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Sustainable Initiatives for E-Commerce Returns:

Investigating the Impact of Returns in E-Commerce and Exploring how to Enhance the Operations through Adopting Sustainable Reverse Logistics Initiatives.

Master of Science in Business

with a major in Supply Chain and Operation Management

BI Norwegian Business School

Supervisor:	Examination Code:	Hand-in date:
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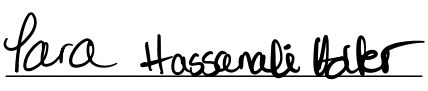
BI Norwegian Business School

Oslo, July 2023

Tina Bondad Kristiansen



Tara Hassanali Holter

ABSTRACT

The purpose of this master's thesis is to provide practical guidelines for e-commerce companies to develop more sustainable return policies by examining the economic, environmental, and social aspects of managing returned products through the Triple Bottom Line (TBL) framework. Hence, the research question of this study is: "*How can Norwegian e-commerce actors implement strategic initiatives to effectively enhance the sustainability of their reverse logistics operations?"*.

Through a mixed-method approach, this master's thesis examines sustainable operations in the e-commerce industry with a particular focus on Norwegian actors. By combining quantitative and qualitative methods and applying an abductive approach, this study extends existing theories on reverse logistics to address return challenges by providing insights, recommendations, and formulating hypotheses based on interviews and consumer surveys.

With specialization in Supply Chain- and Operations Management, the authors were motivated by a common interest in exploring new ways to manage reverse logistics processes in accordance with the TBL and Sustainable Development Goals (SDGs). In this study, the authors sought to identify and analyze the challenges, opportunities, and best practices associated with sustainable reverse logistics. Besides exploring VR/AR's potential to reduce returns by mitigating uncertainty, the thesis also explored the emergence of AI as a viable alternative to addressing e-commerce consumers' uncertainties, improving customer experiences, and contributing to Norway's sustainable e-commerce ecosystem. Additionally, the findings indicated that the proposed tax or fee on high return frequencies could act as a catalyst for change, addressing both the economic and sustainable challenges associated with excessive returns. Furthermore, collaboration with 3PL providers was discussed to explore how long-term perspectives and collaborative relationships can reduce the incidence of returns in reverse logistics operations.

3PL	Third Party Logistic
AI	Artificial Intelligence
AR	Augmented Reality
EU	European Union
LM	Last Mile
RL	Reverse Logistic
SCC	Supply Chain Collaboration
SCM	Supply Chain Management
TBL	Triple Bottom Line
TØI	The Institute of Transport Economics
VR	Virtual Reality

1.0 Introduction

1.1 Background for the Thesis

With the rapid growth of global e-commerce platforms, the escalating number of product returns has become a pressing issue for online retailers, significantly impacting their profitability (Nanayakkara et al., 2022; Kapner, 2023). Returns, particularly those resulting from declining consumer spending due to inflation, have emerged as a significant concern (Kapner, 2023). For too many marketing managers, product returns are a bitter pill to swallow (Andrew Petersen & Kumar, 2009). After all, they can be an enormous drain on revenue. There is the money to be refunded to customers, plus the cost of repackaging, restocking, and reselling the returned items (Andrew Petersen & Kumar, 2009).

Furthermore, the returns processing centers often encounter many items that do not meet the repackaging and reselling criteria (Kapner, 2023). The challenge for online retailers is, therefore, to process returns quickly, and get the goods back onto their virtual shelves, minimizing deprecation, even leading up to some retailers, namely Amazon, sometimes telling returners to keep the product. It would cost them too much to process a return (Bomey, 2021).

