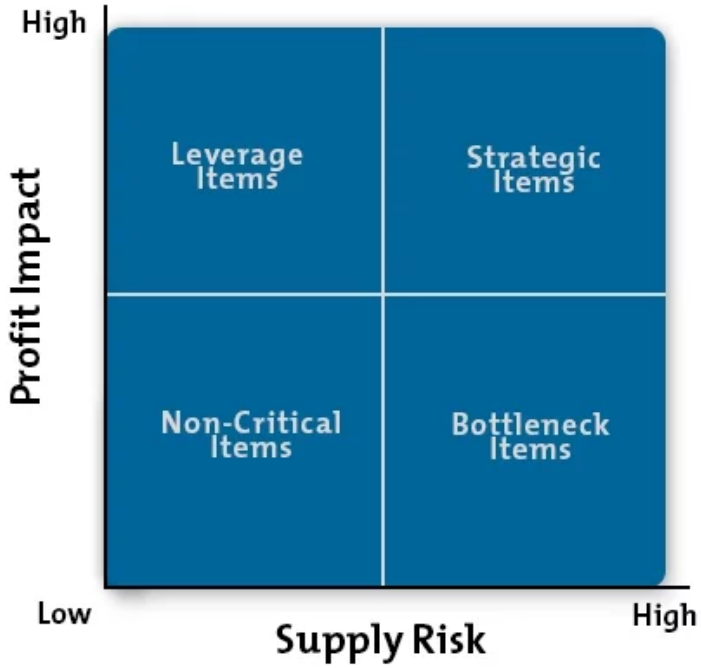

Figure 2 Kraljic Portfolio Matrix

The alternative for the bottleneck product is limited; therefore, there is a relatively high supply risk. Items fall into this category has low strategic importance, yet they can be tricky to manage (Olsen and Ellram, 1997). The limited alternative on the market gives suppliers power over buyers, which can result in poor service, delivery delays, and high prices. Companies should improve supplier control, secure inventories, and develop backup plans. (Gelderman and van Weele, 2002) Olsen and Ellram (1997) agree that securing continuity of supply should be the corresponding strategy for the bottleneck items. Increasing efficiency and having an organized process in place for purchasing should be the concern. Meanwhile, analyzing the markets for alternative suppliers or products to decrease the dependence on suppliers.

Lastly, using risk analysis to map the essential products, can aid the company forming contingency plans to prepare for potential risk (Gelderman and van Weele, 2005).

3.5.3 Knowledge management systems

Increasing business competitiveness, leaner organizations, and rapidly developing technological environments have increased the importance of managing organizational knowledge (Paiva et al., 2002). Chong et al. (2006) state that vast literature provides evidence that knowledge management has become a critical competitive advantage and success factor for organizations. Successful companies that practice knowledge management top the Fortune 500 list. Knowledge management enables companies to take advantage of the skills and experience within the company as well as the tacit knowledge belonging to the employees. The concept of knowledge management lacks a common consensus, and the many current solutions are ad hoc, and different perspectives on it lead to different findings (Malhotra, 1998). One definition given by Alavi and Leidner (2001) is: “a class of information systems applied to manage organizational knowledge."

Marr (2003) shows evidence that many organizations have knowledge management solutions covering information management related to technological solutions, such as intranet and databases. Vittal Anantatmula and Shivraj Kanungo (2006) present outcomes of knowledge management and list benefits such as better decision making, new or better ways of working, enhanced collaboration, sharing best practices, reduced costs and Improved business processes. VisionCor (2010) presents an example where Cisco delivered a knowledge management system that allowed 250 newly hired service support managers to access and share vital information, which considerably reduced their learning curve and increased the efficiency.

Knowledge management has benefited from the advancements in information and communication technology (ICT) since knowledge management is often built on ICT systems. During the implementation of a knowledge management system, it should be kept in mind that it is a complex system composing of interactions between people, technologies and information or data, therefore, due to this complexity, each organization have a unique solution for managing their knowledge (Amin and Muhammad, 2017). Abdullah et al. (2005) present different knowledge management technologies and list solutions like computer-mediated collaboration, electronic task management, messaging, video conferencing & visualization, group decision support, web browsing, data mining, search and retrieval and document management.

Furthermore, the authors elaborate on the most commonly used knowledge management systems and give four examples. (1) Knowledge Portal: a place where users can interact with the system. From here, the user can do everything they want in order to accomplish their task or mission. (2) Electronic Document Management System: Containers of valuable corporate information and explicit knowledge. Many

organizations maintain a vast amount of data in these systems, and it is, therefore, critical to have an effective system for managing this data so that the knowledge can be transferred to potential users. (3) Information Retrieval Engine: It serves as an interface to a diverse set of knowledge silos and plays a central role when setting up a KMS. A search engine features relevancy ranking, natural language querying and summarization, that increases the speed and the precision of finding information. (4) Data Warehouses and Data Mining Tools: Existing legacy databases in organizations contain a vast amount of crucial data such as customer information, product data and sales statistic (Abdullah et al., 2005)

Abdullah et al. (2005) explain that knowledge management technologies such as these support organizations in knowledge use, knowledge finding, knowledge creation and knowledge packaging. The authors continue to explain that "Two heads are better than one" and by sharing knowledge and combining resources and working together, the job will be performed faster and more efficiently, thus ensuring the best result for the job. This stresses the importance of collaboration and the need for adequate knowledge management systems that enables people to take advantage of each other's skills and expertise.

3.5.4 Category management

Category management is a practice of segmenting goods and services into groups according to their function and marketplace, and it is a strategic approach for the company to focus the organization spend on goods/services with suppliers. With category segmentation, organizations work cross-functionally on individual categories, monitoring the entire category spend, investigating the ways the organization uses the products or services, the marketplace and individual suppliers. (O'Brien, 2012)

For category management to success, it calls for all stakeholders, functions and individual across the organization to participate and engage. It requires an investment of time and commitment from the organization, yet the return of investment can be rewarding. It is a process-based approach, and it usually works closely with change management. (O'Brien, 2012)

O'Brien (2012) claims that Category Management is a circular process. There are fundamentally five stages of category management: Initiation, Insight, Innovation, Implementation and Improvement. O'Brien (2012) further points out that the process should follow and reflect the fundamentals of category management, change management and best-practice business improvement. There should only be one process within an organization. Meanwhile, everyone involved should be on board and understand the process.

Stage 1 Initiation is the kick-off of the whole process. Objectives of this stage should

be formation, alignment and motivation of the cross-functional team that will work on the category project. Verification of the opportunity, along with gaining some early insight into an understanding of what is happening in the category. Identification of how stakeholders will be engaged and how project progress and results delivery will be communicated to them and the more extensive business. Formation of a precise statement of the business requirements; identification of potential sources of value; delivery of early benefits; planning of the project.

Stage 2 Insight is about data gathering; three critical areas of data are about marketplace, suppliers and potential alternatives. Investigate the category and how the category serves the organization, then use analytical tools and techniques to analyse those data and gain insight.

Stage 3 Innovation is the bridge connecting how the data and inputs from stage 2 and how this category can be improved and developed further into a solid plan for execution. Ensure an agreement is in place before moving to the next stage of implementation. ‘‘It is called innovation simply because the best sourcing strategies are the innovative ones that represent a significant breakthrough’’. Determining the strategic options requires insights from those involved in the project. ‘‘Practitioners can often lose their nerve and are tempted to settle for a small improvement in the current position.’’ (Chapter 6 p2, O’Brien, 2012)

Stage 4 Implementation is where category management project roots in the organization, which turns the strategy defined in the sourcing plan into reality. O’Brien (2012) mentioned that identifying a strategy is relatively easy when compared to driving change within an organization.
For this reason, implementation is often the longest stage to accomplish that it could last six months or even longer for a big category requires complex change. ‘‘This is the point in the process when the focus, activities and therefore the skill set required by the category management team shift from purchasing to project and change management. Purchasing staff has traditionally not been well equipped with these skills, but they are essential for this stage. ´´ (Chapter 7, p2, O’Brien, 2012) The tasks in this stage include responding and executing the chosen sourcing strategy, managing change within the organization, identifying and agreeing on the arrangements, then developing a contract with the suppliers.

