JÖNKÖPING UNIVERSITY
International Business School

Enhancement of in- and outbound logistics flows

A case study at Dagab Inköp & Logistik AB

MASTER
THESIS WITHIN: *Logistics & Supply Chain Management*
NUMBER OF CREDITS: *30*
PROGRAMME OF STUDY: International Logistics & Supply chain Management
AUTHOR: *Abdelrahman Audi & Yonis Raage*
JÖNKÖPING June 2020

Master Thesis in Business Administration

Title: Enhancement of in- and outbound logistics flows

Authors: Abdelrahman Audi and Yonis Raage

Tutor: Imoh Antai

Date: 2020-05-18

Key terms: CPFR, ERP Systems, Demand Management, Lean, Logistical Flows, Logistics & Purchasing

Abstract

Background: In today's competitive and dynamic market, companies are trying to find new ways of changing their warehousing and logistics operations to increase the value for customers. Inbound and outbound logistics flows are key channels within warehouses as these encompass activities such as planning and scheduling which align with the flow of goods between enterprises and external associates, i.e. suppliers and customers. Due to the complexity of the logistics operations, the planning of both flows is dealt with separately. In this thesis the CPFR business model will be reconstructed and combined with lean tools in all four phases to achieve the potential enablers.

Purpose: The overarching purpose is to analyze the potential enablers of implementing a reconstructed CPFR business model with the application of lean principles to enhance inbound and outbound logistics flows.

Method: This thesis has conducted a single embedded case study at Dagab Inköp & Logistik. Empirical data has been collected primarily through semi-structured interviews with employees within the organization and Snabbgross, which is wholesale company within the corporation. Respondents that participated had different positions such as operational purchaser, forecast specialist, transportation engineer, and warehouse manager.

Conclusion: This study has distinguished enablers of lean tools and its impact on organisations. Lean is essential to integrate in the CPFR business model in order to ensure enhancement within in- and outbound logistics flows. It has been highlighted that is of importance to integrate lean tools in all four phases of the CPFR model.

Key terms: CPFR, ERP Systems, Demand Management, Lean, Logistical Flows, Logistics & Purchasing

Acknowledgement

We would like to take this opportunity to acknowledge individuals that have supported us along this period as well as encouraged our research.

First and foremost, we would like to give a special thanks our supervisor Imoh Antai who has given us great constructive feedback and guidance throughout this process. His valuable insights have been of great value and we are deeply grateful of this.

Secondly, we would like to thank our case company Dagab Inköp & Logistik, especially Tobias Petersson who gave us the opportunity to conduct the research within the organization. Furthermore, we would like to extent our gratitude toward our supervisor from the case company Jonah Wadeskog Kockum who has been very supportive.

Lastly, we would like to express our special gratitude to our seminar group, Sedin Mekanic, Muhammad Soban Adil, and Yara Galouk who has provided with useful and well-appreciated input to our thesis.

Jönköping, Maj 2020

Abdelrahman Audi
Yonis Raage

Table of contents

Abstract i

Acknowledgement ii

1. Background 1
1.1 Introduction 1
1.2 Problem description 3
1.3 Purpose and research questions 4
1.4 Delimitation 4
1.4 Disposition of the study 5

2. Literature Review 7
2.1 Previous Literature Research 7
2.2 The logistics flows 10
2.2.1 Inbound logistics 10
2.2.2 Outbound logistics 11
2.2.3 Warehousing and Key performance indicator 12
2.3 Lean Practices 13
2.4 Collaborative Planning, Forecasting, and replenishment 16
2.4.1 Enterprise Resource Planning systems 18
2.5 The importance of purchasing in supply chain management 19
2.5.2 Safety stock 20
2.5.2 Purchasing process 20
2.5.3 Blanket purchase order/Call-off order 21
2.6 Demand management 22
2.6.1 Demand & Supply misalignment 22
2.6.2 Volatility in demand 24
2.6.3 Forecast techniques to reduce errors 25
2.7 Theoretical model 26

3. Methodology 27
3.1 Project timeline 27
3.2 Philosophical Research 27
3.2.1 Ontology 27
3.2.2 Epistemology 28
3.3 Methodology approach 29
3.4 Research approach 30
3.5 Research Strategy 31
3.5.1 Case Study 32
3.5.2 Product flow operations structure 32
3.6 Data collection methods 33
3.6.1 Interview 33
3.6.2 Observations 35
3.6.3 Literature Studies 35
3.7 Data Analysis 36
3.8 Data Quality 37
3.9 Method criticism 39
3.10 Ethical considerations 39

3.11 Summary of methodology 41
4. Empirical findings 42
4.1 Inbound and outbound logistics flows 42
4.2 Integration of Lean tools....43
4.3 Integration of the CPFR Business Model 44
4.4 Procurement....45
4.5 ERP systems....46
4.6 Demand management....46
4.6.1 Forecasting 46
4.6.2 Demand uncertainty 48
4.6.3 Supply and demand misalignment 49
4.7 Warehousing 50
5. Analytical Discussion 51
5.1 Warehousing 51
5.2 Inbound and outbound logistics flows 52
5.3 Integration of lean tools....54
5.4 The integration of Collaborative forecast and replenishment model (CPFR) 55
5.5 The impact of Procurement on warehouse and inbound logistics flow 58
5.6 The potentials of integrating ERP systems....59
5.7 Demand management....61
5.7.1 Forecast 62
5.7.2 Supply and demand misalignment 63
5.8 Conceptual framework 64
6. Conclusion 67
6.1 What are the potential enablers of implementing the CPFR model?....67
6.2 How can lean practices enhance enhance inbound and outbound logistics flows? 68
7. Discussion....69
7.1 Theoretical implications....69
7.2 Limitations....69
7.3 Future Research 70
8. Recommendations....71
8.1 Recommendations 71
References 73
Appendices 82

Figures

Figure 1 Disposition of master thesis 6
Figure 2 Warehouse trade-off 12
Figure 3 The Eight Waste of Lean 14
Figure 4 Collaborative planning, forecasting, and replenishment model 17
Figure 5 Purchasing process 21
Figure 6 Supply and demand misalignment 24
Figure 7 Theoretical framework higlighting the relationships 26
Figure 8 Thesis timeline 27
Figure 9 Product flow operations structure at Dagab Inköp & logistik 33
Figure 10 Research ethics 40
Figure 11 Summary of methodology 41
Figure 12 Reconstructed model of CPFR based on theoretical and empirical findings 65
Figure 13 Forecast Description & Graph 82
Figure 14 Article Forecast information 82

Tables

Table 1 Illustration of conducted interviews 33
Table 2 Forecasting approaches between different departments 47
Table 3 Purchasing, forecasting, demand uncertainty, supply & demand misalignment..
..... 89
Table 4 Inbound and outbound logistics, lean application & warehousing 90

1. Background

The background will consist of an introduction regarding the critical importance of warehousing dealing with uncertainty in demand and complexities in today's global/dynamic market. Simultaneously, a general introduction of the focus of this study regarding inbound and outbound logistics, lean, and CPFR. The purpose of this study will be presented along with the research questions, delimitations, and disposition.

1.1 Introduction

In today's competitive and dynamic market, companies are trying to find new ways of changing their warehousing and logistics operations to increase the value for customers. Due to the storage of large stock-keeping units (SKU), assortment, and volatility in demand, organizations are facing complexities in their warehousing operations. The ultimate goal of warehousing is to match product supply with demand. Warehousing plays a critical role as no supply chain will function without appropriate design and management of warehouse locations (De Koster, Johnson & Roy, 2017). Furthermore, warehousing plays a major role in delivering the perfect order. Meaning, on time, in full, damage free, and with the correct paperwork (Richards, 2018, p. 8). Kadarova & Demecko (2016) accentuates that lean is an important tool for the elimination of non-value adding activities. Lean tools such as kaizen and 5S enable managers and co-workers to engage in waste removal initiatives. Furthermore, organizations apply lean management (LM) to reduce inventory levels, less space usage, improve employee morale, and increase profitability.

Inbound and outbound logistics flows are key channels within warehouses as these encompass activities such as planning and scheduling, which follow the flow of goods between enterprises and external associates, i.e. suppliers and customers (Ayantoyinbo, & Gegeleso, 2018). The enhancement of logistics processes has an enormous effect on improving the cost-efficiency of supply chains. Inbound and outbound logistics flows can today represent approximately 60 % of the total costs in some industries. Due to the complexity of the logistics operations, the planning of both flows is dealt with separately. Integrated planning has been mentioned as a key because it can potentiate global efficiency gains that are often translated into cost savings (Marques, Soares, Santos, & Amorim, 2020). The collaborative planning, forecasting, and replenishment model (CPFR) enable integrating planning amongst actors in the supply chain. It aims to increase supply chain visibility and

efficiency through synchronizing multiple actors in the supply chain in joint forecasting and planning. Moreover, the CPFR model is an important business model that has been proven to reduce inventory, cost, and lead times while also increase forecasting accuracy and sales volumes (Singhry & Rahman, 2019). Moreover, CPFR enhances interdepartmental synchronization amongst supply chain partners (Eksoz, Mansouri & Bourlakis, 2014). This model will be reconstructed and combine lean as the enablers highlighted requires short- and long-term changes. Lean will help standardize and actively reduce waste and costs whilst integrating what is highlighted in the conceptual framework.

Customer satisfaction is becoming increasingly vigorous with the uncertainty in demand in terms of forecast errors, changes in the order, and product mix (Angkiriwang, Pujawan & Santosa, 2014). One approach undertaken by organizations to deal with uncertainty on demand is through the application of demand management. Demand management practices focus on integrating demand functions with supply activities. The overreaching goal is to deliver the right product volumes, quality, delivery, and cost (Ross, 2015, p. 247).

A study examining small and medium-sized enterprises (SME's) revealed that purchasing cost corresponds to the highest cost pool amongst the studied enterprises. This clearly shows the importance of operational and strategic managers to overcome the cost associated with purchasing. The purchasing segment is becoming a relatively important part of organizations trying to improve their efficiency and effectiveness in their supply chain (Storhagen, 2014, p. 74). Moreover, delivering the right quantity, cost, and right delivery date are other parameters to remain competitive in today's market. However, these parameters cannot be achievable by a sole organization in the supply chain (Angkiriwang, Pujawan & Santosa, 2014)

The overarching purpose is to analyze the potential factors of implementing a reconstructed CPFR business model with the application of lean to enhance inbound and outbound logistics flows, and to guide future studies within this area. Also, the importance of accurate and uniformed forecasting Panahifar, Byrne, and Heavey (2015) explain that most of the research regarding CPFR focuses on the sole implementation of the framework without the usage of other methods. In this research a single embedded case study will be conducted in order to investigate the purpose of this study at Dagab Inköp & Logistik AB. Qualitative interviews and observations will complement secondary data to gain an in-depth overview

and provide further recommendations to decrease inconsistency and yield supply chain inefficiencies.

1.2 Problem description

Dagab Inköp and Logistics is currently experiencing inconsistency created from order behavior by food chains leading. This has a large impact on inbound and outbound flows as the organization might not have the right quantity to deliver at the right time to its customers. The replenishment team creates campaign order suggestions also abbreviated (KOFF) 5-6 weeks before campaign launches. KOFF is a process performed to Willys, Hemköp, Tempo, and Snabbgross, in which the suggestions can be accepted, revised, or deleted during a shorter period. After the deadline order volumes are locked and cannot be revised, which are then picked up by the procurement team. However, in the case of Snabbgross, the retailer is experiencing high volatility in demand and sales fluctuations from its customers between periods. This results in inaccurate forecasting suggestions created by Dagab's auto-replenishment team with the result of Snabbgross deleting order suggestions and creating new ones to meet the customer demand. This behavior is creating duplication in efforts and uncertainty in purchase to the warehouse.

Moreover, during campaign seasons Dagab's customers create a negative order behavior as they set orders through store support (a department of Dagab) and new web orders (NWO), which impacts Dagab's resources, wastages, costs, and inconsistency in outbound and inbound flows. There is also the risk of stores not receiving their full orders as the quantity in stock needs to be shared, so that it is available in most stores. Some products have up to three months of order time, therefore, it is important for the reduction and/or elimination of these types of behavior as it impacts multiple parts along the supply chain and within the organization.

1.3 Purpose and research questions

The overarching purpose is to analyze the potential enablers of implementing a reconstructed CPFR business model with the application of lean principles to enhance inbound and outbound logistics flows. The factors for reaching a successful implementation of CPFR and lean in goods inflow and outflow are described as enablers in this thesis. Consequently, the intention is to answer the following research questions:

RQ1: What are the potential enablers of implementing the CPFR model?
RQ2: How can lean practices enhance inbound and outbound logistics flows?

1.4 Delimitation

This study will be delimited to examine the potential enablers of CPFR and lean tools and the potential impact it imposes on Dagab inköp and logistics in- and outbound logistics flows. However, the supply chain and an organization's value flows can be an extensive topic that portrays the whole supply chain management from raw material to end consumer and reverse logistics flows. Therefore, the focus lies on understanding the process from procurement to customer to understand supply and demand misalignment.

Furthermore, with Dagab handling the logistics operations for Swedish food retailers such as Willys, Hemköp, Snabbgross, and Tempo. This research will investigate inbound and outbound logistics flows using Coyle, Langley, Novack, and Gibson's (2017) definition of logistics flows. However, the transportation aspect of this definition will not be taken into account when conducting this. In order to achieve the purpose of this research, a reconstructed CPFR model will be applied.

1.4 Disposition of the study

Chapter 1. Introduction

The introduction of the study will start with a general background description of the topic. Following the discussion of the problem, which develops the problem formulation and purpose.

Chapter 2. Literature Review

The literature review chapter will cover theoretical concepts connected to the research purpose and questions as well as previous research. A theoretical framework will illustrate the relationships of the theories to fulfill the research purpose.

Chapter 3. Methodology

In the following chapter an overview of the design of philosophical assumptions will be introduced. It is complemented with the choice of design as well as the method utilized in order to carry out the research. Data quality and ethical considerations will also be presented.

Chapter 4. Empirical findings

Empirical findings that have been obtained at Dagab Inköp & Logistics through interviews and observations will be presented.

Chapter 5. Analytical Discussion

This chapter is comprised of a status analysis of empirical data and theory. A reconstructed CPFR model with the application of lean tools will also be presented to highlight important factors that have an impact on the organization and the supply chain, which ultimately impact in- and outbound flows.

Chapter 6. Conclusion

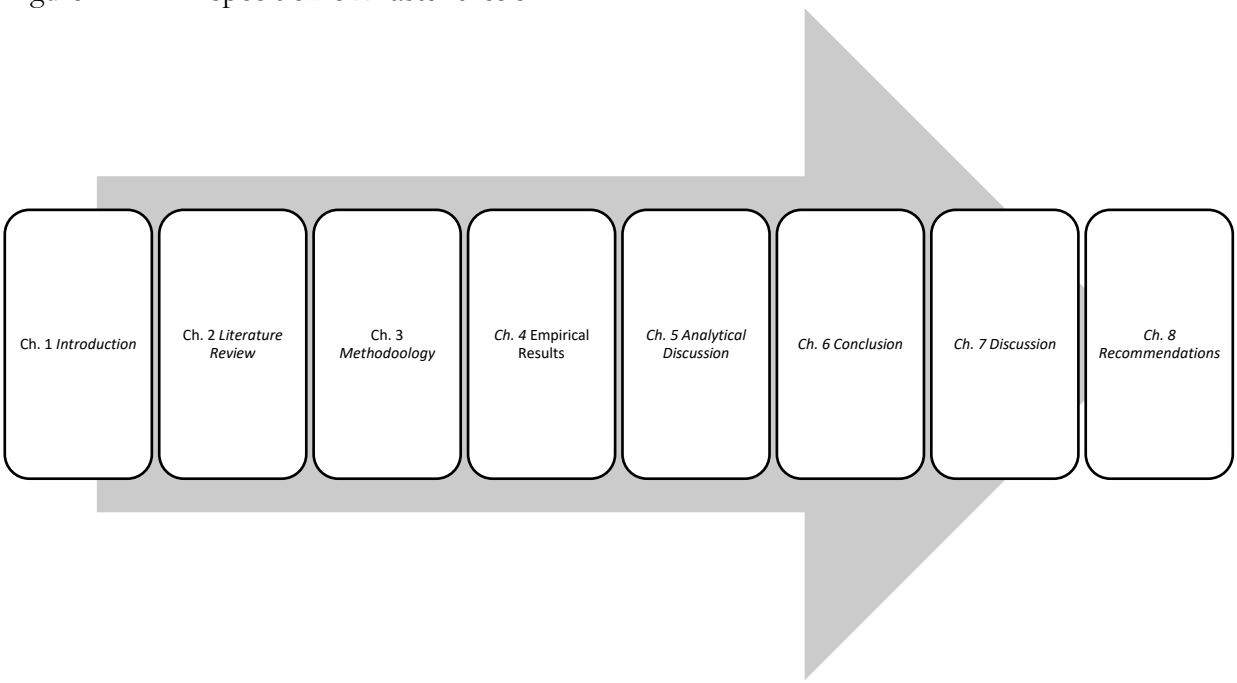
the answers to the research problem will be concluded. The final aim is to achieve the fulfillment of the purpose of this study.

Chapter 7. Discussion – In the seventh chapter of this thesis theoretical implications, limitations, as well as future research, will be highlighted and discussed.

Chapter 8. Recommendations - In the final chapter the authors will employ the findings, conclusion, and the indicated theoretical material into the reconstructed model, which will lie the foundation of the recommendations.

A holistic view of the study disposition is illustrated as per below:

Figure 1 Disposition of master thesis



Source: Self-drawn (2020)

2. Literature Review

In this chapter, core theoretical concepts connected to the study will be presented in order to give the reader knowledge and further understanding of the topic. Moreover, this chapter will act as a node for the development of a theoretical framework. It covers concepts such as Logistics flows, Lean practices, CPFR, ERP, Purchasing, and Demand Management.

2.1 Previous Literature Research

Outbound logistics has played a huge emphasis on the customer relationship management process in terms of last-mile delivery. The planning mechanism of outbound logistics can be seen in the food retail industry by setting reliable delivery standards for suppliers. Furthermore, companies that do not fulfill the right delivery terms to their suppliers can have severe outcomes such as financial penalties and elimination of firms' products at the retail store level. However, previous research has not elaborated on outbound logistics' impact on a firm's performance and profitability (Liberatore & Miller, 2016).

Neubert and Bartoli (2009) discuss in their paper regarding the make or buy dilemma in the automotive industry that inbound logistics is considered a neglected topic in supply chain management (SCM) research. Actors within manufacturing, retail, purchasing, and marketing department in the supply chain's core focus are the consumer's needs leading to a more advanced focus on outbound logistics. Meaning, less or sparse focus in the inbound logistics flows. With the implementation of advanced logistical methods such as Just-in-time, purchasing managers are putting a huge emphasis on balancing the trade-off between lowering inventory and manufacturing cost inbound logistics cost in terms of transportation. Furthermore, Svensson (2002) measured inbound and outbound logistics by developing a vulnerability matrix. This in order to examine vulnerabilities that are occurring in firms' supply chain management with the core focus being inbound and outbound logistics flows.

Faber, de Koster, and Smidts (2013) mentions that warehousing plays a critical role in today's global and dynamic environment. De Koster, Le-Duc, and Roodbergen (2007) highlights a study from 2003 developed to examine the costs aspect of warehousing. The study indicates that approximately 20 percent of the respondents' costs are allocated from warehousing. This shows that warehousing is a critical element in logistics systems. Furthermore, Gunasekaran, Marri & Menci, (1999) research within warehousing focuses on many different aspects such

as receiving, picking, packing, shipping, and storage. However, less attention has been emphasized on improvements in warehousing operations using real-life case studies

To minimize cost and non-value adding activities in the warehouse and other parts along the supply chain lean has been adopted by a variety of sectors, where the aim is to improve their positioning and competitive advantage (Bukhari, Asim & Manzoor, 2020; Jose, Martinez-Jurado, Moyano-Fuentes, 2013). Previous research emphasizes the impact of lean production as well as its impact on performance. Furthermore, the researcher highlights a positive connection between lean tools and business performance. Other findings in lean research indicate that warehousing and transportation are one of the few areas where waste reduction techniques have been successfully implemented. Most of the previous research discusses lean principles in the manufacturing industry. However, current research highlights that service industries are applying principles to reduce waste and improve their operational efficiency (Abushaikha, Salhieh, and Towers, 2018). The implementation of LM practices leads to improvements in areas such as total cycle time, customer service improvements, and higher profitability. However, there is a lack of empirical data supporting that LM implementation leading to profitability (Camacho-Miñano et al., 2013).

One approach to creating an efficient information flow between actors in the supply chain is the CPFR model. Whilst the implementation among supply chains has been limited, the researcher suggests that implementation of CPFR creates significant value in the supply chain (Panahilfar, Byrne, Heavey, Fazlollahtabat, 2015). Fliedner (2003) mentioned that even though collaborative planning, forecast, and replenishment (CPFR) is applicable in any industry, its application until this day has largely focused on food, apparel, and general merchandise industry. Furthermore, previous empirical studies on information sharing benefits point out 50 % reduction in inventory levels, 40 % reduction in inventory cost, and approximately 40 % in supply chain cost (Ali, Babai. Boylan & Syntetos, 2017). According to Fu, Chu, Lin, and Chen (2010) there is currently a lack of empirical evidence supporting successful enablers for CPFR implementation. Potential enablers mentioned in previous research focused on the retail sector with the application of Fuzzy AHP. This study reveals that enablers include collaboration, cross-departmental communication, change management, system complexity, trust and communication, and electronic data interchange (EDI). Also, a study in the healthcare sector highlighted technology as an important enabler for successful CPFR implementation (Panahifar et al., 2015).

Enterprise resource planning (ERP) is also a topic of importance, which allows organizations to integrate their business functions to facilitate information sharing across actors in the enterprise in real-time. Previous literature comprises various areas of consideration when implementing an ERP system. For instance, the uncertainty of managing ERP systems, ERP requirements, critical success factors & pre-implementation issues (Ali & Miller, 2017). However, previous research emphasized the challenges that arise from ERP technology implementation. Research indicates the selection process as an important fundamental for ERP implementation. Areas for consideration include functionality, technology, and expertise, flexibility and application scalability, cost, implementation, and usage (Ranjan, Jha & Pal, 2016).

