



LUT University

School of Business and Management

Supply Management

MASTER'S THESIS

**IMPROVING REVERSE LOGISTICS PROCESSES TOWARDS
SUSTAINABLE PERFORMANCE**

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ABSTRACT

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The purpose of this Master's thesis is to explore how the reverse warehouse logistics flow can be improved, especially in the case of returned finished products either internally or externally in the food and beverage industry. From a scientific point of view, return management usually focusing on transportation, and there is less discussion about what can be improved inside the warehouse.

The primary purpose of the work is to evaluate the performance of the company's reverse logistics process by comparing the process to existing academic data. The study provides comprehensive information on return types, motives and obstacles to implementing reverse logistics. Besides, the study reveals the importance of sustainable development for profitable performance. The research also shows that in order to gain a competitive advantage, the company should take into account the structure of the reverse logistics organization and should also design a particularly robust ERP system that covers the entire reverse logistics process.

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Tämän pro gradu -tutkimuksen tarkoituksena on tutkia, miten varaston logistiikkaprosessia voidaan parantaa elintarviketeollisuudessa, erityisesti palautettujen valmist tuotteiden osalta joko sisäisesti tai ulkoisesti. Tieteellisestä näkökulmasta paluulogistiikka on keskittynyt kuljetuksiin ja vähemmän on keskustelua siitä, mitä varaston sisällä voidaan parantaa.

Työn tärkein tarkoitus on arvioida yrityksen paluulogistiikkaprosessin suorituskykyä vertaamalla prosessia olemassa oleviin akateemisiin tietoihin. Tutkimuksessa saadaan kattavaa tietoa palautustyypeistä, motiiveista ja esteistä, jotka koskevat paluulogistiikan toteuttamista. Tämän lisäksi tutkimuksessa selviää paluulogistiikan kestäväen kehityksen merkitys kannattavamman toiminnan saavuttamiseksi. Tutkimus osoittaa, että saavuttaakseen kilpailuetua yrityksen on myös otettava huomioon paluulogistiikan organisaation rakenne ja suunnitella erityisen hyvin toiminnanohjausjärjestelmä, joka kattaa koko paluulogistiikan prosessin.

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1 Introduction

Reverse logistics has been identified as part of a sustainable supply chain. The sustainable supply chain has been considered generally from economic, environmental, and social factors. There should be in this consideration a balance between these three elements to comply with the triple bottom line main idea (Portney 2015). The interest in sustainability and its correlation to economic performance has grown dramatically. However, there is still not enough literature offers the connection between social factor on economic performance. For manufacturers product returns have been viewed as an evil, annoying manual process, high cost, and potential for customer dissatisfaction. (Stock 2006; Jayaraman 2007; Magon 2018) From the environmental perspective, reusing the returned material has been identified as a solution to increased profitability in industries. For instance, 4% of oil consumptions in the EU used for plastic manufacturing which has raised the price of oil (Bing 2014). The European Commission (2019) states, the material used per person in Europe is 16 tons with only 6 tons become a waste with only 36 % recycled. From the 36 % only 40 % reused for generating new material. This result has led the EU to set clear regulation on turning waste to further resources.

1.1 Background and Motivation

Many organizations are struggling to find enough financial resources regarding reverse logistics improvement. Additionally, a small number of companies are fully aware of the opportunity in reverse logistics. (Deloitte 2014) Reverse logistics could be defined as typically return process start from typical end user to the supplier who aims to recapture value from returned items. Product may return from the customer, such as advertising, warranty and after-sales service, retrieval, or recycling. It may also be an internal function, that is, due to errors caused by other processes, such as production surpluses, disadvantages caused by false predictions, obsolescence of products due to processing errors in storage. Well-managed reverse logistics can save about 3-6 % of net sales. (Logistiikan Maailma 2019; Dekker et al. 2004)

Managing reverse logistics is particularly essential when defects are noticed in the products delivered, as defective products can cause health damage. Industrial companies have realized that reverse logistics also includes storage, handling times and many other various processes. From the retail point of view, reverse logistics allows the retailer to take advantage of free space for other purposes. The development of reverse logistics processes provides an opportunity to improve the company's service level, customer satisfaction, flexibility and cost reduction. Costs reduce when duplication of work or erroneous practices eliminate it. (Dekker et al. 2004) This case study aims to find out the potential to increase the competitive advantage by finding a good way to handle returned items within the warehouse.

1.2 Research Objectives and Research Questions

The research objective is a short announcement of the purpose of the study. It shows what the research is all about. Also, it gives a detail about the steps research will take to answer the questions and achieve the aim of the study. The objective is to express "How" research intends to answer the research problem; in other words, research question express "what" the research striving to solve. (Saunders et al. 2009)

This study will only focus on the warehouse in reverse logistics mainly for finished goods returns in the food and beverage industry. Empties such as; pallets, empty returned bottles are not included. The reason to exclude empties is the high recycle deposit system already in use in Nordics markets. This research assumes that before having any deep dive that, lack of resources is one of the significant challenges in return area because of the negligence from managers. Besides, this study assumes that the process is entirely manual with no motives for investment. One of the critical assumptions, there is no system coverage to make the work more efficient and small possibility to adopt new technologies. If the return area not covered with a system, of course, this will create challenges with transparency and make traceability almost impossible.

Saunders et al. (2009) state, research question allows the researcher to say what is the matter considered and what the study aims to search for, clarify, and response. Research question viewed as the heart of the research project. It affects the literature review, research design, data collection, and analysis. This case study strives to have a complete understanding of reverse logistics by having a comparison between theoretical findings with the case company understanding about reverse logistics. From the case company perspective, the objective is to find a solution to have a more efficient and sustainable way of working in reverse logistics by reducing cost, finding new technology solutions, and have a clear answer whether reverse logistics should be seen as a potential for outsourcing or not. The main question (MQ) of this research is:

➤ *MQ: How to improve sustainability in reverse logistics?*

It is evident in today market sustainability is a hot topic. Many industries are striving to create a green image for building a better tomorrow which has led the companies to turn their visions to reverse logistics. Industries have recognized there is around 3-6 % of revenue engaged in reverse logistics. For those reasons, enterprises are looking for a solution to make more profit by reducing the cost of reverse logistics and creating value by reducing the negative impact on the environment. In many situations, the focus of logistics is on distribution. However, this research aims to concentrate on food and beverage from a warehouse sustainability perspective. The main question of this study has led to two sub-questions (SQ1 & SQ2). These sub-questions support this research to answer the main problem. The first sub-question discusses the improvement possibilities of reverse logistics.

➤ *SQ1: How to improve the reverse logistics process?*

Many companies have not taken into considerations that reverse logistics flow should be designed as same as in forwarding logistics. The idea is to find how the process should look like and what are the opportunities to improve the process. The second sub-question is aiming to answer what are the other existing chances for the company.

➤ *SQ2: Shall reverse logistics be outsourced to improve processes?*

Cost reduction may increase a question shall company make or buy services. Reverse logistics viewed as a potential for outsourcing. This research aims to find out whether this is possible in the food and beverage industries or not especially in the Nordic market.

1.3 Structure of the Thesis

This research paper visualized in picture one. The picture explains what each chapter mainly describe, and also shows the structure adopted to achieve the results. The research started with gathering theoretical data and later on these data has been compared with the empirical findings.

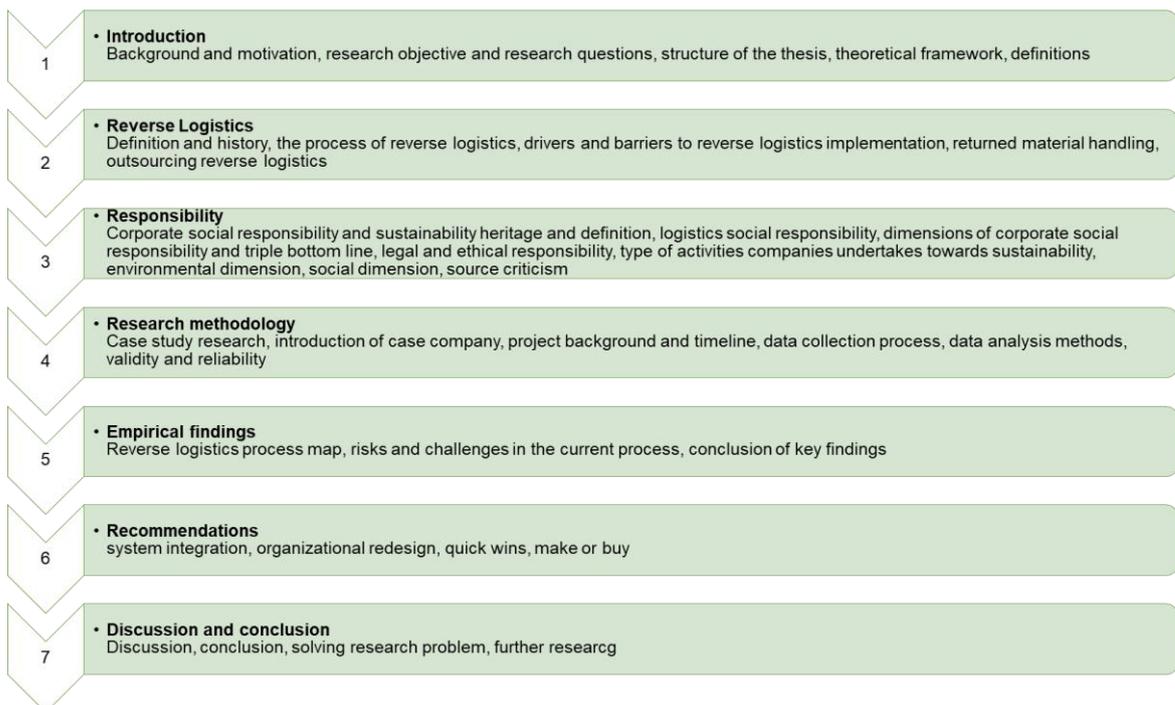


Figure 1 Research Structure

Chapter one goes through the background of the study, highlight research questions, objective, limitations, and assumptions. The second and third chapters will cover theoretical knowledge of this study. In the second chapter, the discussion covers

the theoretical findings of reverse logistics such as; the process of reverse logistics, drivers and barriers for implementation, and the opportunity for outsourcing. The third chapter will cover theories about corporate social responsibility and sustainability in general. Chapter four will describes research methodologies in detail and explanation of why this work choose to mix both qualitative and quantitative research. Likewise, Introduction of the case company is included in chapter four. Part five will clarify the empirical findings in the case company. The recommendations chapter share solutions for the case company. These solutions are related to chapter five findings and aim to help the company to solves the operational problems. The last part of this research provides a discussion and conclusions of the work and aim to answer the research question.

1.4 Theoretical Framework

This section represents an image of the theoretical framework set of connections and offers limitations for the research. The conceptual framework pictured in figure two is limited to the following steps;

- Finished goods handling in the warehouse
- The ideal process of reverse logistics
- Corporate social responsibility and sustainability in reverse logistics
- Creating competitive advantage

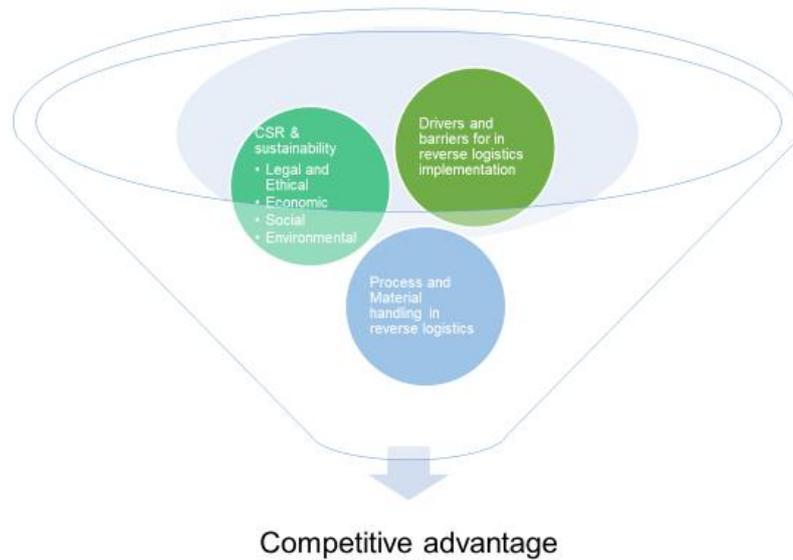


Figure 2 Thesis Framework

Reverse logistics handling process consist of movement, storage, control, reuse, repair, recycle, and disposal (Agrawal et al. 2015). Many researchers have described a different way how the ideal process should look like. Dekker et al. (2004) mentioned that there are four type of returns; warehouse returns, distribution returns, production returns, and customer returns. This thesis will only concentrate on warehouse returns and the impact of other returns on the return handling process. It has been noticed by Dekker et al. (2004) that, return material handling process should be more investigated. Many companies see reverse logistics as a headache, and therefore This paper will estimate the opportunity of outsourcing reverse logistics as a way to create a competitive advantage especially in the food and beverage industries.

The term sustainability defined by WCED (1987) "*Development that meets the needs of the present without compromising the ability of future generations to meet their needs.*" This definition is robust to apply at the operational level, and many organizations are not able to identify the current situation versus future needs. It has been recognized that the WCED definition linked with the triple bottom line concept by Elkington (1998), which cover social, environmental, and economic challenges.

It has also been recognized that companies have put effort on the environmental factor with positive economic performance. On the other hand, less awareness has been shown from a social perspective. (Gimenez 2012)

Creating a competitive advantage can be either tangible or intangible. Tangible competitive advantage in reverse logistics has a positive impact on return on investment. To achieve a robust competitive advantage system should be well-designed and a part of the strategic business development. In opposite, intangible competitive advantage can be gain by the system which creates an opportunity to have a better data analysis and finding a new opportunity for product development. (Vaidyanathan and Yadong 2007) Based on the above discussion this thesis primary theoretical academic data will be gathered are; reverse logistics process, returned item material handling, outsourcing reverse logistics, an environmental, social, and economic factor with a positive impact, drivers and barriers for reverse logistics implementation.

1.5 Definitions

This section describes the core notions presented in this research. The key concepts are reverse logistics and sustainability. A more throughout introduction will follow in the theoretical part of this thesis.

Reverse logistics (RL) is a process of handling returned items typically from end user back for the supplier who strives to recapture value from these items (Deloitte 2014). It may also return from internal departments, that is, due to errors caused by other processes, such as production surpluses, disadvantages caused by false predictions, obsolescence of products due to processing errors in storage (Dekker et al. 2004).

Sustainability considers the needs of the present without jeopardizing the ability of future generations to meet their needs. The notion of sustainability described with three pillars: economic, environmental and social - likewise recognized as profits, planet, and people. Sustainability emerged as an element of business ethics in

response to perceived public discontent over the long-term damage caused by a focus on short-term profits. (Longoni 2014; Portney 2015)

Corporate Social responsibility (CSR) is a regulating or ethics set by the business that aim to make the company be socially responsible — to itself, its stakeholders, and the public. By practicing corporate social responsibility companies can be aware of the kind of influence they are having on all aspects of society including economic, social, and environmental. (Carroll 1997; European Commission 2001)

2 Reverse Logistics

This chapter discusses the theoretical data collected regarding reverse logistics. The chapter consists of five sections; definition and history, the process of reverse logistics, drivers and barriers of reverse logistics implementation, returned handling material, and outsourcing reverse logistics. Some parts may consist of subsections to avoid misperception. The chapter aims to give a brief understanding of reverse logistics.

2.1 Definition and History

The definition of reverse logistics reviewed at the beginning of the '70s (De Brito 2004). In 1992 the council of Logistics Management defined reverse logistic as the recycling, waste and all issues related to logistics activities to be carried out in cause reduction, recovering, reuse of materials and disposal (Stock 1992). Pohlen and Farris (1992) emphasized in their definition the direction of the movements "Going backward" meaning the movement from consumer to the producer concerning transportation and warehousing. From the sustainability perspective, Carter and Ellram (1998) expanded the previous definitions by adding the importance of environmental perspective meaning reverse logistics is the process whereby corporations turn out to be ecologically effective through recycling, reusing, and reducing the total of material used.

The European Working Group on Reverse Logistics, REVLOG (1998) redefined the definition as "*The process of planning, implementing and controlling backward flows of raw materials, in-process inventory, packaging, and finished goods, from manufacturing, distribution or use point, to the point of recovery or point of proper disposal.*" The study decides to use REVLOG definition.

2.2 The Process of Reverse Logistics

Reverse Logistics process has been described differently by many authors from different angles. Figure three adopted by Agrawal et al. (2015) visualize the main key processes in reverse logistics. The key means divided into four main steps; product acquisitions/gatekeeping, collection, inspection & sorting, and disposition. Each step illustrated briefly.

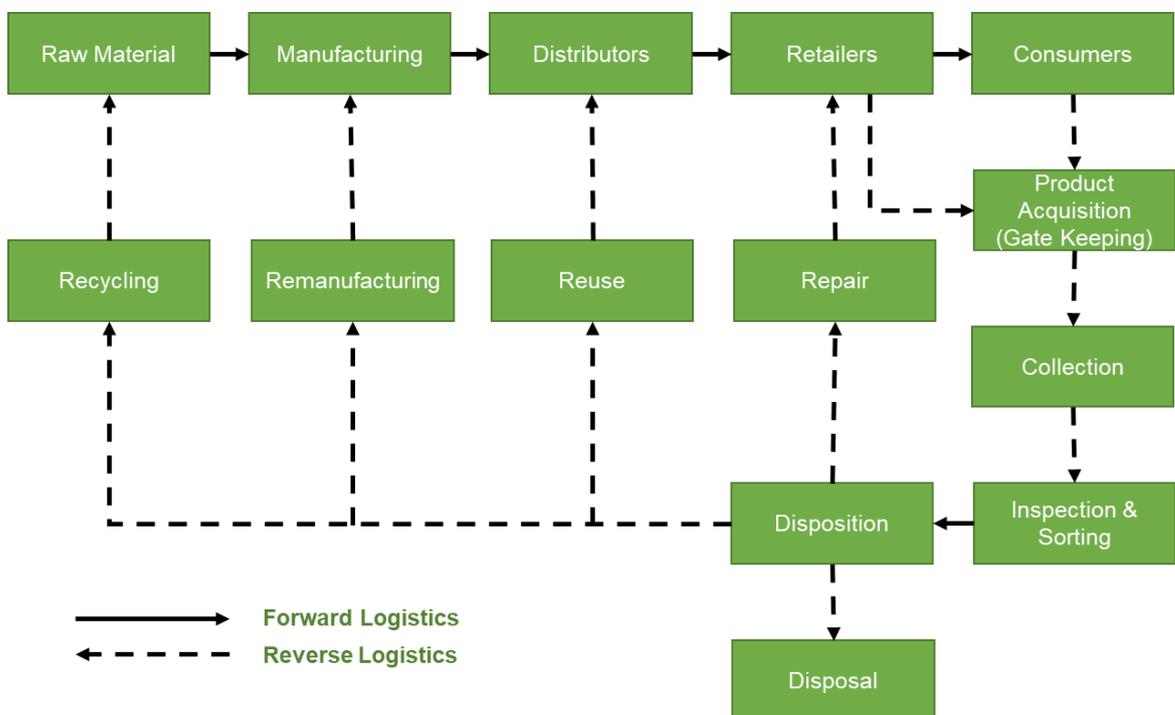


Figure 3 Basic flow of forwarding and reverse logistics process

Step 1 Product acquisitions/gatekeeping

The gatekeeping step is the first step where producer purchase from consumer defected product. The purchasing part heavily depends on reverse logistics overall process, since time, quantity, and quality are usually difficult to estimate (Fleischmann et al. 1997). Guide and Wassenhove (2009) state that; gatekeeping is one of the crucial steps in reverse logistics since it grants the entrance to the process. For instance, if the consumer returns the product to the retailer, the retailer

needs to make a decision where the goods will be sent for further investigation (acquisition) or giving back to the consumer (gatekeeping).