Stage 5 Improvement is the final stage, which is about maintaining the implemented changes and continually searching for new ways to improve the overall sourcing arrangements. This stage should be an ongoing process that continuous improvement can apply to value, quality, performance, price, process efficiency, innovation, or any of the factors that can add value to the organization. Therefore, it is essential that the category manager continues to embrace and improve those activities include searching for value, refining and optimizing business requirements, communicating and engaging with stakeholders. Effort should put into recognizing and optimizing

business requirements to reach a definition that aligns with business needs and wants. The rest of the category management activities flow once the definition is correct and precise. However, the needs of the organization change, the category manager should update business requirements as things change while engaging stakeholder and aligning with corporate aims, strategy and objectives. When the change is significant enough, it is an indicator that the category management process should restart or at least to go back to stage 3 Innovation and revisit the sourcing strategy. (O'Brien, 2012). Moreover, an essential governance and support structure together with some good practices will increase the overall chances of success for category management.

Category management serves organizations in various ways. Innovation from suppliers to end-customer needs and desires can help organizations retain or increase market share. The facts-and-data approach, analysing and understanding of suppliers, the markets and changing internal needs will optimize sourcing solution and reduce supply chain risks. Category management projects, together with the rest of the organization, can identify the breakthroughs relevant to the fast-changing world. Most importantly, cross-functional working makes organizations pull together as a team to solve difficult challenges while ensuring purchasing's role at a strategic level in the organization. O'Brien (2012) summarizes as' 'Organizations can work collaboratively to find ways through complex problems that will unleash the true power of human brilliance. With that, organizations can achieve anything."
The theoretical frames above are selected to answer the three research questions. The authors apply relevant theories throughout the research process with a logic behind the selection. (See figure 3)

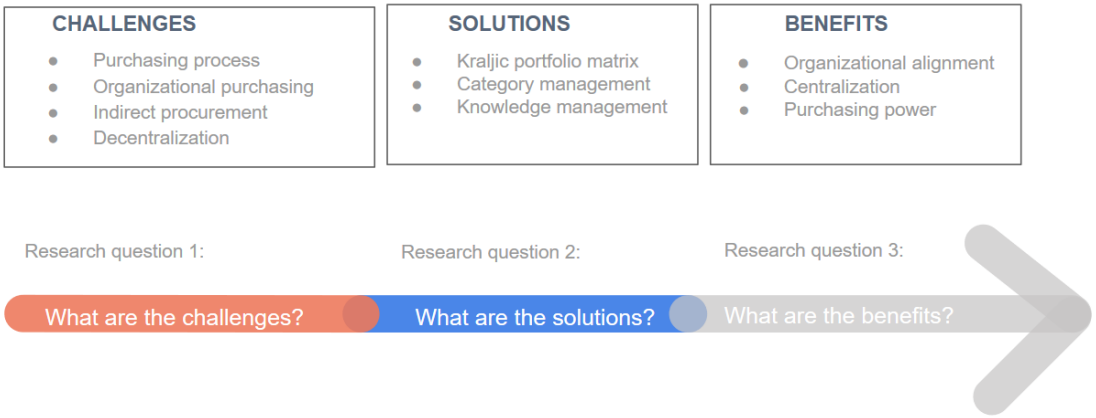

Figure 3. Toolbox for theory

4 Empirical inquiry

This chapter will start by introducing the overview of Volvo Group's Purchasing and Business Intelligence segment. Followed by the second part of the general issues that we have identified in the purchasing process. As one supplier was investigated more thoroughly, all findings related to this investigation is presented as the third part. Lastly, the chapter presents the findings of the investigation into two media surveillance suppliers.

4.1 Overview of Volvo Group's Purchasing and Business Intelligence Segment

The purpose of this section is to introduce Volvo Group, the organizational structure, the purchasing process, the segment business intelligence and the IT systems the company use for all purchases. It serves to give the readers a better understanding by explaining how the organization operates today.

4.1.1 Volvo Group

Volvo Group is one of the world's leading manufacturers of trucks, buses, construction equipment and marine and industrial engines. The Group also provides complete solutions for financing and service. Volvo Group sells its products in more than 190 markets with about 100 000 employees and production facilities in 18 countries. The Groups net sales amounted to about SEK 391 billion in 2018 (Volvo Group, 2019).

Volvo Group comprises of ten business areas: Volvo Trucks, UD Trucks, Renault Trucks, Mack Trucks, Group Trucks Asia & JV: s, Volvo Construction Equipment, Volvo Buses, Volvo Penta, Arquus and Volvo Financial Services.

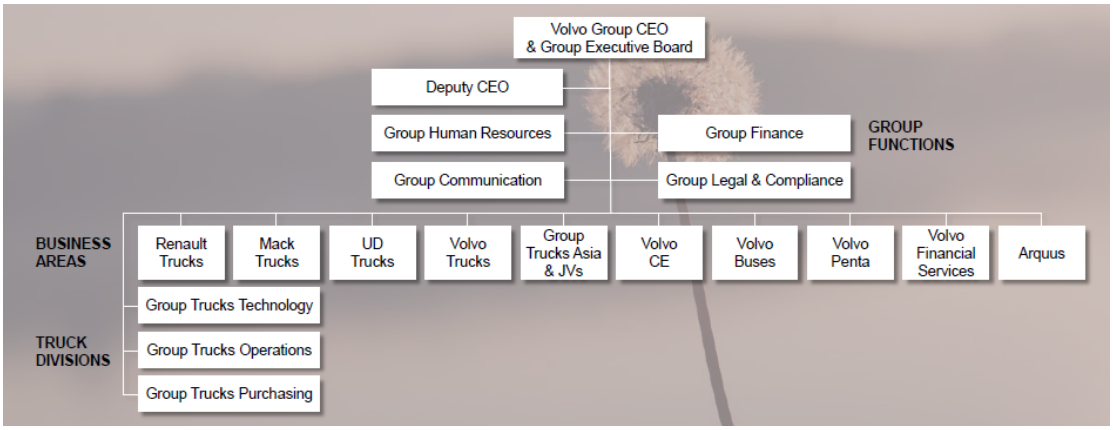

Figure 4 Volvo Group Organization

4.1.2 The purchasing department

Volvo Group's purchasing organization is the global group function covering the purchases of automotive products and parts including aftermarket, for all truck brands in Volvo Group Trucks.
The organization also covers the Indirect Products & Services (IPS) Purchasing which covers all purchases not directly related to the product. Business intelligence is a segment within IPS. The segment is divided into two areas, Primary data and Secondary data. This thesis focuses on secondary data.

Primary data is usually market research mainly about customer intelligence; it makes up 80% of the total purchases within this segment. Common areas of market research surveys are customer satisfaction surveys, brand surveys and competition surveys.

Secondary data are studies bought from different sources. They can include studies about macroeconomic, market intelligence, technology, legal, political, social and environmental aspects. Secondary data also covers services such as media monitoring reports, social media reports, transport industry articles, supply chain information, aftermarket and soft products data. These services are usually purchased as subscriptions which renewed annually.

4.1.3 The purchasing process

Whenever a Volvo Group employee identifies the need for a business intelligence service, the person asks around in the organization. Usually, a coworker has the information and offers the name of a contracted supplier Volvo Group have used before. The employee that request the service specify his requirements and send the request to a buyer at the indirect purchasing department.

If the price exceeds 40,000 SEK, the buyer will condition the order to ensure its legitimacy. If the amount is below 40.000 SEK, the buyer approves the order without conditioning it. There is currently no easy way for requesters to investigate if the service has already been purchased within Volvo Group, meaning there is a risk for overlapping purchases.