Rexhausen, Pibernik, and Kaiser (2012) accentuates that previous research highlights a lack of empirical evidence on demand management practices impact on supply chain performance. Also, previous research mentions scarcity in demand management's impact on distributional performance. However, there have emerged theoretical contributions in the area of demand management. For instance, research has proved an existing connection between accurate forecast and inventory levels, replenishment cost, and service levels. Research within the field of volatility has also been mentioned in SCM literature. Sabbath (1995) mentions an integrated supply chain management positive impact on volatility in consumer demand. Furthermore, demand volatility also occurs in van der Laan, van Dalen, Rohrmoser, and Simpson's (2016) study in the humanitarian logistics context. This is a market that is highly acknowledged by its quick emergency relief planning. Many researchers have raised their concern on-demand volatilities' impact on supply chain performance. Abolghasemi, Gerlach, and Tarr (2019) used real-time demand cases to examine the optimality of using forecasting models. Some of the topics the term previous research highlights are process improvements (Reiner & Frichtinger, 2009), stock and overproduction control (Hofmann & Rutschmann, 2018), and the terms ability to reduce the bullwhip effect (Jaipuria & Mahapatra, 2014).

2.2 The logistics flows

Inbound and outbound logistics flow has encompassed planning and scheduling activities with regard to the flow of goods between a business and external associate, i.e. suppliers and customers. These are two separate processes within an organization as inbound flows can be defined as activities such as transportation, storing, and delivering of goods to a business warehouse. Coyle, et al., (2017, p. 13) accentuates that inbound and outbound logistics are described as primary nodes of the value chain as they can help enhance value creation for customers as well as make the firm financially viable by increasing sales and improving cash flow.

Ayantoyinbo and Gegeleso (2018, p. 70) correspond that these flows are set to help an organization maximize the reliability and efficiency of distribution networks as well as minimize transport and storage costs. It is essential for a firm to understand the differences and correlation between these logistics flows as it can provide insights to develop comprehensive supply chain management strategies. Processes, planning, implementation, and controlling procedures are all included within logistics and its flows with regard to efficient and effective transportation as well as storage of goods. There are key goals of these flows and are of importance to continuously work toward. These objectives are increased efficiency, increased sales, better relationships, and improved customer service.

2.2.1 Inbound logistics

According to Ayantoyinbo et al., (2018, p. 70) and Porter (2008, p. 39), inbound logistics can be described as activities associated with transportation, storing, disseminating inputs to the product such as material handling, warehousing, inventory control, vehicle scheduling, returns to suppliers, and also the delivery of goods into the location of a business. Hakim, Zaqiah, and Zagloel (2018) state that the main goal is to reduce the total cost within inbound logistics by having the right materials at the right place, and the right time. Research has suggested that businesses should pay more attention to the management of inbound logistics as it is one of the most crucial fields to improve within a supply chain. As this part is seen as the starting point of the supply process, it will have a greater effect on all the following processes. Carter and Ferrin (1996) mention that it is important to control inbound logistics to avoid high transportation costs. Organizations have controlled inbound logistics in different ways to reduce these costs, i.e. tight transportation schedules. Furthermore, in terms of cost, the inbound logistics aspect of the process in the flow value comprises material,

delivery, administration, and inventory costs. The efficiency of delivery planning has a great impact on all logistics costs as well as performance. Inefficient planning can lead to increased costs in transportation, a high inventory of excess stock, and low container utilization (Hakim et al., 2018, p. 2). Van Niekerk and Bean (2019) have added to the above that logistics functions can be translated as a key facilitator in a cross-functional effort for supply chain integration to meet future customer needs, which is also seen to be of strategic importance. With the flows of the supply chain, a business' goal is to ensure that costs are managed in relation to creating value moving forward. Also, this supports the view that is common in the logistics field [.. *customer service involves getting the right product, to the right customer at the right place, in the right condition, at the right time at the lowest possible cost*] (Van Niekerk et al., 2019, p. 117).

2.2.2 Outbound logistics

The outbound logistics flow refers to the transportation of goods out of the business to external associates. It is set to help businesses within a supply chain to maximize the reliability and efficiency of a distribution network and further reduce and/or minimize transportation as well as storage costs (Ayantoyinbo et al., 2018, p. 70). The main function of outbound logistics is essential to deliver products to customers (Rajahonka & Bask, 2016, p. 710). Furthermore, Porter (2008, p. 39) mentions that multiple activities are associated with outbound logistics, i.e. collecting, storing, and physically distributing the products to buyers such as finished goods warehousing, material handling, delivery vehicle operation, order processing, and scheduling. Also, outbound logistics is a critical factor for a distributor and can create additional advantages. Furthermore, finding solutions to enhance the outbound logistics flow can help reduce cost and waste. Moreover, logistics is the single function of a firm that interacts with upstream and downstream actors within the supply chain. Outbound logistics is therefore an essential flow to the chain which can create great value if an organization continuously improves what is increasing cost and waste (Abushaikha et al., 2018, p. 577).

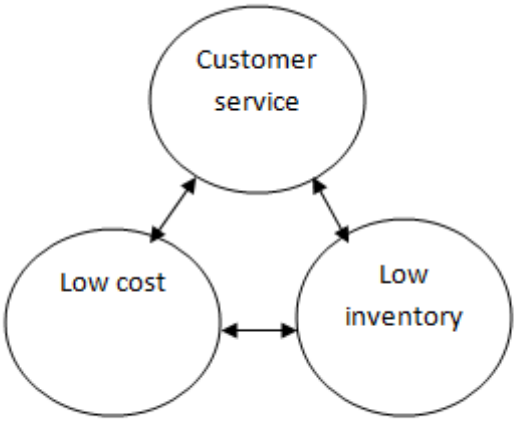
2.2.3 Warehousing and Key performance indicator

Previous approaches to the role of warehouse referred to as cost centers. However, this viewpoint on warehousing is changing and today it is considered a competitive differentiation area. The main reason is that supply chains are shifting from linear towards multi-node supply chains because of high volatility in demand and market signals (Richards, 2018, p. 7). Heragu, Du, Mantel, and Schuur (2005) claims that warehousing can be explained as a storage facility that operates under a two-task-service. Firstly, warehousing provides temporary storage and protection of goods inflow and outflow. Secondly, warehousing provides value-added services such as the fulfillment of individual customer orders, packaging of goods, and so on.

Today, managers are constantly trying to improve their warehousing operations, and managing the warehouse trade-off is a fundamental principle. *Figure 2* describes the trade-off between lowering inventory and cost whilst achieving high customer service. Besides, other trade-offs to manage are whether to increase pick rates or accuracy. Warehousing and supply chain management are operations constantly pressured to reduce costs whilst improving service levels. Moreover, other challenges that warehousing managers are facing is on how to deal with fluctuations in demand, shorter lead time and stock availability, and achieving the perfect order. The perfect order is an order that is delivered on time, in full, in perfect condition, with the correct paperwork, which is further measured with key performance indicators (KPI) (Richards, 2018, p. 54-55). Moreover, shorter lead times and stock availability is one area of competitive advantage. Order lead time refers to the time from order placed until the same order is received by consumers. If popular products are on stockout, the same customer will eventually purchase the products from the competitors. Therefore, maintaining stock availability is essential and the quality of the product is of great importance.

Warehouses that can adapt quickly by having reduced order lead time whilst having the same quality and cost is essential to stay competitive (Richards, 2018, p. 56). Seasonality is the main factor causing fluctuation in demand and its impact on sales volume varies in different markets. This is adding a huge emphasis on warehousing operations to remain flexible in their operations in order to manage heavy and low workload (Richards, 2018, p. 57). There are different approaches to overcoming challenges in warehousing activities.

Figure 2 Warehouse trade-off



Source: Richards (2018, p. 54)

In industries key performance indicators (KPI) are implemented to sustain and increase competitive advantage. With the main objective to carry out warehousing activities in order to create customer satisfaction. Key performance indicators are developed to achieve the organization's core capabilities, which require critical success factors (Chen, Huang, Yu, & Hung, 2017). Richards (2018, p. 366) describes four measurement areas within warehousing. These are reliability, flexibility, cost, and asset utilization. (1) Reliability refers to an order that is delivered on-time and includes order fill rates and accuracy. (2) Flexibility is the most preferred performance measurement tool, which is the order cycle time for measuring flexibility. Flexibility measures stock availability, order handling and order lead time. (3) Cost measures the productivity against labor hours. Another area of measurement is cost as a percentage of sales. (4) Asset utilization is the last measurement area which refers to the measurement that describes the usage of facility warehouse space, workers, and warehouse equipment.

2.3 Lean Practices

The term lean has its roots from lean production which strives to enhance the production system according to the customers and market needs. It aims to create a continuous flow of goods and the elimination of waste in a firm's operations (Phogat, 2013). Lean manufacturing has emerged of two different reasons according to research and these are, advanced production methods and more demanding customers (Meng, 2018).

Toyota has identified eight different non-value adding activities (Muda) within manufacturing and business processes that lean management seeks to eliminate. (1) Transport, which occurs when there is unnecessary movement of goods, people, and/or empty running forklifts. (2) Inventory is another waste in lean and occurs when storing parts and pieces and/or storage of obsolete items. (3) The motion refers to unnecessary activities performed by operators, assemblers, warehousing staff such as walking, searching, and reaching for components is considered a non-value adding activity. (4) Waiting is the fourth type of waste and refers to bottlenecks that slow down operations or waste time waiting for the next step in the process. (5) Overproduction is described as having high levels of inventory and considered as waste leading to higher warehousing costs. (6) Over-processing refers to unnecessary activities such as re-labeling and checking of articles, and goods. (7) Defects as waste are referred to the amount of time staff spent on correcting non-value adding activities such as missed picks. (8) non-utilized talent is the last type of waste which means that without a legitimate engagement between employers and employees, there is a risk for unutilized talent in terms of knowledge and skills possessed by employees. This is often created when there are unused knowledge and creativity amongst employees (Richards, 2018, p. 63; Liker, 2011, 51). An illustration of the eight wastes are presented in *figure 3* below:

Figure 3 The Eight Waste of Lean

Source: Haldan Consulting (2020)

With companies seeking new ways to increase their competitive advantage and from a global perspective, warehousing is becoming a critical demand facilitator. Therefore, with the application of lean strategy there will be a focus on minimizing waste leading to a reduction in warehousing cost and improved service levels. Lean includes the coordination and control of all essential activities and the elimination of non-value adding activities. For many years' companies have searched for tools and mechanisms to improve their warehousing operations. However, the activities carried out in warehousing can be described as a source of waste due to the intense operational activities carried out (Bonilla-Ramirez, Palacios. Flores & Palomino, 2019). Lean warehousing requires continuous improvements in operations and activities requiring the full support of staff. The main reason for implementing lean in warehousing is to increase the responsiveness to the market and minimizing the total cost of distribution operations (Anđelković, Radosavljević, & Panic, 2017).

Also, the most widely adopted lean tool is the 5S method. It is considered a necessary tool for industrial companies to make continuous improvements, creating a well-organized and quality workplace (Filip & Marascu-klein, 2015). Furthermore, the main objective is to eliminate waste, defects, and injuries associated with the workplace. The 5S methodology is built upon the following principles as per below:

- *Sort (Seiri) - Use the necessary tool to mark rarely used articles.*
- *Set in order (Seiton) Organize articles and store them in a logical order in the warehouse.*
- *Shine (Seiso)- Have a well-established and maintained cleaning in the warehouse.*
- *Standardize (Seiketsu)- Create rules in order to maintain the first 3:S.*
- *Sustain (Shitsuke)- Managers should continuously review if these rules are followed in order to make it a standardized process* (Liker, 2011, p. 187; Richards, 2018, p. 68).

Furthermore, lean management (LM) is also a tool that has been adopted by different companies to enhance their results and competitiveness. Its impact on results is a complex phenomenon and cannot be simplified into two variables such as sustainable results and non-sustainable results. Several factors can have an impact on results when implementing LM, i.e. the human and cultural factors (Martinéz-Jurado & Moyano-Fuentos, 2014, p. 143). Six Sigma is a quality improvement methodology to reduce variation in product quality such as process mapping and root cause analysis, which is, developed from the concept Kaizen

(Continuous improvement). LM and Six Sigma are often combined and referred to as Lean Six Sigma (LSS). The essential goal with LM and Six Sigma is to continuously cut costs, improve quality in processes, and essentially reduce and/or eliminate waste (Stanton, Gough, Ballardie, Bartram, Bamber, & Sohal, 2014, p. 2926-2927).

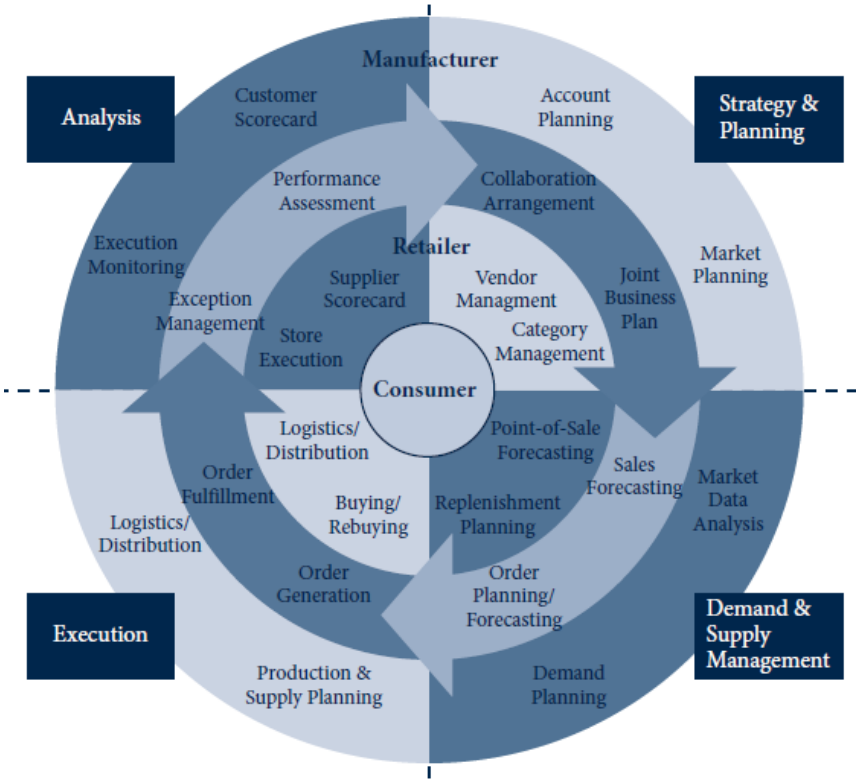
2.4 Collaborative Planning, Forecasting, and replenishment

The overarching goal for an organization is to continuously improve the overall operational performance. The solution to achieve such goals is for supply chains and trading partners to find ways to deliver products or services to customers at a minimal cost and at the required time. Thus, effective SCM requires coordination and collaboration among involved interests such as retailers, suppliers, manufacturers, and other members (Panahifar et al., 2015, p. 1090). Furthermore, Coyle et al., (2017, p. 224) correspond as well as accentuates that there have been many initiatives from different industries in an attempt to create efficiency and effectiveness by integrating supply chain activities and processes. Panahifar et al., (2015, p. 1090) and Coyle et al., (2017, p. 224) have highlighted the identification of new working methods such as quick response (QR), vendor managed inventory (VMI), continuous replenishment planning (CRP), and efficient consumer response (ECR). As these methods have been initiatives to further strengthen the supply chain, they have been somewhat deficient.

This har further led to new initiatives, and in 1998 collaborative planning, forecasting, and replenishment (CPFR) was developed in order to achieve total supply chain integration. It was developed from collaborative forecasting and replenishment (CFAR) in a practical setting that enabled retailers and manufacturers to jointly forecast demand, schedule production, and interchange of relevant information (Poler, Hernandez, Mula & Lario, 2008, p. 515; Hollmann, Scavarda & Thomé, 2015, p. 972). CPFR has been acknowledged as a breakthrough business model regarding planning, forecasting, and replenishment. It helps combines the intelligence of different partners in the supply chain and utilize the technologies available to collaborate on operational planning through execution. This will help fulfill customer demand more efficiently as this approach is recognized as being the most powerful collaboration technique (Coyle et al., 2017, p. 224; Panahifar et al., 2015, p. 1090). CPFR was attempted by Walmart and demonstrated significant results and improvements as they intended to increase forecast accuracy: to have the right amount of inventory when it was needed and where it was needed. There are four processes within the CPFR model, (1)

Strategy & Planning, (2) demand & supply management, (3) execution, and (4) analysis. In addition, two aspects should be considered if integrating CPFR. Firstly, the cooperation and exchange of data among business partners, and secondly, a continuous, closed-loop process, which uses feedback analysis as input to strategize and plan. Consequently, this model emphasizes forecasts and sharing of consumer purchasing data or point-of-sale data at a retail level among and between the partners involved in the supply chain with the overarching purpose of enhancing and managing supply chain activities (Coyle et al., 2017, p. 225).

Figure 4 Collaborative planning, forecasting, and replenishment model



Source: Coyle et al., (2017, p. 225)

Panahifar et al., (2015, p. 1093-1094) mention various enablers for the implementation of a successful CPFR business model integration such as senior management support and commitment that are essential factors for the implementation of the CPFR business model. Secondly, having the ability to manage technological change in an organization is an important enabler for the CPFR implementation. Furthermore, internal alignment refers to the firm's ability to engage in cross-departmental collaboration and is seen as a critical factor when integrating the model. The activities include sharing ideas, knowledge, and resources.

Moreover, Wang, Yuan, Archer, and Guan (2005, p. 36) accentuate trust being of importance along the supply chain and within the organization because of the high degree of cooperation among actors and the extensive changes that are required. The essence lies in business partners to collaborate and guide planning as well as forecasting processes amongst each other. Furthermore, Fu et al., (2010) point out technology infrastructure as an important facilitator for ERP implementation. In addition, variables such as the establishment of a communication channel amongst business partners are key to achieve efficient changes with as little losses as possible when engaging in collaboration.

2.4.1 Enterprise Resource Planning systems

The adoption of integrating management systems has become more of a necessity in the last few decades. The interest has grown due to the promise of great outcomes in all sized businesses. According to different studies, big sized companies with high revenues have implemented ERP systems. The reason being is to their capacity to respond better to the need for change in their business environment. ERP system aimed to integrate multiple application software to be used in a single management process transformation machine (Abdel-Haq, Chatti & Asfoura, 2018, p. 3631). ERP systems should also not be visualized as only an information system (IS), but rather as an integrated business system integrating all functions. This can be defined as a [.. *A software package that combines both business processes and information technology (IT) features*] (Maditinos, Chatzoudes & Tsairidis, 2011, p. 61). Multiple potential benefits have been identified and highlighted regarding the implementation of ERP Systems as per below:

- *Unified enterprise business view that coordinates all functions and departments.*
- *Enhanced efficiency in the supply chain by integrating and synchronizes all activities.*
- *The reduction of operations cost (lower inventory, control cost, lower production costs, lower marketing costs, and costs required to maintain previously segregated legacy systems which provide incompatible data.*
- *Design integrated information systems that allow the elimination of multiple sources of data.*
- *Facilitate information and communication flow among the supply chain to help meet the customers' and employee's needs.*
- *Rapid access to information regarding decision making as well as managerial control.*
- *Strategic planning* (Al-Mashari, Al-Mudimigh & Zairi, 2003, p. 353; Umble, Haft & Umble, 2003, p. 241; Amoako-Gyampah, 2007, p. 1233).

There are three challenges of integrating such systems and these are technical, human, and organizational. There are four determinants of success regarding ERP adoption, and these are information systems with factors related to the role of users, the availability of resources and skills. Secondly, it is software packages, which refers to management commitment, implementation process. Thirdly, the implementation project, referring to communication, recruitment of skilled staff, customer consultation, and so on. Lastly, the actual implementation, to follow through and encouraging change within the business environment and using the right resources and skills in the projects (Abdel-Haq et al., 2018, p. 3631-3632).

2.5 The importance of purchasing in supply chain management

Purchasing is an activity that is receiving more attention in supply chains and logistics and organizations are constantly searching ways to add more value to their logistics operations (Coyle et al., 2017, p. 140-141). Purchasing is an activity that occurs between companies and their suppliers. Moreover, it is referred to as the first activity in the material and product flow and can have a serious effect on organizational performance. Meaning, poorly executed purchasing decisions have negative consequences on organizational performance. Therefore, activities related to purchasing and its impact on organizations needs to be considered when handling purchasing decisions. (Storhagen, 2014, p. 74). Jonsson and Mattsson (2005, p. 49) explains that purchasing is an essential activity for the continuous supply of goods when needed. The purchasing term can be narrowed down to operative and strategic purchasing. Strategic purchasing refers to the establishment of long-term relationships with suppliers on delivery terms. The main objective is to come to an agreement that benefits both parties and to facilitate the information on supply needs. Purchasing creates enormous advantages in the supply chain. For instance, with the ability to plan and execute purchasing decision in an optimal matter can increase value and savings.

Suppliers have a great impact on the final goods sold by producers and early involvement in the design and development of products can help increase value for the end customer. Secondly, purchasing builds relationships and drives innovation with continuous collaborations on lowering costs associated with products and services. The traditional approach of price bargain to lower cost is shifting towards a strategic partnership with suppliers to thrive innovation in the supply chain. It is of the great importance of buyers and sellers to lay acceptable paybacks on investment that gives both actors advantages of the relationship (Monczka, Handfield, Giunipero & Patterson, 2015, p. 8). Thirdly, purchasing

reduces time to market by involving suppliers in the early development of the **product** compared to companies with no supplier involvement. Fourthly, importance in purchasing lies in the supply risk mitigation caused by placing purchase orders with a supplier. Supply threats occur in different forms ranging from natural disasters to financial instability and transportation delays. However, supply managers aim to continuously monitor and mitigate supply threats by developing strategies. Lastly, purchasing generates an economic impact and a critical factor in gaining a competitive advantage. (Monczka et al., 2015, p. 10-11).