The aftermath of the COVID-19 pandemic has witnessed a gradual recovery in various parts of the world, accompanied by a significant surge in e-commerce, as exemplified by Sweden's 40% growth in online retail (PostNord, 2021). Retail sales are on track to increase between 6% and 8% year-over-year. Non-store and online sales year-over-year are expected to grow between 11% and 13% (National Retail Federation & Appriss Retail, 2022). NRF also stated that the total returns accounted for $816 billion in lost sales for US Retailers (National Retail Federation & Appriss Retail, 2022). The financial implications are significant, as evidenced by estimations suggesting that approximately 30% of received products are critically used returns, costing retailers an average of 66% of the item's price

(Optoro, 2019, cited in Kapner, 2023). Similar trends have been observed in other countries, with the fashion industry experiencing notable return rates for clothing items, dresses, skirts, and shoewear (Yocabè, 2023). These statistics indicate the magnitude of merchandise returns in the retail industry, with online retailers facing returns rates surpassing 22% (Rintamäki et al., 2021). Furthermore, return fraud and policy abuse are prevalent among young online shoppers, emphasizing the significance of effective reverse logistics management (Riskified, 2022; Nanayakkara et al., 2022). The most emerging example of return fraud retailers have experienced in the past year is wardrobing (returns of used, non-defective merchandise) of an average of 50% (National Retail Federation & Appriss Retail, 2022).

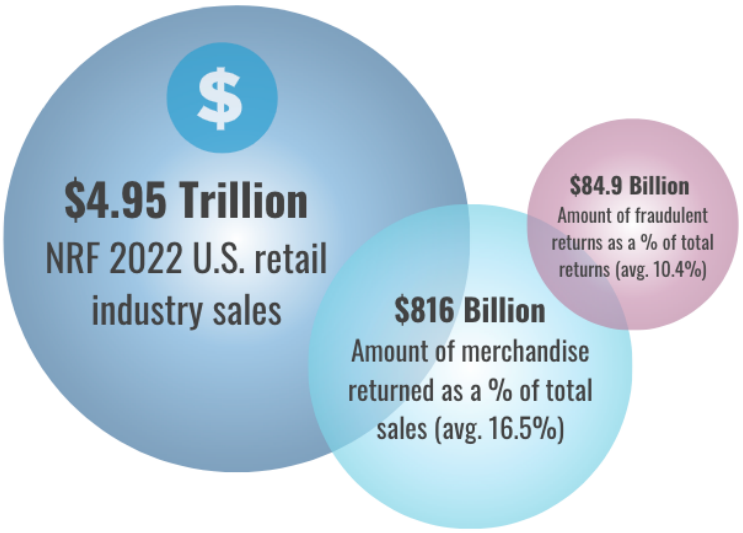


Figure 1: *Merchandise Sales, Returns and Return Fraud. Source: National Retail Federation & Appriss Retail (2022).*

The rapid expansion of global e-commerce and the resulting complexities within supply chains have brought forth concerns regarding the environment and retailers' sustainable practices, particularly regarding carbon emissions resulting from return activities and unnecessary long-distance transportation (Kristiansen, 2022). An experiment conducted by a Norwegian TV program, "TV 2 Hjelper Deg," demonstrated an example of consumer affairs within the online fashion

industry. The investigation was based on purchasing seven products from the e-commerce actor Zalando, where the items were immediately returned. The total traveling distance for the seven items was 26 242 kilometers for six months of tracking (Kristiansen, 2022). Retailers, driven by competitiveness and the demand for fast fashion, have increasingly embraced practices that contribute to shorter product life cycles and the disposal of excess and returned inventory in landfills (Kapner, 2023). Although some retailers opt for liquidation as a streamlined approach to managing rejected inventory, the convenience-driven policies of long return windows and free shipping have encouraged more online purchases and subsequent returns (Kapner, 2023). Retailers also face pressure from shareholders and other investors to adopt sustainable practices (Deloitte, n.d.). Investors are increasingly conscious of how their reputations are affected by the retailers they support (Deloitte, n.d.). Indeed, a study by a global bank found that 59% of investors surveyed invest in companies that align with their values (Deloitte, n.d.). Some global retailers are adopting new practices such as reducing toxic emissions in response to these shareholders' demands (Deloitte, n.d.). However, it is evident that while some companies adapt their policies to address the increasing return rates, many others fail to prioritize effectively managing return items (Kapner, 2023). Creating transparency and awareness regarding the handling of returns may pave the way for necessary changes in the industry (Kapner, 2023). To create a sustainable future, retailers should address evolving customer and shareholder expectations in their business strategies and environmental practices (Deloitte, n.d.).