All orders should be registered in Volvo Group's purchasing system called Enterprise Buyer Desktop (EBD). Employees are suggesting that some orders are not put into the system because a buyer may lack knowledge and education. Moreover, the order specifics registered in EBD does not always give a clear understanding of the product/service due to their complexity. Lastly, if the purchase sum is low, the order is purchased via individual credit cards, making this order difficult to track.

In summarize, there are three different means to purchase business intelligence service within Volvo Group. In the EBD system, there is an order description

available however it is uncertain if 100% of the orders are registered there. System Application and Product (SAP) system contains 100% of the invoices but only have vague product/service descriptions. In this thesis, we only analyzed orders registered in EBD and invoices registered in SAP and not the ones done with a credit card due to the difficulties tracking these orders.

Consequently, analyzing what has been purchased requires looking into both EBD and SAP and bridge the information and fill in the gaps in each system. Furthermore, it is important to note that no system shows who use the service/product. The only way to map this is by contacting the requester and ask.

The business intelligence (secondary data) services/products are usually purchased as several licenses that give access to a database or platform with information. Included in these packages are often a specified number of searches in a database, together with dashboards which are customizable figures displaying analytics and search results. The content in the packages can differ, but this is a general idea. It is important to understand that if one package contains, for example, ten licenses, all of these may not necessarily be used by the person or a project group that ordered it. This implies that two Volvo Group entities may purchase two different packages with ten licenses each, while only using five licenses each, creating the overlap of 10 wasted licenses.

4.2 The factors that complicate the purchasing

The factors causing the complexity in the current purchasing process in Volvo Group are summarized in this section.

4.2.1 Many entities and geographically spread

Volvo Group is a large multi-unit organization consisting of 32 companies such as Volvo Trucks, Volvo Buses, Volvo Penta and Volvo Construction equipment. All the companies operate on their line of products. The purchase of business intelligence lack of communication and coordination. Information and knowledge are lost. A buyer state: *''All Volvo organizations work silo, and this can cause Volvo losing credibility to suppliers if we have no idea our colleagues already bought the thing and we are contacting them the day after and paying once more, I bet some supplier is having a good time''.* Director of Innovation Communication expresses that: *''Volvo should have a main contract with one supplier and all entities follow. Challenge is a big organization with many entities*.''

Volvo Group is a global company covering all the continents. The geographic distance is part of the challenges as well. Volvo Group entities are spread Europe (France, Belgium) Asian (China, Japan, India) North America (USA, Canada, Mexico) and Australia. Culture has an impact on work approaches. Moreover, the time zone difference adds to the complexity of standardizing purchasing process. As a

result, there is little collaboration in terms of operational purchases across the regions. One buyer, who is managing purchases for Canada US and Mexico claims: *' I have no access to the database of purchases in Sweden. People here have little knowledge about the other side of the world; there are too little collaboration and communication. I wish we could start talking to each other and work together.''*

4.2.2 Lack of overview and guidelines

If all the interview questions are summarized to 4 questions: Whom do you buy business intelligence from? How do you buy it? What content do you buy? How do you use business intelligence? The result showed that the approvers, the buyers, and the users all experience degree of confusion towards some of the questions. For example, the buyers know about the purchase process, but they have no idea how the data are used by the users. Or on the user end, they know what they use the data for, but they have little knowledge about the purchase processes. Not one person can answer all those 4 questions and thus has the overall view of the whole process, from selecting suppliers, selecting content, to purchase process and the utilization stage. Senior Commodity Buyer explains that ''*The requester does not care about how much money they spend on a service, they simply care about their deliverables.''* One approver, a purchase analyst shares similar statement *''I do not know what people are buying since its under 40,000 SEK, and the higher amount is approved somewhere else and the supplier selection is already made by other people''.*

Many names come cross in EBD or invoice system when looking through the orders within the business intelligence segment. There are the requesters, the financial approvers and the approvers. The requester can be anyone in need of the business intelligence data for the occasion. The approver is the one who has knowledge of the suppliers and contents within the specific segment. Volvo currently has one segment leader globally and many buyers all over the world as approvers.

Besides all the approvers mentioned above, there is a purchasing analyst who sits in India office taking care of all orders under 40,000 SEK. She showed how she approves her shopping cart of orders. *''I select segments, select all and approval all very quickly without checking much info.''* She further shares that *''It takes me one hour to approve average 600 orders daily, 300 from Sweden, 80 from Japan. Approving shopping cart on EBD is only one of my five job duties.''*

Volvo Group has all information of approvers in one place named how2buy, where you can find the responsible approver under the specific commodity and segment. During the interviews, some stakeholders express their confusion about the process, especially finding the right approver is tricky.

The standard process is the requester requests, then segment leader in IPS or other

approvers approves the order. In many cases, the requester is not the same person who is going to use the service.

4.2.3 Various purchasing means

Currently, there are three means to purchase business intelligence data, through EBD, issuing an invoice or paying by credit card.
Volvo Group encourages all the stakeholders to issue the order through EBD to have all the orders in one place for tracking. Not everybody is on board. The reason could be certain supplier is not listed in EBD system, or the new stakeholders are unsure how to use EBD, so they contact the supplier directly to order services and Volvo Group receive the invoices for the order. Executive Assistant explains "*Some assistants don't know how to use EBD, so they only issue invoices. It is a preference of habits*.''

Lastly, there are cases stakeholders pay the suppliers by company credit cards for convenience, or they think the amount is not significant enough to go through EBD. In these cases, the orders are not showed in any system, so it is impossible for Volvo Group to track it unless interviewing stakeholders one by one.

4.2.4 Ineffective IT system

The current IT systems are rather old and have been in place for a long time. There is a common consensus that they need an update or re-work. In interviews, people often expressed opinions suggesting so. One executive assistant says: ''*The current process should be tightened and optimized. We should do a standard process and share information'' which* pointing out the issue of having more than one process and the current difficulties regarding information sharing. The Director of Innovation and Communication who has similar concerns says: *"People have no idea other Volvo organization has bought the same thing, we need to find a way to share information''* Evidently, the current IT systems in use lack the option to display what has been purchased by whom.

The interviewee suggested that the current process can be improved, recognizing the fact that the current system needs work. Employee Advocacy and Influencer Manager said *'' the buying process for new data is too slow and picky, needs to be faster since the business is fast.''* Here he elucidated the fact that Volvo Group has strict requirements and processes when approaching new suppliers and new contracts. As the interviewee points out that the process is too slow and complicated for some fast-paced business areas.

In EBD or invoice systems, it is discovered that many stakeholders describe their purchased service or subscription in various wording even though the purchase contains the same contents. Some chose to emphasis on the time, e.g., "market

research 2018 to 2019" while others wrote the content, e.g. "global research and premium package." Since the description is the only text shown to share information with other stakeholders, different wording can cause confusion and misunderstanding.

4.3 Complex Service

This chapter presents the features of business intelligence that make it a complicated commodity to purchase.

4.3.1 Intangible feature of Business Intelligence

Unlike tangible goods where all material and parts can be seen and exist physically, intangible goods as business intelligence are often in the form of data and online information. This intangible feature results in making it difficult for stakeholders to know clearly what service they need, and any service evaluation and comparison becomes complicated and requires much effort. The purchasing process relies on promises from suppliers, reputation and feelings previous users shared about the experience. As one stakeholder says: *''We stick to the same supplier unless they mess up, and people get recommendations internally, word of mouth''. ''One of the few reasons for us to switching suppliers is because of misunderstandings in the specifications, ex, we want marketing intelligence, but it turns out 80% is about IT''.* Moreover, the intangible feature makes it hard to estimate the amount of the order needed beforehand as one stakeholder expresses: *''I can just tell that we do not use all the licenses we purchased, it feels like a waste.''*

4.3.2 Overlapping of suppliers and services

After looking into and mapping business intelligence suppliers, there appear to be overlaps between services bought from different suppliers. For example, the Volvo Group often has two different suppliers appeared to deliver the same service.
An Executive Assistant agreed, *''Sure, we do have overlaps, we probably bought the same services from the same supplier.''* Director of Innovation Communication confirmed that: *''Sometimes people just buy one time for certain occasional use, it is good that you are doing the mapping, I feel different Volvo Group entities are buying similar reports without knowing it is already in store''.*

Determining the overlap is not that simple. For example, after meeting the supplier Meltwater, it became clear that the method of collecting media articles may differ greatly between companies. It differs because they gather media from different sources and use different amounts of data which give different results in the end. It means that for one to understand if a service is better than another or overlapping, another, one must go deeper and understand how the data is collected and from where. For example, one supplier may collect data from 15 000 media sources and exclude some expensive sources they don't have access to while another collects from 100

000 sources and cover a larger share of the total information available. One company can be experts on social media monitoring and worse at regular media monitoring. The process of gathering data is complex, thus mapping the overlap of suppliers and their services requires deep investigations.