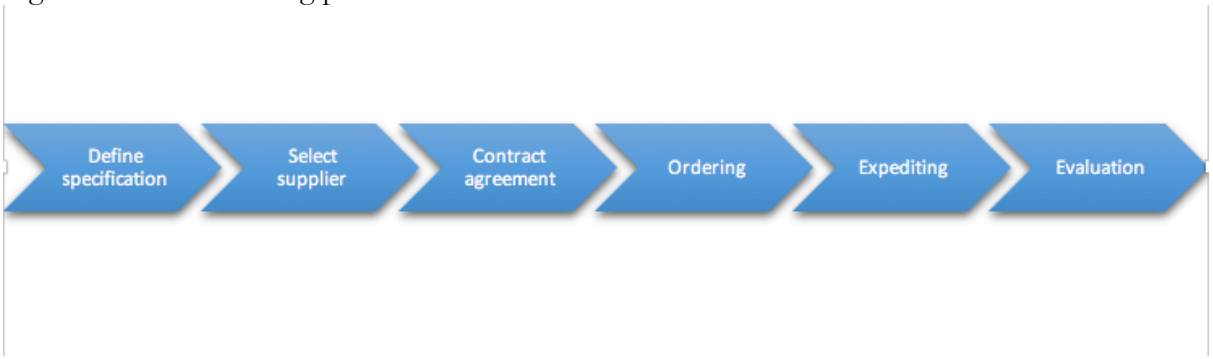
2.5.2 Safety stock

Supply chain design and planning is becoming increasingly complex in today's volatile economy. This complexity amongst enterprises comprises demand uncertainty and placement of safety stock in the warehouse (Puga, Minner & Tancrez, 2019). Safety stock, also referred to as buffer stock is a technique to deal with disruptions in the supply chain. Companies can set a certain level on their safety stock based on assessments on supplier's delivery reliability, the risk associated with stockout, and transportation mode (Storhagen, 2014, p. 88). Jonsson and Mattsson (2005, p. 356) explain that uncertainty is primarily made up of quantity and time uncertainty. Quantity uncertainty refers to uncertainty in the volume of products, product families, and assortments to be acquired in each period. Time uncertainty refers to the supplier's extent to manufacture and deliver the required quantities needed at the right time.

2.5.2 Purchasing process

The purchasing process helps managers coordinate and plan operations necessary to fulfill purchasing in the organization. Van Weele (2009, p. 29) mentions a model for the purchasing process illustrated in *figure 5*. The steps involved are: Define specification, select supplier, contract agreement, ordering, expediting, and evaluation.

Figure 5 Purchasing process



Source: Van Weele, (2009, p. 29)

(1) The Definition of the specification is the first step of the process and specifies a need either in a product or a service. (2) The selection of suppliers refers to the selection of suppliers that can fulfill the needs of an organization on agreed delivery terms (Jonsson & Mattson, 2005). (3) Contract agreement refers to the step of establishing a contract between supplier and buyer. (4) Ordering- refers to the process of placing of the purchase order at a supplier and is considered an administrative activity. (5) Expediting is the fifth step which refers to establishing expediting routines and invoices. (6) Evaluation is the last step of the process and includes following up on the supplier's performance (van Weele, 2009, p. 29)

Moreover, standard purchase processes are common for most organizations engaging in small or large purchasing activities through purchase orders. However, a distinction is made between frequently and less-frequently bought items. Less frequent items are bought when a need occurs meanwhile frequent items are purchased more repetitively and stocked in warehouses (Parikh & Joshi, 2005, p. 10046).

2.5.3 Blanket purchase order/Call-off order

Monczka et al., 2015, p. 68) mentions blanket purchase orders as repetitively purchased sole and family items by suppliers. The length of this contract covers a period of one year and simplifies the purchasing process. By doing so, suppliers order items, that only require an order released by the seller. Terms regarding the purchasing contract are already agreed upon when establishing a blanket purchase order. Therefore, the supply of material from the supplier to the buyer becomes a routine process in the supply chain. In recent years, firms have favored blanket purchase orders when ordering a large supply of goods simplifying the purchasing process. A blanket order includes the same elements as a purchasing order, including quantity and quantity discount, required quality levels, delivery lead times, and

other important details that are of the essence. However, the main difference is the delivery date and the receiving department remains open in blanket purchase orders (Monczka et al., 2015, p. 68). Furthermore, there are cost advantages generated by applying blanket purchase. For instance, this saves repetition, time, and cost caused by issuing a purchase order for every purchase. Moreover, items that are typical of use on blanket purchase orders are items such as low dollar value items, high-volume items, repetitive purchase items, repair, and operating items (Pooler H & Pooler J., 2012, p. 41-44).

2.6 Demand management

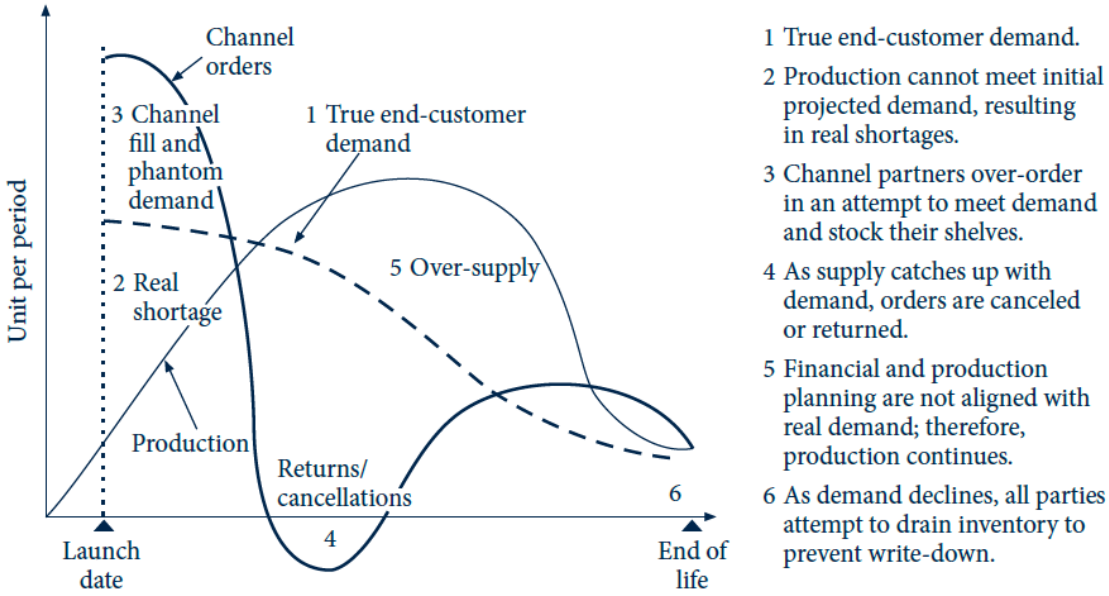
The outbound-to-customers (OTC) logistics plays a significant role to improve and better serve a firm's customers. OTC is also referred to as the physical distribution of an organization, which include processes, systems, and capabilities that enhance the ability to satisfy customer needs. Demand management is described as [.. *focused efforts to estimate and manage customers' demand, with the intention of using the information to shape operating decisions*] (Coyle et al., 2017, p. 209). Demand management has with time been related to the product flow, with significant concern regarding technology, information exchange, inventory turnover, delivery speed and consistency, and lastly transportation. The main goal of demand management is to help strengthen the ability of firms throughout the supply chain, especially manufacturing through customers, to collaborate on activities that are related to the flow of products, services, information, and capital. The final desire and end-result of this are to help organizations create greater value for the end consumer and satisfy their needs. Effective demand management can further help unify channel members with common goals such as customer satisfaction and problem-solving. This can be done by gathering and analyzing knowledge regarding the consumer, their needs, and problems. Also, identifying partners can enable them to perform the functions needed in the demand chain. Furthermore, information sharing between channel members is essential to meet consumer demand, which will help enhance the flow. The development and execution of optimal logistics, transportation, and distribution methods can further help enhance a firm's profitability (Coyle et al., 2017, p. 209-210).

2.6.1 Demand & Supply misalignment

Demand management has been vital to firms in today's competitive market, and several problems occur when identifying the need for improvements. The failure of coordination

between departments in a firm result in little or no efficient response to demand information. In addition, there are too much emphasis placed on forecasts of demand, and little efforts on improving collaboration, strategic, and operational plans that are of importance in order to develop accurate forecasts. Furthermore, the demand information is used more for tactical and operational reasons rather than strategic ones. Therefore, demand information should instead be used to create both collective and realistic scenarios. More importantly, the emphasis should lie on understanding demand scenarios and mapping their relationships to product supply alternatives (Coyle et al., 2017, p. 210). Another significant demand management problem refers to the inability of a firm to gather as well as analyze accurate demand information. This will further lead to companies such as Dagab Inköp & Logistik storing high levels of inventories to ensure that demand can be met at the right time. This can create challenges and go against principles, i.e. lean and further impact planning activities. This might also impact other aspects of the supply chain such as supplier negotiation and pricing (Cox, Chicksand & Ireland, 2005, p. 7). Lack of efficient demand management will not only affect one part of the supply chain, nor one firm but multiple organizations. Furthermore, *figure 6* illustrates how supply and demand misalignment can impact the overall supply chain effectiveness. Thus, it is of high importance to prioritize demand management to avoid not meeting the actual demand projections. It is important to integrate efficient information flow to avoid over-supplying or real shortage, in which, the demand cannot be met. Following this pattern can lead to unsustainable flows which will increase the cost as well as different forms of waste.

Figure 6 Supply and demand misalignment



Source: Coyle et al., (2017, p. 210)

2.6.2 Volatility in demand

The mentioned aim with demand management is to estimate and manage customer demand given the right circumstances such as the right information to make efficient operating decisions. Theoretically, the goal is to meet supply and demand, having zero stock-outs and zero safety stocks. However, in real life these will likely never balance out Coyle et al., 2017, p. 212-213). Sabath (1995, p. 49-50) points out that while volatility in demand increases, the forecast accuracy decreases. Volatility in demand can create operational and logistical chaos. As demand can be a complex task to predict, it is important to expect the unexpected and plan for uncertainty.

Coyle et al., (2017, p. 212) mention four methods that are used across businesses in different industries, these are, Price and lead time which are described as external balancing methods. Inventory and production flexibility are the other methods and referred to as internal balancing methods. The first two methods are used in an attempt to change the behavior in which customer orders, reason being, to balance the supply-demand gap. Lead time can be both accepted and not by customers, increased lead time can translate to the loss of sale. Therefore, it is of importance to avoid having long lead times if the demand exceeds the current supply. Also, price is essential as if the demand exceeds the supply, then an

organization can set higher prices, though it is essential to understand the market and whether there are alternatives to the products a firm sells. Inventory and production flexibility are used and developed to help organizations manage the internal processes in order to balance the supply-demand gap. With production flexibility an organization can change its production lines from one product to another quickly and efficiently. Inventory is used by most organizations to manage the imbalance between supply and demand. The ultimate reason being is to smooth the effects of both demand and lead time variability. This is also the most expensive method as it requires to add safety stocks in order to avoid not meeting the actual demand (Coyle et al., 2017, p. 212-213).

2.6.3 Forecast techniques to reduce errors

Accurate forecasting is essential in the food industry for different reasons, but the essential reason is to satisfy customer needs with minimal losses (Prusa & Chocholac, 2015, p. 63). Forecasting has become an essential component to help predict the number of articles that will be purchased, when it will be purchased, and where the purchase by customers will take place. Albeit, forecasting tools are essential to the progression of predicting the demand for food, as they will ultimately be wrong. To gain successful forecasting, errors are of importance to minimize the forecast demand and actual demand. Many factors can arise in the global marketplace such as the coronavirus which increased the demand significantly. This in mind will affect forecasted demand as the customer behavior will change with the current scenario. Therefore, it is important to highlight factors that can affect demand. Firstly, two types of demand exist, and these are (1) independent demand, which refers to the demand for primary items and (2) dependent demand is directly influenced by the demand for the independent item. Furthermore, it is important to understand that all demand is subject to certain fluctuations. What can impact a fluctuation is, for instance, random variation, which cannot be anticipated beforehand, and is usually the main cause for organizations to hold safety stocks to avoid not being able to meet the actual demand at the time. The trend can also be another reason for demand fluctuations which can gradually increase or decrease demand over time in an organization. (Coyle et al., 2017, p. 213-214).

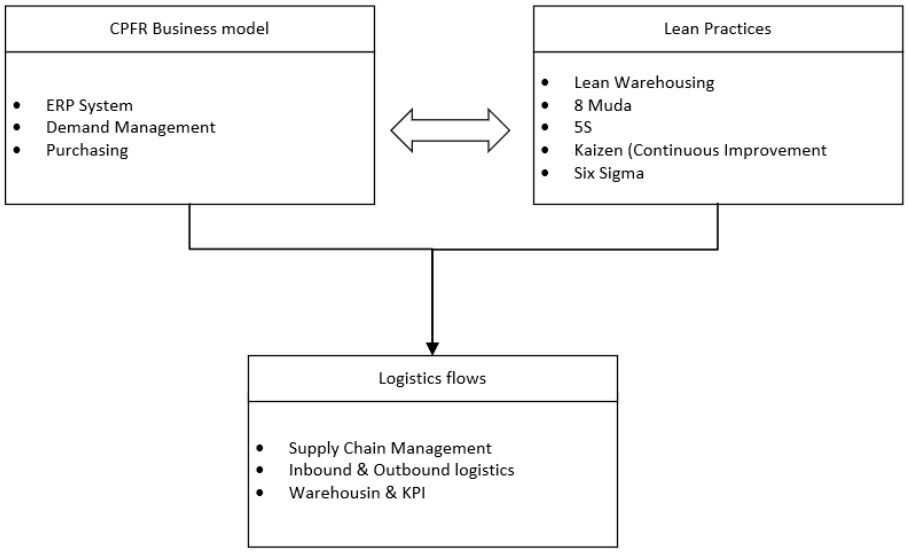
As forecasting will most likely be wrong and not fulfill the actual demand, it will lead to the forecast being higher or lower than the given demand. Therefore, the management of forecast processes requires to minimize errors between actual and forecasted demand. In the literature Coyle et al., (2017, p. 214) highlights four types of forecast errors measures, which

are calculation formulas that will help minimize the forecast error These are Cumulative sum of forecast errors (CFE), mean squared error (MSE), mean absolute deviation (MAD), and absolute percent error (MAPE). Furthermore, van Donselaar, Gaur, van Woensel, Broekmeulen, and Fransoo (2010, p. 766) mentions that another technique to help forecast better demands, automated replenishment systems can be of a key. These systems use heuristics to solve the demand issue, to further improve the levels which will decrease safety stock and meet the demand better. In addition, sharing point-of-sales (POS) data with suppliers could help improve the forecast accuracy to meet the actual demand. Literature suggests that POS data was frequently a better predictor of order quantity, though it does not mean that this is the most optimal tool to analyze forecast data. POS data could provide greater value to suppliers, with which organizations could use to improve the forecast with the help of automated systems. The reason for wanting to use customer-supplied POS data is to drive the demand planning system with independent data. Consequently, the use of demand planning systems driven by POS data is best suited for synchronizing supply chain plans regarding consumer demand (Hartzel & Wood, 2016, p. 173-173; Kiely, 1998, p. 4; Chen & Lee, 2009, p. 781).

2.7 Theoretical model

In this section, a theoretical model illustrating the relationships of theories used to fulfill and answer the research is presented as per below:

Figure 7 A Theoretical Framework Highlighting the Relationships



Source: Self-drawn (2020)

3. Methodology

This section will present how the study of the case company has been conducted and how the authors have gathered the presented data, which is highlighted under the section "empirical data". Furthermore, the authors chosen ontology and epistemology is pointed out. Lastly, the method criticism is going to be presented with reliability and validity in order to show the limitation of this paper.

3.1 Project timeline

This research study covers the timeline from week 4 to 21 and consists of six different parts. To avoid falling behind. Internal deadlines have been of importance to finish the thesis within the set time frame. External deadlines in terms of class seminars have been helpful to set efficient deadlines. The project timeline and its phases can be illustrated in *figure 8,* as per below:

Figure 8 Thesis timeline

Phases/weeks	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Introduction																		
Literature Review																		
Methodology																		
Empirical data																		
Analysis																		
Conclusion																		
Recommendations																		
Final revision & Submission																		

Source: Self-drawn (2020)

3.2 Philosophical Research

There are two research philosophies that establish the assumptions and beliefs for conducting coherent research. These research philosophies that are of importance and highly debated are ontology and epistemology (Easterby-Smith, Thorpe & Jackson, 2015).

3.2.1 Ontology

The philosophical assumptions of the ontological position take form in the nature of reality and existence: how it is perceived externally in relation to social actors or created and shaped. There are generally four different ontological positions which are realism, internal realism, relativism, and nominalism (Easterby-Smith et al., 2015). Willis (2007) accentuates what can

be real and what cannot reflect differently depending on the choice of ontological position. Each viewpoint will lead to different assumptions; therefore, it is essential to understand what the goal of this study is. The fundamental philosophical assumption in this study is the interpretation of the relativist position. The assumptions and beliefs are defined and experienced differently by different individuals. Thus, the relativist position does not accept only one reality to a phenomenon, and that there are many truths that can be discovered along the way. It also assumes that the viewpoint is affected by whom observes as the truth can vary from place to place and from time to time.

As the purpose of this study is to analyze the potential factors of implementing a reconstructed CPFR business model with the application of lean to enhance inbound and outbound logistics flows at Dagab Inköp & Logistik. The relativist perspective has been chosen as the other positions does not align with the purpose of this study, nor pose as a suitable choice regarding the ontological position. There are also many indicators as to why challenges exist within the flows. It is, therefore, essential to gain the viewpoints of multiple experts. The other ontological positions such as realism do not apply in our study because its reality exists in only one single truth or nominalism where reality exists in no truth (Easterby-Smith et al., 2015). the relativist perspective has been chosen as the other positions does not align with the purpose of this study, nor pose as a suitable choice regarding the ontological position.

3.2.2 Epistemology

The philosophy of epistemology encompasses the theory of knowledge which helps understand the nature of the world; how we know it and what we know. It also entails the assumptions of a researcher's [.. *best ways of inquiring into the nature of the world*] (Easterby-Smith et al., p. 47). According to Willis (2007) epistemology is an essential foundation for research in both the natural and social sciences. Epistemology aims to gain new knowledge which is done by asking questions regarding the development and derivation of knowledge. Also, how knowledge is embedded in social reality.

In epistemology two viewpoints are well debated in the literature and are of importance. These are positivism and social constructionism (Easterby-Smith et al., 2015, p. 51). The positivism position advocates for scientific methods when the aim is to study the social reality and the science should be viewed objectively when generating new knowledge (Easterby-

Smith et al., 2015, p. 51; Bryman & Bell, 2017, p. 47-48). Furthermore, social constructionism differs from positivism in the sense that there are multiple aspects of social reality and is determined by people rather than by external factors and objective. Unlike the positivism, the aim is to appreciate different constructions and meanings of people instead of the exploration of external causes as well as the fundamental laws to interpret certain behaviors. As this approach is built upon the social reality and experience of individuals, the interpretation and perception can differ, which is also viewed subjectively (Easterby-Smith et al., 2015, p. 52; Bryman & Bell, 2017).

Considering that a case study has been conducted in this thesis, our main source of information gathering, and knowledge will come from Dagab Inköp & Logistik. There are contrasting implications of positivism and social constructionism. The human aspect is the main driver of science and the aim is to increase the general understanding of the situation. The human aspect of this study was of importance as interviews will lie as the primary source of collecting data. Their experience and viewpoints are essential to the empirical chapter of the thesis. The aim is also to increase the understanding of the situation which corresponds well with what Easterby-Smith et al., (2015) accentuate that it is important to incorporate the perspective of individuals as they are the main drivers of science. Positivism is different as human aspects are irrelevant to the explanations that should demonstrate causality. Social constructionism is the best choice in this thesis as it will help answer the purpose best.

3.3 Methodology approach

When conducting a study, two prominent research strategies are taken into consideration, and these are the quantitative and qualitative research approaches (Bryman & Bell, 2017, p. 58). Qualitative methodology as research focuses on words and observations in order to express reality as well as attempt to describe people in natural situations. It is conducted through excessive and prolonged contact with an "area" or life situation, which are situations that are typically tedious or normal as well as reflective of the everyday life of individuals, organizations, groups, or societies. On the contrary, the quantitative approach has its roots in strong academic tradition with considerable trust in numbers that represent opinions or concepts. Quantitative research is characterized by the hypothesis that human behavior can be explained in what is described as "social facts". The strategy utilizes a deductive logic of the natural sciences in order to investigate a phenomenon (Amaratunga et al., (2002 p. 19;21-22). Some of the common methods within the quantitative approach according to Yin (2013,

p. 274) are surveys, experiments, statistical studies, and quasi-experiments. These can be used in demographic, epidemiological, and economic aspects. In contrast to the qualitative approach which is a softer strategy where data collection is primarily collected through interviews and observations (Yin, 2013, p. 53).

Yin (2013, p. 4) accentuates that a research approach should be chosen as a function of research situation strategies has different approaches to collect and analyze empirical data. Thus, the strategy has its advantages and disadvantages. We believe that the qualitative approach is best suited as we conducted a single embedded study at Dagab, with interviews as a primary source of data collection. The choice of a qualitative strategy is appropriate as the goal is to collect in depth-information from experienced individuals in the company to answer the purpose of the thesis.

3.4 Research approach

Spens and Kovács (2005, p. 375) mention that a research approach can be defined as the path of conscious scientific reasoning. Three research approaches can be used when conducting a study and obtain new knowledge. The three approaches are deductive, inductive, and abductive. Hyde (2000) underlines that both inductive and deductive reasoning may result in the acquisition of new knowledge. Inductive reasoning has its focus on the theory-building process, with its starting point in observations of specific instances with the goal to establish generalizations about the phenomenon which is under investigation. The deductive approach on the other hand, is a theory-testing process, which commences with established theory or generalization, and the goal is to see if the theory applies to specific instances. Spens et al., (2005, p. 375) accentuate that even though the research approaches have a distinct path, they all share the common aim of advancing in knowledge. The third approach of the three is the abductive approach which [.. *stems from the insight that most great advances in science in science neither followed the pattern of a pure deduction nor of pure induction*] (Spens et al., 2005, p. 375). It is best understood as the probational adoption of a hypothesis, which can be thought of as a certain case of modus tollens. Thus, it can be used as a conjecture to explain results or specific instances. Therefore, it will furnish the reasoner with the problematic theory which induction verifies (Riberio, Powell & Baldwin, 1995, p. 184).