Step 2 Collection

According to Agrawal et al. (2015), the collection step will come into effect if the acquisition step approved. There are three types of collection; direct collection from customer to manufacturing, retailers to manufacturing, and from the third party to manufacturing (Kumar and Putnam 2008). According to Agrawal et al. (2015), the direct collection creates no control of returns management. In contrast, returns from a retailer or third party may create an opportunity to control returns. Additionally, cost plays a crucial role in which collection method enterprise will adopt.

Step 3 Inspection and sorting

Customer may return products for known or unknown reasons, and the condition of the goods may differ dramatically. Thus, the role of inspection increases at this stage where each returned item must be inspected and sorted into different categories. Once the sortation is complete, the product will be diagnosed to know what action it needs to gain the best possible value. The cost of sortation, disassembly and remanufacturing are the fundamental variance in decision making, whether to do the step or skip it. (Agrawal et al. 2015; Tibben-Lembke 2002)

Step 4 Disposition

The last step is decision-making (disposition) for further processing, which also called as a recovery process. The recovery process consists of five main elements;

1. Sell as new
2. Repair or repackage and sell as new
3. Fix or repackage and sell as used
4. Resell at a lower price to salvage house
5. Sell by weight to recover the house

Many studies have emphasized slightly different definitions for disposition. Most common discussed in the literature are direct reuse; repair; remanufacture; recycle,

and disposal. Not in all five elements mentioned above of disposition applicable in all industries. It is important to identify what aspects of the disposition needed for each sector. (Agrawal et al. 2015)

2.3 Drivers and Barriers to Reverse Logistics Implementation

In the last few years, the attention in green supply chain management and reverse logistics has grown dramatically from both companies and researchers perspective (Flapper et al. 2012; Govindan et al. 2015). Green Supply Chain Management is named as one of the main elements aiming to integrate environmental requirements with the supply chain systems (Govindan et al. 2014). According to Bouzon et al. (2015), reverse logistics is a technique of reducing the damage to the environment by managing the end-of-life of goods which increased the focus to implement a business model of reverse logistics.

Corporations who aim to implement reverse logistics as a part of their green supply chain are facing challenges from different stakeholders, both within and outside the organization (Abdulrahmanet et al. 2014). Most business sectors still struggle to implement reverse logistics strategies due to a lack of interest from supply chain members. It is still unclear how external and internal factors affect green supply chain management and how many drivers, and barriers are essential to recognize in the implementation process. (Sarkis et al. 2011)

According to Agrawal et al. (2015), the implementation process involves several features, which may affect directly or indirectly decision making. Tibben-Lembke (2002) mentioned that one of the significant factors are the financial drivers who may change reverse logistics implementation. Companies may choose to improve reverse logistics or implement a process because of the inherent economic, and competitive advantage (Agrawal et al. 2015). Dekker et al. (2004) mentioned in their book that, the financial gain could be a direct or indirect for example raw material recovery process may lead to reducing raw material purchasing which bring direct benefit to the company, and it will also minimize disposal/scraping material which effects directly to the cost of labor. It has also seen as a direct financial benefit if

returns finished goods can be returned to the original component, which may decrease raw material purchasing and create a better green supply chain management image.

Indirect financial benefits may also lead enterprises to implement reverse logistics process, because of marketing, competition or strategic decision (Dekker et al. 2004). For instance, the company is preparing for future legislation change, where sustainable enterprises get financial support and also receive a competitive advantage versus those who are coming behind. Another example is recovery program can be built to improve the external image (customer and other stakeholders) or the internal (employees, supplier) where both create savings if internal stakeholders may find a solution to improve finished goods. Table one visualizes direct and indirect financial gains in reverse logistics. (Vaidyanathan and Yadong 2007)

Table 1 Direct and Indirect Financial Drivers in Reverse Logistics

Direct Gains	Indirect Gains
Input materials	Do in advance future legislation change
Cost reduction	Market protection
Value added recovery	Green image
	Improved customer/supplier relations

The legislation drivers which discusses any jurisdiction should take into consideration regarding reverse logistics. According to Europa (2019), “A trader must repair, replace, reduce the price or give you a refund if goods you bought turn out to be faulty or do not look or work as advertised. If you bought a product or a service online or outside of a shop (by telephone, mail order, from a door-to-door salesperson), you also have the right to cancel and return your order within 14 days, for any reason and without justification”. The legislation drivers put some companies under pressure to build a sustainable reverse logistics flow. Additionally, to find a well-designed recovery process since the EU new legislation forcing companies to have better handling of waste to create new reusable raw material. (Dekker et al. 2004)

Corporate citizenship drivers are values or ethics which enterprise establish to become more engaged with reverse logistics. Many organizations have programs on responsible corporate citizenship where both social and environmental issue are growing a high priority. Figure four visualizes the linkage of reverse logistics with above-described drivers. For more detail about social and ecological factors, please read the sustainability chapter.

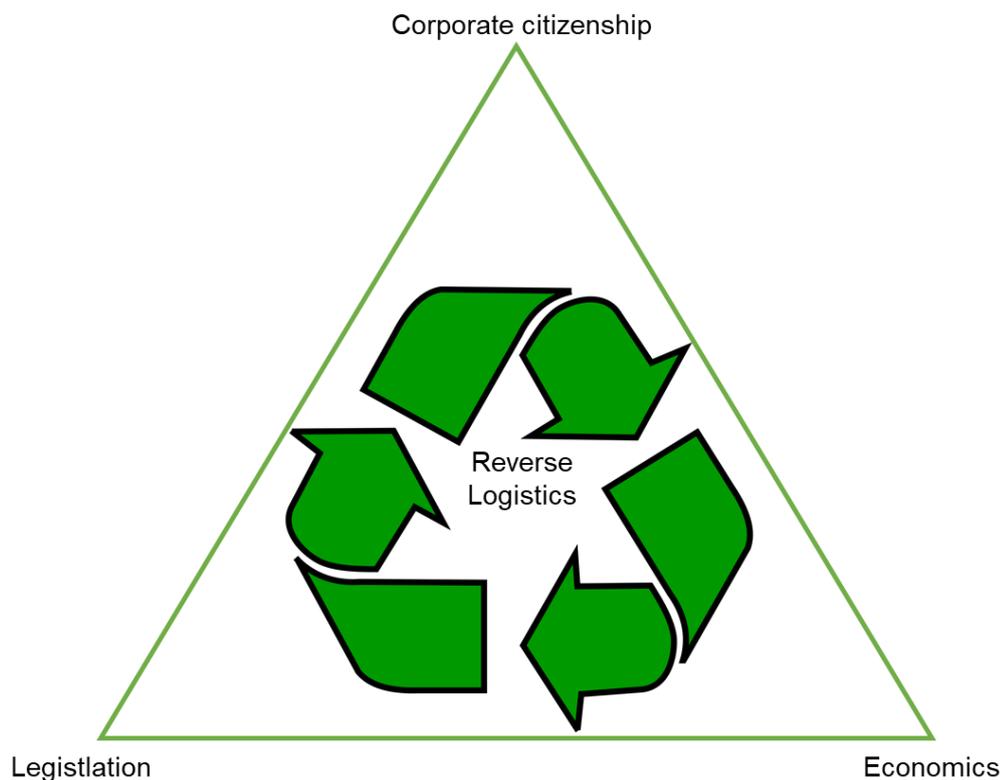


Figure 4 Driving Triangle for Reverse Logistics

There are mainly four barriers to reverse logistics: management, financial, policy, and infrastructure. Each of these barriers illustrated briefly. Management barriers indicate to firm strategy regarding reverse logistics such as the requirement of performance, planning, aim to be the best in the market, also, to supporting system and managers. Financial barriers refer to support activities such as; training, monitoring, and system coverage. Financial constraints are the most significant obstacles for any reverse logistics improvement. Policy barriers are consisting of both external and internal stakeholders' vision of the company. One of the most critical value is the lack of supportive legal policy. In addition to the pitiful waste of

management policy either within the company or at the legislation level. The last barrier identified is infrastructure which plays a dynamic role in reverse logistics. Companies cannot handle returns efficiency and inappropriate time. (Abdulrahman et al. 2014)

The need for a decent returns-handling system can be a source of significant cost savings and even function as a profit center (Stock et al. 2002). According to Jack et al. (2010), the lack of infrastructure will prevent efficient return handling and will create a financial problem with cost exceed the benefits. Table two express the most common barriers in reverse logistics.

Table 2 Reverse Logistics Implementation Barriers

Management	Financial	Policy	Infrastructure
Understanding significance of RL	Lack of initial capital	Lack of enforceable laws and directives on take-back of end of life product	Lack of sufficient in house facilities (storage equipment and vehicles)
Lack of trained personnel	Lack of funds for training	Lack of government supportive economic policies	Lack of system to monitor returns
Management commitment	Lack of funds for storage and handling	RL not considered as critical aspect to competitive performance	Lack of coordination with 3PL providers
Lack of expert at management level	Lack of funds for return monitoring systems	Customers not informed of take back	
Lack of shared understanding of best practices		Lack of public awareness of environmental protection	
Lack of waste management practices		Don't have green design implementation for end-of-life-product	
		No practice in place for recycling	

The table above shows four types of barriers categories; management, financial, policy, and infrastructure. As a result of the table above, lack of policy can be considered as an essential barrier for reverse logistics implementation which has a direct effect on the management barriers, since there is a lack of understanding. Many authors consider the financial barriers elements as the major problem for all four categories.

2.4 Returned Material Handling

Material handling consists of many activities such as; movement, storage, control of goods throughout the process of manufacturing, warehousing, consumption, and

disposal (MHI 2019). Returns handling process may differ from that industry to another. Additionally, the type of return affects directly on return handling process. In the picture below (figure five) return handling process described based on the functions in the warehouse. (Dekker et al. 2004)

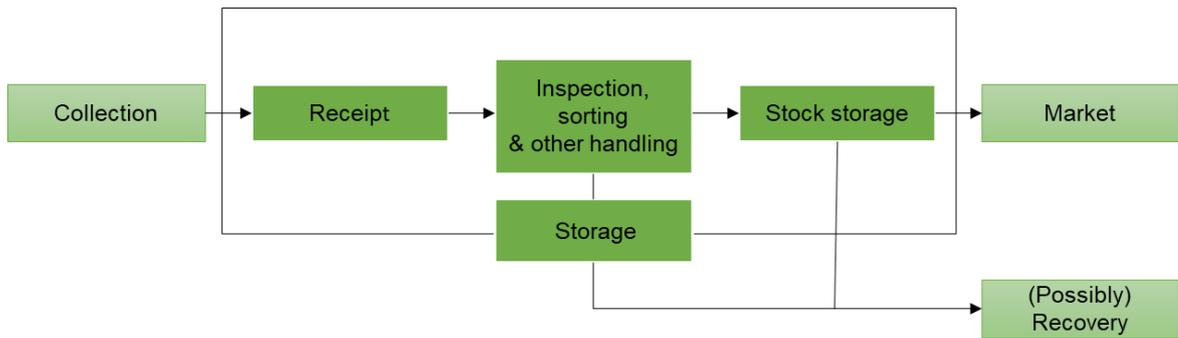


Figure 5 Return handling in the warehouse

Return material handling is an entirely new topic with not enough experience how to deal with it. Many organizations in the European Union have imputed researchers to explore return handling process as it seems to be an issue so far. Returned products usually handled in a separate area, where warehouse employees inspect, sort, and make a decision whether a customer will be credited or not. Most often industries have decided to give the authority of crediting to goods receipt department, which located separately from inspection and sortation area. The goods receipt department is the first part of the warehouse. The process continues by sending a returned product to the buffer area. The area is an optional based on the returned amount and returns handling process time. The goods receipt area considers returns completely separately, since one pallet of returns may consist of many types of products. Therefore this is different from another inbound process. (Dekker et al. 2004)

Return area layout considered as one of the long-term decisions. Companies are recommended to organize an area for returns with the capacity to make the process more efficient. Some warehouses may decide to integrate forward and return logistics to be more efficient. However, this may increase the complexity of the

process. Dekker et al. (2004) emphasize that all nine warehouses which they investigated have decided to separate returns area from forwarding logistics.

2.5 Outsourcing Reverse Logistics

According to Logozar (2008), outsourcing has become a trend in recent years. Outsourcing means transferring specific actions to expert providers who can perform a better level of service than the buyer. Lambert et al. (1999) define logistics outsourcing as “*the use of a third-party provider for all or part of an organization’s logistics operations.*”

Outsourcing is a feasible business strategy since it aims to transfer non-core functions to external suppliers. This will allow the enterprise to control their resources better, divide risks and focus on core competence which is more critical to surviving in today uncertain business environment. The decision of whether to outsource or not is made based on the question of whether to make it or to buy it. There are many options during decision-making; these possibilities visualized in figure six. (Logozar 2008)

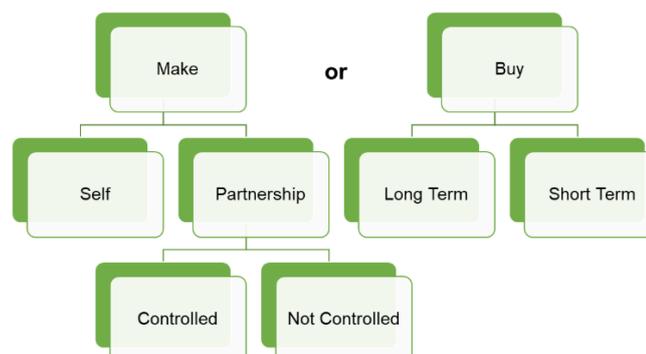


Figure 6 Range of Outsourcing Option

The motivation for outsourcing is to concentrate on core competence to achieve a competitive advantage in the long run. Outsourcing any activity can create an advantage if it is well-designed, understood, and easily described. It has been evident that there is a hidden cost for outsourcing. Usually, these expenses are the

impact of the changeable business environment. Furthermore, outsourcing creates a large amount of information flow. For these reasons, the information system should be improved to achieve a competitive advantage. (Logozar 2008)

According to Deepen (2007), the most often cited advantage of outsourcing is the reduction of logistics costs. He also mentioned that process efficiency is discussed often since the service provider is specialized where the buyer does not see this outsourced function as a core competence. Logozar (2008) states, most of the company motives to outsource are: cost reduction, concentration on core competence, restructure company financial status, a company struggling with organization or culture, and the purpose to provide high-class services. All the motivations as mentioned earlier are beliefs which company either see them as benefits or risks. Table three visualizes all benefits and risks. Data in the table have been gathered from both Deepen (2007) and Logozar (2008) findings.

Table 3 Benefits and Risks of Outsourcing Logistics

Benefits	Risks
Lower cost	Supplier's skills less impressive than expected
More flexibility in financing	Supplier does not meet the customer's expectations and especially its needs
More flexible with level of demand	Supplier incompetent to deal with the customer's culture and internal politics
More competent, technically and managerially	Demand levels may not vary in the way anticipated
Increase communication within the team to correspond business need	Continues need for specialist staff to monitor and direct the supplier
Eliminate the need for specialized staff who do not fit the organizational culture	
Relieve in-house management of non-core tasks	

3 Responsibility

This chapter describes the linkage between responsibility with reverse logistics. Section one discusses and defines Corporate Social Responsibility (CSR) and sustainability, also, a brief discussion about logistics social responsibility, and the dimensions of CSR and triple bottom lines. For limitation reasons some dimensions not illustrated; however, it has been mentioned in this paper. The last section criticizes the sources used in these sections since CSR and sustainability have been discussed by many authors, and an explanation will be provided why this paper chose specific authors.

3.1 CSR, Sustainability Heritage and Definition

The word corporate social responsibility has a root back to the 1930s by authors such as Wendell Wilkie; however, at the beginning of 1950s, Howard Brown published the first book "*Social Responsibilities of the Businessman*" discussed corporate social responsibility. The book criticizes that, there were not enough business women around that time and he also stated that, managers should think about their role in society. (Carroll 2015; 1979) By '80s and '90s CSR was taken into the debate, the first firm to implement CSR was Shell in 1998. Industrial development and the impact of trades on society led to a completely new vision with fine knowledgeable and cultured general people it has become a danger to companies that social responsibility needs to be more taken into concern and CSR is the solution to it. CSR grew beyond the code of conduct and reporting. Eventually, it started taking the initiative in multi-stakeholder, ethical trading. (Corporate watch report 2006)

Corporate social responsibility is defined as "*a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders voluntarily.*" (European Commission 2001) "*the commitment of business to contribute sustainable economic development, working*

with employees, their families, the local community and society at large to improve their quality of life.” (World Business Council on Sustainable Development 2000)

On the other hand, the word sustainability has become one of the most used words in the business environment. It all has started from the environment causes firms are producing to the environment. In 1987 the Brundtland Commission launched a sustainable development report, and since then the word sustainability has been cited, and research on sustainability has increased. (Carroll 2015; Redclift 2005) Sustainability had become more popular in late of the nineties when John Elkington introduced the notion of the triple bottom line. The triple bottom line has a link to word sustainability, and it emphasizes the three pillar which is; economic, environmental, and social (Carroll 2015). It is also known as the three E’s of sustainability which refers to; environment, economic, and equity. It can be understood as the pillars for holding sustainability (Portney 2015). Figure seven visualizes the triple bottom line idea.