4.4 Investigation of the top suppliers for media monitoring

A deeper investigation is conducted on three top suppliers in the business intelligence segment for media monitoring. E-space, Retriever and Meltwater deliver the same service to several companies within Volvo Group. Volvo Group desires to consolidate the purchases and form a master agreement for the whole organization. This has been met by great enthusiasm as it is an opportunity for Volvo Group to negotiate better prices and a chance for the suppliers to secure long-standing contracts with Volvo Group. The suppliers seemed ready and positive for the discussion.

4.4.1 The investigation of Meltwater

The key account manager of Meltwater suggests a face-to-face meeting. The objective from Volvo Group's side here is to gain insight and understand the media surveillance services they provided better, so later, this new understanding could be used in mapping the company's services. The key account manager comments that he thought this conversation is long overdue and agrees that the current contracts between Meltwater and Volvo Group need renewal.

He furthered agrees that there is a lack of coordination and collaboration within Volvo Group and confirmed that different Volvo Group entities had expressed this notion to them before. Meltwater understands the issue Volvo Group faced with overlapping purchases.

During the meeting, they present their latest analytical technologies involving artificial intelligence and machine learning. They showcase their new capabilities and services they will be able to provide shortly.

To propose a solution, Meltwater explains that Ericsson, another client of theirs, has experienced similar problems. For Ericsson, Meltwater developed a unique solution and explained that it is possible for Volvo to implement the same solution. The idea is that all Meltwater purchases go through one key person within Volvo Group. The business units will pay themselves when they need certain service, and the internal key person will act as a filter, with a clear overview of all purchases, making sure no overlapping orders. Meltwater can also set up a filter that prevents people within Volvo Group from purchasing products that have already been purchased.

Instead of purchasing media surveillance packages, including certain numbers of licenses that grant access to the search database, Meltwater will provide a structured framework with users having different access levels. The most important users are called super users; these users are leaders in their business area responsible for organizing media surveillance. The super users will have direct contact with Meltwater consultants, receive training on how to use their software and make the decisions in terms of deciding search patterns, keywords, and what information that is gathered. Other Volvo employees can turn to the super users or if new areas need monitoring, Volvo Group can order a new super user from Meltwater. What costs Volvo money currently is the time spent with the Meltwater consultants educating, setting up the search algorithms and monitoring system. The super user's task is to distribute the information to Volvo teams and people. These other users have little to no contact with the supplier and therefore reduce the cost. The less contact and work require a user with the supplier, the less it costs. The picture below illustrates the proposed framework between Volvo Group and Meltwater.

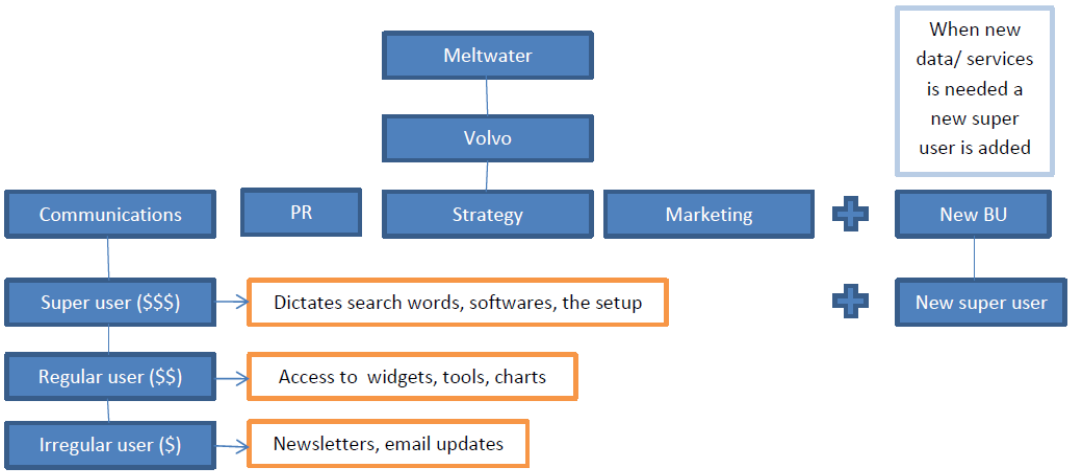

Figure 5 Illustration Figure of Suppliers Proposal

They further express the wish to work closely with Volvo Group in the future within the business intelligence segment. For example, they state it would be ideal to be informed of Volvo's direction in the next six months to one year, so Meltwater can relocate the resource to prepare better, in the sense of delivering right data to the right people within Volvo Group.

4.4.2 Investigation of Retriever and E-Space

In order to review suppliers and identify eventual overlapping services, two more suppliers, Retriever and E-space were investigated.

Retriever is a supplier that on paper appear to provide Volvo Group with similar services as Meltwater. When analyzing the orders, it appears as if Retriever is delivering the same service as Meltwater. This is, however, disproven by the key account manager at Meltwater. As he explains that there are many ways to monitor media articles and companies collect data from different sources meaning two companies who monitor the same keywords most likely present different data seeing as they collect the data from different news articles. To determine whether the services overlap with each other one must analyze the results, each supplier provides and evaluate their methods of collecting data.

E-Space provides services for companies to understand and improve their online performance. Different Volvo entities have been using E-Space's service, such as survey, feedback, and poll for the websites. The senior advisor from E-space understands that Volvo Group is seeking a more consolidated solution towards the supplier. He further states that *'I would prefer a centralized purchasing portal, it will be positive for both parties. We lost the contact with Volvo Truck, but we know we are better than their current supplier. In fact, we even approached Volvo IT with a proposal of a customized portal for Volvo Group, but nothing has happened yet.''*

5 Analysis

The following chapter analyses the theoretical and empirical data. The chapter aims to elucidate the phenomenon further by answering the research questions. Five areas are covered: lack of overview and guidelines, complex services, decentralized purchasing, three purchasing means and inadequate IT systems.

5.1 Lack of overview and guidelines

Business intelligence is one segment defined under indirect purchasing at Volvo Group. It is discovered that the internal stakeholders lack an overview of the segment. As it is presented in the result, the buyers, the approvers, and the users all express a degree of confusion. For example, the buyers know how they buy it, but they do not have the information about how the users are using it, what content they are using and for what occasion. On the user end, they know how they use the data. However, they do not know the purchase processes of how the service has been bought and how this supplier is selected. The approvers are only doing their job to approve the orders as long as the order meets the requirement. Knowledge and information of suppliers, content, and the utilization of business intelligence is lost along the way.

There is a lack of guidelines and standards regarding job responsibilities. The reasons for that could be in line with Kim and Shunk (2004) that, point out indirect procurement as generally receiving far less attention compared to direct procurement. Despite the strategic importance of business intelligence, the sum of money spent on business intelligence is far less than the amount spent on direct purchase. This result in less effort made to structure the purchasing process.

The organization can utilize category management as a strategic approach to monitor the business intelligence segment (O'Brien, 2012) which support investigating the way the organization uses the products or services, the marketplace, and individual suppliers.

Volvo Group's business intelligence segment is lacks an overview. The buyers, the requesters, the approvals, and the users playing different roles without considering the big picture, which is the whole segment. This results in overspend and repetitive purchase from the same suppliers.