With this in mind and in relation to the purpose of the research, the most suitable scientific approach for our research study is the inductive approach regarding the nature of the research study. The reason being that the deductive position is a theory-testing process which means that there are already established theories which the researcher is going to test the hypothesis with. Also, this thesis is taken a qualitative approach that fits well with the inductive position and not the deductive. If a researcher seeks to explore a topic and develop a theoretical explanation, then the inductive reasoning is applicable as the study is data-driven. This type of strategy allows meanings to emerge from data as the goal is to identify patterns and relationships to build theory (Saunders, Lewis & Thornhill, 2012, p. 145). Interviews has been the primary source in this study to help collect data with the intention to build or generate theory. It is important to understand that this approach does not prevent researchers from using existing theory to formulate research questions as well as to identify concepts that are going to be explored. The deductive approach on the other hand, is a theory-testing process that commences with established theory or generalization, and the goal is to see if the theory applies to specific instances (Saunders et al., 2012, p. 49; Hyde, 2000, p. 83).

3.5 Research Strategy

The underlying research strategy of this thesis implies an explanatory and interpretative single embedded case study. Yin (2013, p. 16) accentuates that there is no formula for when to choose the case study approach. Albeit, if questions that seek explanations to some present circumstances, e.g. "how" or "why" a social phenomenon works, then a case study is of relevance. The case study is used in different situations, in which, the goal is to contribute to the knowledge of an individual, group, organizational, social, political, and/or related phenomenon. This research strategy explores topics or phenomenon within its context, or within several real-life contexts. The context within case studies are of high importance, and the boundaries between the phenomenon being studied and the context within are not always apparent. The definition of this approach can be described as an empirical inquiry that *[.. investigates a contemporary phenomenon in depth and within its real-world context, especially when, the boundaries between phenomenon and context may not be clearly evident*]. (Yin, 2014, p. 16; Saunders et al., 2012, p. 180).

In order to answer the developed research questions, an embedded single-case design is a suitable approach as it is described as being effective when the study is about a single

organization with multiple levels of analysis (Yin, 2014, p. 4;54-55, Eisenhardt, 1989, p. 534). The levels of analysis in this thesis are the warehouse, procurement, forecasting, and food chain customer as these are all important areas that impact the flow of products. In order to complete the embedded single-case design, both primary and secondary sources was used to collect data. The primary sources are based on interviews and observations whilst secondary sources are data collected from previous studies (Bell & Waters, 2014, p. 142).

3.5.1 Case Study

The case company of this thesis is Dagab Inköp & Logistik which is a support company for Axfood. Dagab plays an important role in logistics operations by ensuring continuous supply. One of the key responsibilities is to secure continuity and streamline the goods flow from purchase to warehousing, and distribution. Value is created by offering a large assortment of products based on the consumer's needs, which is the goal of their supply chain and within their core principal. Furthermore, Dagab also maintains all negotiations with Axfoods suppliers in order to operate under the greatest possible conditions in its supply chain (Axfood, 2020).

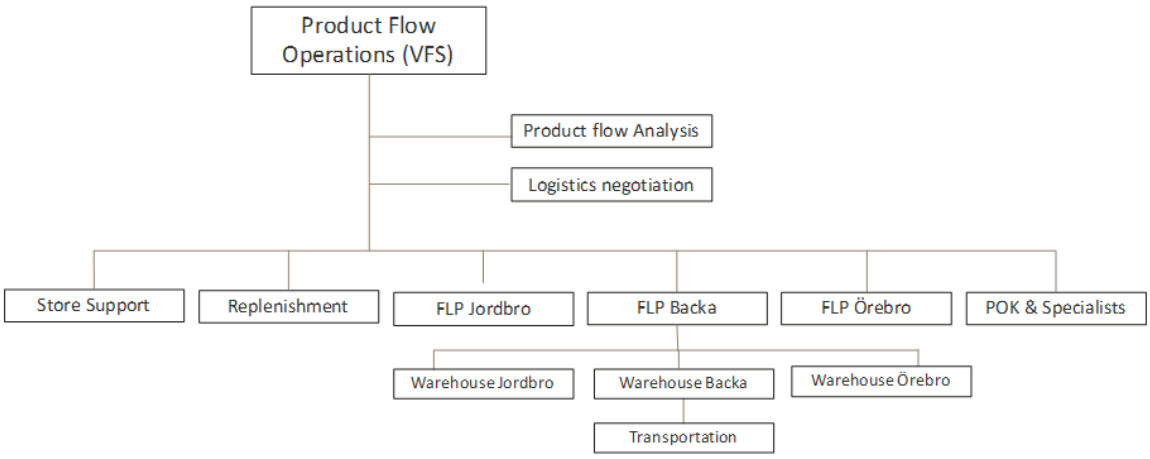
Dagab is constantly looking to improve its logistics and purchasing model in order to improve its inventory turnover rate and order consistency. Their main goal is to create flexible and customized logistics services to their customers such as Willys, Hemköp, and Axfood Snabbgross, and many more. Dagab supplies products to over 7000 customers across Sweden and their net sales year 2019 was approximately 44 895 Billion SEK (Axfood, 2020).

3.5.2 Product flow operations structure

In order to achieve a broad overview of the situation and what can impact variation in demand as well as uncertainty, interviews were conducted with different people within the organization as well as two Axfood Snabbgross stores located in Stockholm and Malmö. Interviews were conducted with logistics managers, warehouse managers, a procurement employee, a transportation engineer, a campaign analyst, and a forecast specialist. A total of seven interviews were conducted throughout the thesis and were determined as enough because of the experience and knowledge given by the employees. Below in *figure 9* is an illustration of departments within the product flow operations departments, warehousing, and transportation to supply the customer demand. All respondents involved works actively

to eliminate unnecessary waste and cost along the supply chain as well as their entity. To understand the phenomenon and what lies behind. it was of importance to interview individuals from different parts of the organization. In this thesis the authors have interviewed a total of seven individuals that work in different areas within the organization and outside. The respondents have come from the replenishment team, FLP Örebro, warehouse in Jordbro, POK & Specialists, transportation, and lastly two from outside the organization, which are Snabbgross. They are the consumer in the supply chain and was interviewed as they are essential as they impact the efficiency of the organizational flows this study is researching.

Figure 9 Product flow operations structure at Dagab Inköp & logistik



Source: Self-drawn (2020)

3.6 Data collection methods

In the literature Easterby-Smith et al., (2015) mention the value of multiple data sources. As this study underlies the relativist ontological position in combination with the constructionist epistemology. It was suitable to entail multiple data collection as a method. The following sub-chapters presents an overview of the chosen methods to collect data within the thesis.

3.6.1 Interview

An interview is a methodology approach used in qualitative studies, where a person can express opinions on the study being conducted. This approach gives a broader view of the situation being studied instead of a survey. Interviews can either be structured as semi-structured or unstructured depending on the number of questions, the amount of

governance the interviewer has over the process, and whether the interviewer or the interview has the right to define the agenda (Alvehus, 2019, p. 84-86).

Furthermore, a structured interview is conducted by having a predetermined questionnaire and feasible answers. However, this setup gives the interview elements of a survey and takes away the interactive part of the interview process. Secondly, an unstructured interview consists of an open conversation about the topic being studied. The interviewer is in a sense less active in the conversation and gives no follow-up questions. Lastly, a semi-structured interview allows the interviewer to ask open questions about the topic being highlighted. This procedure gives the correspondent a higher influence of the interview content with the ability to ask additional questions (Alvehus, 2019, p. 87).

In this thesis, a semi-structured interview approach is adopted in order to examine the currently phased difficulties at Dagab Inkop & Logistik. This type of interview is also referred to as qualitative research interviews. The reason behind this approach is because the questions have a certain theme that is wished to be examined with some key questions that are of importance to cover. The semi-structured interview method makes it possible for it to be an open interview and allows for in-depth exploration. In explanatory studies, this type of interview is also applicable as it can provide important background and contextual material for the study (Saunders et al., 2012, p. 377). To undertake a holistic approach, interviews was conducted with logistics manager, transportation engineer, (two) Snabbgross stores, one operational purchaser, a forecast coordinator, and lastly a campaign analyst to gain a better understanding of the current problem. The respondents that were interviewed are of importance as they have both the experience and knowledge regarding the topic of this study. The number of hours collected in the interviews is sufficient because of their extensive experience within the field. Table 2 illustrates the interviews conducted at the case company: This thesis has conducted approximately 7.5 hours of interview material, and even if it does not meet the recommended time (10-15 hours), the authors believe that the extensive experience the respondents have within the field is sufficient. It has also been a challenge because of the unforeseen COVID-19 situation. In addition, the interview's observations have been made, to an extent, which would help cover the rest of the hours.

Table 1 Illustration of conducted interviews

Respondent	Role	Date conducted	Interview duration (Minutes)
1	Operative Purchaser Dagab	2020-04-06	65
2	Acting chief Snabbgross	2020-04-08	55
3	Transportation Engineer Dagab	2020-04-08	70
4	Team leader Snabbgross	2020-04-09	60
5	Warehouse manager Dagab	2020-04-09	65
6	Forecast specialist Dagab	2020-04-14	60
7	Campaign Analyst	2020-04-15	70

Source: Self-drawn (2020)

3.6.2 Observations

Observation is a method approach used when observing situations that occur and can range from an individual group to a whole department. Depending on the amount of involvement from the observer, observations can be classified into different categories. It ranges from passive observers that acts as an outside participant to partaking observers who participate in the environments that are currently being observed. Furthermore, there is a distinction between conducting an open or closed observation. For instance, the observation that brings the observant's attention to them being examined is called an open observation. However, if the attention of the observations is not highlighted, it's then considered as a closed observation (Alvehus, 2019, p. 97).

To complement interviews, observations will also be a primary source of collecting data in order to answer the purpose of the study. Observations has been carried out to understand the organization's systems. The observations were performed electronically through Teams Microsoft. The authors also observed the volume that was purchased and forecasted.

3.6.3 Literature Studies

Secondary data is available to help researchers develop a good understanding as well as insight into previous research. The literature review is defined as [.. *a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners*] (Fink, 2019, p. 6). Literature studies can further be divided into three categories, primary, secondary, and tertiary, which represents the flow of information from the original sources (Saunders et al., 2012, p. 82-83). The literature sources in this study has been of primary and secondary sources such as company

data, literature books, previous articles, and mainly used to develop the critical literature review. The literature process can be complex and overwhelming as it requires continuous research throughout the project.

Albeit, this process being complex it can help the researcher develop a critical review which is a constructively critical analysis that develops clear arguments. It is essential to assess what is significant to the research and not only summarize a series of books and articles. The literature review builds the foundation of which the thesis is built upon. In this thesis the literature review will set the base to explore the collected data and to develop theories from them, as well as subsequently relate to the literature in an ensuing discussion.

3.7 Data Analysis

According to Easterby-Smith et al., (2015) and Bryman and Bell (2017, p. 288) the content analysis approach aims to help researchers draw systematic assumptions from qualitative data that have been structured by a set of ideas or concepts. This method helps analyze documents and texts in different forms such as, printed, handwritten, or electronic. Easterby-Smith et al., (2015) mention that this type of approach helps researchers study the data for the presence, meanings, and relationships of ideas or concepts that are developed from pre-existing theories or hypotheses. Content analysis can be used for both hypothesis testing and theory building. Forth, the differences between types of content analysis arise from:

- *How organizing ideas or concepts are determined.*
- *The ideas and concepts themselves and how they frame the data.*
- *The methods and techniques used for organizing, and evaluating data* (Easterby-Smith et al., 2015, p. 459*).*

This type of approach leans more toward an interpretative, qualitative method, and a positivist framework, though it is possible to introduce some element of quantification into the process (Easterby-Smith et al., 2015). Seuring and Gold (2012, p. 546) mention that the content analysis process is built upon four steps, material collection, descriptive analysis, category selection, and material evaluation. The first step is delimiting the material that is going to be analyzed as well as defining the unit of analysis. Followed by an assessment of the material characteristics which will provide the background for subsequent content analysis. Thirdly, structural dimensions, and other related analytic categories are selected. The

last step is to analyze the material according to the analytic dimensions. Furthermore, content analysis is suitable when the aim is to analyze various qualitative and unstructured data that are collected during unstructured or semi-structured interviews. The content analysis was used thoroughly to analyze and interpret the information collected from the interviews. Firstly, the data collected from interviews was recorded, transcribed in detail, and finally thoroughly assessed to proceed to the coding aspect of the analysis. Simultaneously, the fourth step of the process was followed to analyze the material accordingly and extract the necessary elements to answer the problem questions to fulfill the overall purpose. Furthermore, grounded analysis and content analysis share common techniques but are used differently. Concepts and themes are developed with the help of coding methods from the interviews which are further engaged and analyzed with the help of the critical literature review. The aim is to find clarity as well as unity in the research conducted (Easterby-Smith et al., 2015).

3.8 Data Quality

Assuring and establishing quality in research is essential and should be taken seriously to obtain credibility. Interpretivist researchers use the construct of credibility, transferability, dependability, and conformability when conducting research (Saunders et al., (2012, p. 192). These concepts were developed by Lincoln and Guba (1985) to substitute reliability, internal validity, external validity to fit the qualitative and interpretive approach more. By doing so, assurance of quality could be achieved as well as a higher level of trustworthiness. Also, the quality of the research can be achieved by following identified criteria. (Saunders et al., 2012, p. 194; Easterby-Smith et al., 2015).

Credibility as a criterion within a study is a major factor in trustworthiness. If credibility is lacking, then the findings and conclusions as a whole cannot be justified as credible. Therefore, gaining high credibility in a study is of importance, a study cannot be well-established without recourse to the original data sources themselves. If the results are stable and replicable that means a study can claim credibility (Lincoln & Guba, 1985, p. 213;219). To claim credibility in this thesis, transparency and communication have been of importance throughout the research process between the interests involved in this research. Also, to avoid losing credibility, the collection of data has come from multiple sources.

Furthermore, transferability refers to external validity and depends upon the degree of fittingness. It is when researchers have the possibility to generalize and transfer findings to other contexts. Lincoln and Guba (1985, p. 124) highlights this question in regard to fittingness; [.. *one need not know anything about either originating and receiving contexts to know the "truth" of the generalization, assuming only that originating and receiving contexts are in some sense part of the known population of contexts and that the generalization is based upon a study of a representative sample of contexts*]. As an individual who seeks to make a judgment of transferability needs information about both contexts to make sufficient judgment. This thesis presents a comprehensive description established by the purpose and problem formulation.

The dependability criterion is developed from the term reliability and refers mainly to replicability, where the findings are tested. With the help of an extensive description of the methods used in this master thesis and strong audit trail a higher degree of dependability is applied. The authors have clarified the subject of this thesis and clearly stated as well as providing good documentation of the process. The dependability is also of importance to the credibility of the study (Lincoln & Guba, 1985, p. 316).

Conformability is the final term applied, which refers to the objectivity of the study and covers data collection and ensuing analysis. Lincoln and Guba (1985, p. 318-319) mentions that conformability can be assured with the help of triangulation techniques. This added value to the thesis as the authors could concatenate with the audit process. To ensure conformability the process of how data has been collected was well documented. The use of several sources when gathering data was important to strengthen the study.

Lastly, in coherence to the triangulation technique, data has been collected from several sources such as interviews, internal company data, and previous literature. Consequently, Saunders et al., (2012, p. 179) accentuate that if case studies are used in research as a strategy then triangulating multiple sources of data is most likely to be used. Triangulation is described as the use of different data collection techniques within research to assure that the data is what a researcher thinks it is. In addition, the triangulation of data is important to naturalistic studies. The technique is a mode to improve the probability of the findings and interpretation to be found as credible (Lincoln & Guba, 1985, p. 283;305).

3.9 Method criticism

Bryman and Bell (2017, p. 484) have mentioned that after finding a relevant research area and necessary tools have been used to develop a theoretical framework, empirical findings, analysis, and a conclusion is drawn. Research and management ethics have to be included to examine the quality of the research. Some researchers have mentioned that case studies do not have a rigor of natural scientific designs, as this type of approach does not allow for generalizations to be made. They also produce a lot of data that allows for any interpretations to be made (Easterby-Smith et al., 2015). Also, another limitation that can occur when choosing a constructionist epistemology is that it can be very time-consuming as analysis and interpretations are difficult and can impact the credibility of the study.

3.10 Ethical considerations

When collecting personal information, it is important to avoid breaching security and confidentiality. Therefore, in this thesis, GDPR has been taken into consideration to avoid breaking the law as well as protect all interests involved. There are three subject-matter and objectives in the GDPR regulation which are described as (1) [.. *This regulation lies down rules relating to the protection of natural persons with regard to the processing of personal data and rules relating to the free movement of personal data*]. (2) [.. *This Regulation protects fundamental rights and freedoms of natural persons and in particular their right to the protection of personal data*]. Lastly, (3) [.. *The free movement of personal data within the Union shall be neither restricted nor prohibited for reasons connected with the protection of natural persons with regard to the processing of personal data*] (Intersoft Consulting, 2020).

There are ethical considerations that need to be highlighted and dealt with when conducting a research study. Easterby-Smith et al., (2015) describes ten key research principles that protect the research subject, participants, and integrity of the research community. These principles are illustrated in *figure 10* as per below:

Figure 10 Research ethics

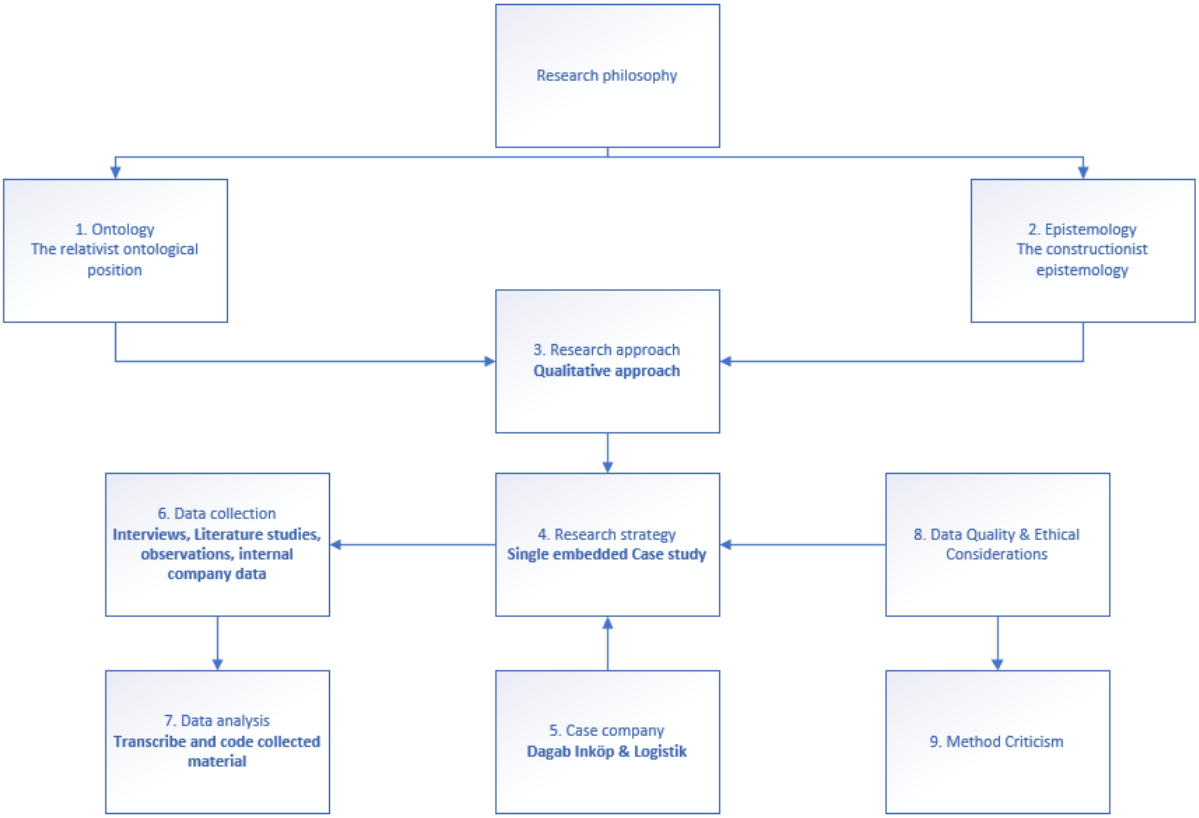
Source: Easterby-Smith et al., (2015, p. 330)

The 10 key principles in combination with the regulations of GDPR have been taken seriously to protect the research study as well as the interests involved. In the initial process, the company was provided with a research agenda and background information, in which, an agreement could be finalized regarding the amount of participation from the company and what is required from them. For the interviews, a consent form was given to them to inform them of their responsibilities and what was required. Lastly, the clarification that their participation was completely voluntary and that they could leave at any time of the interview if felt uncomfortable.

3.11 Summary of methodology

Figure 11 describes a summary of the methodological viewpoint and approach used in this study as per below:

Figure 11 Summary of methodology



Source: Self-drawn (2020)

4. Empirical findings

The empirical chapter highlights the findings gathered from interviews and observations conducted on Dagab Inköp & Logistik and two Snabbgross stores. All respondents from the interview process display codes and themes connected to the research purpose and questions. Moreover, this chapter highlights the areas of procurement, Erp systems, Demand management, Warehousing, Lean integration, Inbound-outbound logistics flows, and the CPFR model.

4.1 Inbound and outbound logistics flows

Inbound and outbound logistics planning is another element highlighted in the conducted interviews at Dagab. All respondents agreed that streamlining the inflows and outflows is the goal within the supply chain. Purchasing creates challenges for inflow and outflows and this was also highlighted from the interviews with respondents who work at Snabbgross. The respondent who works as a store manager at Snabbgross stated in the interview that [.. *purchasing affects inflow and outflow in terms of having wrong pallets in the warehouse which results automatically in the reduction of efficiency. At the end of the day, maintaining a high service level is more important than costs because it is the products we sell in-store is our only source of income*]. Furthermore, all respondents agreed upon the fact that if the workload exceeds above expected whether it is regarding the inbounds logistics or outbound logistics flows, there is not enough manpower, trucks, and surfaces.