Sustainable business models aligned with environmental goals are becoming increasingly important in the era of e-commerce (Nosratabadi et al., 2019). Managing product returns effectively is an essential aspect of sustainable business models since it impacts financial performance as well as environmental sustainability (Srivastava & Lee, 2006). For retailers, it is vital to understand the costs associated with product returns, although there is yet to be a standardized method for estimating these costs (Gustafsson et al., 2021). This thesis offers

practical guidelines for e-commerce companies to develop more sustainable return policies by examining the economic, environmental, and social aspects of managing returned products through the TBL framework. Furthermore, integrating sustainable business models and customer value creation is essential for achieving sustainable development goals (Muller et al., 2018). It has been demonstrated that design thinking and value mapping are effective tools for creating perceived value and appealing to environmentally conscious consumers (Geissdoerfer et al., 2016). Exploring sustainable business models and customer value within the thesis makes it possible to identify gaps, assess effectiveness, and develop sustainable strategies that align with the TBL framework.

1.2 Purpose of the Thesis

This thesis aims to examine how Norwegian e-commerce actors can effectively implement strategies to enhance the sustainability of their reverse logistics operations. While reverse logistics operations involve many processes, the authors will focus mainly on the increased scale of product returns by e-commerce consumers. Since previous research indicates that "ease of returns" is one of the most important factors influencing customer satisfaction (Pham & Ahammad, 2017), the authors will also consider the e-commerce actors' return policies. There is an increasing preference among consumers for online shopping due to its convenience. However, the effects of e-commerce on the environment remain uncertain (Escursell et al., 2021). In order to minimize the frequency of returns in the Norwegian e-commerce industry, the authors explore strategies that can be implemented during the purchasing stage. By emphasizing proactive initiatives at the point of purchase, e-commerce actors can reduce the occurrence of returns, which has financial and environmental implications. Also, the thesis aims to examine how long-term perspectives and collaborative relationships can reduce the incidence of returns in reverse logistics. The use of third-party logistics (3PLs) is becoming increasingly widespread due to globalization, the expansion of e-commerce, and increased client demand (Qureshi, 2022). Adopting a long-term perspective on returns management can provide insights into sustainable solutions

for minimizing returns by recognizing that it is not solely a transactional process but an ongoing relationship between businesses and consumers.

The authors of this study, with specialization within Supply Chain- and Operations Management, were motivated by a mutual interest in exploring new ways to manage reverse logistics processes in accordance with the Triple Bottom Line (TBL) and Sustainable Development Goals (SDGs). Using the Norwegian e-commerce industry as a case study, this study aims to identify and analyze the challenges, opportunities, and best practices associated with sustainable reverse logistics operations. The handling of returns significantly impacts the environment (Agrawal & Singh, 2019); coupled with a dysfunctional RLs system within the organization, this impact is accentuated. There is undeniable evidence and an obvious need for improvement in this area. Companies must embrace a sustainable shift to maintain positive public perception (Macchion et al., 2017). Ultimately, the author intends to provide practical recommendations and guidelines for Norwegian e-commerce actors to assist them in developing and implementing sustainable practices, which will reduce environmental impact, improve resource utilization, and enhance overall sustainability performance in the reverse logistics operations.

This thesis objective can be summarized in three focus areas to find a solution that is meant to reduce the returns within e-commerce:

1. What strategies can be employed during the purchasing stage to minimize the frequency of returns?
2. How can long-term perspectives and practices be utilized to reduce the occurrence of returns?
3. How can collaborative relationships contribute to reducing the frequency of returns in reverse logistics operations?