For Volvo Group to manage the business intelligence segment properly, the knowledge of the suppliers and data have to be shared with and understood by all stakeholders involved. The most appropriate way to go about this is to form a team of individuals who understand the category and will be responsible and committed for the segment, as O'Brien (2012) claims that for category management to succeed, it calls for all functions and individuals across the organization to participate and engage. This team should have an overview, instead of only having one piece of the

puzzle in hand as in the current system today. They understand, manage the segment, and then provide the knowledge to rest of the organization.

The drawback is that category management requires an investment in terms of time and commitment from the organization. To some extent, the job duties of the category management team are similar to what this thesis project cover which is investigating and gathering an overall understanding of the segment while attempting to improve the process. Ideally, the team solving this issue should be given more responsibility, more cross-functional support, and access to relevant information.

Despite the drawbacks and challenges, the return of investment in category management can be rewarding. It can trigger innovation from suppliers to end user. This effect will put the purchased data into more effective use. Optimized sourcing solution based on analysis and understanding of supplier, markets will reduce cost and decrease risk (O'Brien, 2012) The specifications offer suppliers a clear picture of specified details to use their full expertise, and it motivates innovation. Moreover, it sets one standard which all supplier proposals are evaluated upon (van Weele, 2010). All those efforts will enable Volvo Group to stay ahead of the competitors. Especially in the business intelligence segment where the data and reports support organizational decision making, a well-defined and aligned category management project can be the breakthrough for Volvo Group.

Moreover, it can be used as a stepping stone to encourage a more cross-functional purchasing structure that plays a more strategic role in the organization. At the end of the day, it boils down to people. Volvo group had attempted to change the process over the years. A purchase analyst said ¨there is a need to improve the process, but I think the challenge is that the rules change all the time within Volvo and people don't like change.'' There are reasons behind certain behavior. People are comfortable with their safe routines on a day to day job, or perhaps they lack awareness of the problem. Buyers already have their relationships and approaches with certain suppliers. In multiple Volvo meetings, the management group mentioned that everyone should act like a small CEO at his everyday job and have the ownership mentality to be innovative and responsible for the interest of Volvo Group.

At the end of the day, it is people who drive the organization. Category management can be the solution of bringing people together to work on the improvement of the business intelligence segment.

5.2 Complex Services

Business intelligence plays an important role for companies as in the rapidly change business environment. It is a segment hard to manage due to the intangible feature of business intelligence.

Unlike tangible goods where all material and parts can be seen and exist physically, intangible goods as business intelligence is often in the form of data and online information. This intangible feature makes it difficult for stakeholders to grasp exactly what service they need, and service evaluation and comparison becomes complicated and requires much effort. The purchasing process relies on promises from suppliers, reputation and feelings previous users shared about the experience.

Furthermore, this intangible feature of business intelligence makes it hard to understand the exact content of the service for the trace and track purpose. In some cases, different Volvo Group entities purchase the same service from the same supplier over the same period, which creates the overlap. In reality, it is not that simple and straightforward. Although the name of the service is the same, the content of the service the supplier is offering can be different. It all depends on the customers' needs and agreement. Or in the opposite cases, multiple suppliers might offer similar content, which is the overlap, although they name the services differently.

Volvo Group is currently using Kraljic's model as one of the tools to manage suppliers. The two measurements of Kraljic's model are the strategic importance of the purchase and the supply risk, which depends on the complexity of the supplier market (van Weele, 2010). The power balance between companies and suppliers on the purchase items determines the strategy (Gelderman & van Weele, 2003). Business Intelligence is falling into the bottleneck segment classification in the Kraljic Portfolio Matrix according to Volvo Strategy (Volvo Group strategy for business intelligence segment 2018). The market of business intelligence suppliers is highly competitive, yet there are only a few niche suppliers providing high-quality data and service. The data Volvo Group purchased is linked to the company's overall business strategy, which makes it strategically important but has a relatively low impact on the financial result.

Bottleneck products can be tricky to manage (Olsen and Ellram, 1997). Securing continuity of supply should be the corresponding strategy for the bottleneck items. Aside from the switching cost of changing supplier, longer contracts with fewer optimal suppliers are preferred for data consistency *(*Volvo CSS and Brand*)*. Furthermore, for bottleneck products, companies should improve supplier control, secure inventories, and develop backup plans by analyzing the markets for alternative suppliers or products to decrease the dependence towards suppliers. (Gelderman and van Weele, 2005).

The suppliers of business intelligence segment provide access to their portals for data analysis; these portals require time and effort to learn. All these investments make Volvo Group dependable on certain suppliers (Volvo Group strategy for business intelligence segment 2018). As a fact, as today, Volvo group has over 100 suppliers offering business intelligence service providing data about market intelligence, media & PR, macro economy, sales support, and special reports. It is time for Volvo Group

to assess all suppliers and make a few cuts to keep some key suppliers. Volvo Group should have an up-to-date record of suppliers for future purchases and the ratings of suppliers' capabilities, quality, and deliverables. Due to the intangible feature of business intelligence, more effort should be made into the evaluation of the suppliers.

There are several benefits of having a few suppliers.

Firstly, one benefit is a closer relationship with knowledge sharing. Few suppliers mean more focus and effort can be made to those chosen ones instead of managing unnecessarily too many suppliers, and a closer relationship with more knowledge sharing is expected. Many studies point to organizational knowledge is the key factor for organizations to success in this rapidly changing business world. (Pavia et al., 2002) Suppliers express their interests to collaborate with Volvo Group closely that they wish to get the first-hand knowledge about the organizational strategy, market, and potential demand shortly. The reason one certain supplier mention is that they can be prepared and relocate their resources to meet Volvo's expectation with the better-quality data.

Secondly, another benefit is reduced costs**.** From supplier selection to contract finalization with suppliers. It takes time and resources to manage suppliers. Not to mention the switching cost when terminate and develop new suppliers. Therefore, having fewer suppliers who understand and meet Volvo group's demands is the ideal situation which leads to the straight rebuy that only required the last three steps of the purchasing process model (van Weele, 2010; Robinson et al., 1967).

Thirdly, better data consistency is one benefit. Volvo Group understands the importance of the data consistency (Volvo CSS & Brand) Although business intelligence data are expected to bring insights to make a better decision, it is not the case if the data has come from too many fragmented sources. To eliminate the risk, Volvo Group needs to make sure they choose very few global suppliers for a consolidated data source. Moreover, when using fewer providers, it is easier to compare the data since they are from the same measurement. Therefore, it is easy for the organizations to connect the dots from the business intelligence data to have an overview of the progress or the contributing factors.

5.3 Decentralized purchasing

Volvo Group uses a centralized purchasing function; the results, however, show that the purchasing occurs in a decentralized fashion. On the one hand, each organization within Volvo Group must take responsibility for their purchases. On the other hand, the purchasing organization needs to be able to consolidate the different organization's purchases. The responsibility to achieve this task land on the buyers and requires them to analyze the purchases for all organizations and identify where different organizations buy the same service. This task requires buyers to have an overview of

all purchases of the same character. It also requires the buyers to coordinate with the requesters and make sure the negotiated master contract satisfies all parties connected to the service. Due to the complexity of certain services, integrating a solution that satisfies all parties is complicated. The buyers need to act as a mediator between the suppliers and requesters, and understand complex services and evaluate them. On the one hand, buyers may lack the technical knowledge to handle these tasks. As new technologies such as artificial intelligence and machine learning are entering the market, services become more complex. On the other hand, the buyers have the greatest overall knowledge of suppliers, services, and requestor needs. One solution could be to hire technical buyers with project management skills; these buyers will have the tools and knowledge to understand and implement complex solutions.

Consolidating purchases for the whole organization provides better deals and thus reduce the cost of the service (Donociková, 2014). Doing so takes time and resources, and requires a great deal of collaboration and organizing. The amount of work involved may not outweigh the amount saved. There are however ways to make this process more efficient. The organization can invest in systems that provide an overview and expedite the analysis of services and suppliers. Developing and implementing such systems within Volvo Group imply a tremendous challenge in itself; however, by doing so, Volvo Group may gain significantly more than they invest.