The transportation engineer highlighted that [.. *synchronizing the planning of delivery dates between the warehouse and purchasing is another major challenge for inflow and outflow*]. This is because a lot of planning is established for delivery dates on warehouses, for instance, the number of employees that are needed daily for maintaining the flow of goods. And by having larger flows of goods some days than others greatly affect the planning of the number of workers needed to carry out necessary activities. To increase efficiency in Dagab flows it is essential to buy the right volume for the right time as one respondent described that sometimes the volume of certain articles is too high and creating unnecessary inventory. The transportation engineer also stated that [.. *once we mapped out what we had in our warehouse to analyze the volumes that were necessary to meet customer demand during a specific period. Planning management is essential from all interests during hectic periods such as Christmas and to maintain efficient flows it is important not to purchase what is not required*].

The team manager from the warehouse explains the challenges they are currently facing within the area of inflow and outflow. The respondent mentioned that [.. *Inflow of goods to warehouse is carried out Monday through Fridays and outflow Monday through Sunday. Leading to an extensive number of pallets on the weekends which affect our buffer on highbay*]. Highbay is the fully automated warehouse for pallets that Dagab uses in their warehouse. Therefore, pallets that are not fully applicable in Dagab's highbay is not needed. With regard to improvements for more streamline inflows and outflows all respondents agreed upon a collaboration between the purchasing and warehouse team to decide a number of suppliers that can deliver pallets that are qualified for highbay.

Moreover, all respondents believed that robust information flow and pre-planning will lead to a more efficient supply chain. Also, the arrangement of transportation to stores is another area where consistent flows can be achieved.

4.2 Integration of Lean tools

When asking about Lean and its usage in the daily operation, the answers varied between the different departments. One of the respondents who works as a warehouse manager quoted that [.. *the lean concept is implemented in our work approach even if we do not call it lean. We have developed our own way of working with the integration of essential lean principles. We have developed key performance indicators in order to ensure that we are holding up to the expectations set and having the right number of people at the right place to handle daily demand levels*]. Furthermore, the respondent elaborated upon waste also known as muda being a challenge, however, the concept of continuous improvement has been well integrated, i.e. to reduce the number of bottlenecks. [.. *suggestions regarding continuous improvement from personnel are placed on a whiteboard, which we later gather and actively work to solve them as soon as possible. These are priority graded in order to work with those that are of more importance and whether the suggestion is feasible*]. Reducing and/or eliminating waste has been important to Dagab as it lies within the vision of the organization. Consequently, it is important to continue integrating the tools and receive the right training to sustain efficiency within the processes. Lean tools are not implemented well in other departments of Dagab as in the warehouse. For instance, the replenishment team works with continuous improvement, though 5S and other tools that can help enhance work productivity are not implemented efficiently. Also, the lack of transparency and efficient information between departments, suppliers, and customers is creating nonvalue-adding activities such as creating different forecasts because of lack of communication (Defects). The process of analyzing

forecasts by campaign analysts can take between 8-20 hours a week depending on the workload and number of articles, which, are then changed along the supply chain. The sales team of a food chain accepts, increases, or decreases the forecast volume of an article, and is further changed a third time when pre-order forecasts are sent to a store level. Some of the stores erase all forecasts and goes through the articles themselves with the help of POS as mentioned in 4.4.1 or stores that accept decreases or increases given suggestions. This is clearly a process that is leading to waste i.e. non-utilized talent and cost i.e. personnel cost. All respondents mentioned that waste comes in all types of form and it requires intense cooperation and commitment by personnel and stakeholders to help reduce and/or eliminate these in order to increase profitability and minimize the costs as much as possible.

4.3 Integration of the CPFR Business Model

The Collaborative planning, forecasting, and replenishment business model is not integrated into the supply chain, nor organization according to the respondents. They were not aware of this model and did not have knowledge about it. The forecast specialist accentuated that [.. *there are customized models that have been developed within the firm and integrated into the system, which is used daily, in which, the analysis will help feed the system with information that will be essential down the pipeline. There is not a common business model integrated with the suppliers where we share the same information channels and plan thereafter*]. In addition, all respondents believed that such a business model is of importance to integrate to the four processes and implement a common vision board, in the sense of what is the overarching goal, what strategies are essential. Also, the forecast specialist mentioned that some of the suppliers don't live up to the expectations and can have a negative impact on Dagab and its customers. Therefore, it is important to implement strategies & planning to develop collaborations that can meet the expectations that are set such as having the right quantity, at the right time, right condition, right place, right cost, and the right product. When establishing a strong and long relationship with suppliers, there is a possibility to reduce the uncertainty in demand. As stated by the forecast specialist regarding the suppliers, [*they do not hold the measure which results in not getting the right volume at the right time as well as increases the risk of high inventory. The overall and negative outcome of this is that we do not have the warehouse capacity to hold such* volumes]. Another point of view that was highlighted from one of the respondents was that [.. *a major problem that we are facing is within the context of communication between, for instance, the replenishment team, procurement team, and food chain can be at times very limited. Essential information that can be of importance is not channeled through involved parties*].

4.4 Procurement

The forecast coordinator procurement team explained procurement as [.. *replenishment to warehouse activity*]. The operational purchaser and the forecast specialist mentioned that purchase is based upon historic data on what has been ordered previously. The forecast tool has been automated and calculates the quantity that should be ordered to meet customer demand.

Furthermore, variables, i.e. lead time and supplier dependency are integrated to ensure that the right volumes are purchased at the right time. Also, this makes it possible for the purchaser to only look in-depth on articles that are "watched" and require an extra look to ensure that the forecast is correct instead of going through 45-80 articles manually on a daily basis. The system is well developed and calculates on variables of importance, and in which, can develop trust in the systems that are used daily. Another advantage that was highlighted by the respondent is that each flow planner (purchaser) works closely with specific suppliers, which gives them great knowledge in their behavior as well as availability. It gives them great insight in regard to the articles and allows them to take make better decisions that will benefit the organization and customer demand. Many challenges that have been identified but those that were highlighted in the interviews and recognized as factors that have a huge impact on procurement and meeting the demand on time were supplier uncertainty, which one of the interviewees quoted [*Suppliers doesn't hold the measure, which results in not getting the right volume at the right time as well as increases the risk of high inventory. The overall and negative outcome of this is that we do not have the warehouse capacity to hold such volumes*]. Another challenge that is of importance to highlight is perishable food as these have a shorter shelf life which requires another type of planning. Also, [.. *It was just recently that all perishable foods became "watched" list in order to make a more precise decision with regard to the volume that was going to be purchased to decrease waste*]. This is important as the system is looking to meet a weekly demand but with perishable food this is not optimal. Long backorders (LRE) is also a major challenge as it can be heavy on the procurement team to retrieve the demand, in translation [.. *how much should we have in the warehouse to be able to meet the demand when the backorder is released*].

Dagab works with a blanket purchase order in the sense of delivery terms. The organization has negotiated terms & contracts with suppliers, which means that they have to purchase a minimum volume for a certain price during a set period. The blanket purchase order is nothing that flow planners work with on a daily basis, but from time to time get a good

bargain which results in these types of purchase orders. Blanket orders can also be established, i.e. summer articles during a certain period where the customer order demand will cover the purchased volume.

4.5 ERP systems

All respondents described ERP as an essential tool for organizational growth and gaining efficiency. The forecast specialist emphasized [.. *that we need more training to understand ERP systems we are using and that we need to integrate them more along the supply chain to exchange information faster and better*]. Some use older ERP systems which can also be an issue as the demand is growing and it is important to have an efficient system that will help personnel make the right decisions and execute the tasks. Today, the replenishment team does not have an efficient system to create forecasts and has to extract the data from different databases before importing it to excel sheets and analyzing the information. Consequently, all respondents agree that ERP systems will help enhance the business as it enables the flow of data between them. The forecast specialist accentuated also that [.. *even if ERP systems are costly and time-consuming to integrate it is a critical success factor to meet the customer demand efficiently with the reduction of costs and waste in mind*].

4.6 Demand management

Dagab picks approximately 600.000 parcels on a daily basis but under different circumstances the parcel number can increase dramatically. The warehouse manager stated that [.. *some days the warehouse in Jordbro has over 240.000 parcels that need to be processed instead of 140.000 which is the normal level*]. Also, these types of changes require more planning in order to avoid not having the right number of personnel nor trucks to deliver to the customers. Another challenge to demand management is the limited warehouse capacity, in which, orders need to be canceled due to not being able to process them.

4.6.1 Forecasting

When the interviews were conducted with different managers within Dagab and the store, forecasting was brought up multiple times as it is an essential tool with regard to handling the demand management and also ordering and delivering the right volume at the right time. Forecast tools used within the organization and stores lie as a central contributor to the outcome of the actual demand. All respondents agreed that a unified forecast system is

important in order to gain significant profitability and reduce unnecessary costs as well as waste. It was highlighted that the forecast in procurement was based on historic order data and not point-of-sale (POS) data. The replenishment team (campaign analysts) on the other hand creates a forecast on POS data to meet the actual demand more precisely. The suggestions set by the replenishment team are then changed by the sales team of a food chain and discussed. Furthermore, these forecast suggestions are then sent to the food chain on a store level and have the opportunity to accept, decrease, or increase the forecast suggestion. One of the respondents mentioned that [.. *we do not look at the forecast suggestions we receive as we erase them completely and make our own based on point-of-sale statistics we have in our data*]. Also, the respondent added that [.. *the replenishment team should put more time and effort into creating more precise forecast demand that will satisfy the customer demand*]. In *table 2* two questions regarding the differences of how the forecast is created, analyzed, and purchased are illustrated below:

Table 1 Forecasting approaches between different departments

Questions	Purchaser	Replenishment team	Snabbgross 1	Team leader SNG2
What is your forcast based on?	Historical data on what has been ordered	POS data	POS	POS
How is forecast analysed?	Automated systed, integrated variables that calculates the demand	Manual forecast of 100-600 articles a week depending food chain	Office level: do not analyse Store level: Increases, decreases, accepts, or deletes suggestions	Increases, decreases, accepts, or deletes suggestions

Source: Self-drawn (2020)

Figure 13 and *14*, (see appendix) illustrates the tools used by campaign analysts within the replenishment team to analyze the demand of articles for a given campaign. The analysts receive articles that are going to be on campaign 10-11 weeks ahead. These are then analyzed with the help of sale statistics from previous campaigns. The articles that are going to be analyzed are added in the "article list" column and information and a sale statistics graph regarding the article will become visible. Important information such as sold per unit during a specific week, price, and campaign type is highlighted which is studied by the analysts to make more accurate forecasts that will meet the actual demand. The data given in this excel worksheet is exported from different databases in order to make the right decisions regarding what should be ordered.

4.6.2 Demand uncertainty

Another opinion highlighted from the interview process is how to deal with uncertainty in demand, which is an essential element in demand management. The operational purchaser mentions that forecast coordinators constantly work with uncertainty in demand when planning forecast suggestions on articles. The respondent quoted that [.. *forecast coordinator constantly monitors historical deviations between forecast and demand which is done by the system on Monday*]. Furthermore, this is done through examining abnormalities between forecast and demand, forecast coordinators can either adjust the forecast upwards or downwards in volume to match demand. Meanwhile, the forecast specialist described that Dagab identifies uncertainty in demand through parameters embedded in the system. The respondent quoted that [.. *our system highlights if there is any uncertainty in demand by examining the supplier quality from the aspects of late deliveries, capacity, or shortage issues*]. The system can then highlight that there needs to be a buffer stock in place in case if the supplier cannot fulfill the 7:R of logistics. Moreover, another respondent highlight making complementary orders leads to higher uncertainty in demand. The team leader at Snabbgross accentuated [*With our consumer base varying from large and small companies to wholesalers who purchase large volumes of articles from Snabbgross, the problem lies in creating campaign order suggestions because the demand on articles can differ between periods*].

The explanation for that is wholesalers can decide to acquire large volumes of a certain article, but for another period avoid purchasing leading to uncertainty in demand which can be illustrated in *figure 14*. Moreover, the respondent from Snabbgross explained that the varying demand leads to stockout on certain articles. These articles are delivered based on pre-agreed delivery dates leading to that the next delivery for that article will be the next week. This leads to a loss in sales, and the customer will end up acquiring goods from another retailer. Also, all respondents mention that during a campaign season, if an article is selling above expected leads to repetitive purchases being made. The respondent from Snabbgross also said that [.. *repetitive purchases can occur during a campaign season, for instance with commodities such as rice. I.e., let's say that the rice is selling above expected, and there is a discounted price with a supplier that results in changes within the orders*].

Moreover, all respondents believed that a well-established pre-order and campaign order suggestions, which leads to more accurate forecasts creating less uncertainty. One of the team leaders at Snabbgross highlights that [.. *assessments and comprehensive planning of previous historical demand going 12 months back are essential for developing accurate forecasts. This is something*

many people are lacking with and it leads to volume changes in orders]. Moreover, all respondents agreed-upon improvements in variables and parameters in the system for more accurate forecasting.

Lastly, one way of dealing with uncertainty in demand is through the application of safety stock. The forecast coordinators, operative purchaser, and Snabbgross clearly explained that safety stock is embedded in the system. The forecast coordinator quoted [.. *our system uses safety stock variables based on how many parcels needed before the system highlights that we need to make a purchase. This is highly dependent on how many suppliers are able to supply the required item and lead time*]. However, in Snabbgross' case where the sales fluctuation is enormous between different weeks. With these parameters in place some weeks they have empty shelves because of the high demand for certain articles. Therefore, it is difficult to establish safety stocks at the Snabbgross store level.

4.6.3 Supply and demand misalignment

Inefficient demand management practices will affect the whole supply chain and create challenges in planning activities. All respondents agreed upon having necessary planning tools in place for satisfying customer's needs. The campaign analyst stated that [.. *under normal condition, information necessary to carry out forecasting activities campaign and season articles are working well to meet the customer demand, though there is the need for a forecast system to improve and avoid making errors*]. However, pitfalls concerning supply and demand misalignment were also highlighted from the interview sessions. The forecast specialist mentioned that [.. *one of the challenges that we are facing today is that we don't have access to our customers' stockout balance. Also, information related to changes in volume purchases or other unpredictable circumstances*]. Moreover, all respondents believe that information on stockout balance should be embedded in the system leading to improved planning in the logistics operation. However, the respondent believed this kind of system change would be costly. On the other hand, the operative purchaser explained their thoughts on how to improve and handle supply and demand misalignment. The respondent further mentioned that [.. *a supplier portal is a tool where suppliers can obtain information on forecasts on articles for their organizational usage. For instance, suppliers can easily through the portal detect if the anticipated demand exceeds the supply for that specific week and make changes easily*]. Furthermore, the respondent explains that the portal is not being used effectively today and that suppliers constantly evaluates forecast suggestions. Another improvement suggestion explained by the forecast specialist is to introduce a new application in the supplier portal where Dagab sends pre-

order proposals to their respective suppliers. This will give the supplier the ability to pre-produce on goods and enhance supply and demand planning.

4.7 Warehousing

The warehouse manager accentuated that even if the warehouses have different work approaches to successfully handle parcels in and out from the warehouse, they have had a management group called LLD that has together worked closely the last few years to establish unified routines. The warehouse managers have worked together exchanging experience and knowledge in order to maintain standardized work approaches. Consequently, KPI's have become essential for Dagab, and have been important for all warehouses to measure i.e. productivity and degree of filling the same way. The transportation engineer further accentuated thatv[.. *if you ask different warehouse employees and team managers they would agree that we have clear goals that we work toward, which will ensure that even if we have some differences in our approaches we have integrated uniformed lean tools and KPI's to ensure that we are moving in the same direction*].

Also, the three dimensions regarding low cost, low inventory, and high customer service are well integrated and taken into account on a daily basis. The warehouse manager further quoted that [.. *we plan the number of staff needed to handle the right volume to not have too many employees when not needed and too little when we have more than expected. We receive information regarding the next day which makes it easier to plan what is needed to successfully handle the demand given a certain day. We also plan for how many trucks are needed so we do not lose efficiency. One of the challenges we are faced with today at Jordbro, Stockholm is that the warehouse is limited capacity wise, which is one of the key reasons we are building a fully automated and much bigger warehouse out in Bålsta*]. Low inventory is one of the biggest challenges at Dagabs warehouses of the three dimensions as the procurement team doesn't have the right tools to make accurate purchases, in which we are dealing with high inventory. The respondent accentuated further that the level of customer service is something they are proud of as they have over 97 % in customer satisfaction, and they are continuously working to increase the number.

Respondents from the procurement team, replenishment team, and warehouse agreed that the collaboration to make more accurate decisions in regard to handling parcels is creating inefficiency as it impacts planning. Information that affects the warehouse operations is exchanged efficiently between the different departments in Dagab.

5. Analytical Discussion

In this chapter the empirical findings and theoretical framework will be combined to find deep insights. The problem of this thesis will be analyzed from different aspects in order to create valuable interpretations of the empirical findings. The content analysis will be used to interpret and analyze the findings in light of the academic discourse.

5.1 Warehousing

Porter (2008, p. 39) and Ayantoyinbo et al., (2018, p. 70) mention that storing, and warehousing are fundamental activities within inbound and outbound logistics flows. In Dagab's case the three major warehouses are located in Stockholm, Gothenburg, and Jönköping. Jönköping today has a fully automated warehouse in comparison to Gothenburg and Stockholm where there is only one part of the warehouse that is automated. In Stockholm, the warehouse has exceeded the pre-existing capacity levels causing complexity in handling and storing goods. This has caused Dagab investing in a fully automated warehouse expected in the year 2023 which has the capacity to handle more parcels.

Moreover, key performance indicators (KPI´s) are essential in enterprises for creating competitive advantage and gaining customer satisfaction (Chen et al., 2017). In Dagab's case, the transportation engineer explained that KPI's are in place for increasing productivity and reducing cost in the warehouse operation. Furthermore, this is an area companies need to continuously work with to streamline the inflow and outflow of goods. Richards (2018). mentioned that four central KPI's companies need to continuously measure in warehouses are *reliability, flexibility, cost and asset utilization.* These KPIs helps companies to achieve critical success factors and core capabilities. Moreover, all respondents agreed that information sharing between logistics functions such as procurement, forecasting, campaign analyst is essential for warehousing activities planning activities such as trucks and manpower needed for handling the daily demand. This is now an ongoing process for Dagab as there is an LLD project group in place to enhance skills and knowledge sharing between the different warehouse managers on capacity and parcel handling. Moreover, Dagab objective is to generate high customer service. An area where they are currently proud of by having over 97 % customer service. Also, the fundamental principles explained by Richards (2018) on the trade-off between lowering cost and inventory whilst achieving high customer service is one

area that both the transportation engineer and warehouse manager are continuously working on.

5.2 Inbound and outbound logistics flows

Coyle et al., (2017) explained that inbound and outbound logistics is considered a two separate process that defines inbound flows as the storing, delivering, and transportation of goods to the business warehouse. Meanwhile, outbound logistics flow refers to the transportation of goods out of the business to external associates. Snabbgross store manager explained that purchasing is an area that affects inbound and outbound logistics flows in terms of having the wrong pallets and was uplifted by the store manager at Snabbgross. Their main factor is that they want to obtain a high service level over cost because store sales are their only source of profitability. According to Abushaikha et al., (2018) outbound logistics is a critical flow in the supply chain by increasing value through cost reduction. In addition, with logistics being the sole function that interacts with upstream and downstream actors in the supply chain it is of great importance for Dagab and Snabbgross to engage in planning activities. For instance, in the inbound and outbound side, one improvement area uplifted by the transportation engineer is to synchronize delivery dates between purchasing and warehousing as a major challenge for streamlining inflow and outflow.

Ayantoyinbo et al., (2018) mentioned that inbound logistics comprise activities such as collecting, storing, and receiving goods into the business. In Dagab's warehouse, a lot of planning is pre-established before the inflow of goods to the warehouse. For instance, the transportation engineer explained the number of manpower needed to handle the daily demand is pre-planned. This in order to handle the storage process for goods in their respective picking locations or unloading when it is time for delivery to stores. Furthermore, with the constant changing volumes of orders delivered to in and out from the warehouse. This is causing a major complexity and Hakim et al., (2018) argues that the main goal for inbound logistics is to reduce cost by having the right material at the right place and time. However, with volume changes the planning of manpower, trucks, and surfaces to overcome this complexity will increase and create inconsistent inbound and outbound logistics flows.

Moreover, Carter et al., (1996) describe inbound logistics as an area to control to avoid high inventory and transportation costs. Measurements that can be undertaken by companies are actively working on improvements in delivery planning. This is an area where Dagab is trying

to make changes through cross-departmental collaborations. This will heavily rely on continuous information sharing between warehousing and the procurement department on-demand information. Van Niekerk et al., (2019) claims that inbound and outbound logistics planning is an approach organizations need to embed in their supply chain by integrating multiple actors in the supply chain to meet customer needs Furthermore, this will also greatly improve the planning of amount of workers needed to carry out necessary activities. Also, undertaking this approach will improve streamlining inflows and outflows caused by demand fluctuations at Snabbgross store level leading to larger flows of goods than other days creating unnecessary inventory.

Furthermore, Ayantoyinbo et al., (2018) elaborated on inbound and outbound logistics helps an organization to maximize reliability and efficiency in their distribution network as well as reduce transportation and storage costs. This to continuously work on objectives such as increased efficiency, increased sales, better relationships, and improved customer satisfaction.

Table six highlights the objectives mentioned by the different actors in Dagab and Snabbgross to streamline inbound and outbound logistics flows. Both the campaign analyst and procurement team brought up robust information flow between all involved parties as an essential tool for planning inbound and outbound logistics flows. With a more enhanced communication on supply and demand information between parties in the supply chain will greatly improve planning and ultimately decrease transportation and storage cost. Moreover, further objectives uplifted by transportation engineer is to improve transportation planning between the procurement department and warehouse department. This to reduce volume abnormalities causing inefficiencies in the warehouse. Furthermore, purchasing the right volumes and synchronizing delivery dates between food chains and warehouses where mentioned as a possible route to undertake for streamlining outbound logistics. As mentioned by Porter (2008) where the huge emphasis in the outbound logistics flows lies in delivering products to customers and is considered an important element for the reduction of cost and waste. Recommendations highlighted by transportation engineer is establishing Saturday deliveries to food chains ordering their largest volumes on Fridays. This indicates that the store has increased demand on weekends. Therefore, the food chain needs delivery on Saturday in order to streamline outbound logistics and reduce volume tops.