1.3 Research Question

Given the objectives and information outlined in this research, the following research question was undertaken:

RQ: *How can Norwegian e-commerce actors implement strategic initiatives to effectively enhance the sustainability of their reverse logistics operations?*

Environmental sustainability and increased competition are driving firms to develop more green activities and extend their reverse logistics processes to be less costly and more efficient. This research question is based on the assumption that there is a need for improving RLs practices in the e-commerce industry in Norway due to the high activity of returns in the e-commerce retailing market. Specifically, the study will focus on the challenges associated with consumer returns in e-commerce. Therefore, a better understanding of the current return policies and practices' environmental- and cost effects is needed to identify the most critical areas to improve and which processes can be more efficient and sustainable. In doing so, it is essential to emphasize the aspect of sustainability, frameworks for the implementation of RLs, and the current RLs practices of e-commerce actors in Norway. Further, the barriers to implementing RLs and using 3PL providers will be covered to explore how Norwegian e-commerce actors can overcome the challenges related to RLs today. As part of this thesis, potential initiatives, such as government incentives and AR/VR technology, will also be considered since this may be implemented in the purchase stage to prevent consumer returns.

1.4 Thesis Structure

The thesis is divided into six major chapters, each following several sections to ensure the essential information is concisely highlighted. The Watson (1994b: S80) framework "*What, Why, and How*" is applied to conduct the research study. This framework mainly focuses on the first three chapters of this thesis. In the

first chapter, the authors present the introduction by explaining "What" and "Why." The authors discuss the background for the problem statement and the motivation to further research the topic and aspect of the chosen part within the explained case. The second chapter consists of a literature review, which shows "*How*" from a conceptual standpoint. Here, the authors have divided further into what has already been researched and relevant existing theories relevant to the topic presented. This approach allows the authors to establish a solid theoretical foundation for further discussion, analysis of the data, and conclusion. Thirdly, chapter three presents the methodology the authors have used for this thesis, which explains the "How" practically in the framework. The purpose of this chapter is to present the choice of the research strategy and design, as well as the specific methods used for collecting and analyzing the data.

In chapter four, a summary of the authors' data collection findings is presented, in addition to formulating three hypotheses under the three stated focus areas, followed by hypothesis verification. Next, in chapter five, the significant findings from the data collection are discussed and analyzed in light of the research question and theoretical background presented in chapter two. The final chapter of the thesis concludes with a conclusion from the findings, where the authors also further note the implications, limitations, and future research guidelines. The detailed structure of the thesis is illustrated in Figure 2, along with highlights of the main sections that illustrate how the sections interrelate over the entire paper.