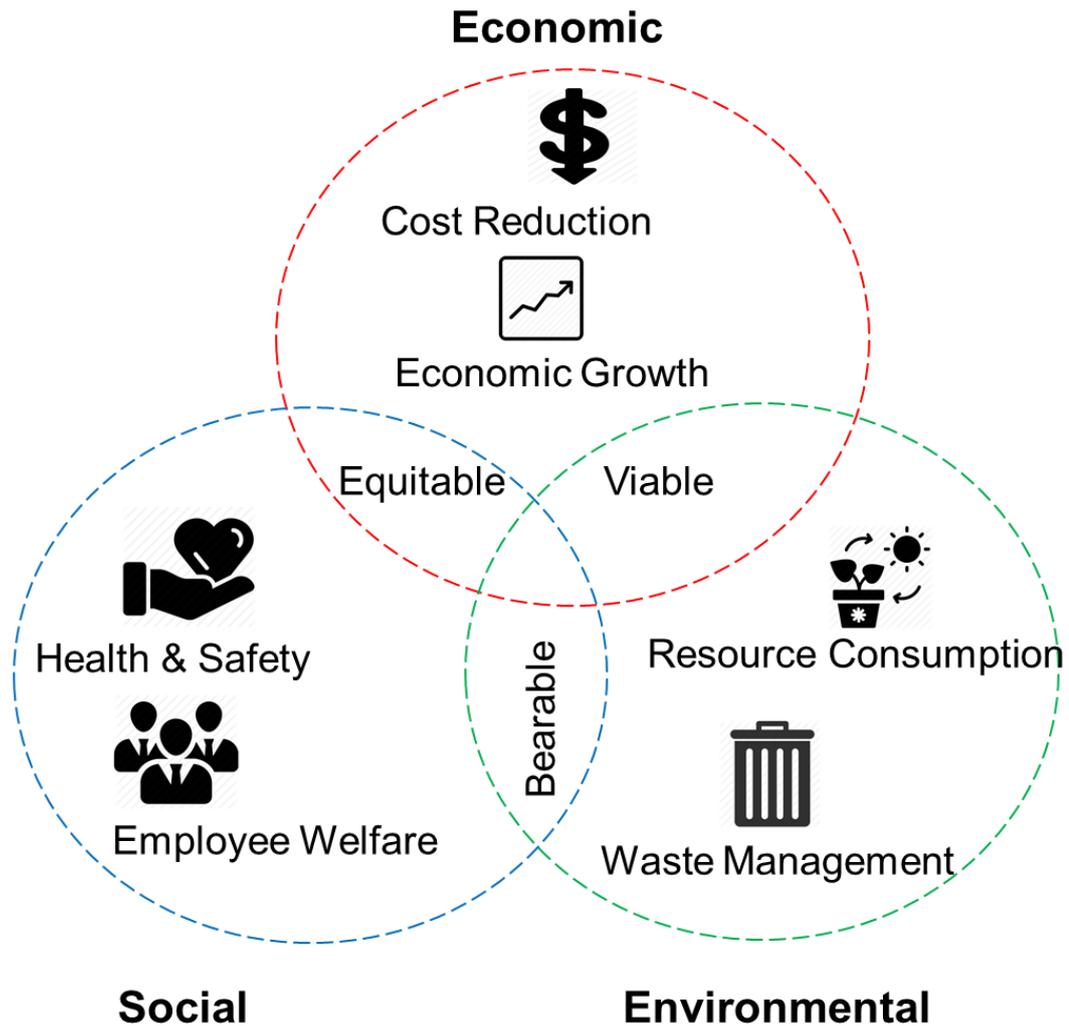


Figure 7 Triple bottom line

Carroll (2015), Redclift (2005), Portney (2015) all agree that sustainability cannot be achieved by developing one pillar. For instance, sustainability can be achieved when a company can reduce waste, increase economic growth, and creating a better workplace. These three pillars create together sustainable results. Portney (2015) defines sustainability as, meeting our needs without creating damage for future generation to meet their demand concerning the social and economic factors. As mentioned earlier this work will discuss sustainable operation management, and for that reason a definition needs it.

3.1.1 Logistics Social Responsibility

Logistics Social responsibility (LSR) is a part of corporate social responsibility. The LSR is as well a part of logistics management which is dealing with several processes such as inbound and outbound transportation management, warehousing, inventory management, purchasing, and 3PL management. The LSR evaluates some of these processes; transportation for forwarding logistics and reverse logistics. Also, LSR is evaluated by six main elements; environment, ethics, diversity, working conditions, human rights, safety, philanthropy, and community involvement. (Carter and Jennings 2002) The ethic has been identified as an issue since ethically behaving company should be socially responsible. Also, studying a specific part of logistics to enhance the environmental issues are only a part of LSR; for example, reverse logistics is dealing with only a specific part of logistics business processes. There are extensive studies about transport optimization or reverse logistics; however, lack of social perspective is missing in these studies. (Ciliberti 2008) This paper will not discuss the whole six elements for limitation reasons.

3.1.2 Dimensions of CSR and Triple Bottom Line

According to Carroll (1979), there are four dimensions in corporate social responsibility; economic responsibility, legal responsibility, ethical responsibility, and discretionary responsibility. This thesis will illustrate some of these dimensions briefly to comprehend better what CSR consists of. Also, legal and ethics have been merged as one dimension.

1. Economic responsibility

The economic dimension connected to company performance which is understood as a service the company provides to the market and its shareholders. The shareholders are expecting a return to their investment. (Ahmed & McQuaid 2005) According to McKinnon et al. (2015), the economic dimension concerns is not only considering growth and shareholders' profits. Other significant characteristics include how the cash is received and divided among parties involved in a deal.

Examples of economic responsibilities are fair pricing and acquiring policies, actions and policies against corruption, and contributions to the economic development of local communities.

The economic dimension defined as a financial possibility including challenges of competitiveness, work creation, and long-term viability. Economic sustainability is understood to generate added value on a broader sense, rather than typical financial bookkeeping. The economic or the financial aspects of sustainability, therefore, may cover:

- Reducing operating costs through enhancement in resource management
- Attracting new business through demanding business integrity policies
- Increasing production through motivated personnel
- Charming a new array of investors
- Offering a chance to participate in socially responsible investment indices

3.1.3 Legal and ethical responsibility

Legal responsibility main goal is to set out regulations to protect social responsibility and ensure that business is productive in a sustainable manner. It can also be understood as a way of working a business should operate to fulfill the law requirements. On the other hands, ethical refers to those norms or behavior and activities that not codified into law; however, these norms are expected to be conducted by a business. It is also good to remember there is no clear definition of ethical responsibility, since the ethics way of working change from that country to another by the society way of thinking. Nevertheless, it has been a topic of debate what is not ethical and what are the social expectations from the business which is above the legal requirements. (Carroll1979)

3.1.4 Type of Activities Companies Undertakes Towards Sustainability

Corporate social responsibility has created many unusual activities in a sustainable way of working. For example, donating to charities is one way to enhance CSR.

Some companies did donate quite small values of cash which increase the criticism from society, and that has forced businesses to make a more significant donation, this kind of activity called corporate philanthropy. Another create example increasing in today business society is codes of conduct which is a statement about the company values and standards behaviors. The codes of conducting covering many values such as; the treatment of employees, consumer reliability, supply chain management, community impact, human rights, health and safety, environmental impact, transparency between suppliers, etc. One of the most trends lately been used by the company is social and environmental reporting. This activity has lately been expected from businesses to respond to their stakeholders; still, this model is the point of criticism since no is benchmarking between these reports and the value of these report is still unclear to many of the stakeholders. (Fauset 2006)

3.1.5 Environmental Dimension

Most of the authors agree that environmental factors enhance economic performance; however, not enough evidence proving that environmental program has a positive economic impact (Longoni 2014). Companies are also facing high pressure from society to improve the negative environmental impact they are creating. The pressure from the community has been seen as a decisive factor since it creates a competitive advantage for those who succeed in it. Create environmentally sustainable product will lead to product differentiation and will create a new way of working; these factors may be the advantage in the market. Besides, cost reduction has also a positive economic impact in environmental program implementation (Pagell 2009). From another perspective, still it is not clear how the environmental program can create a positive impact, since Klassen and Whybark (1999); Vachon and Klassen (2008) state: creating environmental program cost is high and the program by itself will not help the operational level for improvement. For instance, pollution control technology needs massive investment; however, the technology does not provide a solution to reduce environmental impact. It is vital during analyzing the environmental program effect on economic to realize that, short- and long-term analysis must be conducted because from a short-term perspective it has been seen as a high cost. On the other hand, from long-term

perspective authors agree that the investment is enormous in the beginning, but the price will be low in the long run because it gives an opportunity to reduce resources, cost savings, efficiency, and increase operational performance (Longoni 2014).

According to Veleva and Ellenbecker (2001), there is not enough theoretical evidence discussed the relationship between the environmental program on social performance. Longoni (2014) emphasizes the critical relationship between these two by giving an example of famous Wal-Mart where he mentioned that company environmental program not aligned with the social performance since company social conditions are less improved than other in the market. The ecological program may influence on social performance such as motivation, job satisfaction, stress (Getzner 2002). This means that employees may lose their motivation since the job profile is changing which lead to stress and dissatisfaction with the job. Contrariwise, this may attract better employees and increase goodwill for current employees (Longoni 2014). No matter what the case is, it is essential to design a program which improves both factors, for instance, installing a new automatic system for recycling is considered as good from the environmental perspective. However, if the automation system is noisy, it will affect negatively on social performance (Pagell 2009).

3.1.6 Social Dimension

Social factor has been divided into two flow: pro-active and reactive. The pro-active program responds to employee specific needs which have the potential to affect positively on both social and economic factors — for instance, worker well-being, skill improvement, and social equity. The reactive program responds to workers basic needs such as health and safety which is in most cases led by governments. Several studies suggest conducting pro-active programs as a way to achieve economic benefits such as: reducing lost time and workers-compensation expenses (Chrisman and Carroll 1984; Vredenburg 2002). Contrariwise, the reactive concentrate on health and safety improvement to create a positive influence on operational performance (Brown et al. 2000). This could need significant investments which may harm economic performance. It is difficult to evaluate the

influence of health and safety on reverse logistics since there are many variable factors which effects on decision-making, for example, chemical returned items dismantling are more harmful than good returns such as furniture (Sarkis 2010). The Commission of the European Communities (2001) has suggested, “*Some companies with good social and environmental records indicate that these activities can result in better performance and can generate more profits and growth.*”

3.1.7 Source criticism

The word CSR and sustainability has been in the last two decades a hot topic. Many authors such as Carroll and Portney have discussed the role of sustainability quite often. It is evident that CSR dimensions have changed during the time; for example, Carroll (1997) divided CSR dimensions to four dimensions, economic responsibilities, legal responsibilities, ethical responsibilities, and discretionary responsibilities. Carroll thoughts has been compared with nowadays thoughts articles, and there is a different thought about the dimensions in nowadays; for example, Panapanaan et al. (2003) describe the dimensions of CSR as economic, environmental, and social. Also, some authors describe LSR as a part of CSR with six main dimensions aim to cover all logistics processes; environment, ethics, diversity, working conditions and human rights, safety, philanthropy and community involvement (Carter and Jennings 2002). These dimensions are also discussed in CSR, and it is in some point overlapping with CSR principle; however, the authors mentioned that LSR is only a part of CSR. As a researcher, the usages of many terms such as; CSR, LSR, sustainability, and triple bottom line are confusing even though all the terms striving to achieve the same point.

This research paper chose Carroll’s theoretical findings for many reasons; the author has made many findings into this area during long research time. His sustainability pyramid visualized in picture eight visualizes the main points in corporate social responsibility which personally as a researcher agrees with all four dimensions.

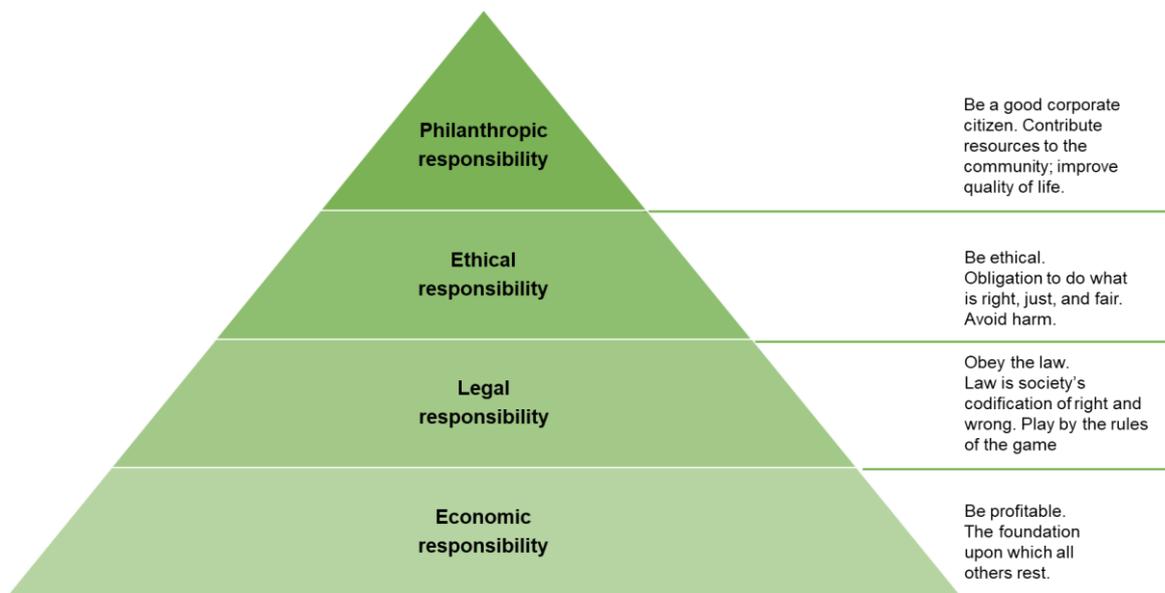


Figure 8 The Pyramid of Corporate Social Responsibility

It is evident that there are different thoughts about what are the dimensions; however, the four dimensions mentioned above capture all the three triple line dimensions as well. For instance, philanthropic responsibility is dealing with environmental factors. Contrariwise ethical and legal deals with the social factor. As a result, this research suggests following Archie Carroll sustainable pyramid since it is considered as reliable based on reading articles.

4 Research Methodology

The chapter will discuss the research methodology used in this master thesis — also, an explanation of the research data collection process and data analysis. The case company will be introduced briefly and the empirical project duration into the case company as well. The validity and reliability of this research will be evaluated under this chapter as well.

4.1 Case Study Research

“The most important person in your research is you, and the outcome will depend on the work and the other attributes such as stamina, intellectual capacity, and self-belief” (Farquhar 2012). He also mentioned that many of us do not study the research alone. We research with those stakeholders who are interested in our topic, and we are excited about sharing this information with them. In this research, many of a picture below (figure nine) stakeholders involved in this case study. These stakeholders have helped to identify better the scope and to be more aligned and structured.



Figure 9 Stakeholders in research Adopted

It is essential to understand that there is two case study research approach; during the study and the second during the research. There is a difference between these two since the first aim to teach; in contrast, the second one is looking for an answer to specific questions in a real-life business situation (Farquhar 2012). This research aims to answer a real-life business challenge, and that was one of the fundamental principles to use qualitative research approach. Case study defined as, an empirical investigation which object is to examine a modern marvel within the real-life background, especially when the boundaries between phenomenon and experience are not clear (Farquhar 2012). As the case company's main scope was unclear, this is why qualitative research fits perfectly to this study.

Baxter et al. (2008) discussed, through qualitative research method researcher aims to explore marvel or phenomenon with diversity data resources. By doing so, the researcher strives to answer the question from many perspectives to ensure the problem understood. Both Stake (1995) and Yin (2003) mentioned that the topic should be interested and well explained. Moreover, one of the most benefits in the qualitative research method approach is the close teamwork between researcher and participant. Participants shared information helps the researcher to have a complete understanding of the challenge or the problem. This research in reverse logistics has started in the middle of 2018 to have a vast knowledge of all organization, or members are related to the process. Also, this helped in decision-making to use a qualitative method.

Although this research mainly was covered by the qualitative method, the need for a quantitative research method is required to support the result of the work. According to Saunders (2016) quantitative analysis techniques such as tables, graphs and statistics allow the researcher to explore the relationship and trends of the data. Furthermore, any business research is likely to involve some numerical data to help answer the research question and meet the object of the study. For these reasons, this master's thesis conducted the quantitative research method partly to ensure research result and validation. The quantitative data collected show the trends of reverse logistics in case company in 2018.

As a case study, multiple methods was conducted of data sources in mainly qualitative research; it can be stated that this case study is a triangulation of qualitative research. The study approach is used as strategic techniques to ensure the validity of a qualitative research study. Carter (2014) mentioned that there are four types of triangulation; method triangulation, investigator triangulation, theory triangulation, and data source triangulation. The first type is method triangulation where multiple uses of data collection methods strive to find an answer for the same phenomenon. Usually, it used in qualitative research which includes interviews, observations, and field notes. The second type is investigator triangulation; this method used when at least two researchers aim to answer a specific phenomenon by conducting observation techniques and concluding the result. The third type is theory triangulation where the researcher aims to use different theories to analyses the specific marvel. Moreover, the last type is data source which involves data collection from a different type of people to ensure data validation.

No matter what type of triangulation researcher uses, the aim is to confirm that the research is valid by analyzing the data from a different perspective. This case study conducted data source triangulation where interviewing different people and collecting a different type of data (both qualitative and quantitative) to ensure data validation. According to Jick (1979), triangulation definition is combining methodologies in a research study of the same phenomenon, and this is precisely the case in this study.

4.2 Introduction of Case Company

The case company is one of the leading food and beverage company in the world, and it has an extensive product portfolio of different food and beverages. The company has more than forty thousand employees all over the world — furthermore, the case company products sold in over 150 markets. Its heritage goes back to over 150 years of producing a premium product. The company supply chain departments handle procurement processes, planning, and logistics services. These services are integrated to respond better for business customer needs and expectations. All

supply chain markets need to report to the headquarter with limited decision-making power; however, all decisions related to operation management can be decided locally. (Case company 2019; Group Warehouse Director 2019)

4.3 Project Background and Timeline

The Gantt chart below (figure 10) represents the research approach process in the case company. This research started in June of 2018, where has been named five members from Nordic markets and Switzerland. The project goal was to investigate reverse logistics flow with a particular concentration on return finished goods management.