5.3 Integration of lean tools

Bonilla-Ramirez et al., (2019) emphasized that lean and the enhancements made on businesses by coordinating and controlling essential activities and the elimination of non-value adding activities. In Dagab's case, the transportation engineer explained that lean is being applied in the warehousing operations even though they don't call in Lean. This in order to work with the right number of people that can handle the daily demand levels. However, from the interviews conducted, it became clear that challenges on how to deal with Muda were an issue. In the literature, Richards (2018) and Liker (2011, p. 51) explain that Toyota identified eight non-value adding activities connected to manufacturing and business processes. These are overproduction, wait, unnecessary movement, transportation, extra processing, inventory, motion, defects, and un-utilized talent. This is a methodology that can be useful in Dagab's daily operations as it can increase productivity and identify bottlenecks in the existing processes.

Bonilla-Ramirez et al., (2019) mention that with the organization's underlying objectives being to reduce and/or eliminate waste. Integrating lean tools are essential in their operations. Furthermore, other lean tools that are being applied in their daily operations is the ability to train staff/members to localize bottlenecks and to incorporate feedback to managers and employees to overcome these inefficiencies. Moreover, Dagab warehouse manager at Jordbro explained that 5S is a lean tool that is being used in daily operations. Filip et al., (2015) described 5s as an essential tool for companies aiming to improve their quality of the workplace. Furthermore, Liker (2011) mentioned that 5S stands for *sort*, *set in order*, *shine*, *standardize*, and *sustain*. Dagab works with these principles and creates projects for staff willing to participate in a meeting where the aim is to increase staff/members' knowledge of finding waste. Moreover, the above-mentioned regarding non-value adding activities can be seen from different actors in the supply chain. For instance, Snabbgross store-level experience wastage when receiving mixed parcels. This when Dagab delivers to Snabbgross facilities were some parcels containing several articles such as sugar, salt, and soft drinks on the same pallet. This creates the form of waste explained by Liker (2011) as [.. *unnecessary movement or transportation*] when storing articles in their respective area.

Snabbgross Malmoe is currently the largest Snabbgross chain in terms of the surface leading to that mixed pallets create unnecessary transportation when storing articles placed in multiple locations. This is a problem area where Snabbgross can gain improvements and with

the application of lean tools and information sharing between Dagab warehouses and store level will ultimately lead to less mixed parcels. Furthermore, non-utilized talent is one of the eight forms of waste emphasized by Liker (2011) describing this waste type as a lack of engagement between employers and employees in communication creating a loss of talent. However, these wastes can be seen in Dagab's supply chain where the campaign analyst explained that carry out forecasting suggestions 8-20 hours per week depending on workload and articles. These forecast suggestions then get sent to the Snabbgross store level where there is a risk of them being deleted or changed in volume. This creates waste and is a non-value adding activity by creating duplication in efforts along the supply chain. However, both the procurement team and the campaign analyst explained that through continuous improvements and collaboration between multiple entities along the supply chain will result in less cost and increase profitability.

5.4 The integration of Collaborative forecast and replenishment model (CPFR)

Coyle et al., (2017) emphasize that with the main objective of an organization being to continuously improve the performance. With the underlying purpose of supply chain management being to deliver goods to end consumers at minimal cost and time. Panahifar et al., (2015) mention that there is a need for a successful implementation of collaboration and coordination amongst supply chain members. In, Dagab's case, there is currently a lack of collaborative initiatives with their supply chain members. This is one area uplifted by the procurement team, (Two) Snabbgross members, warehouse manager, and forecast coordinator that here is not a common business model in place for strategy and planning.

The forecast coordinator explained that there is not a common business model integrated with suppliers enabling information sharing. From a theoretical standpoint, Coyle (2017) mentioned that the CPFR business model as an initiative for achieving supply chain integration. The model is built upon strategy & planning, demand & supply management, execution, and analysis and aims to reduce/and or eliminate forecasting efforts and duplications. This tool aims to help Dagab as in their current supply chain duplication on forecasting suggestions is causing inefficiency. Coyle (2017) accentuates that the CPFR enables more enhanced planning, forecasting, and replenishment initiatives, and will ultimately reduce forecasting duplications in the supply chain. Panahifar et al., (2015) mentions internal alignment, senior management support, and internal alignment as potential enablers for CPFR implementation. Furthermore, Wang et al., (2005) mention trusts and Fu

et al., (2010) points up enhancement of relationship by setting up on common communication channels.

Factors that come into consideration are the firm's ability to adapt to technological change in the organization, willingness of senior management support, share knowledge and skills amongst trading partners, degree of cooperation, and the firm's ability to enhance relationships through establishing a communication channel.

Today forecasting suggestions established by campaign analyst and forecasting coordinators sent to Snabbgross store level are deleted or re-made due to the high level of uncertainty. The result of not having strong collaborative planning can essentially lead to this outcome. Therefore, it is important to understand the root of the problem and solve it right away instead of continuously working with a system that is creating unnecessary costs and waste. Poler et al., (2008) and Hollmann et al., (2015) mentions that in a practical context, CPFR permits retailers and manufacturers to jointly forecast demand, schedule production, and enable information sharing. This will help improve Dagab's ability to meet demand by fulfilling on time, in full, damage-free, and with the correct paperwork. However, forecast coordinator explained that today an ongoing issue is supplier uncertainty resulting from not receiving the right volume at the right time increasing the risk of high inventory. Furthermore, an integrated information planning system such as CPFR will decrease the risk of uncertainty in demand and result in a more efficient supply chain.

5.5 The impact of Procurement on warehouse and inbound logistics flow

Procurement is an essential branch as they work closely with many suppliers in order to purchase articles to meet customer demand. It is also an important activity for the product and material flow, which can have a great impact on organizational performance. Poor execution in purchasing decisions can have major negative consequences on other parts of the supply chain (Storhagen, 2014, p. 74). All respondents agreed that a critical factor to meet customer demand is how well the procurement department executes their planning and decisions. It was also highlighted that poor supplier management impacts how well the procurement team can execute purchase decisions. Moncska et al., (2015, p. 10-11) mention that involving suppliers early is important as it can help reduce the risk of not receiving the requested volumes. Also, the supply risk mitigation within purchases. The forecast specialist accentuated that some of the suppliers do not hold the standard of delivering the right

volume at the right time, in which, Dagab purchases more to secure that the demand can be met. This type of behavior results in higher inventory in the warehouse.

Procurement was defined as a replenishment to the warehouse which can be described as providing the necessary volumes to meet customer demand. The warehouse can only manage a certain volume because of manpower and truck availability as well as to the maximum capacity of the warehouse. With this being said, participants pointed out that it is of importance for the purchaser to have the right systems as well as have trusted partners that can deliver what is expected to a specific deadline. In addition, for the procurement team to find suitable suppliers that can deliver on the weekends to our highbay automation facility which will have a significant impact on the flows. Today there are only five in-days delivery while the outbound logistics flows are in motion for seven days. Therefore, it is essential to add more in-days delivery to the schedule to be able to enhance the balance between both flows. This would further enhance the process and streamline the flows. It was also mentioned that the warehouses are often up to full capacity which is causing a huge problem and creating inefficiency.

The purchasing process is an essential tool/process to follow as it will help enhance the coordination and operations to make accurate purchases that will reduce cost and waste. When integrating the six-step model it is of importance to understand them and make a critical assessment on each step. For instance, the second step of the process is the selection of suppliers. The supplier has been a critical issue for quite some time for Dagab as some do not hold the measure and cannot live up to the conditions and expectations set by Dagab. The organization works with thousands of suppliers, in which, it is critical to assess suppliers who fit the vision and goals set within the company. Using suppliers who cannot help enhancing meeting the customer demand will only cause problems along the supply chain. Also, the integration of unified systems will give the procurement team the possibility to plan and decide on more accurate orders rather than purchasing with high safety stock levels to avoid the possibility of not meeting the demand for a certain period. Dagab manages the logistics operations and provides products to over 7000 customers, i.e. Willys, Hemköp, and Snabbgross Axfood. In order to provide the right volumes at the right time, in the right condition, it is of high importance to have an efficient and enhanced information and communication flow. This to keep costs and waste as low as possible.

5.5 The impact of Procurement on warehouse and inbound logistics flow

Procurement is an essential branch as they work closely with many suppliers in order to purchase articles to meet customer demand. It is also an important activity for the product and material flow, which can have a great impact on organizational performance. Poor execution in purchasing decisions can have major negative consequences on other parts of the supply chain (Storhagen, 2014, p. 74). All respondents agreed that a critical factor to meet customer demand is how well the procurement department executes their planning and decisions. It was also highlighted that poor supplier management impacts how well the procurement team can execute purchase decisions. Moncska et al., (2015, p. 10-11) mention that involving suppliers early is important as it can help reduce the risk of not receiving the requested volumes. Also, the supply risk mitigation within purchases. The forecast specialist accentuated that some of the suppliers do not hold the standard of delivering the right volume at the right time, in which, Dagab purchases more to secure that the demand can be met. This type of behavior results in higher inventory in the warehouse.

Procurement was defined as a replenishment to the warehouse which can be described as providing the necessary volumes to meet customer demand. The warehouse can only manage a certain volume because of manpower and truck availability as well as to the maximum capacity of the warehouse. With this being said, participants pointed out that it is of importance for the purchaser to have the right systems as well as have trusted partners that can deliver what is expected to a specific deadline. In addition, for the procurement team to find suitable suppliers that can deliver on the weekends to our highbay automation facility which will have a significant impact on the flows. Today there are only five in-days delivery while the outbound logistics flows are in motion for seven days. Therefore, it is essential to add more in-days delivery to the schedule to be able to enhance the balance between both flows. This would further enhance the process and streamline the flows. It was also mentioned that the warehouses are often up to full capacity which is causing a huge problem and creating inefficiency.

The purchasing process is an essential tool/process to follow as it will help enhance the coordination and operations to make accurate purchases that will reduce cost and waste. When integrating the six-step model it is of importance to understand them and make a critical assessment on each step. For instance, the second step of the process is the selection of suppliers. The supplier has been a critical issue for quite some time for Dagab as some do

not hold the measure and cannot live up to the conditions and expectations set by Dagab. The organization works with thousands of suppliers, in which, it is critical to assess suppliers who fit the vision and goals set within the company. Using suppliers who cannot help enhancing meeting the customer demand will only cause problems along the supply chain. Also, the integration of unified systems will give the procurement team the possibility to plan and decide on more accurate orders rather than purchasing with high safety stock levels to avoid the possibility of not meeting the demand for a certain period. Dagab manages the logistics operations and provides products to over 7000 customers, i.e. Willys, Hemköp, and Snabbgross Axfood. In order to provide the right volumes at the right time, in the right condition, it is of high importance to have an efficient and enhanced information and communication flow. This to keep costs and waste as low as possible.

The purchasing process is an essential tool/process to follow as it will help enhance the coordination and operations to make accurate purchases that will reduce cost and waste. When integrating the six-step model it is of importance to understand them and make a critical assessment on each step. For instance, the second step of the process is the selection of suppliers. The supplier has been a critical issue for quite some time for Dagab as some do not hold the measure and cannot live up to the conditions and expectations set by Dagab. The organization works with thousands of suppliers, in which, it is critical to assess suppliers who fit the vision and goals set within the company. Using suppliers who cannot help enhancing meeting the customer demand will only cause problems along the supply chain. Also, the integration of unified systems will give the procurement team the possibility to plan and decide on more accurate orders rather than purchasing with high safety stock levels to avoid the possibility of not meeting the demand for a certain period. Dagab manages the logistics operations and provides products to over 7000 customers, i.e. Willys, Hemköp, and Snabbgross Axfood. In order to provide the right volumes at the right time, in the right condition, it is of high importance to have an efficient and enhanced information and communication flow. This in order to keep costs and waste as low as possible.

5.6 The potentials of integrating ERP systems

Enterprise resource planning systems are essential for an organization as it is the system that deals with the management of information and such. Abdel-Haq et al., (2018, p. 3631) clarified that ERP systems integrate multiple application software into a single management process transformation machine. Also, these systems should be seen as integrated business systems that integrate all functions (Maditinos et al., 2011, p. 61). ERP system was mentioned

many times by all participants and was potentially a key factor in different functions of the organization and the supply chain. The operational purchaser, forecast specialist, and campaign analyst all accentuated that implementing an efficient ERP system would help meet customer demand efficiently and reduce multiple costs and waste. As mentioned in the literature review regarding ERP many potential benefits come with the integration of a successful ERP. It will reduce costs, facilitate information and communication flows to meet the demand, unify systems, in which, coordinate all functional departments, and much more. Why an integrated system with strong information flows is significant is to make accurate decisions to meet the demand. For instance, suppliers need information regarding certain articles beforehand because of long lead time, or availability (Al-Mashari et al., 2003, p. 353; Umble et al., 2003, p. 241; Amoako-Gyamph, 2007, p. 1233).

Furthermore, it is essential to Dagab to analyze whether the articles will arrive on time or if they need to purchase more to meet the demand, and in addition plan for uncertainty. The integration of successful ERP systems will help ensure and facilitate the coordination across the supply chain and make better strategic decisions to meet common goals. Information should be short and concisely when transmitted through different functions of the organization as well as the supply chain. Therefore, it is important to integrate change in the total environment to not face resistance when looking to make what is assumed as improvements. There are critical success factors to ERP systems and if implemented well. These could help ensure that the right levels are purchased and allocated efficiently in the warehouse and further delivered to customers. It is an essential tool that needs to be integrated and managed to avoid imbalance in the flows of the organization and further it will help ensure that the right stock is available which will cut down costs significantly. This has been well argued and corresponds to the references.

The adoption of integrating management systems has become more of a necessity in the last few decades. The interest has grown due to the promise of great outcomes in all sized businesses. According to different studies, big sized companies with high revenues have implemented ERP systems, and the reason being is to their capacity to respond better to the need for change in their business environment. ERP system aims to integrate multiple application software to be used in a single management process transformation machine (Abdel-Haq et al., 2018, p. 3631). ERP systems should also not be seen as only an information system (IS), but rather as an integrated business system integrating all functions.

This can be defined as a [.. *A software package that combines both business processes and information technology (IT) features*] (Maditinos et al., 2011, p. 61). Multiple potential benefits have been identified and highlighted regarding the implementation of ERP Systems. Dagab has an integrated ERP system, but from the understanding of multiple respondents, there is a need for training and a better understanding of the systems and its potentials.

5.7 Demand management

Coyle et al., (2017) the main objective with applying demand management practices in the supply chain is to help strengthen the manufacturing to customers on the collaboration of activities. Moreover, demand management practices aim to handle customer demand by receiving the right information to make efficient operating decisions. Following, Sabbath (1995) mentions that without proper handling of uncertainty in demand can lead to operational and logistical hindrances along the supply chain. With the help of Dagab's highly automated system by examining deviations between forecast and demand. Dagab's forecast coordinators constantly monitor and evaluate abnormalities between forecast and demand on volatile articles. The system examines supplier quality measuring 7:R of logistics such as delivery and supply shortage issues. This in order to evaluate if there needs to be a safety stock in place if the supplier is unpredictable and/or obtains a low score in the system. Moreover, the procurement team and campaign analysts work with historical data and evaluate the historical demand covering a period of 12 months back. This to understand and develop an accurate forecast for the respective food chains.

Coyle (2017) emphasize on internal and external measurement precautions used to deal with uncertainty across businesses. These can be seen in Dagab's supply chain on articles such as rice on campaign season, if the article sells above expected forecasting demand can lead to supply shortages. These circumstances can occur at the store-level when the price is for instance lower than the previous campaign season. Also, lead-time effects on store-level could be seen in Snabbgross in their customer' ordering behavior. With many wholesalers and restaurants purchasing large quantities of certain articles, their customers purchasing behavior varies between two time periods. The respondent mentioned that one consumer can purchase large volumes leading to the supply shortage one week, leading to that another consumer not being able to purchase articles. This will lead to as Coyle (2017) pointed out loss in sales because Dagab because of the time it takes for placing the order until Snabbgross receives is composed on set delivery dates based on a pre-agreement between Dagab and

Snabbgross. Moreover, both respondents representing Snabbgross also explained the difficulty of planning a forecast on campaign orders for their respective food chains due to the changing volume purchase by consumers. *Figure 13* illustrates the varying demand for an article of the total volume purchased by costumers in 24 stores. Because of the uncertainties portrayed in *figure 13*, Coyle (2017) mentions that information and more engaged planning between the actors need to occur to decrease the uncertainty in demand. Also, this means a collaborative action undertaken in the supply chain to reduce repetitive purchases leading to volume changes in orders. Furthermore, Coyle (2017) emphasizes that internal balancing methods are being used to reduce uncertainty. Interviews conducted reveal that the system recognized the number of parcels available, to prevent stockouts.

5.7.1 Forecast

Forecast of customer demand within Dagab is only performed by some departments, therefore, only some of the respondents were asked about how the forecast is performed and analyzed. The authors also interviewed to customer store to gain an understanding of the customer behavior and their impact on Dagab as an organization and its inbound and outbound logistics flows. The first issue that was highlighted was that forecast is performed differently in two functions of Dagab. Two of the respondents answered that purchase is based on historical order data and not point-of-sale. The other participants accentuated that when analyzing the customer demand, it is carried out with the help of actual sales statistics. Also, the procurement team has a well-developed system that is automated and helps assess the customer demand, in which, only "watched" articles need to be carefully analyzed before purchase. The campaign analyst who specializes in analyzing campaign forecast accentuated that analysis is performed in excel sheets as illustrated in *figure 13-14*, and because the SPSS-forecast model is inefficient, employees need to analyze most of the articles which is very monotonous and time-consuming. It is described as an inefficient approach even if the analysis is performed based on POS.

According to van Donselaar et al., (2010, p. 766) POS data is a key factor to assess accurate forecast demand which will meet the actual demand. It is highly a better predictor regarding order quantity than other data. After compiling the information given from the respondents, it is important to note that Dagab has many of the right tools to meet customer demand. Some are used more efficiently than others and identification of improvements has been found. Prusa et al., (2015, p. 63) mention that one of the reasons to conduct an accurate

forecast is to meet customer needs with as little waste as possible. It is also emphasized that the forecast will not be perfect, nor meet the actual demand, yet it is of importance to find tools to minimize the gap as much as possible. There have been developed different forecast error techniques to close the gap such as MSE, MAD, CFE, and MAPE (Coyle et al., 2017, p. 213-214. As highlighted, there are two defined demand, the independent and dependent demand. As all demand is subject to some fluctuations, it is of importance to find ways to purchase volumes with balanced safety stocks, to not fill the warehouse to full capacity, which will increase cost and waste of different form.

It is important to make accurate decisions that will not have a huge blowback on the inbound and outbound logistics flows. There are multiple challenges within the organization and pipeline. Issues that were highlighted as critical factors to creating forecast that will improve the accuracy is a developed supplier portal that is used efficiently in the sense of information sharing and volume availability. Secondly, the use of POS data in all departments and improved forecast tools with accurate SPSS-forecasts. Also, the elimination of setting forecast manually and instead develop a more automated system. This will create transparency and let the customer trust the given suggestions. It is also of importance to have customers trust the given suggestions for the system to give improved forecast calculations. Automated systems will give great value to Dagab and customer as will information sharing between Dagab and suppliers. Information sharing between all interests can give great value to all parties, therefore, customer-supplied POS data will help drive the demand planning system. This type of tool will synchronize supply chains and enhance meeting customer demand Hartzel et al., 2016, p. 173; Kiely, 1998, p. 4; Chen et al., 2009, p. 781). This will consequently, help create more efficient inbound and outbound logistics flows.

5.7.2 Supply and demand misalignment

Coyle et al., (2017) explain supply and demand misalignment is another essential element to firms in today's competitive and dynamic market. This puts a huge emphasis on actors in the supply chain to understand demand scenarios and map their relationship to product supply alternatives. All respondents explained that there are necessary tools in place for planning and information sharing across the supply chain. These tools are essential because insufficient demand management practices in a supply chain affect multiple organizations. Snabbgross explained that forecasting accuracy can be one factor causing supply and demand misalignment. The forecast specialist explained that forecasting suggestions from Dagab are

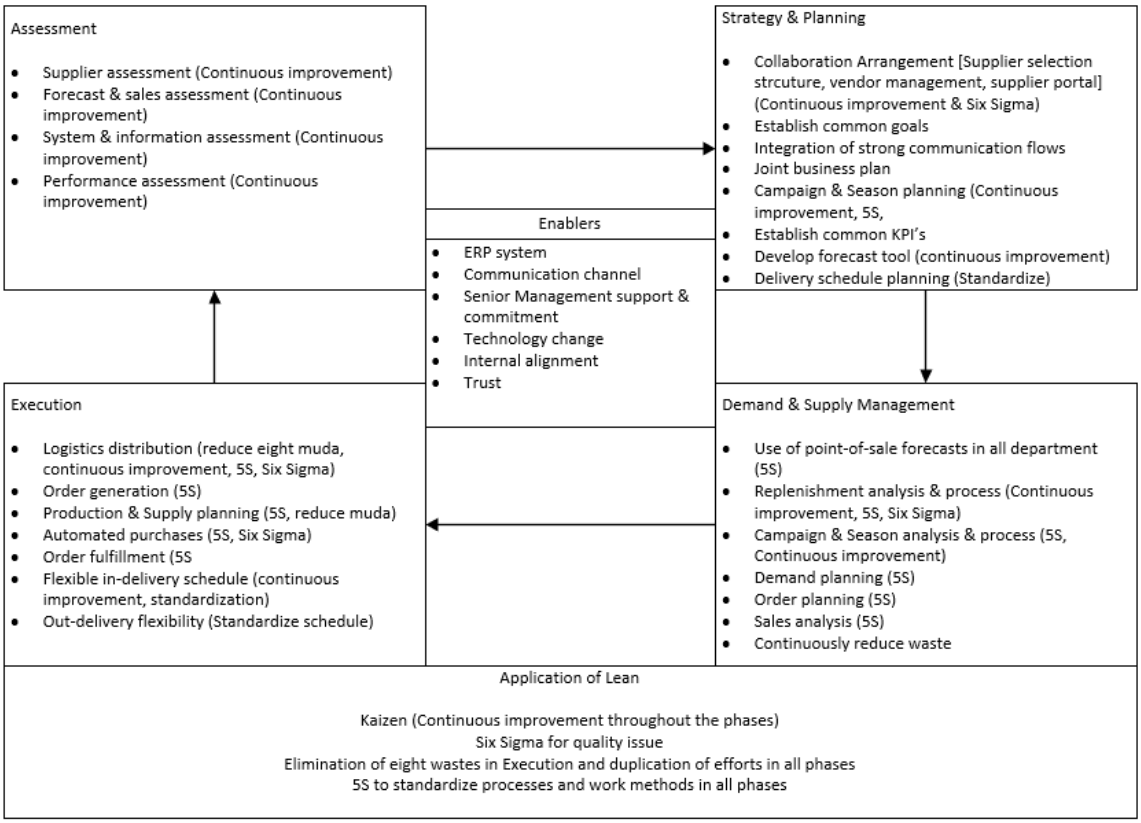
accurate in general. However, there are times when they are less accurate, and the suggestions highlight 10-12 times higher supply than sold on previous campaign seasons.