1.4.1 Illustration of Thesis Structure

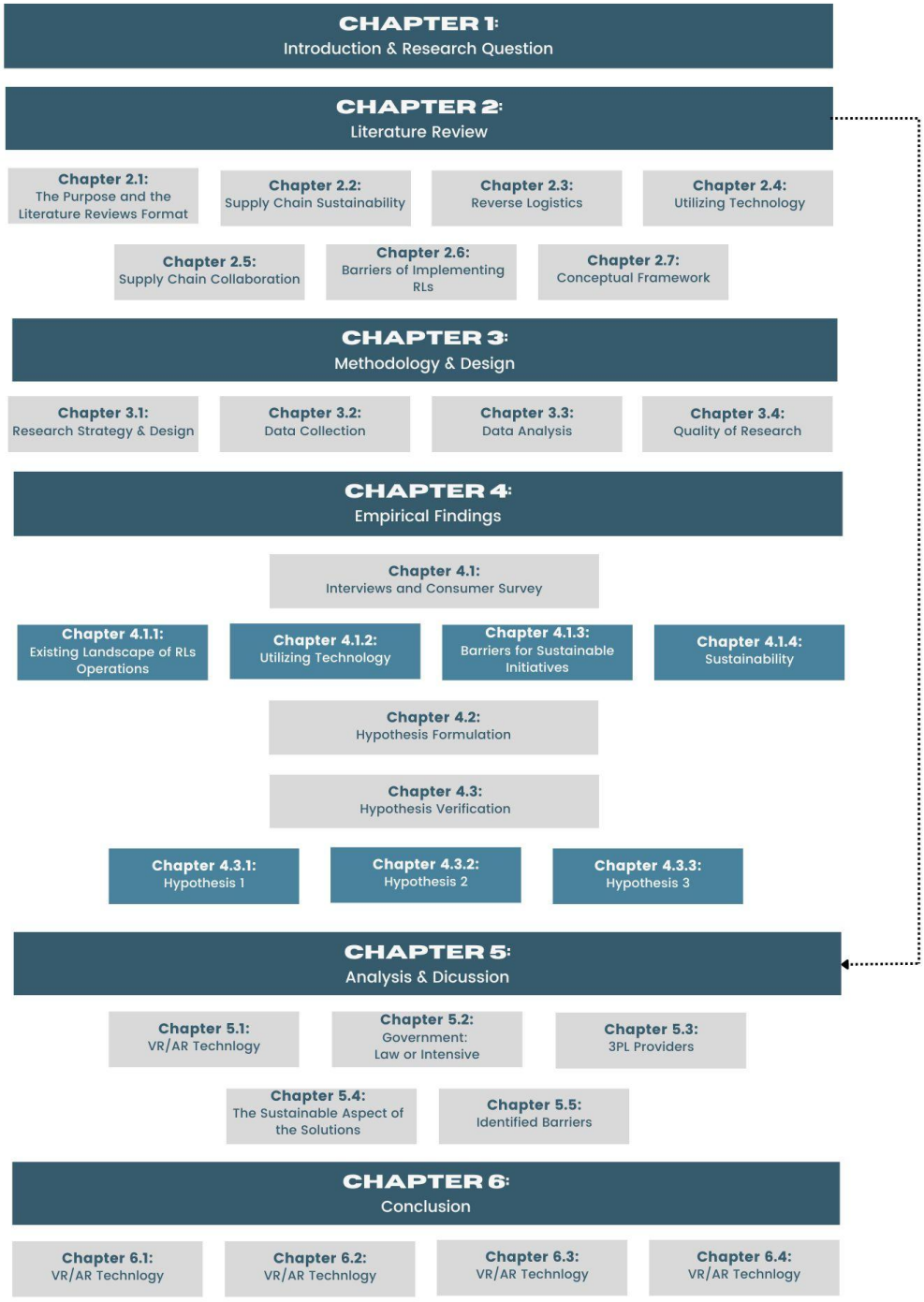


Figure 2: *Thesis Structure made by The Authors'.*

2.0 Literature Review

2.1 The Purpose and the Literature Reviews Format

Previous literature was considered when constructing this master thesis. This enabled the authors to determine which issues were already addressed and which required further investigation. Through integrating sustainability and the Triple Bottom Line, the authors examined RLs further and explored possible ways to improve this aspect of online business. This thesis specifically investigated what initiatives can be implemented in terms of utilization of technology, collaborative relationships, collaboration with 3PL providers, and potential barriers, given the problematic situation that has emerged today. The authors also focused on the aspect of a prevention strategy in terms of finding the root of the problem and then investigating what precautions can be taken to prevent returns in the first place. Based on these objectives, the authors conducted their research and built on the results of previous literature.

2.1.1 Literature Gap

Several limitations affected the scope and depth of the study, including the absence of previous studies on the Norwegian e-commerce industry and consumers of Norwegian e-commerce. Further, there is substantial research regarding RLs in the existing literature. However, with the rise of the sustainable shift, the focus has been prominently on direct recovery and reprocessing in the RLs system in the e-commerce industry. Though there have been several experiments toward the collection of product return by consumers, few of the studies focus on the identification of the cost-effectiveness of return policies in the context of the Norwegian e-commerce industry, as well as the identification of how different initiatives can be implemented in the purchasing stage can contribute to minimizing the probability of consumers returning their purchase.

With global sustainable goals in mind, the literature offers only a few studies. This results in a literature gap on settling issues and future initiatives related to the

sustainable impact associated with product returns. Consumer attitudes toward sustainable products are generally positive; however, the price consumers are willing to pay for these options is not necessarily aligned with their attitudes. In this area, there needs to be more literature that provides insight into the actual market situation in Scandinavia, particularly Norway. While e-commerce has evolved over the last two decades, previous literature still needs to gain explicit knowledge of the challenges and opportunities connected with its implementation and the components required to satisfy the triple bottom line. As for technological development to reduce product returns, there is still a great need in the literature to identify the appropriate incentives Norwegian e-commerce actors can implement to enhance the sustainability of reverse logistics operations due to the high intensity of product returns.