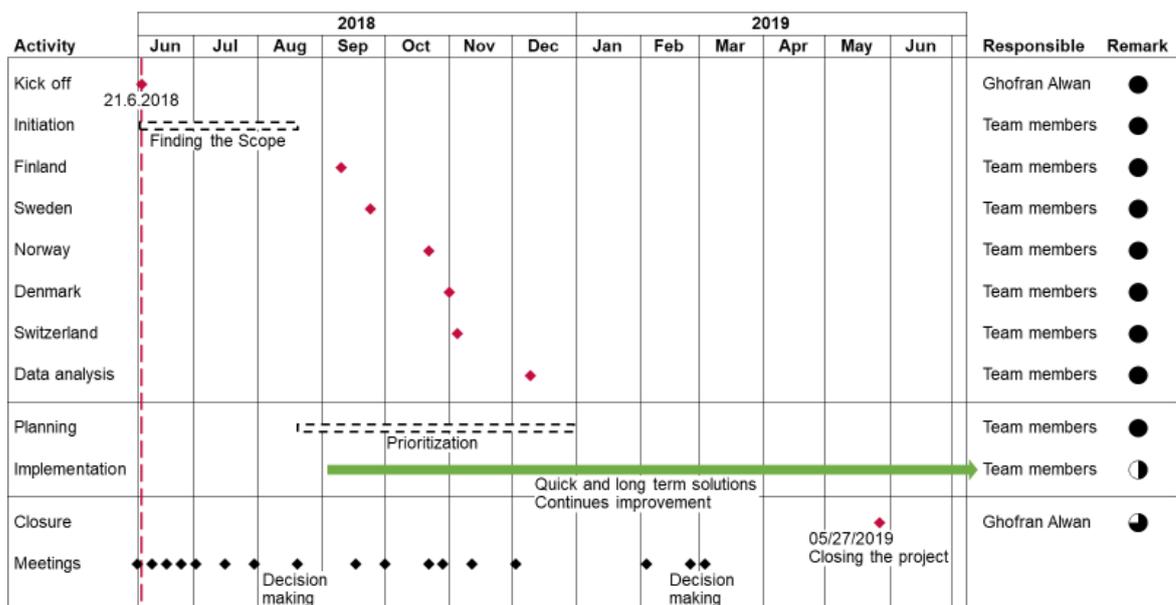


Figure 10 Gantt Chart of Empirical Research Process

During the kick-off meeting, the workstream members used Kamba Kaizen, post-it notes, and brainstorm methods to have a better understanding of what the scope includes. Also, process flow map used as a supportive source. As a result of the conducted methods, the workstream members set out a clear scope for the project. Also, the workstreams made other decisions such as; visit all five markets to find best practices, make interviews with those stakeholders who are directly involved with reverse logistics, go and see to have more comprehensive understanding about

return handling management, compare interview answers with go and see findings to evaluate data validity, make a risk assessment to prioritize findings, find quick and long term solutions.

Risk assessment and process map checklist have been created to make the prioritization more manageable. Risk assessment aimed to identify all the vulnerable topics which need to be fixed. However, these topics have been prioritized based Pareto principles whose goal is by fixing 20% of the problem can achieve 80% of the project outcome. Before any implementation step, all findings or changes have been presented to the top management to ensure whether the project shall continue or stop (also known as a milestone). All quick solutions have been implemented when it does not need a decision by the top management since the aim is to focus on the long-term challenges.

4.4 Data Collection Process

This thesis has used two data collection methods; primary and secondary data. For primary data, there have been three different approaches; quantitative and qualitative. The quantitative research method used only for data observation which been gathered during the research. For qualitative research, there has been used many techniques such as;

1. observation
2. interviewing
3. partly ethnographic fieldwork

1. Observation

Observation consist of hearing, recording, discussion, and reporting. Also, it might be essential to hear for weeks or months to attain sufficient examples to conduct a careful study. Even though no notes have been written, observers should come with reasonable understating of the role played by different occupational. (Travers 2011) In this master's thesis observation has been conducted by working with all employees related to the whole end to end process (from customer to product end

life cycle). During observations there were mainly three tasks to be considered; recognition, self-observation, and reporting the background of everyday life in a flexible way to create reliable and valid data. The aim is to describe and understand the research problem based on several examples (Rodriguez & Ryave 2011). It has been evident from the beginning in this thesis the observation technique is one of the most valuable tools to understand reverse logistics since the clear scope was missing and data reliability was quite low in the first phases of the work.

2. Interviewing

There are three types of research interviews: structured, unstructured, and semi-structured. Structured interview answers only prearranged questionnaires, and there is might be the ability for small dissimilarity or not at all — besides, no opportunity to follow up question. Structured interviews require specific people to answers the problem; for that reason, it is not in use quite often. Alternativly, the unstructured interview does not contain any predetermined material or questions. That is why the meeting may start with “Can you tell me something about you.” An unstructured interview usually conducted when the researcher does not know enough information about the subject. Semi-structured interviews contain some key questions that help the interviewee to describe the issue with more detail through the help of the questions. (Saunders 2016)

In this research, both semi-structured and unstructured method was conducted. Both approaches have been undertaken with formal and informal techniques to increase reliability and validity. The formal semi-structured interview mainly used with the top management, and the informal, unstructured interview conducted with employees. For more detail about semi-structured questions, please read appendices.

3. Ethnographic

The ethnographic research method is a combination of both interviewing and observation. It requires much time to explore a specific group of people by living just the same way they do. It is also known as fieldwork. Mostly this method not

applicable to conduct for students under graduating, since the technique require time as mentioned before. The primary purpose of this method to observe a wide range of fieldworks and understand better what the routine activity consists of. (Travers 2011)

This case study conducted this method by doing the job of different organization related to the reverse logistics process. Nevertheless, it took around three years of working in the case company to understand the fundamental concept of each organization role. As secondary data articles, books, journal, websites have been critical resources in this master's thesis. The data has been collected from respectful sources, which is social science, information collected by government departments, and data that was initially collected for other research purposes. For more detail about data collection, please see figure ten.

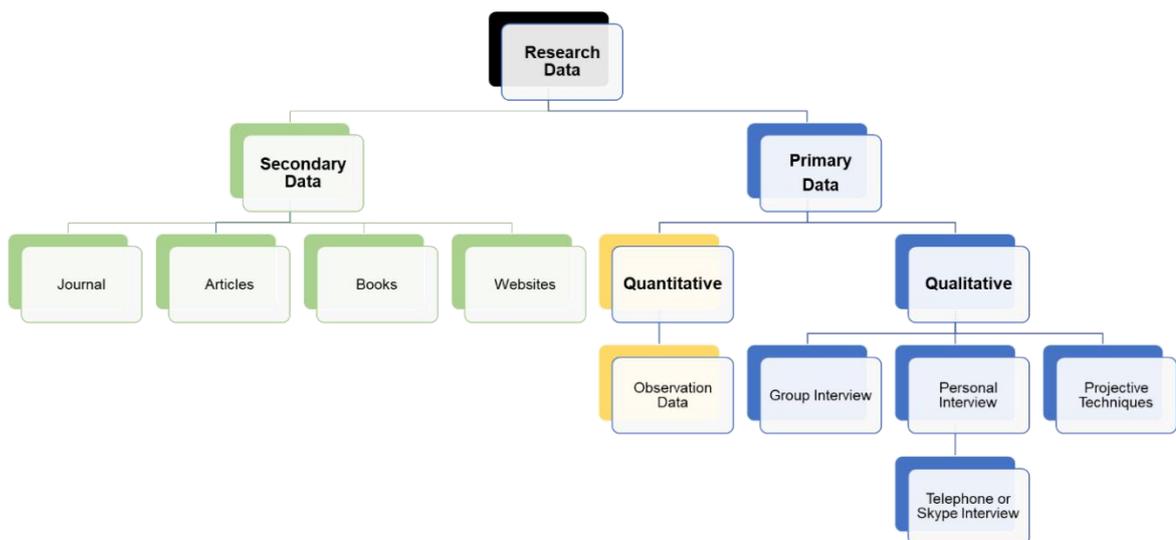


Figure 11 Data Collection Process

4.5 Data Analysis Methods

Data analysis is one of the most critical stages in the case study process. Data analysis is a technique to reduce, conclude, draw, and validly data. In many academic articles, the data analysis phase has been discussed in too general terms.

(Kähkönen 2014) The researcher's job is not finished when enough data from the company has been gathered. The challenge is not just to observe, listen and record systematically. The result comes from analyzing and interpreting the data to what individuals are trying to say. (Stuart 2002)

This case study data analysis was conducted by first requiring from each market representative a process map to observe the process in reverse logistics in these markets. After the data was collected a group meeting was arranged. In the meeting brief presentation was held of each market to understand more with detail the current way of working and analyzing the challenges in these markets. Some of the markets have provided only part of the process. Since the data was not supplied from all requested aspect, process flow map was created to make it easier to analyze the data.

Also, quantitative data was also requested; however, many fail to provide even half of the needed data. It was apparent that numerical facts were hard to achieve even with the help of a local business controller, accounting, a specialist from the warehouse, and financial departments. However, some of the markets obtained some facts to support case study analysis. Both exist process map, and the figures did not match with each other. Based on these findings individual unstructured meeting was implemented to understand how numbers are not correlated with process map and experts words. Thus no one knew why numbers did not match with experts words the case study decided to create a detail process map checklist to support the case study, especially during the interviews. The process map checklist main point is to write down the process, sub-process, and activities of each market to enable an opportunity for data comparison between each other in target markets (please check appendices for perceiving the idea). Also, color coding conducted based on the interview challenges mentioned by the interviewees.

The Interviews were unstructured and semi-structured, interviewees had the right to share his/her experience just as the work is happening nowadays. Over fifty interviews were conducted. All findings were documented in the detail process map checklist file. This file has been shared with workstream members to have an

opportunity to revise results for quick solutions. The detail process map checklist was also divided under all five markets, and the findings have been colored base on the risk priority with the help of the interviewees. After each market meeting was arranged to evaluated risks with more detail. Risk assessment has been made based on two main factors; probability and consequences. Each factor has five evaluation values which are described in table four.

Table 4 Risk Assessment Evaluation Criteria

score	Consequence	Score	Probability
1	Insignificant	1	Rare
2	Minor	2	Unlikely
3	Moderate	3	Possible
4	Major	4	Likely
5	Catastrophic	5	Almost Certain

After having these results, workstream members focused only on the highest risks and aimed to find a mitigation plan for these risks. Not all findings have been solved since there are many deviations in these five markets. The data was considered as valid based on the experts building detail process map checklist and heat map evaluation. Also, the evidence was still compared with numerical fact to increase reliability and findings gaps. After data were aligned and accepted within all five markets, interviews were conducted with all markets supply chain directors to understand the challenges from their perspective. Each supply chain director was separately interviewed, and e-mail with the case study findings was sent before the meeting to avoid misperception. Furthermore, to ensure the challenges have been understood before the meeting. Each of these market directors has different problems based on the local market regulation and available resources.

As a challenge, this study can highlight numerical data was only available from a specific sub-process. Overall, this case study can state that the lack of data

knowledge observed before doing any quantitative data analysis. The detail process map checklist was studied to find similarity and implement a standardized process in these markets. It is also good to know that unused data was removed from findings. However, it is documented in the shared file as a backup. Detail process map checklist is attached in this case study as appendices to have a better picture of a way of working. Nevertheless, the case company did not permit to show in detail the process map checklist used, and for that reasons, it is difficult to read what is written into the process map checklist.

4.6 Validity and Reliability

Reliability indicates how reliably and reproducibly the meter used measures the desired phenomenon. Reliability can be assessed, for example, by repetition measurements. For instance, assume a group of people height has been measured today, and tomorrow the same group measured again if the result still the same then the data can be stated as reliable. (Uusitalo 1991) In contrast, validity means the capability to measure specific thing what was the purpose to measure (Yin 2003). One of the critical points for validity failure is the lack of reliability; contrariwise reliable material does not promise valid data. For example, a house square meters area does not affect the validity of the house comfortability. Some qualitative research validity result can be obtained afterward; this is called the *validity of forecasting*. This model cannot be evaluated before the change is made. (Stuart et al. 2002; Uusitalo 1991)

This research paper has measured the reliability by mixing both qualitative and quantitative approach for estimating the specific phenomenon. The qualitative triangulation data approach was conducted with the help of statistic data of the case company 2018 result which has been compared to interviews, group focus, and fieldwork notes to help out the reliability measures. From a personal viewpoint, the reliability of this study can be measured at an excellent level. Also, if other researchers exams the same issue will receive the same result. Part of the interviewees received a presentation before the interview to avoid confusion and allow them to prepare for the meeting. Group focus interviewees have not received

any prepared list, however short brief about what we will discuss during the meeting. Both using methods results has been documented to increase data validity and ensure a better data analysis. All interview was translated to English, with the help of the team member who works as a translator in group interviews to mitigate misinterpretation. In contrast, the validity of the research is difficult to be estimated yet since the recommendations of this case study require massive changes in the case company; system integration, and organizational redesign. Hence, this research suggests validating the work after the change has been made.

5 Empirical findings

In this chapter, empirical findings are presented and analyzed. Data and the findings are presented according to themes; reverse logistics process map, risk & challenges in the current process, and the conclusions of critical findings. Each part discusses a specific finding or issue. Some section may suggest a quick solution based on the findings.

5.1 Reverse Logistics Process Map

The case company is dealing with reverse logistics daily. Nevertheless, no process map was available to understand the big picture. For those reasons, it was critical to visualize how reverse logistics is considered in the case company with the help of the process picture by Agrawal et al. (2015). The process map (figure 12) visualizes that the case company is dealing with three types of finished goods returns; warehouse, transport deviations, and customer returns. Dekker R. et al. (2004) mentioned production returns; however, this is out of the scope in this study. Each return types will be defined to consider what kind of returns case company is dealing with.

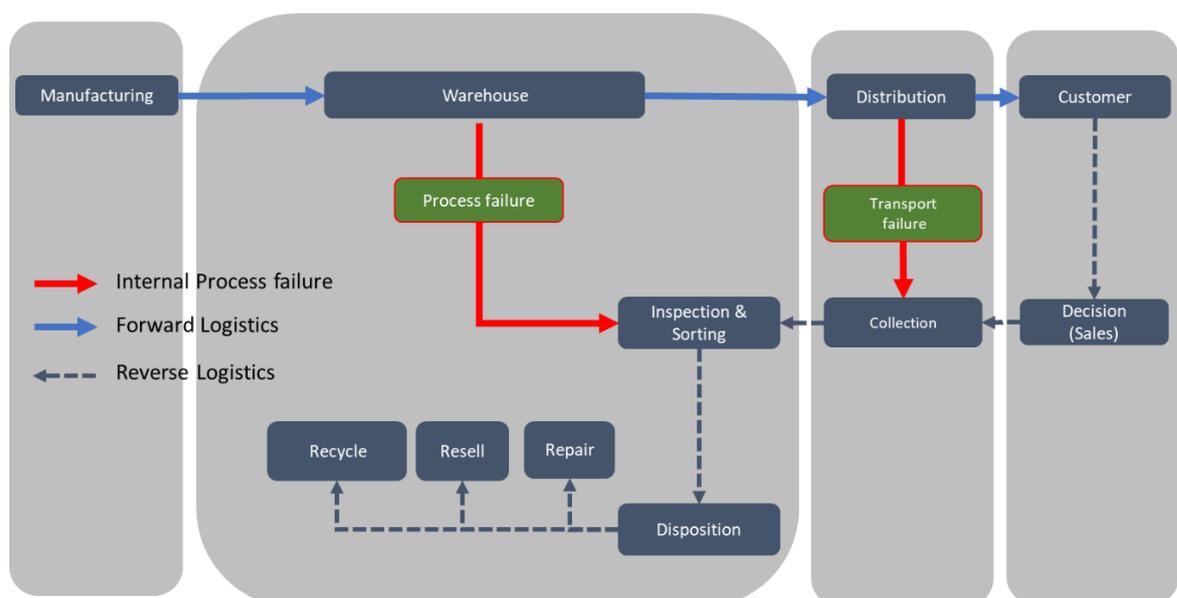


Figure 12 Reverse Logistics Process in Case Company

Warehouse returns are those returns which are observed during material handling within the warehouse. It might be a damaged product during picking, automation failure, damage during transportation within the warehouse, FIFO/FEFO -error within the warehouse, de-listed material, or forecasting failure transport deviations are all the deviations happening during transportations. In many cases, it is understood as customer return which is not the case. Transport deviation might be transport process failure, warehouse picking failure, and the customer refuses to accept the order. Transport process failure refers to the error happening by drivers either during transportation, loading, and unloading which lead to customer dissatisfaction. Picking failure refers to the error happening during the picking process within the warehouse, which is not observed by the driver, and for that reason, the customer will not accept products. The last is customer refusal, which means the customer refuses to take orders even though the picking and transporting processes were well-handled.

Customer returns refer to those returns which customer has already received; but, the customer would like to return the products. These kinds of returns go through a gatekeeping part which is the sales department, and in this situation decides whether the product will be accepted or not. If the merchandise is approved by the sales department, the product will hold a return order.

5.2 Risks and Challenges in the Current Process

This section discusses how returns numbers are divided between markets and an explanation about returns flow. Challenges will be described based on qualitative and quantitative research findings. The figures used in the quantitative study were taken from the result of the case company in 2018. The first sub-section is a discussion about returns from a different department within the warehouse. The second sub-section will visualize external returns; customer returns and transport deviations. Sub-section three discusses the disposal figures and the aim to show the correlation between returns and disposal value. Sub-section four presents the organization challenges regarding the current way of working.

5.2.1 Warehouse Returns challenges

Based on the qualitative research, markets experts have identified five types of returns; production, automation, manual picking area, sampling returns, and promotion. All five markets agree that these returns mostly come via the main warehouse and it plays a crucial role in returning product for further process. Returned products are usually sent to inspection and sorting area to decide whether the product will be repaired, resell, or recycle. The challenge with the current way of working is that there is no linkage between picking and return area. In other words, picking and returns are not covered under the same warehouse management system. Based on that, during the transportation within the warehouse, all data must be copied from system to paper, because data required for a further decision in inspection and sortation area. Also, the data helps decision-making and makes the process faster and material handling process more efficient. Working with paper may create risks such as; stock discrepancies, not committed employees, stress, lack of transparency, lack of traceability, lack of control, the threat to mix unsellable goods with sellable if papers are missing, manual process, and not even sustainable way of working from all triple bottom line pillar perspective.

One of the utmost challenge case company faces in all markets is that there are no data available measuring how much products returns from main warehouse area to return area, how much product is repaired and resell, and how to reduce stock discrepancy. No one can answer these questions, and for those reasons, the size of the problem is difficult to evaluate. In the interviews with all the experts of these five markets, all of them admitted that they have no control on returns within the warehouse and that is why, it is highlighted as one of the main challenges for in-house problems. During the visit to all markets Swedish National Warehouse Manager states "*Finally, someone sees internal returns as a challenge.*" He also stated that as food and beverage company "*We should have a better way of working to comply with ISO 22 000*".