As previously pointed out in *figure 3* illustrated by Coyle (2017), collaborative engagement in the supply chain are of the essence to avoid supply and demand mismatch. Therefore, the challenge lies exploiting the supplier portal more frequently between the supplier and customer to handle supply and demand issues. The supplier portal indicates future forecast suggestions on articles, this information can then be accessed by suppliers so that they can produce accordingly. On the store level, one approach undertaken is to participate in meetings monthly with potential customers. This to receive an indication of future consumer demands. Also, the inability of gathering and analyzing accurate demand information is a challenge that can create demand misalignments. This can impact multiple parts of the supply chain and also have a significant blow on inbound flows. Supplier selection and development can be of importance (Cox et al., 2005:4), which corresponds to what the forecast specialist accentuated on, that some suppliers do not hold the measures, which results in purchasing more than needed because of high uncertainty.

5.8 Conceptual framework

Key Themes that emerged from the interviews and observations have been considered when analyzing the existing framework of CPFR as well as lean practices. This has ultimately led to the reconstruction of the original CPFR into the comprehensive framework below, which combines lean tools in all four phases. Furthermore, the reconstructed CPFR aims to act as a guideline to Dagab, in establishing ways to enhance different parts within the organization and along the supply chain, in order to enhance in- and outbound logistics flows as well as the efficiency.

Figure 12 Reconstructed model of CPFR based on theoretical and empirical findings



Source: Self-drawn (2020)

The model presented above have similar factors to the original model, but there have been added multiple factors that are of importance for Dagab to apply to enhance the topic of this thesis. Different enablers can be achieved with the original CPFR model as the enablers of such a model are, i.e. senior management support and commitment, technological change, internal alignment, trust, and communication channel. Moreover, with all respondents accentuating that EPR is a key factor for organizations in engaging in data sharing and cost and waste reduction initiatives. ERP systems enable trading partners to share important data regarding for instance information on the availability of an article. In *figure 12* above, the potential enablers from existing theory and Dagab inköp and logistics are summarized. These enablers are essential for the successful implementation of CPFR. However, the adaptation of such a model requires active work. Therefore, the application of lean tools is essential to increase the efficiency of CPFR. Also, combining lean tools in this model will allow for enhancing the logistics flows, which are in the third phase. It is essential to understand that

the logistics flows are highly impacted by many different factors along the supply chain and within the organization.

Therefore, in the reconstructed model, the authors argue that the application of lean should in fact be applied to all four phases due to its beneficial factors from both an economical and performance perspective. The original CPFR model does not apply these tools and after extensive analysis of the collected material, it is concluded that a combination would help enhance not only inbound- and outbound logistics flows, but also different areas within the organization and outside that has a positive impact on efficiency as well as profitability.

The application of lean tools such as Six Sigma, 5S, Kaizen (continuous improvement) in decision-making and daily work tasks can help reduce and/or eliminate different forms of waste, and also, increase productivity and performance. It is also essential to apply these types of tools to strengthen relationships between different departments as well as organizations in the supply chain. Also, this type of application will increase efficiency and further enhance product and process quality. Changes are deeply dependent on the engagement and motivation of managers as well as the overall organizational hierarchy. One vital challenge to the successful integration of this extensive framework is finding the balance between the reduction and accession of excessive costs. However, to achieve the potentials of the reconstructed CPFR model, all interests in the supply chain need to be motivated for change and understand the potential outcome of this.

This also aligns with the research by Ayantoyinbo et al., (2018, p. 70) which describes that flows are set to help organizations maximize the reliability and efficiency of distribution networks as well as minimize transportation and storage costs. The main goal is to achieve the objectives; increased efficiency, increased sales, stronger relationships, and ultimately improve customer service. Therefore, the phases of CPFR is of major importance as attaining optimized flows requires extensive strategy & planning, the management of demand & supply with, execution, and assessing the performance. Applying lean tools in each phase is important because it strives to enhance the production system to meet the customer and market needs as well as continuously improve the flow of goods to reduce and/or eliminate waste in a firm's operations (Phogat, 2013). Stanton et al., (2014) and Martinéz-Jurado et al., (2014) have both mentioned that LM and Six Sigma are tools to help organizations to progress and enhance established results as well as become more competitive in the market.

6. Conclusion

This section aims to answer the research purpose and questions based on the frame of reference, empirical findings, and analysis. The underlying purpose of this study is how to enhance inbound and outbound logistics flows at Dagab Inköp & Logistik. This chapter concludes how a combination of CPFR and lean tools can help enhance inbound and outbound logistics flows.

6.1 What are the potential enablers of implementing the CPFR model?

With the goal of organizations being to improve the overall performance supply chain partner needs to find new ways to deliver to the end customer at minimum cost and time. Through the application of CPFR trading partners can engage in collaborative activities such as forecasting, scheduled production, and information sharing initiatives. However, for the accomplishment of successful implementation of the CPFR business model there are several enablers. Theory suggests senior management support and commitment, internal alignment, trust, and communication as critical success factors. In addition, finding from empirical data highlighted that the ERP system supports data sharing amongst various departments in their supply chain. Moreover, the respondents highlighted the ERP system as an important tool for cost reduction and facilitate the coordination across the supply chain in order to better meet common goals. Therefore, ERP in combination with the theoretical enablers acts as a tool for the successful implementation of ERP systems.

Moreover, with the case study being a company that handles the logistic operations for large Swedish food chains. Implementing the CPFR model with strategy & planning, demand & supply management, execution, and analysis will ultimately help Dagab Inköp & Logistik by combining knowledge from multiple actors in the supply chain by utilizing technologies available for engaging in collaborative planning. As members of Dagab's supply chain suffer from inefficiencies caused by duplications and limited information sharing between actors as model enhancing cross-departmental collaboration is essential.

6.2 How can lean practices enhance enhance inbound and outbound logistics flows?

In conclusion, this study has distinguished the enablers of lean tools and the impact it has on an organization. Based on theory as well as the empirical findings it has been highlighted that tools such as Kaizen, elimination of waste (eight Muda), Six Sigma, and 5S, organizations, can, in fact, undertake a holistic approach in their planning, and thus, enhance systems, work methods, and more specifically the logistical flows, which have been the main focus of this study. Furthermore, CPFR as a business model focuses on the integration of collaborative planning with suppliers and customers, forecasting, and replenishment, but the integration of lean tools has not taken into consideration to help enhance the four phases that are part of CPFR.

Lean is a concept integrated into an organization to create efficiency and effectiveness. Reducing cost and wastes are also essential and key factors. Therefore, it is believed to be an essential concept that should be integrated into CPFR as illustrated in the conceptual framework. Lean will actively work to standardize the way of working as well as influence change, which is essential to increase competitive advantage. The reason for implementing lean tools is ultimate because it will have an impact on the whole supply chain, and more specifically the chosen topic as the empirical findings highlighted that multiple interests affect how efficient inbound- and outbound logistics flows are. The application of lean tools will increase productivity and performance, which will essentially result in higher profitability and increase quality to satisfy customer needs. These types of tools will also benefit the enablers mentioned in the reconstructed model. Essentially, the reason to adopt these tools is to enhance the inbound- and outbound logistics flows, and to do so it is required by the organizations and involved interests to reduce as much waste as possible as well as strengthen the communication flows. By applying i.e. 5S or Kaizen, processes can be standardized and continuously improved. This will have ultimately had an overall performance enhancement, which will be very much appreciated within the supply chain.

7. Discussion

This chapter discusses theoretical implications and limitations when conducting this thesis. Followed by a short discussion of interesting research for the future.

7.1 Theoretical implications

Dagab Inköp & Logistik work in a high paced environment where they need to satisfy and meet uncertain demand often. This has a great effect on multiple areas of the supply chain and specifically the logistics flows. This thesis provides a well understanding of how the combination of lean tools and the CPFR business model can have a positive impact on daily efficiency and long-term profitability. In previous research, CPFR has not applied any lean tools in any of the phases. After analyzing the empirical findings to theory, it has been noted that a gap exists and according to the results it is essential to apply such tools in different areas, which can be highlighted in the reconstructed framework. The reason is that the CPFR model is limited and would benefit from lean tools that actively works to reduce costs and wastes with the intention to gain efficiency and effectiveness. The reconstructed model used the same phases but has added other factors to obtain the enablers. This requires lean tools in all four phases as highlighted in the new model to enhance the logistics flows.

7.2 Limitations

The first limitation to highlight is the time frame of conducting this thesis. The limited time frame resulted in the authors deciding to study the phenomenon from the perspective of one customer instead of multiple food chains.

The unforeseen COVID-19 situation globally impacted also the collection of data and limited the number of respondents that were supposed to participate. The interviews were also performed through Microsoft Teams, which might have limited the validity and reliability of the respondent's answers as observations of body language could not be taken into account. It also affected the observations that was going to take place in the different departments and with Snabbgross. The observations that were conducted took place digitally through Teams Microsoft.

This thesis was conducted with a single case company, Dagab Inköp & Logistik within the food industry. There is a possibility that the result would differ between companies within

the same industry even if the methodology approach was justified and feasible. Also, because of the time frame, the phenomenon was studied from a limited point of view. Therefore, the result can differ if other variables were to be considered.

7.3 Future Research

The authors found several interesting areas for future research when conducting this thesis at Dagab Inköp & Logistik. This study has focused on Snabbgross's purchasing behavior and its impact on inbound and outbound logistics flows. A future research area would be to examine multiple food chains such as Hemköp, Willys, and Tempo's purchasing behavior and examine its impact on inbound and outbound logistics flows. Furthermore, the environmental impact of transportation of goods inflow and outflow would be an area for future research examining fill rate and capacity. Also, the mentioned enablers such as communication channels and technology change should be evaluated or chosen as variables when conducting future research regarding the logistics flows. This thesis has also been more of theoretical research, therefore, a study based on actual data to study the impact of cost with regard to the current logistics flows would be of interest. Furthermore, another area for future research would be inbound and outbound logistics flows' impact on long term profitability.

Moreover, quantitative research for examining forecasting techniques and errors would potentially help Dagab in planning for current demand. This would potentially impact its inbound and outbound logistics flows by creating more accurate forecasts. Lastly, the authors believe research on the implementation process for an information system in a real case such as Dagab and the different stages/processes be a potential area for future research.

8. Recommendations

The last chapter of this thesis highlights short- and long-term recommendations based on the findings analysed in light to the discourse of theory, which helped reconstruct the CPFR business model and further apply lean tools in the model.

8.1 Recommendations

There are both short- and long-term changes that can be integrated into Dagab to enhance in- and outbound logistics flows. As the flows are impacted by internal and external interests, it is essential to motivate employees and important interests to want to change. As the market and demand are shifting, it is inevitable not to implement changes.

Short term suggestions are less costly and require the motivation of change within the group, therefore, the authors have highlights short-term recommendations as per below:

- *Implement 5S and Lean management in order to reduce and/or eliminate waste and costs.*
- *Integrate continuous improvement in the culture for employees to actively improve processes and systems.*
- *Implement supplier selection structure to find attractive and trustworthy suppliers in order to reduce. order with high safety stock because of fear of not being able to deliver expected demand.*
- *Teach employees about eight forms of waste to actively reduce waste levels at a warehouse- and office level.*
- *Use point-of-sale data throughout the whole process.*
- *Assessment of processes, suppliers, and demand.*
- *Increase the number of days for delivery.*
- *Follow-up with food chains of potential enablers and inhibitors.*

The authors also suggest long-term changes as these are costly and time-consuming. There are many variables that needs to be considered. These recommendations can help enhance the overall profitability and enhance in- and outbound logistics flows as it will allow involved interests to have the right information at the right time.

Furthermore, Dagab needs the right tools and the right data to assess the best solution to meet the actual demand. Therefore, the *long-term recommendations* are presented below:

- *Implement the CPFR business model in full and continuously improve the phases.*
- *Implement a forecast engine & tool to reduce and/or eliminate forecast uncertainty.*
- *Implementation of an efficient and fully integrated ERP system.*
- *Actively apply the lean concept into the organization and across the supply chain.*
- *Strengthen long-term relationships with suppliers to find suitable approaches to meet supplier demand and establish common goals.*

References

Abolghasemi, M., Gerlach, R., Tarr, G., & Beh, E. (2019). Demand forecasting in supply chain: The impact of demand volatility in the presence of promotion. Vol. 142, pp. 1–12.

Abushaikha, I., Salhieh, L., & Towers, N. (2018). Improving distribution and business performance through lean warehousing. *International Journal of Retail & Distribution Management*. Vol. 46 (8), pp. 780-800.

Ali, M. M., Babai, M. Z., Boylan, J. E., & Syntetos, A. A. (2017). Supply chain forecasting when information is not shared. *European Journal of Operational Research*. Vol. *260* (3), pp. 984-994.

Ali, M., & Miller, L. (2017). ERP system implementation in large enterprises–a systematic literature review. *Journal of Enterprise Information Management*. Vol. 30 (4). pp. 666–692.

Al-Mashari, M., Al-Mudimigh, A. and Zairi, M. (2003). Enterprise resource planning: a taxonomy of critical factors. *European Journal of Operational Research*. Vol. 146 (2), pp. 352–364.

Alvehus, J. (2019). *Skriva Uppsats med Kvalitativ Metod: En Handbok*. Stockholm: Liber.

Amaratunga, D., Baldry, D., Sarshar, M., & Newton, R. (2002). Quantitative and Qualitative Research in the Built Environment: Application of Mixed Research Approach. *Work study*. Vol. 51 (1), pp. 17-31.

Amoako-Gyampah, K. (2007). Perceived usefulness, user involvement and behavioral intention: an empirical study of ERP implementation. *Computers in Human Behavior*. Vol. 23 (3), pp. 1232-1248.

Anđelković, A., Radosavljević, M., & Stošić, D. (2016). Effects of Lean tools in achieving Lean warehousing. *Economic themes*. Vol. 54 (4), pp. 517-534.

Angkiriwang, R., Pujawan, I. N., & Santosa, B. (2014). Managing uncertainty through supply chain flexibility: reactive vs. proactive approaches. *Production & Manufacturing Research*. Vol 2 (1), pp. 50-70.

Ayantoyinbo, B. B., & Gegeleso, O. M. (2018). Impact of Inbound and Outbound Logistics Services on Small Scale Business. *Transport & Logistics*. Vol. 18 (44), pp. 69-76

Axfood. (2020). Ett framgångsrikt 2019. Source: https://www.axfood.se/media-och-opinion/pressmeddelanden/2020/02/ett-framgangsrikt-2019/ (Access 2020-03-02).

Bell, J., & Waters, S. (2014). *Doing Your Research Project: A Guide For First-Time Researchers*. UK: McGraw-Hill Education.

Bonilla-Ramirez, K. A., Marcos-Palacios, P., Quiroz-Flores, J. C., Ramos-Palomino, E. D., & Alvarez-Merino, J. C. (2019). Implementation of Lean Warehousing to Reduce the Level of Returns in a Distribution Company. In *2019 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*. pp. 886-890.

Bukhari, A., Asim, M., & Manzoor, S. (2020). Role of Lean Warehousing in Improving Business Performance and Distribution. *Journal of Entrepreneurship and Business Innovation*. Vol. 2 (1), pp. 23-32

Bryman, A., & Bell, E. (2017). *Företagsekonomiska forskningsmetoder*. Lund: Liber AB

Carter, R., J., & Ferrin, G., B. (1996). Transportation costs and inventory management: Why transportation costs matter. *Production and Inventory Management Journal*. Vol. 37 (3), pp. 58-62

Camacho-Miñano, M. D. M., Moyano-Fuentes, J., & Sacristan-Diaz, M. (2013). What can we learn from the evolution of research on lean management assessment?. *International Journal of Production Research*. Vol. 51 (4), pp. 1098-1116.

Chen, P., S., Huang, C., Y., Yu, C., C., & Hung, C., C. (2017). The examination of key performance indicators of warehouse operation systems based on detailed case studies. *Journal of Information and Optimization Sciences*. Vol. 38 (2), 367-389.

Chen, L., & Lee, L. H. (2009). Information Sharing and Order Variability Control Under a Generalized Demand Model. *Management Science.* Vol. 55 (5), pp. 781-797.

Cox, A., Chicksand, D., & Ireland, P. (2005). Overcoming Demand Management Problems: The Scope for Improving Reactive and Proactive Supply Management in the UK Health Service. *Journal of Public Procurement.* Vol. 5 (1), pp. 1-22.

Coyle, J. J., Langley, C. J., Novack, A. R., & Gibson, J. B. (2017). *Supply Chain Management - A Logistics Perspective.* Boston: Cengage Learning.

De Koster, B. M. R., Johnson, L. A., & Roy, D. (2017). Warehouse design and management. *International Journal of Production Research.* Vol. 55(21), pp. 6327–6330.

De Koster, R., Le-Duc, T., & Roodbergen, K. J. (2007). Design and control of warehouse order picking: A literature review. European journal of operational research. Vol. 182 (2), 481-501.

Easterby-Smith, M., Thorpe, R., & Jackson, P. (2015). *Management & Business Research.* Los Angeles: Sage Publications Ltd.

Eisenhardt, M., K. (1989). Building Theories from Case Study Research. The *Academy of Management Review.* Vol. 14 (4), pp. 532-550.

Eksoz, C., Mansouri, S. A., & Bourlakis, M. (2014). Collaborative forecasting in the food supply chain: a conceptual framework. *International journal of production economics*, Vol. 158, pp. 120-135.

Faber, N., de Koster, M.B.M., & Smidts, A. (2013). Organizing warehouse management. *International Journal of Operations & Production Management.* Vol. 33 (9), pp. 1230-1256.

Filip, F. C., & Marascu-Klein, V. (2015). The 5S lean method as a tool of industrial management performances. *In IOP conference series: materials science and engineering*. Vol. 95 (1), pp. 1-6

Fink, A. (2019). *Conducting Research Literature Reviews: From the Internet to Paper*. Thousand Oaks: Sage Publications, Inc.

Fliedner, G. (2003). CPFR: an emerging supply chain tool. *Industrial Management & data systems*. Vol. 103 (1), pp. 14-21.

Fu, H. P., Chu, K. K., Lin, S. W., & Chen, C. R. (2010). A study on factors for retailers implementing CPFR—A fuzzy AHP analysis. *Journal of Systems Science and Systems Engineering*. Vol. 19 (2), pp. 192-209.

Gunasekaran, A., Marri, H., B., & Menci, F. (1999). Improving the effectiveness of warehousing operations: a case study. *Industrial Management & Data Systems*. Vol. 99 (7 & 8), pp. 328-339.

Haldan Consulting. (2020). The Eight wastes of Lean. Source: https://haldanconsulting.com/the-8-wastes-of-lean/ (Access 2020-05-17).

Hakim, M., I., Zaqiah, O., R., & Zagloel, M., Y., T. (2018). Optimization of Inbound Logistics Cost in Automotive Industry. *MATEC Web of Conferences 204*. pp. 1-7.

Hartzel, S., K., & Wood, A., C. (2016). Factors that affect the improvement of demand forecast accuracy through point-of-sale reporting. *European Journal of Operational Research*. Vol. 260 (1), pp. 171-182.

Heragu, S., S., Du, L., Mantel, R., J., & Schuur, P., C. (2005). Mathematical model for warehouse design and product allocation. *International Journal of Production Research*. Vol.43 (2), pp. 327-338.

Hofmann, E., & Rutschmann, E. (2018). Big data analytics and demand forecasting in supply chains: a conceptual analysis. *The international journal of logistics management*. Vol. 29 (2), pp. 739-766.

Hollmann, L. R., Scaverda, F. L., & Thomé T. M. A. (2015). Collaborative planning, forecasting and replenishment: a literature review. *International Journal of Productivity and Performance Management.* Vol. 64 (7), pp. 971-993.

Hyde, F. K. (2000). Recognising Deductive Processes in Qualitative Research. *Qualitative Market Research: An International Journal.* Vol. 3 (2), pp. 82-90.

Intersoft Consulting. (2020). General Data Protection Regulation (GDPR). Available: https://gdpr-info.eu/art-1-gdpr/ (Access 2020-03-20).

Jaipuria, S., & Mahapatra, S. S. (2014). An improved demand forecasting method to reduce bullwhip effect in supply chains. *Expert Systems with Applications*. Vol. 41 (5), pp. 2395–2408.

Jonsson, P., & Mattsson, S. A. (2005). *Logistik: Läran om effektiva materialflöden*. Lund: Studentlitteratur AB.

Kadarova, J., & Demecko, M. (2016). New approaches in lean management. *Procedia Economics and Finance*. Vol. 39 (1), pp. 11-16.

Kiely, A. D. (1998). Synchronizing supply chain operations with consumer demand using customer data. *Journal of Business Forecasting Methods & Systems.* Vol. 17 (4), pp. 3-9.

Liberatore, M. J., & Miller, T. (2016). Outbound Logistics Performance and Profitability: Taxonomy of Manufacturing and Service Organizations. *Business & Economics Journal.* Vol. 7 (2), pp. 1-9.

Liker, K., J. (2011). *The Toyota Way: Lean för Världsklass.* Stockholm: Liber.

Lincoln, S., Y., & Guba, G., E. (1985). *Naturalistic Inquiry.* Thousand Oaks: Sage Publications, Inc.

Maditinos, D., Chatzoudes, D., & Tsairidis, C. (2011). Factors affecting ERP system implementation effectiveness. *Journal of Enterprise Information Management.* Vol. 25 (1), pp. 60-78.

Marques, A., Soares, R., Santos, J. M., & Amorim, P. (2020). Integrated planning of inbound and outbound logistics with a Rich Vehicle Routing Problem with backhaul. *Omega.* Vol. 92, pp. 1-18.

Martinéz-Jurado, J. P., & Moyano-Fuentos, J. (2014). Lean Management, Supply Chain Management and Sustainability: A Literature Review. *Journal of Cleaner Production.* Vol. 85, 134-150.