Moreover, while reverse logistics is a requirement in European countries, such as Norway, there are significant barriers to its implementation within the European context. In many cases, especially for small and medium-sized companies, low awareness and the absence of pressure from customers mean that few efforts are made to address environmental issues (Hillary, 2004). Many authors have considered and discussed the several barriers to RL implementation in general (Govindan & Bouzon, 2018). However, there needs to be more research as regards the implementation of RLs, as well as barriers, in the context of the Norwegian industry.

2.2 Supply Chain Sustainability

In recent years, there has been an increased focus on sustainability in the industry, and many companies have found that adopting sustainable practices can give them a competitive advantage (Macchion et al., 2017). The study by Morioka et al. (2017) highlights how coercive, mimetic, and normative pressures, such as the United Nations and the Sustainable Development Goals, impact sustainable businesses. The UN has published a comprehensive global plan of action for

people, the planet, and prosperity (United Nations, 2022), broken down into 17 target goals that must be reached by 2030.

2.2.1 Sustainable Business Models

Based on a review by Nosratabadi et al. (2019), sustainable business model construction constitutes an essential component of a business strategy. However, the actual application of this concept will vary according to the type of industry and business the actor is engaged in (Nosratabadi et al., 2019). Further, Geissdoerfer et al. (2018) explained three elements of a business model: value proposition, value creation and delivery, and value capture. The Circular Economy requires all three business model elements to be circular to achieve optimal sustainability performance (Geissdoerfer et al., 2018).

Regarding circular business models, Geissdoerfer et al. (2018) stress that this must maximize product and service value for society's well-being, minimize depletion of natural resources, and ensure long-term capacity to address social, economic, and environmental issues concerns. Tolkamp et al. (2018) also highlight that sustainable business models focus on resolving societal and environmental problems and should have a value proposition that provides both financial and non-financial value. Sudusinghe & Seuring (2022) also specified that resell/reuse, remanufacture, and recycling are the most discussed CE strategies within Supply Chain Collaboration. Despite recycling being the most popular method for waste prevention, recycling only addresses the final stage of the product life cycle, leaving aside overproduction and consumption of materials (Muranko et al., 2020).

Additionally, Nosratabadi et al. (2019) examined the number of articles published regarding the sustainable business model in several journals. They concluded that the number had increased substantially in the last two decades, with only two documents published in the area in 2002 compared to 62 and 74 documents in 2016 and 2017, respectively (Nosratabadi et al., 2019).

2.2.2 Measuring Sustainability

According to Shim et al. (2021), sustainable management is attained when companies prioritize their communities, the environment, and profits in a balanced manner. To evaluate sustainability, Elkington (1994) introduced the concept of the "triple bottom line," which provides a practical framework for distinguishing economic, environmental, and social sustainability. This framework promotes a win-win-win approach, encompassing "People, Planet, Profits" as its core elements, as later developed by Elkington. Based on Elkington's (1994; 2004) work, Figure 3 summarizes the triple bottom line.