In meetings, upper management stresses and press the fact that Volvo Group is a well-known organization, and this should be used as bargaining power with its suppliers. Volvo Group is constantly approached by new organizations seeking to do business with them.

When it comes to bargaining power in negotiations with suppliers, Buchanan (1992) says that the most independent party dominates the exchange. Marjolein and Gelderman (2005) continue on this and state: the more one party depends on the other, the more power is given to the other party. In Volvo, it is stressed by upper management that buyers need to be tough and unyielding when dealing with suppliers. They emphasize that Volvo is a large organization that every company wants as a business partner. Often suppliers mention that everyone wants to work with Volvo Group as they are a large company with equally large financial resources.

This gives Volvo Group a good position, and great advantage in negotiations, and their ability to consolidate volumes for the total organization gives more power. Suppliers make unique solutions that fit the Volvos business model and are forced to align themselves with the standards and regulations of Volvo. Due to the volume Volvo Group purchase, the company can get better deals. On another note, since Volvo Group is large and has much financial resources intuition yells that they are not as careful or critical in the spending as other companies could be, seeing as sums below 300.000 SEK is regarded as not worth questioning. This gives companies great

opportunities to strike deals with Volvo that are overpriced. Volvo is willing to accept this to a degree if other factors such as on-time deliveries and quality are delivered. These factors are very important since late delivers or unreliable services have consequences in other parts of the Volvo organization and can have severe repercussions.

5.4 Three purchasing means

There are currently three purchasing means that employees use for the purchases of business intelligence. The upside to this is that smaller purchases can be done instantly without having to go through the process. The downside is that it scatters information in different systems making purchases more difficult to analyze and thus consolidate. Switching to one single system would be an optimal solution that stores all transactions in one place. The new system could still support three purchasing means so that the positive aspects are kept. It would benefit Volvo Group by making an analysis of suppliers and orders easier for buyers, which in turn would make consolidation more effortless. Another benefit would be shorter learning times for new employees or consultants since they only need to learn one system and not search for information in several systems. One could argue that having one system makes the purchasing process more sensitive should any malfunction occur. On the other hand, that risk is small, and the benefits heavily outweigh the risk. The new buyer system can combine the positive aspects of each of the three systems and exclude the negative aspects.

5.5 Inadequate Systems

The investigation shows that the current buyer system lacks properties that provide buyers with a clear overview of all suppliers and services within business intelligence. Buyers strive to consolidate purchases for Volvo Group, yet the process of analyzing and evaluating suppliers and services takes much time. The current systems are not optimized for efficient analysis and evaluation, perhaps because these properties were not considered in the initial design. Looking back 20 years ago, the digital services available then are no way near as many or as complicated as they are now (Hashem et al., 2015). Hence, technological development has advanced, which require systems to change accordingly. The technological advancements in the field of business intelligence will likely continue, which is why investing in a new system designed to support the buyers is important. In the new system, important data such as detailed service descriptions should be included seeing as its one component missing in the current system. Another function that is missing is the ability to sort services by the undertaking; this function would assist buyers and the business intelligence team in consolidating purchases and analyzing suppliers faster (Abdullah et al., 2005).

One downside of installing a new system is that people need to learn the new system. It takes time and may cause efficiency losses for a shorter period. It is, therefore, a

good idea to implement the change during less stressful periods. Another downside for people familiar with the current system is irritation if the systems change too often. They are comfortable with the current systems and might resist the change. Further complications may occur if the buyer system is integrated with other systems. This would result in potential changes for the interconnected systems unless the new system can be integrated without affecting other systems.

Results show that buyers need additional support. Furthermore, new people should not require long periods to understand the systems. The results showed that all the information about suppliers and services that were collected could have been more easily available in the current system if the design had been optimized. These systems are complex; however, the best systems should be easy to use, especially for new employees (Amin and Mohammad, 2017). Another benefit is that anyone, internal or external, collaborating with the business intelligence team can learn the system more quickly and thus work more efficiently. Finding the right information becomes easier, and as Abdullah et al. (2005) state, having an efficient system for knowledge transfer is important because it contributes to the benefits mentioned above. If a new system is not implemented, Volvo faces a risk to have suppliers without frame agreements in place; no performance follow up and risk of not keep up to date in the market for business intelligence.

6 Conclusion

This chapter presents the conclusion of the study. Firstly, main findings are presented. Secondly, future research is discussed.

6.1 Main Findings

Table 4 illustrates the main findings of the research questions: what the identified challenges within business intelligence segment are, solutions selected or developed, and the benefits that can resolve and mitigate the current challenges.

Table 4 Main findings to research questions

RQ1 Challenges	**RQ2 Solutions**	**RQ3 Benefits**
Lack of overview and guidelines	Category Management	Work cross-functionally Monitor cost Manage suppliers A better understanding of the whole segment
Complex service	Kraljic Portfolio Matrix	Closer relationship with the supplier Suppliers insight Data consistency Less switching cost
Decentralized purchasing function	A New Data Solution	Digitalization Better preparation for changes Solid foundation Short Learning period
Multiple means		
Inadequate systems		

Volvo Group's centralized purchasing function, more specifically, the business intelligence segment identified that different companies purchased similar business intelligence services within Volvo Group. Consequently, the segment leader for business intelligence initiated the task of mapping, analyzing, and investigating the suppliers and orders for business intelligence as a master thesis. Several reasons were identified for this behavior. There are parts of the purchasing process that needs improvement.

It is discovered that the business intelligence segment suffers from lack of overview and guidelines**.** Different stakeholders play their roles in the process without seeing the whole picture of the segment. Very few people have an overview of the marketplace, the supplier, and how Volvo Group purchases and use business intelligence service. Stakeholders express confusion about how to find the right data from the right supplier and what is the right purchasing process to follow.

Category management could be the solution to this problem. The general idea of category management is setting up a team to work in an agile environment, with continuous improvement in mind, at the same time being flexible and focusing on the goals. By achieving the objectives of initiation, insight, innovation, implementation and improve stages, the business intelligence segment will work cross-functionally to investigate how internal stakeholders buy and use the services, manage the external suppliers and monitor the cost.

Unlike material and parts can be seen and exists physically, business intelligence is often in the form of data and online information. This intangible feature makes business intelligence a complex service to grasp and understand. Hence it is hard to evaluate suppliers. Business intelligence is strategically important for Volvo group, which makes it bottleneck product according to Kraljic Portfolio Matrix. Volvo Group should execute the corresponding strategy of having a closer relationship with fewer suppliers. The supplier can offer Volvo Group better insights with better data consistency, and Volvo Group can reduce the switching cost.

Volvo Group is a global organization with many entities. Every entity is running their operation; this factor, together with the geographical spread over the world makes the purchasing function decentralized and lacking synergy. Currently, there are three means of purchasing and storing all the orders, which makes it hard to track. Most importantly, the current system is not up to date. Stakeholders are not able to see what is already purchased by other Volvo entities, which creates overlaps. There is different wording describing the orders and insufficient information about suppliers in the current system.

It is believed a new data solution can solve these last three challenges. The solution is based on current business requirements. It improves the existing digital landscape of data sources and identifies critical information needs to connect with Volvo models through cross-functional partnership and collaboration. The new solution visualizes and displays the data by combining the right visuals with the right data to stimulate new perspectives and provide a clear overview of the segment.

Benefits of the new data solution include faster learning times for new employees and people working cross-functionally or collaborating with the segment. Better knowledge storage systems which make the supplier database and services easier to analyze for buyers and thus consolidate purchasers or make sure Volvo receives the

best value. As digitalization is happening all around us, a new system will provide a better foundation to build on as future digital challenges arise, and changes can be handled better.

Three suppliers were investigated, E-space, Retriever and Meltwater, that delivered the same service to several companies within Volvo Group and discussed our desire to consolidate the purchases and form a master agreement for the whole Volvo Group. This has been met by great enthusiasm as it is an opportunity for Volvo Group to negotiate better prices and a chance for the suppliers to secure long-standing contracts with Volvo Group. The suppliers seemed ready and positive for the discussion.