According to warehouse administrators, it is an immense challenge for them to trace any in-house repaired or resell products. The warehouse administrators also

mentioned that they do not know what is exactly happening on the floor, they see only papers, and they make a decision based on these papers and data entry as well. The administrators also stated, product traceability quite often gives not reliable information because some paper may not find their final destination where data should be entered into the system, and this problem may lead to stock discrepancies. For example, the system has more product than physically found during inventory. Also, during the risk assessment with experts, all of the five market experts agree that system coverage is one of the highest risks identified in all five markets.

5.2.2 External Returns Volume

This sub-section describes the case company external returns volume. According to experts, there are seven types of external returns; customer returns, a third-party provider, import finished goods returns, transport deviations, product recall, event customer returns, and de-listed material. These returns were identified based on the semi-structured interview. The case study will mainly focus on the following returns; customer returns, event returns, and transport deviations. Both event and customer returns will be captured under the name of customer returns. As a result, this case study represents the challenges with detail regarding customer returns and transport deviations.

Figure 13 visualizes the number of the total delivered volume of finished goods in all five markets in comparison with the number of total returns. The picture shows that the total returned liters it is quite low as a percentage. However, the total sum of this percent is creating millions of returned liters. These returns in the picture below visualizing only the Nordic markets and Switzerland volumes. Also, these returns just giving a fact of customer returns and transport deviation. Inbound process, raw material goods reception failure not concluded.

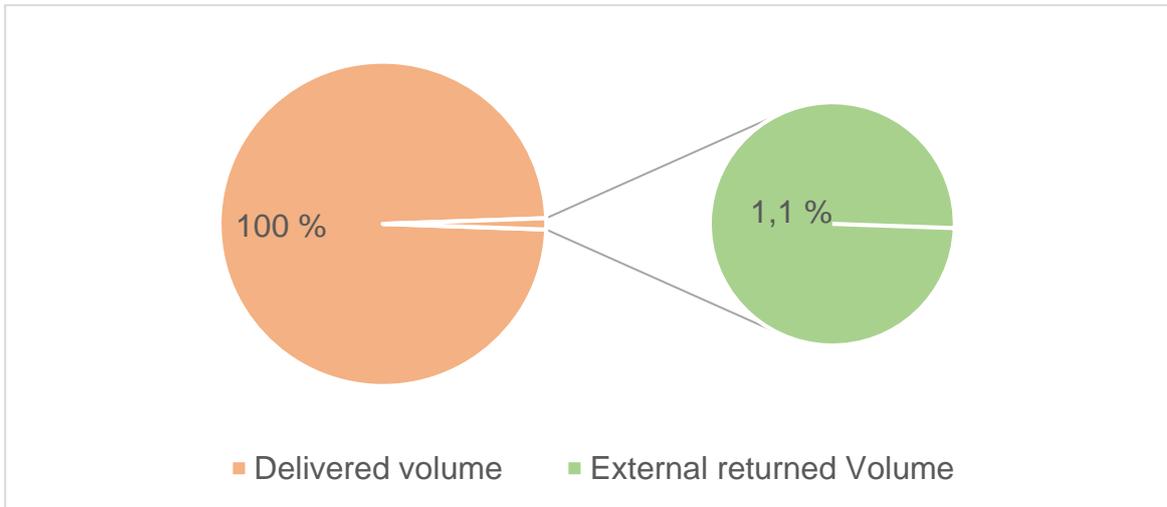


Figure 13 Delivered Volume vs. External Returned Volume

It mentioned earlier that, the external returned volume divided under two categories and for that reason, the total 1,1 % of the volume divided with these two categories. Figure 14 represents the full share of transport deviations and customer returns of the total external returned volume. The first findings based on the fact is that around 30 % of the total external returned volume is related to transport deviations and 70 % are customer returns where the customer is using his/her right to return products.

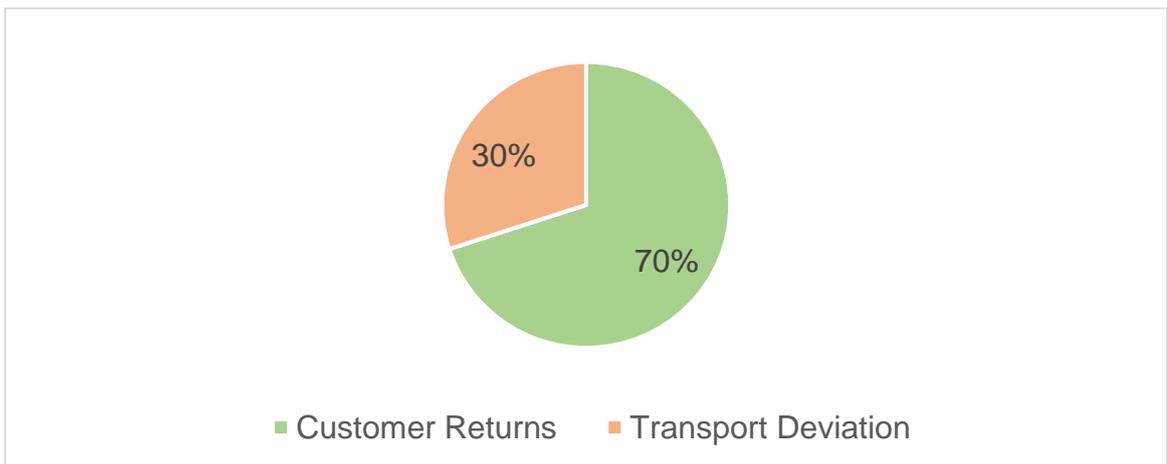


Figure 14 Total share of transport deviation and customer returns

To understand the situation better, the case study divided the returns quarterly to have a comprehensive understanding when the high season of returns. Figure 15

shows in Y-axis the volume and X-axis shows the season which is divided into four seasons. Returns high season in most of the cases is Q3 and the reason behind that is the summer season where the case company sale volume increases and thus the returns volume will increase as well. Other findings Norway have an exceptionally high season of returns in Q1, and this can be answered 2017 Christmas high sale season affect the Q1 directly in 2018. Furthermore, Norway, Finland and Sweden returns can be analyzed as stable in comparison with Denmark and Switzerland. Some markets returns show volatility in the curve of the returned item. For example, Denmark Q1 returns volume is quite low; however the volatile between Q1 and Q2 is massive. It also seems evident that Switzerland has the highest season returns. For concluding the findings Q2 and Q3 can considered as summertime and for that reasons sell increase and thus returns volume increase.

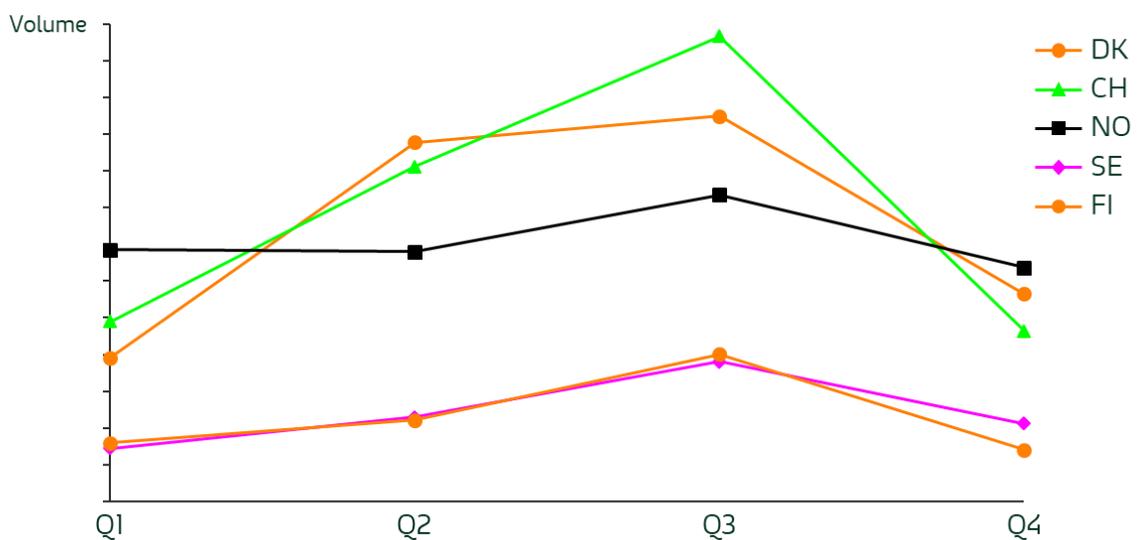


Figure 15 Season Returns

Some may argue that total sales volume and its influence on the total returns should not be analyzed by counting together all these markets and because of that figure 16 visualizes each market percentage of returns in comparison with the total delivered. The picture below shows that Denmark volume is almost double in comparison with Switzerland. Despite the huge differences, Switzerland returns percentage is higher and even the quantity too. Sweden returns amount is quite small in comparison with the total delivered volume. Also though the returns volume

of Finland is low as well, it can be concluded that Sweden way of working is the best practice in comparison with other markets.

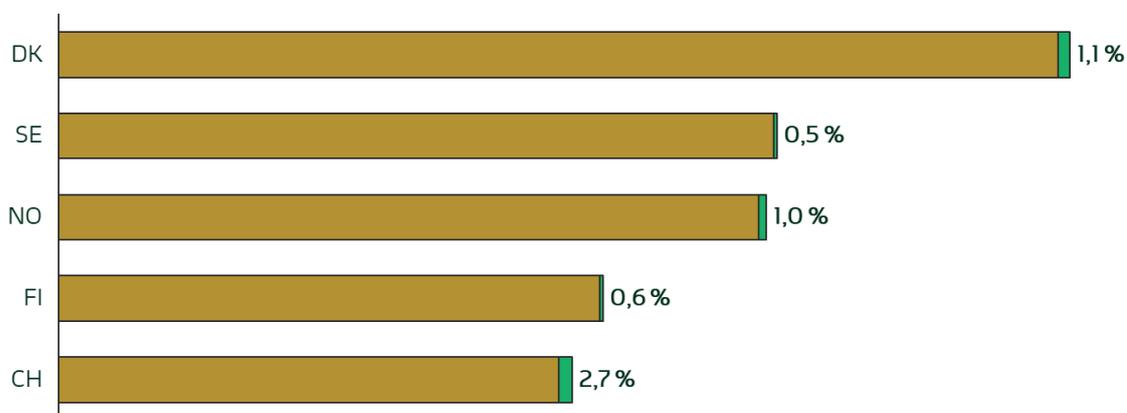


Figure 16 Delivered vs returns for each market

So far, this paper discussed the quantitative findings in case company. On the other hand, there were qualitative findings as well. During the interviews, the return material handling process has been divided into five sub-processes. Each sub-process consists of many activities. These activities define the current way of working in the returns area. These subprocesses are; arrival, decision making, a way of working, recycling, and monitoring. During the observations and interviews, their message was clear that each market has an idea they have a high volume of returns. However, no country has made any quantitative correlation between the delivered amount with total external returns volumes. Another finding was that external returns volume understood as a customer returns only. Four of the five markets understood that all returns are coming back with returns order, which is not the truth and the process map confirmed that in the previous section. The clear message was that there is no broad knowledge about what external returns consist of.

During fieldwork, all markets use papers and give the warehouse operator much responsibility without any special training material and the help of nowadays modern technology tools. It was apparent in all five markets that at least three to five form papers needed to cover all information. Furthermore, challenges such as language barriers and lack of know-how identified rapidly. Experts agreed that returns area

employee's knowledge is limited and there is no training material provided for them. Furthermore, most of the market's supervisor role was unclear which increase the challenge. One of the five markets has not put enough effort into health and safety in the returns area — more detail about the problems illustrated in the next subsections where transport deviations and customer returns described.

Transport Deviations & Customer Returns

During the interviews with transportation and distribution manager, it was clear that all five markets managers have not thoughts about what happens after the product returned into the warehouse. It was also noticeable that the transportation and distribution department has implemented some projects with a direct effect on return material handling without any discussion with warehouse experts. For example, there was no standard operating procedure on how to manage product recalls during transportation and that creates a challenge into the warehouse if there is no communication between warehouse employees and drivers.

The perception of distribution flow should be understood more precisely to recognize the issue better. There are mainly three important distribution flow; National Distribution Center (NDC), Regional Distribution Center (RDC), and Cross-docks (XD). Figure 17 visualizes NDC, RDC and XD flow. The NDC is a site with warehouse, customer delivery, and a production facility. It means all deviations which are happening close to the national distribution center will be returned directly to the NDC site. The RDC is a site with warehouse activity, customer delivery but without a production facility. The XD is a site where the material is mainly unloaded from the heavy load and directly reloaded into outbound trucks for customers. The case company is mainly distributing for business customers either retailers (Off-trade) or restaurants (On-trade). The idea of RDC and XD is to cover long distance distribution and because of that, returns will be sent back to RDC or XD and later on will be sent back to NDC.

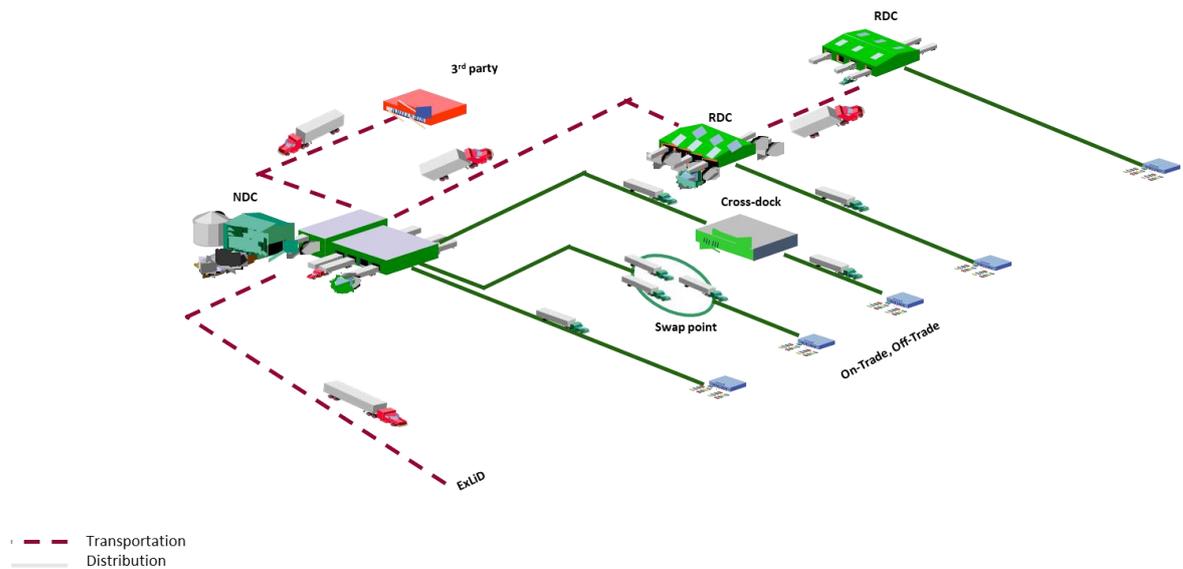


Figure 17 The Role of NDC, RDC, and XD in Logistics

The next step is to find out how the 1,1 % of external returns volume divided from both customer returns and transport deviation perspective. This case study shows previously that 70 % of all external returns volume are related to customer returns and 30 % related to transport deviations. Table five visualizes the share of each market in comparison of all external returns volume from all these five markets to both customer returns and transport deviations. Based on the findings this paper can conclude the following results. Most of the returns are happening in Switzerland which has 35 % of all external returns. Denmark external volume of returns is the second high and Norway is the third. Additionally, the volume of external returns in Finland and Sweden are considered as good. However, since Sweden produces more than Finland, it considered as the best practice.

Table 5 share total external returns

Country	Customer Returns	Transport Deviation	Total %
CH	25 %	10 %	35 %
NO	15 %	4 %	19 %
DK	17 %	12 %	29 %
SE	7 %	2 %	9 %
FI	7 %	2 %	9 %
Total External Returns	70 %	30 %	100 %

Since the percentage of total external returns volume may not help the local market to understand the influence of each flow. Each market total external returns volume are divided by customer returns and transport deviations in the following table (table six). The most relevant finding is the high number in Denmark for transport deviations. It is also a fact that most of the external returns volume are related to customer returns which mean there is a return order with it.

Table 6 share of customer returns and transport deviations of each market

Country	Customer Returns	Transport Deviation	Total External Returns
CH	70,9 %	29,1 %	100 %
NO	78,4 %	21,6 %	100 %
DK	60,0 %	40,0 %	100 %
SE	76,6 %	23,4 %	100 %
FI	77,0 %	23,0 %	100 %

The evaluation needs to dig deeper into the challenge; it is rational to understand each of customer returns and transport deviation effects on NDC, RDC, and XD. Since not all markets are using RDC or XD, this case study decided to merge these two and discuss them as RDC returns. Table seven visualizes the influence of transport deviations on NDC and RDC in percentage. The first finding is that all markets are struggling with returns via RDC since data not carried out properly. It is also clear that the markets are controlling direct distribution which product returns directly to NDC much better than RDC returns. Even though Finland numbers are quite low, it is still facing challenges in the comparison between NDC and RDC.

Table 7 Share of RDC & NDC on Transport Deviations

Country	NDC share in %	RDC share in %	Total % of transport deviation
CH	8,8 %	20,3 %	29,1 %
NO	3,1 %	18,6 %	21,6 %
DK	19,1 %	20,9 %	40,0 %
SE	2,8 %	20,6 %	23,4 %
FI	9,5 %	13,5 %	23,0 %

During the interviews, many interviewees stated, the challenge in RDC starts when no resource available in RDC and for that reason no inspection can be made for any returns (customer returns and transport deviations). It may create a more significant challenge when heavy load return sent from RDC to NDC. Besides, movement between RDC and NDC is happening by papers which produces extra problems during the handling process. This way of working creates stress, risks, not committed employees, traditional paper documents are missing which creates double handling, and no clue when returns will arrive, products stored for a long time which leads to product expiration. In the end, one of the critical problems the case company is facing is papers since data are not available easily to eliminate issues. In additions, no one can give a decent answer to why products are returns from RDC and via which customer. Employee frustrations can be identified quickly, at the floor level employee mentioned, “Unfortunately, *there is no interest or motives to invest in a better tool to create a better way of working.*”

The second flow is the customer returns which represent 70 % of total external returns volume. The number is quite high, and one of the utmost reasons for the high return’s percentage is summer season high returns volume because the case company is dealing with events customers. Table eight represent the influence of customer returns on NDC and RDC in percentage. The table below shows volatilities between all five markets. However, Switzerland customer returns considered as stable between NDC and RDC. On the other hand, Sweden customer returns figures are quite high in RDC, and this is because of the geographical location of the plant where most of the customer are located far away from the NDC. One other finding is that the customer returns volume in Finland is higher in NDC than RDC.