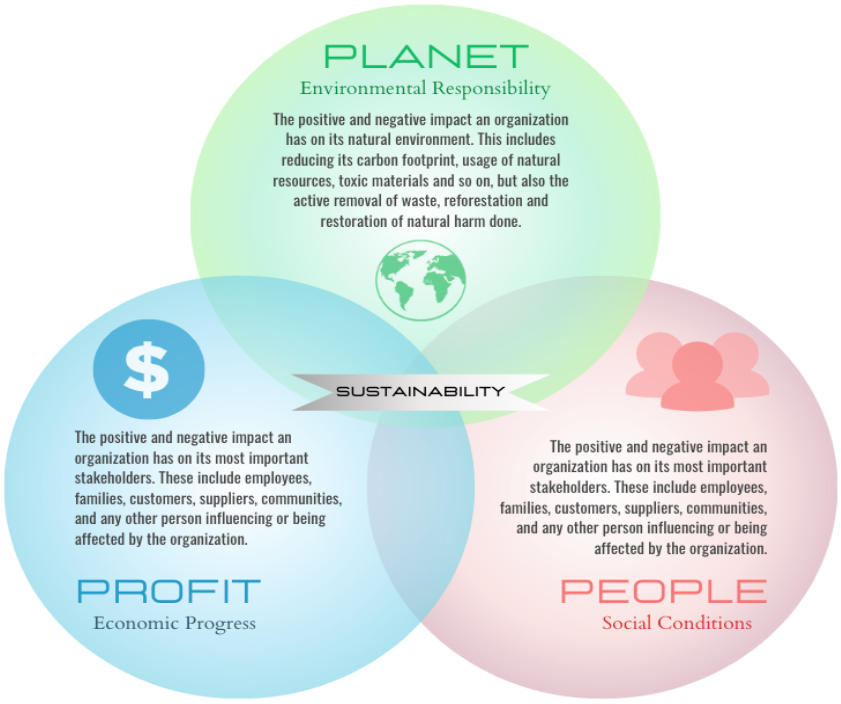


Figure 3: *The Triple Bottom Line by Elkington (1994;2004)*

The TBL emphasizes the microeconomic perspective by incorporating economic, environmental, and social considerations, whereas the definition of sustainability alone leans towards a macroeconomic perspective (Gimenez et al., 2012). Kleindorfer et al. (2005) further explain sustainability principles, highlighting the importance of environmental management, closed-loop supply chains, and a comprehensive view of the triple bottom line that integrates profit, people, and the planet in strategic decision-making.

Sustainable supply chain management (SCM) involves integrating social and environmental concerns into business processes to enhance company performance, supplier relationships, and customer satisfaction without compromising economic viability (de Ron, 1998; Seuring & Muller, 2008; Pagell and Bobeli, 2009 as cited in Gimenez et al., 2012). Geissdoerfer et al. (2018) emphasize the need for companies to balance economic and environmental sustainability in their supply chain management practices. This balance is particularly relevant in industries like fashion, which face criticism for their excessive consumption and waste (Dissanayake & Sinha, 2015). Macchion et al. (2017) point out that sustainable SCM reduces operating costs, optimizes resource utilization, and reduces pollution and waste. Moreover, Prajapati et al. (2022) emphasize the significance of sustainability for competitiveness, highlighting the positive impact of green supply chain management practices on operational and financial performance. Steenis et al. (2018) suggest that incorporating multiple sustainable design strategies provides a more comprehensive understanding of functionality, behavior, and cost trade-offs instead of relying solely on a single approach. However, they also note that the additional benefits diminish with each new strategy, resulting in a diminishing increase in consumer purchases and willingness to pay for sustainable products. It is important to emphasize this when encouraging companies to implement new and multiple strategies for a more sustainable approach.

The rise of e-commerce has further emphasized the need for sustainable business models that align with companies' environmental goals (Nosratabadi et al., 2019). Tolkamp et al. (2018) highlight the importance of balancing profitability with environmental and social challenges in sustainable business models. In e-commerce, managing product returns efficiently and cost-effectively has gained significant interest (Srivastava & Lee, 2006). Understanding the actual costs of product returns is crucial for retailers to gauge their financial performance,

although no standardized method exists for estimating these costs (Gustafsson et al., 2021).

Cullinane and Cullinane (2021) studied the environmental impacts and costs of returns in the clothing industry. They found that increasing prices to cover the high return rate is challenging, and returns contribute to additional kilometers traveled by various means of transportation. The study also identified initiatives to reduce energy use and costs and improve the environmental sustainability of returns. E-commerce companies can adopt more sustainable return policies, such as incentivizing customers to keep their purchases and offering repair or reuse options to minimize returns and associated costs. Implementing such policies improves a company's financial performance and enhances its reputation by appealing to environmentally conscious consumers (Cullinane & Cullinane, 2021). As the e-commerce industry evolves, companies with sustainable return policies can differentiate themselves from competitors and attract customers who prioritize environmental concerns. Muller, Kiel & Vogt (2018) emphasize the importance of customer value in sustainable business models, highlighting the need to create perceived value through design thinking and value mapping. Geissdoerfer, Bocken & Hultink (2016) outline a four-step process for sustainable business modeling that includes exploration, conceptualization, identifying gaps and improvements, and assessing effectiveness and value.