6.2 Future research

The study leaves many doors open for future research. The requirements for a new IT system should be investigated, together with appropriate design solutions and other tasks required for the creation of a new IT system. Moreover, there are many suppliers that still needs to be investigated. Their services need to be mapped carefully, meaning it should be done in great detail and a systematic manner. It makes the more complex orders easier to understand and later register into the new IT system. Finally, the media monitoring suppliers and their services need to be understood better. It remains unclear how to measure and evaluate their services. Meaning it is challenging to evaluate the quality of such service and to confirm whether two media monitoring services overlap or complement each other.

The knowledge management systems are one such part. With fully adequate computer systems, this task could have been solved easily, as the main challenges of this task were to collect data that would enable the analysis. The larger portion of the identified issues is connected to the current systems, which is why improving them is one of the main aspects of this thesis.

As companies collect data from different sources of media monitoring, the results can vary. It implies that even though they provide the same service for Volvo Group, they deliver potentially different truths. There is no certainty that one supplier delivers the absolute truth; in fact, it is rather unlikely since no media monitoring company can have full coverage of every news source. The questions are, how should one handle the information? Which supplier should be the most trusted? And how much can the results vary? It opens up for a whole new research study that needs to be addressed to answer the question of whether the services are overlapping or serve different purposes.

This report will give the leaders for business intelligence and indirect purchases an overview of the current state of the purchasing process, what areas could use improvements, and how these improvements could be. The thesis has laid a foundation and provided documentation of the current situation, via our research and

interviews. The thesis can be used as a source of information regarding the purchasing process and the three suppliers that were investigated. It can act as decision basis material and motivate future actions to deal with the issues.

In the end, it is concluded that it did not matter how much organizations optimize and improve their processes, systems, and structures because eventually, it boils down to people. There needs to be incentives, cultures, and reasons for people to follow the processes and use the systems the way they were designed. Otherwise, people will go their ways or find ways to work around the established processes and render the optimization efforts meaningless. Therefore, we welcome future researchers to continue our work yet focusing on aspects like organizational psychology, motivation, and incentives in organizations and subjects related to the human factor.

7 Recommendations to Volvo Group

After investigating current purchasing process and identifying the factors that complicate the process with the analysis, this chapter presents some recommendations to solve or mitigate these challenges.

7.1 New IT system

The table below shows the problems with the current IT system together with the proposed solution for a new IT system.

Table 5, problems with the current IT system and the corresponding solution

Problem	Solution
Three means in the process with data mixed	Have all data in one single place
Lack of knowledge of EBD	Provide training and workshops
Insufficient information about the services that have been purchased	Trace and visualize previous orders
No information of who uses the purchased service	Trace previous users and obtain knowledge
No overview of the segment	Visualize all information for an overview

We recommend the Volvo Group to set up a more effective IT system. The general idea is to have all data in one place to visualize all the information, for people internally to an overview of the whole purchasing process, making it easy to use and able to trace previous purchases.

We propose an IT system that enables sharing of supplier and purchase information internally within Volvo Group. Consider the concept as something similar to a library consisting of suppliers and their data, with all relevant information listed. The system is as illustrated below in figure 6:

Buyers view

When you click on the company name a new page opens up showing the order, detailed service description, price, what it is used for.

Supplier	Services	Price	Speciality	Volvo organizations with current contracts (Contact person)	Master contract	Evaluation
Meltwater	Media monitoring Social media monitoring		Monitors 200,000 sources. Focuses on global media articles. Includes all major news media sources. Very few smaller local media sources. Easy to use their software. Many sources in Asia.	Volvo AB (Lars-Erik Göransson) Volvo Lastvagnar (Bo Strömberg) Volvo Penta (Lena Alm)	No. Individual contracts for each business function.	Delivers on time. Well structured reports.
Retriever	Media monitoring		Monitors 100,000 sources. Focuses on Swedish media. Includes many smaller local Swedish media sources. Fewer international sources. Many sources from Scandinavia. Includes translation capabilities.	Volvo Construction Equipment (Lisa Larsson) Volvo Lastvagnar (Per Granberg) Volvo Busses (Sofia Andersson)	Yes.	Setting up new monitoring takes aprox three weeks.

Figure 6 Buyer's view of the IT system

Figure 6 illustrates how the new system looks from the buyer's perspective. The system should be one single system replacing EBD and workflow. It should contain all information the buyers require to evaluate suppliers and services effectively. Notice the "Specialty" column that lists detailed information about the supplier's services. Moreover, the system should be more interactive meaning that it's possible to click on lines of text or pictures and open up a new window that displays relevant data such as order descriptions or price for example.

Figure 7 illustrates how the new system looks from the requestor's point of view. It uses clear visuals to display categories of business intelligence services and make the system user-friendly so that employees, especially new ones, find it easy to use. The first page lists the subcategories, by clicking the category of the data you need you open a new window.

Figure 7 Requester's view of the IT system

The new window, as displayed in Figure 7, shows requestors what services are already available within Volvo Group. The system shows the name of the services and how many licenses are available. With this new system, employees do not need to purchase a new service subscription if its already available. From this window, the requestors can place an order for what service they need and how many licenses.

Supplier	Content	Price	Licenses	Info
Meltwater	Social Media Package Global Content PR report		6 out of 10 left 3	Media Monitoring
E-Space	Date Collection Data Analysis		5 out of 15 left 3	Website Survey
Retriever	Media Insight Context Monitoring		7 out of 20 left 4	Media Portal

Figure 7, main page for the requester of IT system

The fundamental idea is to have all information in one place, therefore, relevant people in Volvo Group have access to the database, making it easy and clear for purchase selection and decision.

Moreover, the system gives the segment leader and all stakeholders a clear overview of all the knowledge and information within the segment.

Lastly, this is a universal problem in Volvo Group; this IT system can be customized and applied in other organizations or segments of purchasing.

The benefits of the recommended new IT system:

There are many alternatives to the suggested new IT system with various design opportunities and ways to go about it. The main concept remains the same, however, which is to alter the current computer system into a more efficient one, capable of storing and spreading information more effectively. The benefits generated by such a new system are many, and as presented in the previous chapter, a new solution has the potential to solve many of the current issues connected to the IT system. The following benefits are obtainable through a new IT system:

Increased purchasing power
When purchasers can more easily analyze and identify the services that are being purchased within the organization, they can consolidate purchases, evaluate supplier propositions, and have a better understanding of what the organizations require. This facilitates better decision making and constitutes for faster and more efficient purchasing.

More efficient use of current resources
Since the system enables everyone within Volvo Group to search for business intelligence services, people can see what is already available. It mitigates the risk of purchasing overlapping services. Furthermore, it enables users to easier find suppliers capable of delivering the services they need, that already have service contracts with Volvo. It reduces overspending and expedites the procedure when ordering business intelligence for the whole organization.

Reduced learning curve
Seeing as the system combines three systems into one, the process of educating new employees to decrease significantly. The new system should give an easier overview of all current orders and suppliers, which implies reduced time and effort whenever someone accesses the system for any purpose. The system and all tasks interconnected with it become less complex and much easier to navigate. Additionally, any future project interconnected with the business intelligence segment will have shorter lead times and more effortless work due to the more effective and practical design.

Better prepared for the future
A new system will have a positive impact overall. As the new system gathers all data in one place and presents suppliers and orders much more clearly, anyone who attempts to analyse and change the system somehow will have a much easier time doing so. It means that the system and Volvo are well prepared and properly set-up for future changes and improvements, and considering how rapidly new technologies are emerging, the notion of being prepared for future changes is important.

7.2 Newly developed interaction strategy with Meltwater

Since meltwater explained that they had a similar case with Ericsson and that a similar solution could be developed for Volvo, it was decided that this is the best solution. The basic idea is to group users according to the extent of their need for the supplier's service. The cost will differ due to the intensity of the supplier service. Therefore, the cost of Volvo will be reduced. In the meantime, Volvo can keep the solution flexible for the future expansion of unforeseen needs.