Table 8 Share of RDC & NDC on Customer Returns

Country	NDC share in %	RDC share in %	Total % of customer returns
CH	33,1 %	37,8 %	70,9 %
NO	36,9 %	41,4 %	78,4 %
DK	32,4 %	27,6 %	60,0 %
SE	15,1 %	61,5 %	76,6 %
FI	39,1 %	37,9 %	77,0 %

During the interview, many of interviewees mentioned that events product returns are the main issue for high customer returns. Subject matter experts stated, event customers have the right to buy “as much as” they want and mostly return all product leftover to the case company. During the observations, it was easy to identify that event customers can return damaged goods and receive credit. The case company did not have any other option than recycle these products. All experts agreed there is no clear policy from sales departments what customer can return and what customer should not send back. Some of the experts mentioned that the return cost is not considered. All experts agree that event product returns create a vast number of scrapping. This means it affects directly obsolete figures, cost of transportation, and cost of material handling. Experts also mentioned another problem which is the transparency since data written by the sales department not seen in the warehouse and especially in the inspection and sorting area. This kind of challenges increase frustration and is a motive to dispose of a product to make warehouse employees life easier.

Last but not least this paper can conclude that both NDC and RDC are facing challenges based on many various factors. Table nine visualizes the total external returns volume of each distribution center without taking into consideration the two flows (customer returns and transport deviations). The table represents that all five markets are mainly facing trouble with RDC. Denmark and Finland are those markets where challenges are divided equally for both NDC and RDC. Additionally, Sweden figures represent that, the primary challenge in Sweden plant is the RDC and quick recommendation is to concentrate more on RDC returns than NDC. Other findings are 17,9 % returns via NDC in Sweden which confirm that the direct distribution in Sweden does not create many challenges since the geographical

location is far of the urban city and most of the delivered volume will need to go through RDC. Both Norway and Switzerland should consider seriously how to handle returns via RDC smoothly.

Table 9 The Share of NDC & RDC on total returned volume

Country	NDC %	RDC %	Total %
CH	41,9 %	58,1 %	100,0 %
NO	40,0 %	60,0 %	100,0 %
DK	51,5 %	48,5 %	100,0 %
SE	17,9 %	82,1 %	100,0 %
FI	48,6 %	51,4 %	100,0 %

5.2.3 Disposal

This part explains how disposal figures are related to returns handling process. The researcher wants to highlight that a requirement from the case company not to present any real financial numbers and for that reason, values displayed in percentage. Disposal which is known in the case company as scrapping process is covering the recycle process, where finished goods will be sorted to have the opportunity to recapture value from components which are mainly; nylon, plastic, aluminum, liquid, carton, and metal. The scope of this case study considers only finished goods and therefore, only finished goods scrapping figures displayed. Additionally, the case study aims to find out how much product is sent for destruction area after deciding to dispose of the product. Also, the statistics only cover supply chain values, where production and commercial driven disposal not considered. However, it is reasonable to understand the share of each department. Figure 18 represents the three departments share of total scrapping in these five markets. It is clear that commercial driven disposals are representing approximately half of the total scrapping value in case company; on the other hand, supply chain number represents 28 % of total scrapping in these five markets.

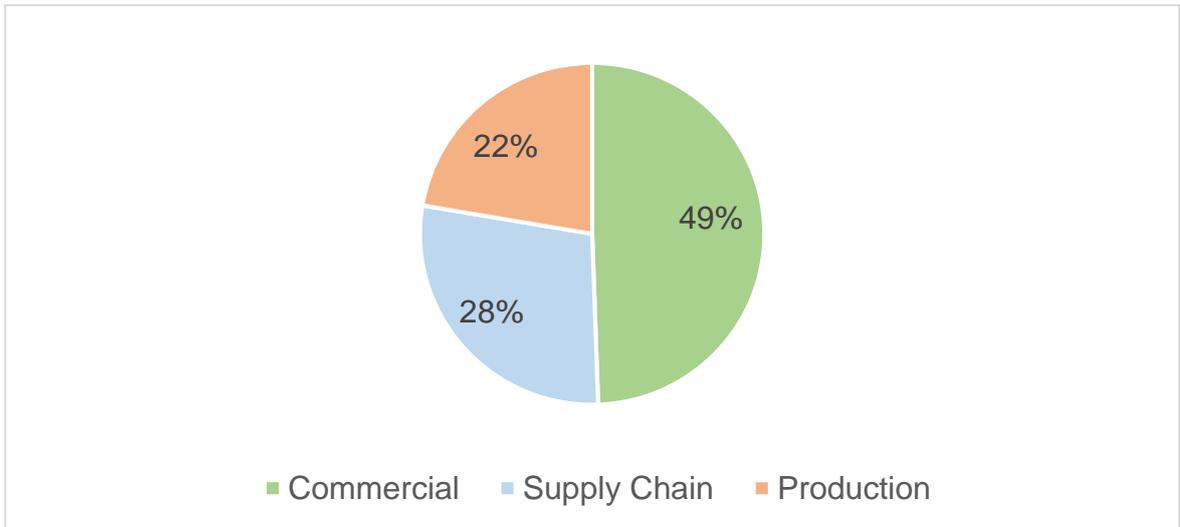


Figure 18 Share of Departments of Total Scrapping

Scrapping table 10 represents the share of each department at the country level. First finding, Sweden commercial department scrapping share is low in comparison with other markets. The Finnish market is on edge from the commercial perspective. On the other hand, Norway, Denmark, and Switzerland have the highest commercial driven disposal value. From the supply chain perspective, Finland disposal percentage is the highest in contrast to Denmark who has the lowest. It is also good to keep in mind that Finland delivered volume is almost half of the Danish. The last department is production, and it is clear that Sweden and Denmark are facing issues during production.

Table 10 Share of Departments of Total Scrapping at country level

Country	Commercial	Supply Chain	Production	Grand Total
CH	57 %	22 %	21 %	100 %
DK	53 %	16 %	31 %	100 %
FI	40 %	43 %	16 %	100 %
NO	57 %	37 %	6 %	100 %
SE	24 %	36 %	40 %	100 %
Grand Total	49 %	28 %	22 %	100 %

The supply chain is the only scope which means this study aims to understand the total of supply chain share (28 %) of these five markets. This 28 percent is divided by each market share to be able to understand supply chain scrapping share on a country level (figure 19). The figure reveals that Norway has the highest scrapping value, Denmark share is seriously in second place, and Finland is holding third place. Switzerland is the best country from supply chain scrapping value perspective.

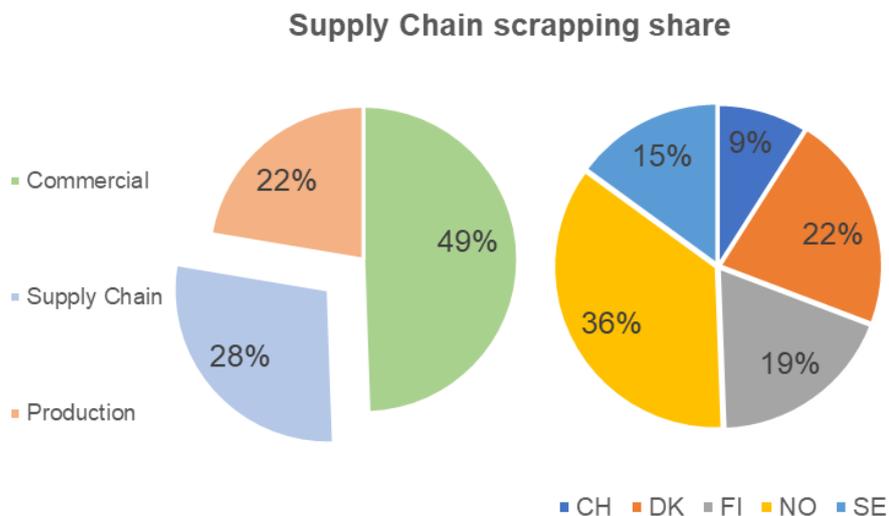


Figure 19 Supply Chain Scrapping Share

The supply chain disposal allocated under five cost centers or departments; procurement, planning, warehouse, transport deviations, and customer returns. This case study discusses only warehouse, customer returns, and transport deviations. Moreover, since the previous statistics numbers show just the general situation, the aim is to analyse each market separately. Figure 20 represents Switzerland scrapping percentage in the supply chain; the warehouse percentage is almost 60 %

of the total scrapping. However, since there is no system coverage it is difficult to evaluate how the rate divided at the sub-department level.

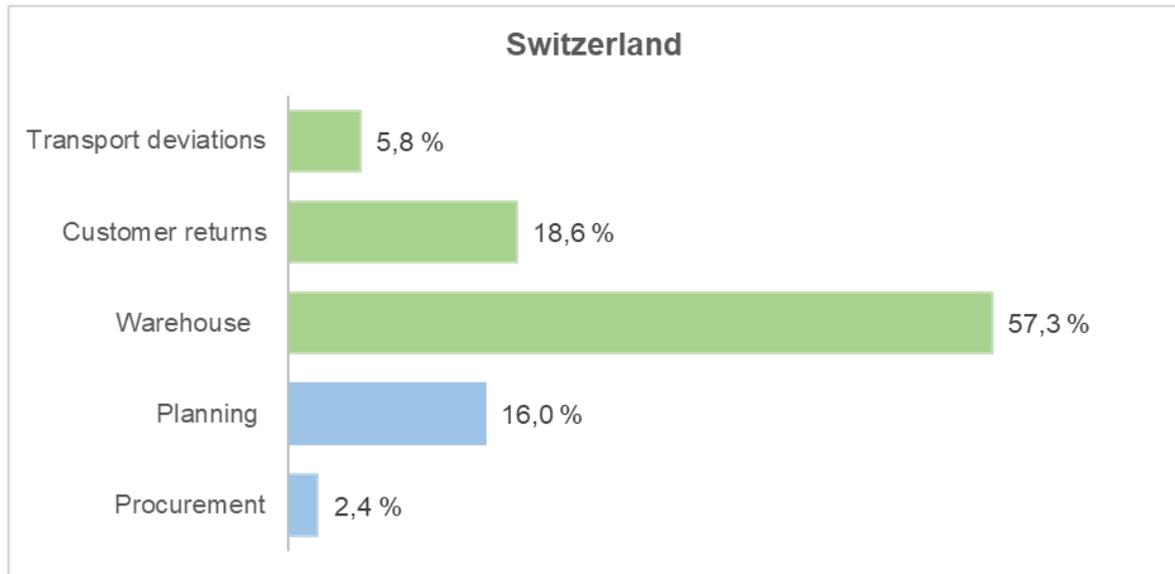


Figure 20 Switzerland Scrapping Share in Supply Chain

As a result, this case study estimates that 24,4 % of total scrapping correlated with external returned volume and 57,3% related to warehouse process failure. Also, this paper mentioned that Switzerland has the highest external returns volume and here the market demonstrates the lowest scrapping value. It indicates that inspection and sortation process in Switzerland is better than other markets and they have found a way to recapture value from returned items. The qualitative study also confirmed this result based on the observations and interviews.

The second country to analyze is Denmark (figure 21), and the trend is the same as in Switzerland where the warehouse scrapping share is the highest. During the observation in Denmark, the automation of damaged products volumes was identified as the challenge internally. The external returned volume creates 29,5 % of the total scrapped volume which also produces an enormous amount of product disposal. The critical findings in Denmark statistics are that transport deviations numbers are high. It is also good to remember that their scrapping share is holding third place between all these five markets.

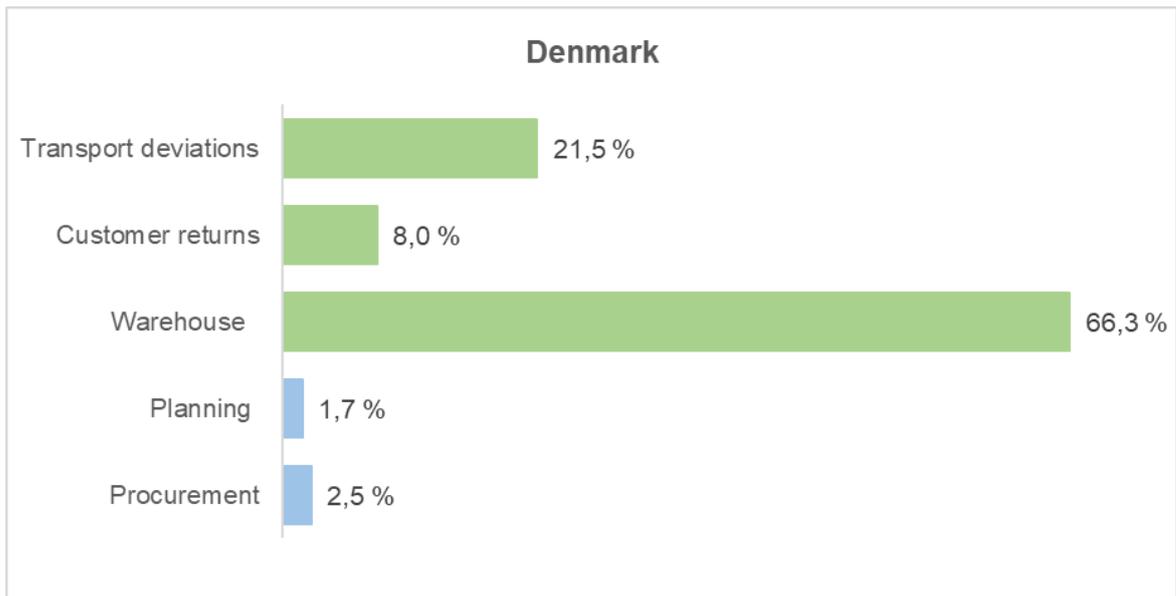


Figure 21 Denmark Scrapping Share in Supply Chain

Figure 22 represents the Finnish market challenges in the supply chain. The trend of warehouse struggles continues; however, the Finnish market has a smaller number in comparison with the two previous markets. On the other hand, transport deviation scrapping percentage is extremely high, and it is confirmed by the local representative of the Finnish market. It is obvious that the Finnish market needs to put more effort into transportation. According to the local distribution manager, transportation in Finland is outsourced and since then the trend of transport deviations growing. Some part of the transport deviations are invoiced from service provider, which effects on the total percentage value of disposal transport deviations share. But, this does not mean the total waste of working is decreased because company needs to recycle product in all cases. Another finding is customer returns damage percentage is too low which this case study assume it cannot be reliable. because of this, It is recommended for Finland to revise the customer returns related disposal numbers.

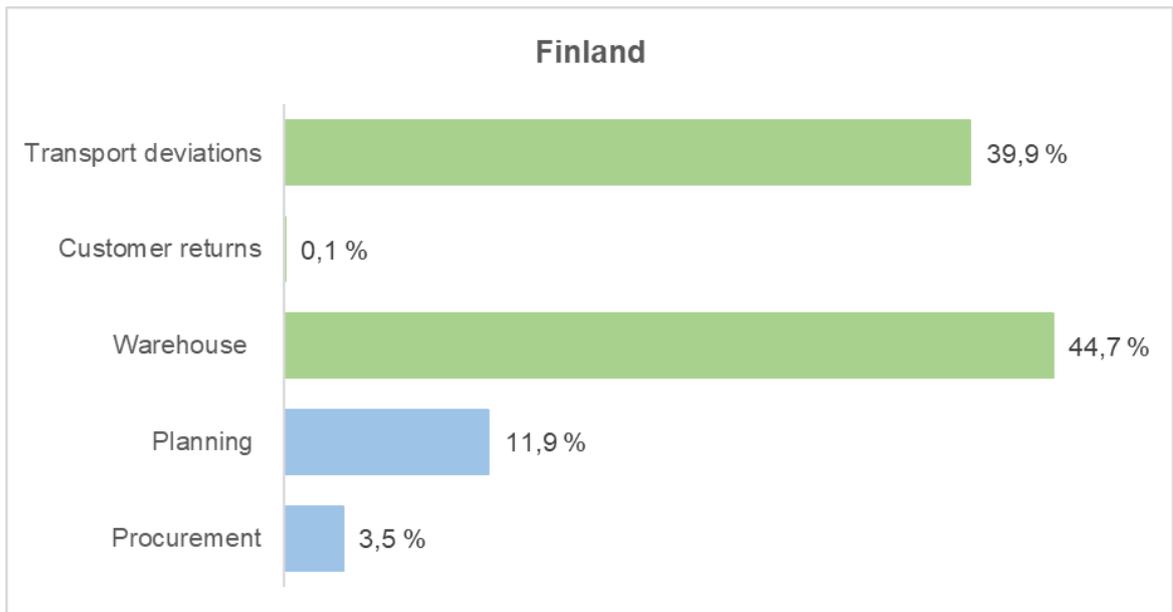


Figure 22 Finland Scrapping Share in Supply Chain

Norway numbers are much better from the warehouse and external returns perspective. Figure 23 demonstrates the main challenges into the supply chain. The first finding is the challenge in the procurement department which is not the scope of this study. The warehouse disposal value is high; however, it demonstrates the lowest value in comparison with other markets. Another finding is customer returns numbers are quite small, which indicate that the returned material handling process is well-designed. On the other hand, transport deviations represent 0 % even though 21,6 % of total external returns are related to transport deviations in Norway. As a quick recommendation, Norway should revise why no product is disposed of under transport errors.