Meng, X. (2018). Lean management in the context of construction supply chains. *International Journal of Production Research.* Vol. 57 (11), pp. 3784-3798.

Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2015). *Purchasing and supply chain management.* Boston: Cengage Learning.

Neubert, G., & Bartoli, P. (2009). Impact of Inbound Logistics on Design of Production System. *IFAC Proceedings Volumes*. Vol. 42 (4), pp. 1802-1807.

Panahifar, F., Heavey, C., Byrne, P. J., & Fazlollahtabar, H. (2015). A framework for collaborative planning, forecasting and replenishment (CPFR). *Journal of Enterprise Information Management*. Vol. 28 (6), pp. 838-871.

Panahifar, F., Byrne, P. J., & Heavey, C. (2015). A hybrid approach to the study of CPFR implementation enablers. *Production Planning & Control.* Vol. 26 (13), pp. 1090-1109.

Parikh, M., A., & Joshi, K. (2005). Purchasing process transformation: restructuring for small purchases. *International Journal of Operations & Production Management*. Vol 25. (11), pp. 1042-1061.

Phogat, S. (2013). An Introduction to applicability of Lean in Warehousing. *International Journal of Latest Research in Science and Technology*. Vol. 2 (5), pp. 105-109.

Poler, R., Hernandez, E., J., Mula, J., & Lario, C., F. (2008). Collaborative Forecasting in Networked Manufacturing Enterprises. *Journal of Manufacturing Technology Management.* Vol. 9 (4), pp. 514-528

Pooler, D. J., & Pooler, V. H. (2012). *Purchasing and supply management: creating the vision*. New York: Springer Science & Business Media.

Porter, E., M. (2008). *Competitive Advantage – Creating and Sustaining Superior Performance.* New York: Free Press.

Prusa, P., & Chocholac, J. (2015). Demand Forecasting in Production Logistics of Food Industry. *Applied Mechanics & Materials.* Vol. 803, pp. 63–68.

Puga, S., M., Minner, S., & Tancrez, J-S. (2019). Two-stage supply chain design with safety stock placement decisions. *International Journal of Production Economics*. Vol. 209, pp. 183-193.

Rajahonka, M., & Bask, A. (2016). The development of outbound logistics services in the automotive industry A logistics service provider's view. *Development of Outbound Logistics Service.* Vol. 27 (3), pp. 707-737.

Ranjan, S., Jha, V. K., & Pal, P. (2016). Literature review on ERP implementation challenges. *International Journal of Business Information Systems*. Vol. 21 (3), pp. 388-402.

Reiner, G., & Fichtinger, J. (2009). Demand forecasting for supply processes in consideration of pricing and market information. *International Journal of Production Economics*. Vol. 118 (1). pp. 55-62.

Rexhausen, D., Pibernik, R., & Kaiser, G. (2012). Customer-facing supply chain practices—The impact of demand and distribution management on supply chain success. *Journal of Operations Management*. Vol. 30 (4), pp. 269-281.

Riberio, A. R., Powell, L. P., & Baldwin, E. J. (1995). Uncertainty in decision-making: An abductive perspective. *Decision Support Systems*. Vol. 13 (2), pp. 183-193.

Richards, G., (2018). *Warehouse management: A complete guide to improving efficiency and minimizing costs in the modern warehouse*. London: Kogan Page Ltd.

Ross, D. F. (2015). *Distribution Planning and control: managing in the era of supply chain management*. Chicago: Springer Science & Business Media.

Sabath, R. (1995). Volatile demand calls for quick response: the integrated supply chain. *Logistics Information Management*. Vol 8 (2), pp. 49-52.

Saunders, M., Lewis, P., & Thornhill, A. (2012) *Research Methods for Business Students*. Harlow: Pearson Education Ltd.

Seuring, S., & Gold, S. (2012). Conducting Content-Analysis based literature reviews in Supply Chain Management. *Supply Chain Managemement: An International Journal*. Vol. 17 (5), pp. 545-555.

Singhry, H. B., & Rahman, A. A. (2019). Enhancing supply chain performance through collaborative planning, forecasting, and replenishment. *Business Process Management Journal*. Vol. 25 (4), pp. 625-646.

Spens, M. K., & Kovács, G. (2006). A Content Analysis of Research Approaches in Logistics Search. *Department of Marketing*. Vol. 36 (5), pp. 374-390.

Stanton, P., Gough, R., Ballardie, R., Bartram, T., Bamber, J. G., & Sohal, A. (2014). Implementing lean management/Six Sigma in hospitals: beyond empowerment or work intensification? *The International Journal of Human Resource Management*. Vol. 25. (21), pp. 2926-2940.

Storhagen, G. N. (2014). *Logistik-Grunder och möjligheter*. Stockholm: Liber

Svensson, G. (2002). A Conceptual framework of vulnerability in firms' inbound and outbound logistics flows. *International Journal of Physical Distribution & Logistics Management.* Vol. 32 (2), pp. 110-134.

Umble, E., J., Haft, R., R., & Umble, M., M. (2003). Enterprise resource planning: implementation procedures and critical success factors. *European Journal of Operational Research*. Vol. 146 (2), pp. 241-57.

Van der Laan, E., van Dalen, J., Rohrmoser, M., & Simpson, R. (2016). Demand forecasting and order planning for humanitarian logistics: An empirical assessment. *Journal of Operations Management*. Vol. 45, pp. 114-122.

Van Donselaar, H., K., Gaur, V., van Woensel, T., Broekmeulen, A., C., M., R., & Fransoo, C., J. (2010). Ordering Behavior in Retail Stores and Implications for Automated Replenishment. *Management Service.* Vol. 56 (5), pp. 766-784.

Van Niekerk, H., J., & Bean, W., L. (2019). Evaluation of the Cost Drivers and Allocation Framework in Outbound Logistics of the Fast-Moving Consumer Goods Industry. *South African Journal of Industrial Engineering.* Vol. 30 (2), pp. 115-130.

Van Weele, A. J. (2009). *Purchasing and supply chain management: Analysis, strategy, planning and practice*. Cengage Learning EMEA.

Wang, W., Yuan, Y., Archer, N., & Guan, J. (2005). Critical factors for CPFR success in the Chinese retail industry. *Journal of Internet commerce*. Vol. 4 (3), pp. 23-39

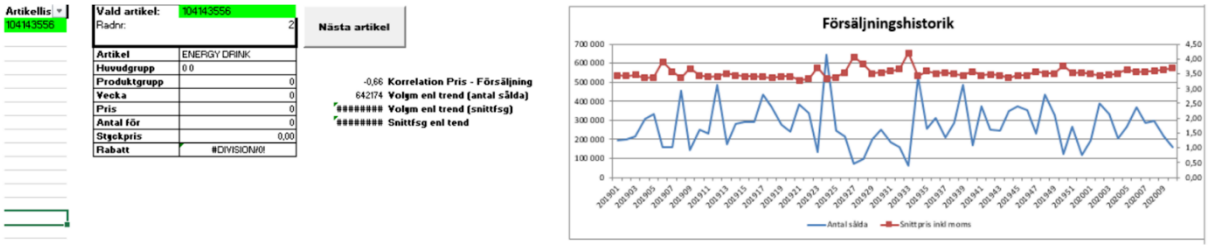
Willis, W. J. (2007). *Foundations of Qualitative Research: Interpretive and Critical Approaches.* Thousand Oaks: Sage Publications Inc.

Yin, K. R. (2013). *Case Study Research: Design and Methods.* Los Angeles: Sage Publications, Inc.

Appendices

Appendix 1. Forecast Description & Graph

Figure 13 Forecast Description & Graph



Source: Dagab Inköp & Logistik (2020)

Appendix 2. Article Forecast Information

Figure 14 Article Forecast information

Week	Price	Antal för	Ord. Pris	Price per unit	Discount	Number units sold	Number of stores	Average sales	Campaign Type
201908	3,15	1		3,15		456270	24	19011	Type 2
201911	2,50	1		2,50		232603	24	9692	Type 1
201912	2,50	1		2,50		487409	24	20309	Type 1
201912	3,20	1		3,20		487409	24	20309	Type 2
201917	3,15	1		3,15		437006	24	18209	Type 2
201921	3,33	1		3,33		385042	24	16043	Type 1
201922	3,33	1		3,33		337667	24	14069	Type 1
201924	3,15	1		3,15		643185	24	26799	Type 2
201929	3,19	1		3,19		199575	24	8316	Type 2
201934	3,19	1		3,19		525367	24	21890	Type 2
201939	3,19	1		3,19		484159	24	20173	Type 2
201941	2,99	1		2,99		374897	24	15621	Type 3
201942	2,99	1		2,99		249765	24	10407	Type 3
201943	3,37	1		3,37		246462	24	10269	Type 1
201944	3,37	1		3,37		347828	24	14493	Type 1
201948	3,19	1		3,19		432466	24	18019	Type 2
201951	3,37	1		3,37		267511	24	11146	Type 1
201952	3,37	1		3,37		119782	24	4991	Type 1
202001	3,37	1		3,37		195573	24		Type 1
202002	3,37	1		3,37		390601	24	16275	Type 1
202003	3	1		3,39		332675	24	13861	Type 1
202004	3	1		3		203913	24	8496	Type 1
202008	3	1		3		297720	25	11909	Type 2

Analys | Försäljningsstatistik | Kampanjhistorik | IndataFörsäljning | IndataKampanj

Source: Dagab Inköp & Logistik (2020)

Appendix 3. Consent form

Consent for Participation in Research

JÖNKÖPING UNIVERSITY
International Business School

I volunteer to participate in a research project conducted by Abdelrahman Audi and Yonis Raage from Jönköping International Business School. I understand that the project is designed to gather information about the value flows within Dagab.

1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty. If I decline to participate or withdraw from the study, no one on my campus will be told.

2. I understand that most interviewees in will find the discussion interesting and thought-provoking. If, however, I feel uncomfortable in any way during the interview session, I have the right to decline to answer any question or to end the interview.

3. Participation involves being interviewed by researchers from Jönköping International Business School. The interview will last approximately 45-60 minutes. Notes will be written during the interview. An audio tape of the interview and subsequent dialogue will take place for researchers to not miss details said in the interview.

4. I understand that the researcher will not identify me by name in any reports using information obtained from this interview, and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

5. It is only the researchers that will have access to raw notes or transcripts. This precaution will prevent my individual comments from having any negative repercussions.

6. I understand that this research study has been reviewed and approved Dagab Inköp & Logistik AB and JIBS.

7. I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

8. I have been given a copy of this consent form.

Signature	Date	Signature	Date
		Abdelrahman Audi & Yonis Raage	
Printed name		Printed Name	

For further information, please contact:

Abdelrahman Audi and/or Yonis Raage

Auab18er@student.ju.se

Rayo1800@student.ju.se

Appendix 4. Intervjuguide-Swedish

Vi skriver en masteruppsats i jönköping universitet och vårt problemområde är att undersöka hur tillämpningen av CPFR modellen och lean verktyg kan utjämna in och utflöden. Vidare kommer denna undersökning att analysera Snabbgross köpbeteende och hur detta påverkar inköpsfunktionen, prognostisering, lagerhållning och flödesplanering i det dagliga arbetet.

Intervju Bakgrund

- Berätta lite om din roll
- Hur länge har du haft din roll?

Inköp

- Hur ser inköpsprocessen ut idag?
- Hur arbetar inköpsavdelningen för att tillgodose kundbehovet?
- Vilka fördelar ser du med nuvarande inköpsprocess?
- Vilka utmaningar ser du med nuvarande inköpsprocess?
- Hur upplever ni idag med att arbeta med ramavtal (avtal som innefattar beställningar från kunder med fasta priser och kvantiteter under en tidsperiod)?
- Vad baseras era inköpsprognoser på?
- Hur säkerställer att kundens efterfråga levereras?
- Hur förhåller ni er till kapacitetsnivån i lager vid inköp?

Efterfråga

- Vad för information behöver ni i förväg för att kunna förse efterfrågan?
- När bör informationen tillhandahållas för att arbeta med efterfrågan på bästa möjliga sätt?
- Var skulle du vilja se förbättringar i försörjningskedjan för att förse behovet bättre/mer effektivt?
- Hur nära inpå en leverans kan kunden ringa in och ändra beställning?
- Vilken nivå på efterfrågan kan ni hantera på daglig bas?
- Har vi en klar struktur på hur arbetet från efterfrågan, köp, inleverans till utleverans?
- Hur jobbar ni på Dagab med osäkerhet i efterfrågan?
- Hur ser kapacitetsnivån mot efterfrågan ut?
- Vad för verktyg använder vi idag för att effektivt möta efterfrågan?

Inbound and outbound logistics

- Hur påverkar inköp Dagabs in- och utflöden?
- Vad krävs för att effektivare flöde?
- Vilka utmaningar ser du med in- och utleverans från lager?
- Vilka är de största utmaningarna med inflöden samt utflöden?
- Hur kan vi förbättra utflödet till kund?
- Vilka utmaningar ser ni med era in- och utflöden?
- Vad skulle du säga krävs för ett effektivare utflöde?
- Hur många dagar innan bör efterfrågan ha fastställts för att kunna arbeta effektivt samt leverera rätt mängd vid rätt tid?
- Hur påverkar ramavtal in och utflödet (dvs att kunden ringer in innan utleverans och ändrar sin beställning)
- Hur påverkar manuella beställningar (NWO och butiksupport) in- och utflöden, främst utflödet?

Gemensam planning, beräkning och påfyllnad (CPFR)

- CPFR är ett verktyg för att förbättra resultatet i försörjningskedjan med fokus på olika processer. Applicerar ni denna modell eller annan modell effektivt idag?
- Om en annan modell? Vad för modell utgår ni ifrån?
- Modellen består av dataanalys, strategi och planering (det vill säga mellan dagab, leverantörer och kedja) för att tillgodose det faktiska behovet Demand & supply management är processen av prognoserna?
- Hur är kommunikationskanalen i försörjningskedjan? Är det något som skulle behöva förbättras för att få bättre utflöden till butik?
- Vad krävs för att få bättre kommunikationskanaler?
- Har ni något system idag för detta?
- Har vi en klar struktur på hur arbetet från efterfrågan, köp, inleverans till utleverans?
- Vilken inverkan har den på era resurser, planering samt har den en effekt på kostnader ur ett lager+ logistikperspektiv?Hur planerar ni fördelning av manuella beställningar och det som kommer in på KOFF+Autoorder?
- Hur ser informationsflödet ut mellan Kedja och Dagab? Är den effektiv?
- Första steget för att tillgodose efterfrågan är att ha en bra och stark relation samt kommunikation mellan parterna. Hur gör vi idag? Hur kan vi förbättra informationskanalen samt relationen för att tillgodose efterfrågan effektivt
- Hur planeras fördelning av manuella beställningar och förslag som kommer in på KOFF+Autoorder?

Lagerhållning och Lean

- Utövas Lean konceptet i det dagliga arbetet samt varuflödet?
- Hur ser ni på slöseri?
- På vilket sätt kan slöseri reduceras och/eller elimineras?
- Ser ni att slöseri uppstår på grund av inkonsekventa utflöden.
- GS1 och EAN-koder, vad är det som gör att 40 % inte har det? Hur skulle det förbättra dagens flöden?
- Har ni implementerat ett effektivt slottschema? På vilket sätt skulle det effektivisera ut-flödet samt skulle det bidra till mindre slöseri och kostnader?
- Varför uppstår så mycket slöseri och hur kompenserar vi efterfrågan från det som går förlorad?
- Hur planerar ni fördelning av manuella beställningar och det som kommer in på KOFF+Autoorder?
- Det är fler utleveransdagar, hur kommer det sig att det är färre inleveransdagar? Och på vilket sätt skulle det förbättra arbetet samt utflödet?
- Hur nära inpå en leverans kan kunden ringa in och ändra beställning
- GS1 och EAN-koder, vad är det som gör att 40 % inte har det? Hur skulle det förbättra dagens flöden?
- Har ni implementerat ett effektivt slottschema? På vilket sätt skulle det effektivisera utflödena samt skulle det bidra till mindre slöseri och kostnader?
- Hur förhåller ni er till de tre dimensionerna vad gäller låg kostnad, låg lagerhållning och hög kundservice? Hur gör ni för att uppnå detta?

Appendix 5. Interview guide - English

We are writing a thesis on master level at Dagab Inköp and Logistik where the focus is to examine the potential enablers of integrating CPFR business model and lean to optimize inbound and outbound logistics flows. Furthermore, the focus area of this work will be on store, procurement, forecasting, and warehousing level. This in order to examine the current existing hindrances creating inconsistent inbound and outbound logistics flows.

1. General questions

- How would you describe your role?
- For how long have you had your role?

2. Purchasing

- How does the purchasing department work to meet customer's needs?
- What are the advantages with the purchasing process?
- What are the challenges with the purchasing process?
- How do you experience working with Blanket orders?
- What type of forecast is purchase based on?
- How does purchasing ensure that customer demand is delivered

3. Demand

- What information is needed in advance to be able to meet supply & demand?
- When should information be provided in order to work with demand in the best possible way?
- Where would you like to see improvements in the supply chain to supply the need more efficiently?
- When can a customer call in and change his/her order at latest?
- What demand levels can you manage on a daily basis?
- Is there a clear structure in place for planning demand, purchasing, inflow and outflow of goods?
- How does Dagab Inköp & Logistik work with uncertainty in demand
- What planning tools are in place in order to effectively meet demand?

4. Inbound and outbound logistics

- How does purchasing affect Dagab's inflow and outflow of goods?
- How can Dagab achieve more efficient inflow and outflow?
- What are the current existing challenges within inflow and outflow from warehouse?
- What are the biggest challenges with inflow and outflow?
- How can Dagab improve outflow from warehouse to customer?
- What would you say is needed for more efficient outflow?

- How many days in advance should demand have been determined in order to work efficiently and deliver the right amount at the right time?
- How can Blanket agreements affect outflow to customer?
- How do manual orders (NWO and store support) affect inflows and outflows, mainly the outflow?

4. Collaborative planning, forecasting and replenishment model

- CPFR is a tool for enhancing results in the supply chain by focusing on certain steps. Does Dagab apply this model or other model effectively today?
- If another planning model? what model is used?
- How is the current communication between SC partners? Is this something that should be improved to enhance outbound logistics?
- What is needed for enhancing the communication in the supply chain?
- How is the current information flow between Dahab and SC partner? is it effective?
- To satisfy demand, there should be communication between SC actors? how is it today?
- How can we increase information channels to satisfy demand efficiently?

5. Warehousing and lean

- How are Lean practises applied in the daily operation of handling goods inflow and outflow?
- How do Dagab look at waste? Is it of importance?
- In what way can waste be reduced or eliminated in warehousing operations?
- Do you believe that waste is caused by inconsistent inbound and outbound logistics flows?
- What is that makes 40 % of the pallets not having GS1 and EAN-bar codes?
- How would this impact the logistics flows?
- Have Dagab implemented an effective slot scheme?
- In what way would it streamline the outflow and contribute to less waste and cost?
- What are the main contributions for waste in warehousing operations and in what sense does it impact demand planning?
- How is the separation done between manual orders and campaign orders?
- How close to a delivery can a costumer makes order change?
- How does Dagab manage to achieve low cost, low inventory and high costumer service?

Appendix 6. Content analysis part 1

Table 2 Purchasing, forecasting, demand uncertainty, supply & demand misalignment

Themes	Procurement (1)	Forecast (6) Coordinator	Campaign (7) analyst	Store level (2,4) Snabbgross
Procurement Definition	Replenishment to warehouse activity	Replenishment to warehouse activity	X	X
Objective	Customer satisfaction, Supplier collaboration	Customer satisfaction, Supplier collaboration	Provide accurate forecasts, costumer satisfaction	No empty shelf's, 7:R of logistics
Procurement variables	Lead-time and supplier dependency, LRE, Perishable goods.	Procurement system, supplier quality, blanket order.	Close collaboration with suppliers.	Sale statistics, campaign, price.
ERP system enablers	Reduce cost, consumer demand and waste reduction.	Reduce cost, consumer demand and waste reduction.	Facilitate information, reduce cost, and enhance communication.	Reduce cost, enhance communication .
Forecasting	Essential tool, Historical data.	Historical demand data.	Point of sales data.	Point of sales data.
Analyzing forecast	Automated system, variables calculate demand.	Looks for deviations in demand for articles.	Manually and through POS data.	Accepts configurates or erases forecasts suggestions.
Challenges	A developed supplier portal that is used efficiently.	Training members to make more accurate forecast.	Inaccurate SPSS-forecast, replenishment, manual analysis, store level analysis.	Training, insufficient planning in forecast, duplications.
Demand uncertainty	Examines historical deviations.	System embedded, supplier quality.	Historical demand.	Axfood historical sales.
Supply and demand misalignment	Planning tools, information.	Planning tools, Information.	Planning tools, correct information at the right time.	Planning tools, information, supplier-costumer meetings.
Challenges	Supplier portal, creating more accurate forecasts.	Costumer stock-out balance.	No trust along the supply chain.	Creating accurate pre-orders.

Source: Self-drawn (2020)

Appendix 7. Content analysis part 2

Table 3 Inbound and outbound logistics, lean application & warehousing

Themes	Procurement (1)	Campaign analyst (7)	Warehouse manager (5)	Store level (2)	Transportation Engineer (3)
Inbound and outbound logistics	Supplier selection & development, Purchase right volumes at the right time.	Right articles at the right time, transparency, information analysis.	High inventory, fewer inflow dates than outflow, Highbay.	Wrong pallets, efficiency,	Volume changes, planning, manpower, trucks, information-sharing, bottlenecks.
Objective	Robust information flow, More consistent flo	Robust information flow, more consistent flows.	Cross-department collaboration, increase efficiency, Transportation planning, Reduce pallets, improve efficiency.	High service over cost, purchase right volume.	Purchasing right volume, reduce volume tops, good basic layout Synchronizing delivery dates, Saturday deliveries.
Lean application	Continuous improvement, Non-utilized talent.	Continuous improvement, Non-utilized talent.	Training staff, 5s, 1-2 projects, volume changes.	”Clean” pallets, cut waste, delete forecast suggestion.	Eliminate bottlenecks.
Warehousing	Information sharing.	Information sharing.	Capacity level, right amount of staff, right tools, information sharing, transparency.	X	Information sharing, KPI’s, projects.

Source: Self-drawn (2020)