The problem is complex and interconnected due to the intangible and complicated nature of the product, especially considering the complexity and size of the Volvo

Group. Because Meltwater had experience from a similar situation with Ericsson, it became very convenient to request the same solution simply. Allegedly, Meltwater worked for several years with the solution for Ericsson indicating how extensive and complex improvement efforts of this character can be in large companies.

There are plenty of business development opportunities and much room for improvements within the business segment. The conversation with Meltwater ended with them asking to be informed of Volvo's direction in the next six months to one year so they can relocate their resources and prepare better, in the sense of delivering the right data to the right people within Volvo Group. This implies a willingness from Meltwaters side to have two-way communication which according to Harrington and Voehl (2012) improves productivity together with an opportunity for them to sell additional services and strengthen their relationship to Volvo Group.

The suppliers have a lot of knowledge about the market, the users, and since they are the first-hand service provider, they encountered and understood the company's problems. Very often, Volvo can benefit from inputs from suppliers.

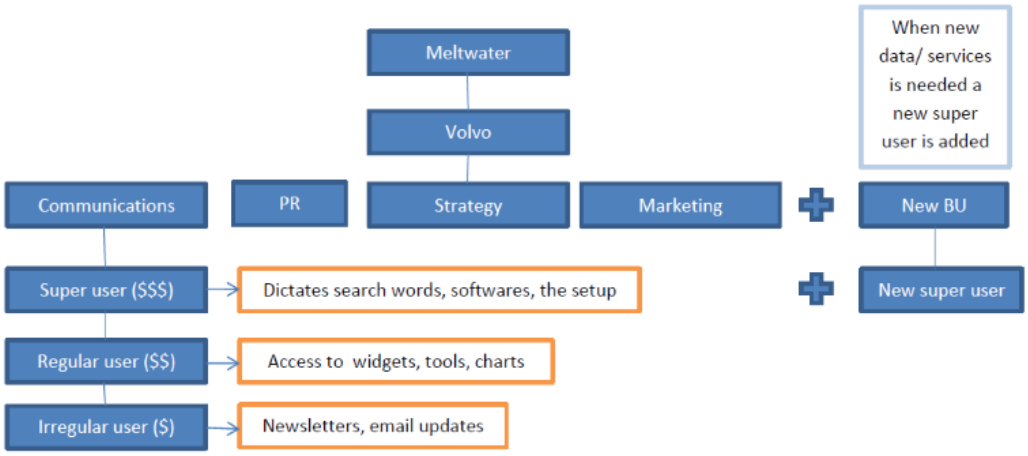

Figure 8. Illustration Figure of Supplier Proposal

7.3 Category Management

O'Brien (2012) summarizes the following five steps: initiating, insight, innovation, implementation, and improve. For Volvo Group to apply category management in the business intelligence segment, there are different objectives along with those steps.

Initiating
Form a cross-functional team who is committed and responsible for the project of reorganizing the process, make sure all the team members understand and have knowledge about the business intelligence category. Set a stakeholder plan. Who else should be involved and informed? Get a clear picture of the business requirements

here, how is Volvo Group using business intelligence data? Identify the current sources, how many suppliers do we have, and plan the project with a scope.

Insight
Gather data about the business intelligence marketplace, what is the trend. Look into the current suppliers, what is the price, how is Volvo's relationship with them, how are the deliverables. In the meantime, develop potential alternatives for the unforeseen risk.

Innovation
Exam all the data from previous insight stage, for the decision making, as which suppliers should stick with and develop a long lasting and closer relationship, and which suppliers to terminate the contracts. Decide on the strategic options based on all the inputs from data.

Implementation
Execute the strategy and make it happen. Identify and agree with the supplier regarding the arrangements and develop a contract with customized terms that align with the strategy. Expect that certain changes need to be managed within the organization on different levels.

Improve
Notice that category management is a circular process. (O'Brien, 2012) It should never be still in the sense that Volvo group should constantly stay innovative with new insights, then implement and improve the process to stay ahead of the game. Search for value, refine and optimize business requirement while communicating and engaging stakeholders. Things change in Volvo Group, or on the supplier side, as a big organization, there is always some problem to discover, and there is always room to improve.

8 References

Amin and Muhammad. (2017): Knowledge management system model for learning organizations, Int. J. Learning and Change, Vol. 9, No. 4, pp.290–305.

Baily et al. (1998): Purchasing Principles & Management, Eighth Edition. London: Financial Times Pitman Publishing

Blaikie (2007): Approaches to social inquiry: Advancing knowledge. Polity.

Bryman and Bell (2011): Business research methods. Oxford University Press.

Buchanan (1992): Vertical trade relationships: the role of dependence and symmetry in attaining organizational goals' Journal of Marketing Research, 29, pp. 65-75

Burton et al. (2006): Organizational Structure: Business Intelligence and Information Management',

Chong et al. (2006): Criteria for measuring KM performance outcomes in organizations", Industrial Management & Data Systems, Vol. 106 Issue: 7, pp.917-936

Dubois and Gadde (2002): Systematic combining: an abductive approach to case research. Journal of business research.

Gelderman (2005): Purchasing strategies in the Kraljic matrix—A power and dependence perspective, Journal of Purchasing and Supply Management, Volume 11, issue 2–3, March-May 2005, Pages 141-155

Gelderman and van Weele (2003): Handling measurement issues and strategic directions in Kraljic's purchasing portfolio model, Journal of Purchasing and Supply Management, Issue 9, pp. 207-216.

Gelderman and van Weele (2005): Purchasing Portfolio Models: A Critique and Update, The Journal of Supply Chain Management: A Global Review of Purchasing and Supply, August 2005, pp. 19-28.

Harrington and Voehl (2012): 'The Organizational Alignment Handbook: A Catalyst for Performance Acceleration,

Jayaram and Curkovic (2018): The right way to procure indirect materials & services: A new IP standard offers a framework to get the most from your indirect spend, Supply Chain Management Review, 22(2), pp. 14–23.

Kim and Shunk (2004): Matching indirect procurement process with different B2B e-procurement systems, Computers in Industry, Volume 53, Issue 2, Pages 153-164

Kraljic, (1983). Purchasing must become supply management – How managers can guard against materials disruptions by formulating a strategy for supply. Harvard Business Review, September-October 1983, pp. 109- 117

Lecompt and Goetz (1982): Problems of Reliability and Validity in Ethnographic Research, Review of Education Research, 52

Marr (2003): Known quantities, Financial Management, pp. 25-27

Mason (1996): Qualitative Researching, London: Sage

Olsen and Ellram (1997): A Portfolio Approach to Supplier Relationships. Industrial Marketing Management, Issue 26, pp. 101–113.

O'Brien (2012): Category management in purchasing: a strategic approach to maximize business profitability, second edition'.

Paiva et al. (2002): Focusing information in manufacturing: a knowledge management perspective, Industrial Management & Data Systems, Vol. 102 No. 7, pp. 381-3899.

Rajala and Tidström (2017): A multilevel perspective on organizational buying behavior in coopetition–an exploratory case study' Journal of Purchasing and Supply Management, Volume 23, Issue 3, Pages 202-210

Robinson et al. (1967): Industrial Buying and Creative Marketing. Boston: Allyn & Bacon.

Van Weele (2010): Purchasing and Supply Chain Management: Analysis, Strategy, Planning, and Practice, Fifth Edition. Hampshire: Cengage Learning

VisionCor (2010): A VisionCor Case Study Knowledge Management: Cisco Systems Service and Support Advocacy, VisionCor, Charlotte, NC

Vittal Anantatmula, Shivraj Kanungo, (2006) "Structuring the underlying relations among the knowledge management outcomes," Journal of Knowledge Management, Vol. 10 Issue: 4, pp.25–42.

Volvo Group accessed 23 May 2019, <http://www.volvogroup.com>