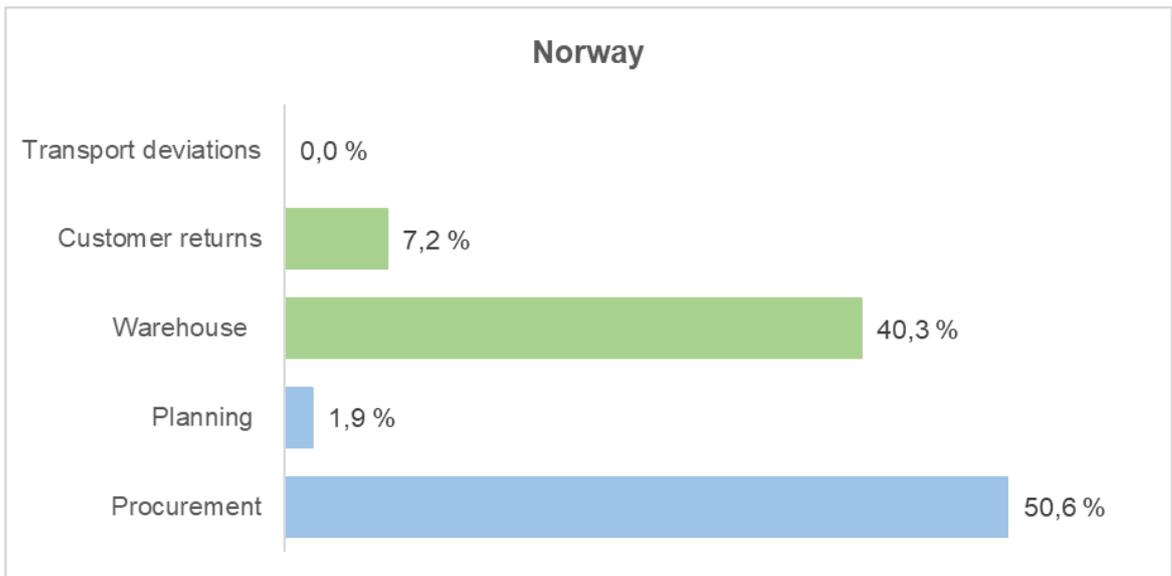


Figure 23 Norway Scrapping Share in Supply Chain

Sweden scrapping figures represented in figure 24. The results reveal that the warehouse process failure trend continues and the Swedish number is serving over 60 % of disposal value. One of the main reasons for the failure is the automation damage in Sweden which is quite high. From the external returns' perspective, 28 % of the total scrapping value correlates with the returns.

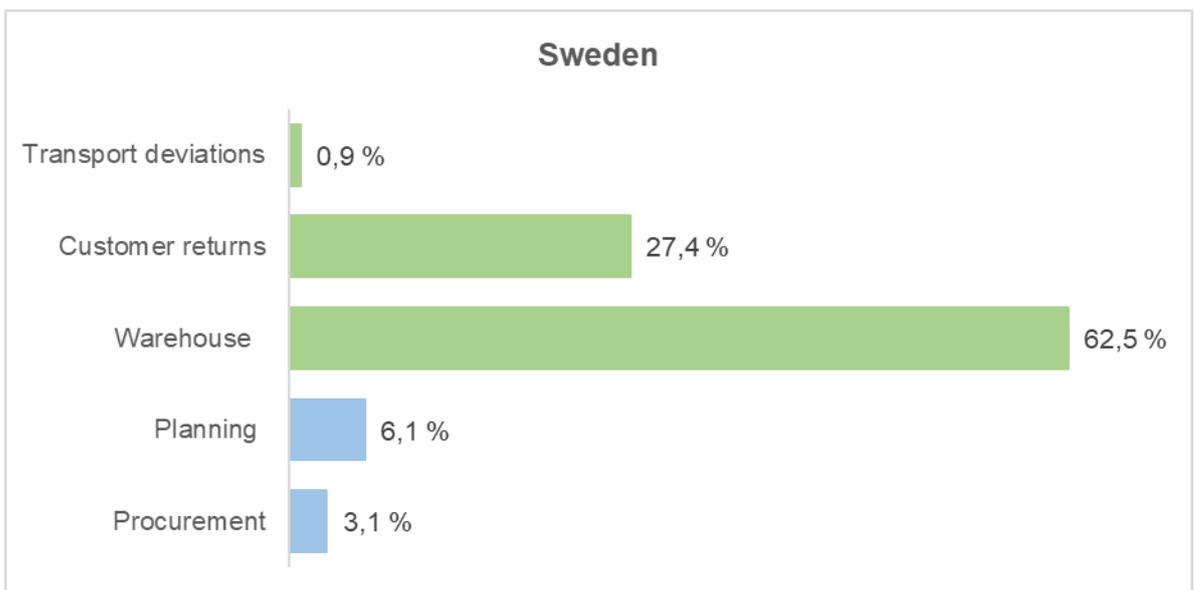


Figure 24 Sweden Scrapping Share in Supply Chain

To understand the problem better, top scrapping reason codes are needed especially from the warehouse and transport & distribution (T&D) departments. Figure 25 shows three mainly used reason codes which are; internal damage, handling failure, and returned as damage. The internal damages are creating the highest loss value within the warehouse. The main reason for scrapping is automation damages which represent over 80 % of all internal damages in all five markets. Some of these damaged goods are not recognized during the warehouse process, and it will create an error during picking which affects customer order. In the worst scenario, it will create a problem with scrapping process since the product is missing. Besides, if the driver does not observe the missing item, it will affect the return handling process since there is no physical product returning. The second reason is handling failure which refers to an error within the warehouse for any motives such as inappropriate product handling. One of the most common reasons related to returns is FIFO error. The figure below visualizes huge error during handling which will be sent back for returns area for the recovery process. The last mostly used reason code for scrapping is returned as damage which is related directly to external returns volumes. Under this reason code, the damage during transportation holds the highest value. It increased the question about the role and responsibility of the drivers during transit, and it is identified as one of the most critical problems for transport deviation. According to subject matter experts, the outsourcing of transportation has affected negatively on the quality of the product.

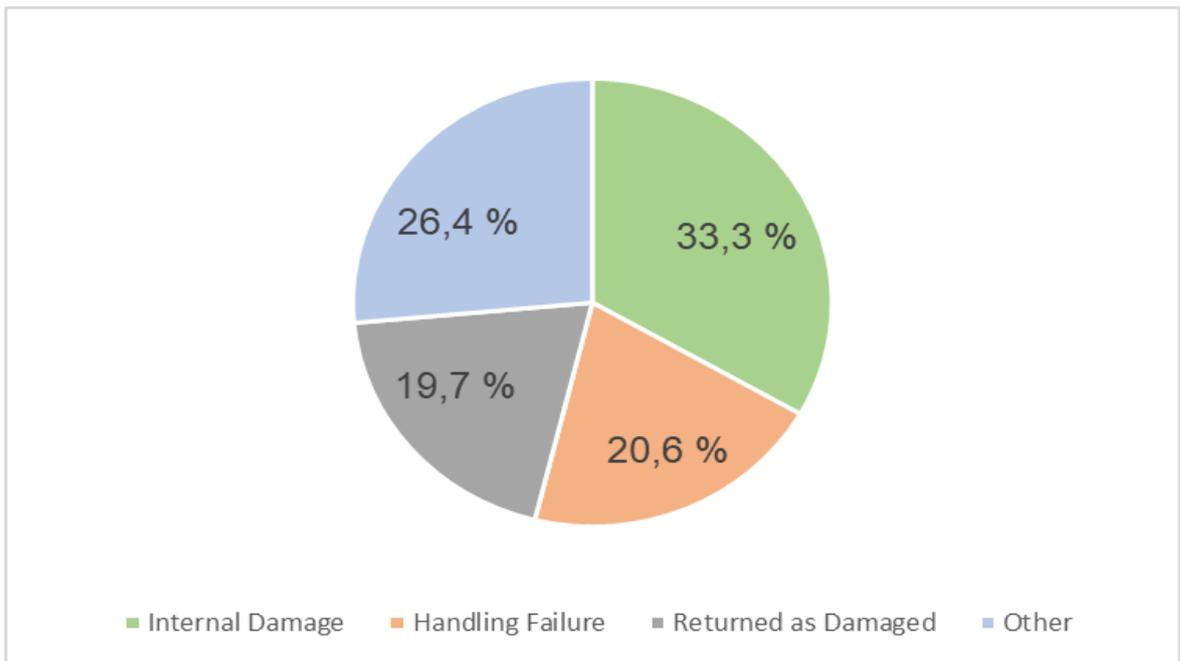


Figure 25 Top Used Scrapping Reason codes

5.2.4 Organizational structure

Reverse logistics magazine (2019) emphasizes the role of organization and change management. This sub-section discusses organizational challenges in the case company — the following problem identified in all five markets. Figure 26 represents the current organization. Researcher wants to highlight the amount of Full-time equivalent (FTE) in the image below is not representing the case company FTEs. The purpose of the picture is to display the current challenges.

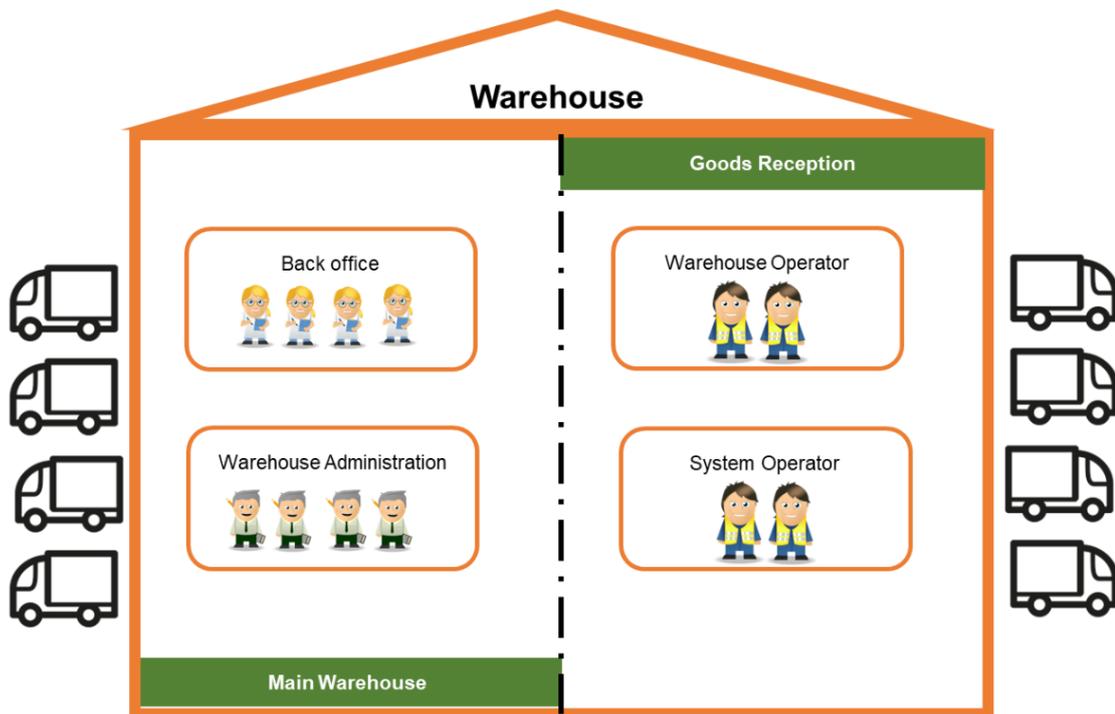


Figure 26 Organizational Design in Case Company

The picture above demonstrates four units or sub-departments who are directly related to return management. It can identify that case company units are; warehouse operator, system operator, back office, and warehouse administrations. The warehouse operator main job is to check trucks (quantity) physically, and later on, make a decision what the next step for the product (quality) is. All physical action taken by the warehouse operator needs to be written down on a paper. The system operator, on the other hand, makes data entry based on what warehouse operator has decided and wrote on a paper. Data will enter into the ERP system for further process and, the system operator needs to save all documents and send them to a back-office employee who located in the opposite part of the building. The back-office employee ensures that customer returns or transport deviation errors during the goods reception are matching the invoice and makes a correction for invoice if there is an error. The back-office, later on, will send the paper to warehouse administrator who is responsible for writing off damaged articles or ensures the stock balances is correct within the ERP system.

Based on the description as mentioned above the current way of working consists of many risks' activities and the possibility for errors. Also, throughout the interviews, it was apparent that stakeholders in the process were frustrated with the current way of working. Since it requires a lot of manual works and data was not merely achievable when it needed. Another challenge recognized is back-office and warehouse administration working hours since these two units operate in the day shift when the system operator and the warehouse operator are working three-shifts. Thus material handling process challenges increase and create stress at the floor field shop. To ensure the result is a valid comparison between stock discrepancies with the qualitative research observation findings conducted. The effect of stock discrepancies in returns and scrapping area confirm the problem as more prominent than thought in the beginning. This case study will not show any number related to stock discrepancies as it is not acceptable from the case company.

5.3 Conclusion of Key Findings

The main point of this chapter is to conclude the key findings in the case company and explain the quantitative and qualitative research findings. First, an explanation of how reverse logistics flow works in the case company. Based on the interviews and observation there are two types of returns; internal returns and external returns. Internal returns refer to the warehouse; this case study failed to provide statistics regarding the total amount of internal returns for the missing of system coverage between returns- and main warehouse area. External returns volumes divided into two flows; transport deviations and customer returns. The result shows that 70 % of returns are related to customer and 30 % connected to an error during transportation. Also, this chapter visualized the difference between NDC and RDC and their effect on external returns volume.

The disposal subsection describes the total disposal product in case company. The correlation between returns and disposal is covered with the best possible way. As a result, the warehouse disposal rate plays a crucial role with an average of 50 %. External returns disposal rate is approximately 25 %, and planning is dealing with the rest. The last sub-section demonstrates the current organizational challenges.

The directly involved sub-departments or units show that the connection and communication level is currently low. The current organization is not supporting the data challenges since employee location is quite far from each other. The findings were compared with the theoretical table by Abdulrahman et al. (2014) in chapter two. This case study agrees with part of the challenges by the authors, and for that reason, this case study selects only the problems detected in case company, and the rest of the assumptions has been removed. Table 11 shows, the main challenges case company are facing in today way of working in the left side and on the right side the impact on the triple bottom lines.

Table 11 Challenges and Impact in Case Company

Findings	Impact
Lack of funds for training	Social, environmental
Lack of trained personnel	Social, economic
Lack of management commitment	Social, economic
Lack of shared understanding of best practices	Social, environmental, economic
Lack of waste management practices	Environmental, economic
Lack of funds for return monitoring systems	Economic, social, environmental
Reverse logistics not considered as critical aspect to competitive performance	Economic, social, environmental
Lack of sufficient in-house facilities (storage equipment and vehicles)	Social, economic
Wrong workstation location	Social, economic
Lack of coordination with 3PL	Economic, social, environmental
Lack of expert at management level	Social, economic

The results show that common challenge is the case company is the missing knowledge and financial support to create value. It is evident that process cannot managed well without good training material which was the challenge in the case company. Additionally, reverse logistics improvement not seen as capital expenditures and for that reason, this case study suggests for top management to accept the problems since there is no intention for investment.

This research paper evaluates that a lack of understanding in the sustainability aspect has been identified in the case company because the most common challenge is the lack of knowledge and more focus on “savings attitude.” The main

idea is to supply products without thinking about the impact of supply chain process failure in reverse logistics. Lack of data, knowledge, funding, and training program has created an enormous cost in stock discrepancy and taxation. However, the loss of control, traceability, and transparency are the most critical.

6 Recommendations

This chapter recommends solutions for the case company. These recommendations have been presented for the case company top management, and some of the solutions are already implemented. The chapter recommends four solutions; system integration, organization redesign, quick wins, and either to make or to buy services in the case company.

6.1 System Integration

In the previous chapter, this research identified that the data problem is one of the critical challenges in the case company, and system integration has been prioritized as one of the essential solutions. As it was mentioned before, there is no system coverage in the returns area. Also, there is no linkage between returns and the main warehouse area. The first recommendation for the case company is to create a system which links external returns until product end life. With the help of today technology, this change is achievable; however, it requires investment. The solution has been studied with information technology (IT) experts, and they do see the potential in the change, and admit this change is needed to have better control and to gain a competitive advantage in comparison with other competitors in the markets.

The change will have a direct positive impact on social factors since it creates an opportunity to have a better way of working with less stress. Besides that, employee welfare has been evaluated to be increased by approximately 5 % if the change will be implemented. The other benefit is the environmental impact since system integration will eliminate papers, and the system will make a decision automatically, whether a product should be repaired, resell, or recycle based on the input data from the previous party. It will also create an opportunity to reduce FEFO -errors; nowadays no one knows when a product is going to be expired if not reading all papers. This solution has a positive impact on the environmental factor and can reduce product recycle up to 1 %. As optimistic as it sounds, there might be a disadvantage of the system integrations — the benefits and challenges visualized in the next table 12.

Table 12 Benefits and Challenges in System Change

Benefits	Challenges
Performance transparency & traceability	Too many local projects aiming to solve the same problem
Automation and digitalization	Driver Handheld terminal update may create challenges
Availability to robotize admin work	RDC flow is complicated
Management awareness	System integration enforce new WOW, which may create challenge
Reduce stock discrepancies and taxation	Resistance to change
Create new WOW in returns management	Cost of the change
	3PL role with new system coverage

The system integration with other exists systems in case the company should cover many processes and subprocesses. Figure 27 demonstrates the overall picture of what the system needs to include.

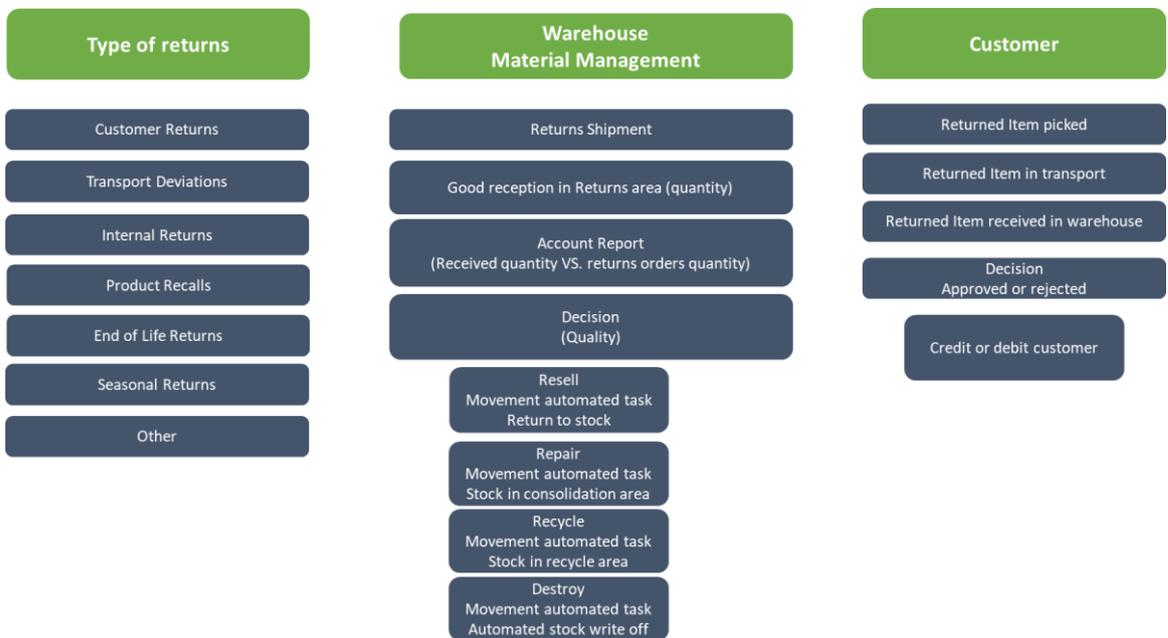


Figure 27 System Coverage in Returns Management

The system should cover three categories to make returns management process more efficient — these categories; the type of returns, material management, and customer view. The type of return should give a clear picture under which kind of

category returns may be fit. This will allow the recipient to understand the barriers the return items may have, and It also should give a clear message which customer are returning which item. With the help of reusable tags, this is achievable. Based on the type of returns data, the recipient may be able to continue the process without wasting too much time. The in-house process consists of many subprocesses. One of the most critical parts is to check returned item quantity and then, later on, decide the quality. Based on each decision system may create tasks and these tasks will lead to different results. From the customer perspective, the in-house process is not adding value process, and for that reason, the customer should only be informed as follow. The product has been picked, received into the warehouse, the decision whether returned item accepted or not based on the reason for return.

6.2 Organizational Redesign

It was clear that the current way of working in case company is creating challenges. For those reasons, the case study second recommendation is organizational redesign. The corporate restructuring is usually a sensitive topic which may lead to resistance to change. During the investigation, it was apparent that case study suggestion was not readily accepted even as a thought level.

In the section organization structure, the case study has identified four units (figure 26). Based on the observations and interviews the case study recommends changing roles in three units. System operator and back-office units are not currently adding value, and eliminating these two units will make the process more efficient. The case study identifies that system operators should be supporting the warehouse operator to make the physical work. In that way, more employees will be able to check return shipments and make the correction immediately if need it. Releasing a system operator may increase the operation performance.

The other unit which has been recognized as not needed is the back-office unit and part of warehouse administration work. Currently these units are located so far from the return's facility area, and the case study estimates by doing this change the company can gain an advantage. On the other hand, the case company still needs

the employee to do the office work, and for that reason, back-office unit and part of the warehouse administration should move closer to the return facility work area (control unit). This will create an opportunity to increase knowledge and communication skills. Besides, working close to each other makes the process more efficient. Figure 28 visualizes the change; one of the critical points in the organizational redesign is that number of FTEs will maintain the same but the job profile will change. The case study does not suggest FTE reduction at this stage since the case company way of working is still quite tricky to evaluate.

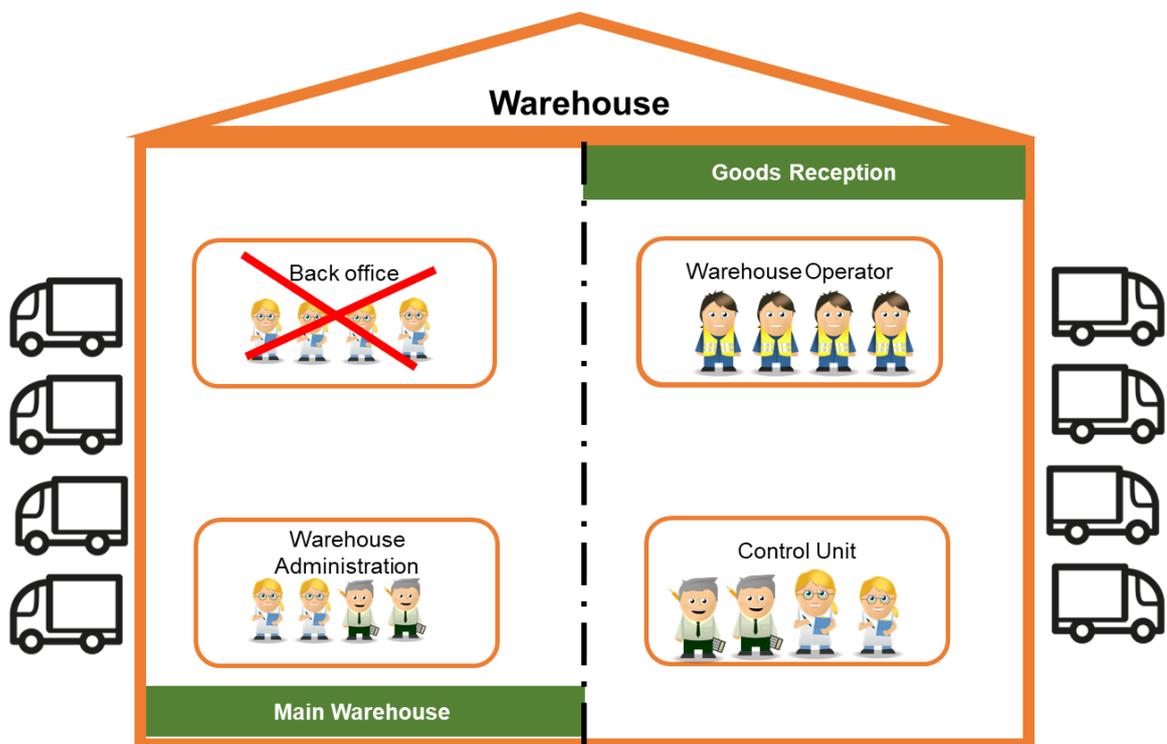


Figure 28 Organizational Redesign Recommendation

As with any other changes, there are benefits and challenges. One of the primary vital findings during the investigation is that Switzerland is currently working quite similar to the recommended way of working. Other markets still not seeing the value-added by the change. The benefits, and challenges provided in table 13.

Table 13 Benefits and Challenges in Organizational Redesign

Advantage	Disadvantage
Help the proposal for system integration	Might need CAPEX for relocation
Reduce double handling of WH operator work and admin work.	Union impact for employee job descriptions change
Increase the percentage of checked trucks with returns	Resistance to change
Increase warehouse operators skills of return handling.	Employee engagement and commitment may be effected
Create control over material handling and fixing problems immediately "attitude"	
Increase information & communication flow	
Might create savings of working hours	
Performance visibility and transparency	

Case study estimated more benefits than challenges. Despite the amount of advantages, the resistance to change is considered as one of the huge matter the case company may face. Workstation relocation from one area to another may create motivation issues. The case study recommends that change should be made smoothly and in a proper manner.

6.3 Quick Wins

Quick wins are findings during the workshops. These findings are identified based on observations, interviews, and expert's knowledge sharing. The case study has identified over forty findings during the workshops. For confidentiality reasons, only a few quick wins will be presented in this case study. Furthermore, savings cannot be shown here (table 14).

Table 14 Quick Wins

Action	Market	Savings €
Improve layout and signs in returns, scrapping, and consolidation area	All	Confidential information
Use booklet as returns policy for event customers	Some markets	Quality improvement
Create an opportunity to feed manually returns items to automation picking system	Some markets	Confidential information
Sub processes standardization	All	Quality improvement

The quick wins show that there is an opportunity to standardize some of the processes in the case company. A great example is annual returns from events which were decorated as a motive for high returns during the summer season. Conducting booklet to be shared with the customer about return policy may help to increase profits, reduce returned item quantity, and increase customer responsibility. Layout improvement is identified as an issue, and the case study recommends that all five markets need to have better signs, floor marking to avoid misperception. Warehouse employee knowledge may increase by having clear signs. In additions, an instructions required for subprocesses. These instructions may increase visibility and also create an opportunity for subprocesses standardization. Direct savings amount can be assessed as satisfactory level. However, the quality improvement quick win solutions can be assessed as very good.

6.4 Make or Buy Decision

The case study agrees that reverse logistics is a potential area for outsourcing. Based on findings in the case company, this case study recommends keeping reverse logistics as a part of the food and beverage industry because companies have the responsibility to collect empties from business customers such as boxes, pallets, bottles, et cetera.

This study also estimated there is a potential to reduce cost in the whole supply chain if the case company keeps reverse logistics as a part of their main

competencies because it creates an opportunity to identify all errors in forwarding logistics. This paper highlight that, if the case company is not willing to invest in an appropriate system to cover returns management and support the whole reverse logistics flow, then the company should consider seriously to buy the services from external third party.

7 Discussion and conclusion

This chapter discusses the case study findings and evaluates these findings with existing theory. Section one will go through significant results by discovering the relationship between outcomes and existing literature. This will help in decision-making whether this research paper agrees or not with existing theoretical data. Section two will restate significant results and explain the contribution case study conducted on the existing literature and limitation of the study: section three answers the research problem and part four recommendation for further research.

7.1 Discussion

This research paper started by investigating existing data about reverse logistics such as definition, the process of reverse logistics, outsourcing reverse logistics, drivers and barriers for reverse logistics implementation. Besides, a discussion about the sustainability from environmental, social, and economic factors provided. One of the significant finding during the work was that no data exist about how reverse logistics organization should look like. Many authors have discussed the reverse logistics process. Still, no data was found about the optimal organization. This case study struggled to have valid data regarding the organizational part; for that reason, the organization of reverse logistics was estimated based on the interviews and the data gathered inside the case company.

Contrariwise, the reverse logistics process was designed by many authors; the process was a slightly different from author to others. This case study chose the process model build by Agrawal et al. (2015) where they mentioned the four significant steps in reverse logistics. These steps are product acquisitions/gatekeeping, collection, inspection and sorting, and disposition. This paper agrees with the author about the four levels and believes these steps are the main point in reverse logistics. There is still an unclear picture of the phases of the landfill. Also, there was no mentioning about quantity part, since product returns first part is to count how much the goods reception area has received items versus the

amount in the order. Returned handling process within the warehouse was mentioned by Dekker et al. (2004) where they chose a buffer model after goods reception. Buffering returns after goods reception are a great model for all industries excluding food & beverage since there is a risk of product expiration. The role of the warehouse in reverse logistics not discussed enough, and for that reason, this paper agrees with Dekker et al. (2004) it needs more investigation. The empirical part of this research discussed the challenges in the case company regarding returns handling; however, the practical part highlighted other issues in case company such as lack of system coverage which it has been observed as a significant reason for process inefficiency.

Sustainability as a word been used in many types of research (Carroll 2015; Redcliff 2005). With the help of John Elkington sustainability, it becomes more popular since he creates the triple bottom line (People, Plant, Profit). This case study agrees with Portney (2015) that one pillar of the triple bottom line does not create sustainability. In other words, the three pillars walk hands in hands with each other. This case study focused mainly on the social and environmental factors on the practical part, and it agrees with Pagell (2009) and Brown et al. (2000) that these factors are the most relevant at the operational level. During the empirical investigation, it was identified that case company had neglected these two factors. The consideration was only on creating economic value. For that reason, the case study has suggested system change to facilitate a way of working within the warehouse (social) and eliminate paper (environmental). The solution will also help the company to identify the return handling process and improve the reverse logistics process.

Last and most important findings are drivers and barriers for reverse logistics implementations. This case study agrees with all authors in the theoretical part such as Govindan et al. (2014), Abdulrahmanet et al. (2014) and Tibben-Lembke (2002) about the drivers and barriers. For instance, the indirect financial gain can be the legislation change, and direct benefit can be cost reduction. On the other hand, obstacles in reverse logistics are mainly the lack of funding, lack of trained personnel, lack of management commitment, and lack of policy. It is clear that no change has happened regarding this part and the empirical study proves these results as a fact

since it was part of this paper empirical findings. This research has started with an assumption before making any data collection, analysis, and empirical study. These assumptions were lack of recourses, no motive for investment, manual process, lack of management commitment, no system coverage, lack of transparency and traceability. After conducting the research, the case study verifies these assumptions as facts based on the findings.

7.2 Conclusion

This section divided into two main categories; theoretical and practical conclusion. In the theoretical part of the research a discussion about reverse logistics process was provided with a picture. The process helps me as a researcher to comprehend the big picture of the reverse flow. Discussion about barriers and drivers in reverse logistics to create a competitive advantage was also provided with table to visualize these benefits and challenges. One of the critical problems is the lack of financial support in reverse logistics. Inversely, direct financial gain was identified by some authors such as gaining the damaged material to produce new resources. Also, returned items handling process covered quite seldom; however, clear enough picture of the return handling process was provided to support the research. Additionally, discussion about the opportunity of outsourcing reverse logistics was supplied with the help of make or buy theory.

From the sustainability perspective discussion about the term sustainability and the linkage with the triple bottom line was provided. Also, the economic factor and the meaning of the sustainable economic dimension was discussed briefly. The research has focused more on the environmental and social dimensions and their support to economic performance. The last chapter in the theoretical part explained the methodology used in the research. A qualitative and quantitative study was conducted to support the validity of the study. Both methods were performed respectively by following the main steps in these methods. The quantitative study was performed only for ensuring the result of the findings. Data collection and

analysis was performed with coding techniques such as coloring, summarizing the findings, and prioritizing based on the Pareto principle.

The empirical part discusses in the first chapter case company introduction and the project timeline. The project started in June of 2018, and it is designed as a start to create a center of excellence. Risk and challenges in the current process were described in the experimental part. Risk and problems were divided to; Internal returns challenges (warehouse returns), external returns challenges (customer returns and transport deviations). Also, scrapping challenges and organization current structure issues were displayed.

The recommendation chapter gives the case company four proposals; system integration, organization redesign, quick wins, and make or buy decisions. The first proposal has been considered in this research as a vital principle to create a competitive advantage. Additionally, there is no sense to implement other solutions if information and communication technology is inadequate. The organization redesign has been considered as a fundamental solution because of the case company back-office employees and the warehouse administration are currently located far from the floor field shop and for that reason, back-office employees do not add required value from the reverse logistics perspective. The quick wins proposals are actions identified during the research, and these actions do not require enormous investment and may create financial benefits. Last recommendation discusses the opportunity of outsourcing reverse logistics in the food and beverage industry in Nordic and Switzerland. The research does not recommend to outsource reverse logistics in these mentioned markets, since the regulation force such industries to collect empty bottles and cans which is part of reverse logistics. However, if a case company is not willing to invest in a well-designed system, the business should consider seriously outsource reverse logistics to a professional third party.

7.3 Solving the Research Problem

At the beginning of this research paper, it was required to describe reverse logistics and sustainability from theoretical backgrounds. The theoretical part helps to solve the research problem. The academic data collected from articles, books, and experts who have worked mainly with these areas. As a result, this research set out clear research question:

- *MQ: How to improve sustainability in reverse logistics?*

As a result of the main question, two sub-questions were addressed to support the answer of the leading research question. Each of sub-question will be answered briefly before the main question answer.

- *SQ1: How to improve the reverse logistics process?*

There are many thoughts about how the ideal process of reverse logistics should look like. Some authors think about customers where others take into consideration the internal process. This research paper believes that the typical reverse logistics process should consist of all the failures within and outside the plant. To improve the process of reverse logistics; identification of the type of returns are critical. Also, it is difficult to improve operations without system coverage since the system coverage helps the business to identify more easily where the attention should be. From the organization perspective, this paper believes all employees should work in the same area, which was not the case on investigated markets. This paper encourages managers to rethink where to locate directly involved employees. The closer, the better value the company can gain. By doing these two changes, the company will be able to avoid some new risks which may be not identified earlier, and this is how you create a competitive advantage.

- *the SQ2: Shall reverse logistics be outsourced to improve processes?*

Reverse logistics has been recognized from the theoretical perspective as a potential outsourcing area. However, this research paper will not recommend outsourcing reverse logistics in the food and beverage industry into Nordic and Switzerland markets. The reason behind this decision is the EU regulation, where the customer has the right to return the product. Besides, the deposit system which forces food and beverage to collect empty cans, bottles, etcetera from markets and this regulation has forced this industry to create reverse logistics flow. However, if there is no intention to develop a system for the return handling process, this paper highly recommends considering outsourcing the whole return flow for a professional third party.

The two sub-questions have raised the value of well-designed and handled of reverse logistics. Based on these two sub-questions this research aims to answer "How to improve the reverse logistics process". This research has investigated in sustainability from both social and environmental factors since the case study believes well-designed process from both previously mentioned pillar will create a positive impact on economic growth. Industrial companies may build a competitive advantage by gaining the existing technology. One of the primary things that must be improved is information technology since it will create an opportunity for finding gaps with supply chain processes and also create a chance to have a more efficient operation. From the environmental perspective with the help of nowadays information technology paper usage can be eliminated or reduced dramatically in reverse logistics and from a social standpoint, information technology gives excellent opportunity to increase employee knowledge, less stress and more concentration in core competence.

Handling returned product in a sustainable manner will give company advantage for regulation changes such as waste management regulation and customer return regulation. A company who knows how to implement strategic decision into daily operation life without losing the economic value may and will have an advantage in comparison with others. Well-designed operation in reverse logistics should take into consideration signs, instructions, floor marking, and equipment which support warehouse operator to produce the expected result. It is also required to create a

returns policy to support operational management. The procedure must be conducted cross-functionally with especially the help of sales, marketing, procurement, planning, transportation, and warehouse. Each one of these departments consider the problem from a different viewpoint; however, cross-functional problem solving may and will create a competitive advantage.

7.4 Further Research

This research did not take into consideration how to handle better liquid waste. This research highly recommends studying the potential of creating biofuels from the waste of sugar and alcohol. Also, there is an opportunity to generate biogas from scrapped foods. It is also recommended to think about how to separate liquid with sugar or alcohol from water to create reusable raw material. This may create significant value for the water scarcity problem.

Other suggestion is to have more in-depth research on the social factor impact on economic performances from a reverse logistics perspective. During this study, it was noticed that employee role in reverse logistics from the social factors was not supported with enough data. Some authors argue that reverse logistics have created new work opportunity; however, they highlighted the work is not permanent which affect the economic performance. Third, it is recommended to see from the theoretical perspective all presented reverse logistics processes and do a review based on that. Also, there is an opportunity to find gaps in how reverse logistics has been understood from the theoretical perspective.

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Appendices

1. Semi-structured interview questions

- Tell me about yourself?
- What are the challenges you are facing in your daily work activities?
- How in your opinion the process should look like?
- Why in your opinion returns management not covered by system?
- How can the case company gain a competitive advantage in reverse logistic

2. Detail process map check list (Example)

	Sub process	5 countries				
Main process		Finland	Sweden	Norway	Denmark	Switzerland

- Ok for market. Possible best practice
- Improvement opportunity
- At risk

3. Meeting and interview schedules

Date	Attendees	Topic	Country
Autumn 2018	Head of automations	Returns product within warehouse and relationship of automation with RL	All markets
Autumn 2018	back office, Data Controllers	The impact of returns management on customer crediting and correction process challenges	All markets
Autumn 2018	Warehouse admins	Stock discrepancy errors and returned material handling process challenges	All markets
Autumn 2018	Distribution Managers	Return order and transport deviations challenges	All markets
Autumn 2018	National Warehouse Managers	The challenge from top management perspective	All markets
Autumn 2018	Warehouse and system operators (Go & See)	Ethnographic method used	All markets
Autumn 2018	Customer Supply Chain Directors	Presentation of the findings during the workshop. Challenges presented from top management perspective	All markets