In conclusion, measuring sustainability within the TBL framework involves considering economic, environmental, and social factors. Sustainable supply chain management integrates social and environmental concerns to improve company performance without sacrificing economic viability. E-commerce companies can enhance sustainability by implementing more sustainable return policies, reducing costs, and appealing to environmentally conscious consumers.

2.3 Reverse Logistics

Reverse Logistics (RLs) is a vital component of the supply chain that most businesses pay great attention to nowadays (Nanayakkara et al., 2022). The term RLs is defined as "the method of planning, implementing and controlling the cost and efficiency of material flow, in-process inventory, finished good and related information from the point of consumption to the point of origin, in order to recover value" (Daugherty et al., 2001). Figure 4 illustrates four main elements characterizing an RLs process: a collection process, a combined inspection/selection/sorting process, a reprocessing or direct recovery process, and a redistribution process. The process after collection, the disposition process, is emphasized as one of the crucial decisions which may significantly affect the reverse logistics performance from a sustainability perspective. It also plays an essential role in improving the operational efficiency of reverse logistics (Agrawal & Singh, 2019).

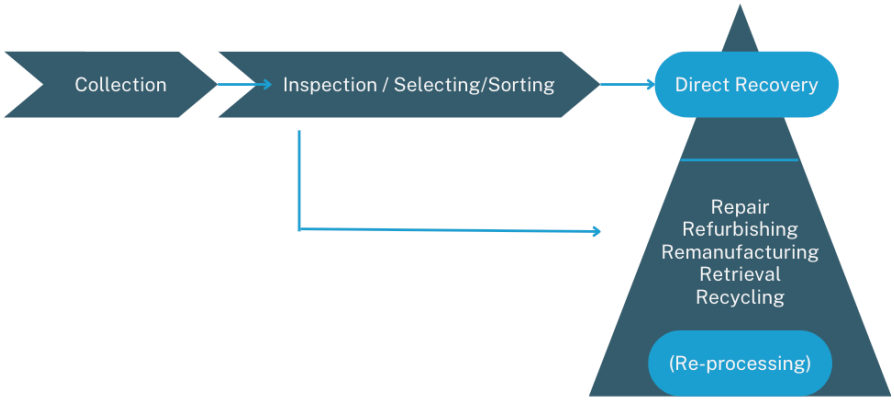


Figure 4: *Reverse Logistics Processes. Source: De Brito & Dekker (2002)*

As reverse logistics practices are essential to promote environmental initiatives, improve customer service & corporate image, and reduce pollution (Prakash et al., 2015), it is clear that e-commerce actors can make their return policies more sustainable and reduce the impact they have on the environment in several ways (Mondal & Giri, 2022). Moreover, it is evident that the return policy practice in e-commerce also varies across industries and stores (Mukhopadhyay & Setoputro, 2004).

In order to fully understand how the return policies of different e-commerce actors affect the sustainability of their operations and the consumers' return behavior, it is vital to explore reasons for returns and customer satisfaction drivers in more detail. Kaushik et al. (2020) investigated the probable reasons for return in the online apparel industry, where the findings showed that "fit and size variation," "found a better product," and "lenient return policies," among others, were identified as crucial factors for online apparel return. Disconformity of expectations was also accounted for as a prompt explanation behind item returns (Kaushik et al., 2020). Moreover, the various forms of returning behavior result from retailers increasingly competing through lenient return policies that lower perceived risk for online purchases and thus increase demand. The key to managing the diversity in online returning behavior is understanding it (Saarijärvi et al., 2017).

Concerning the impact of return policies on customer satisfaction, a study conducted by Pham and Ahammad (2017) examined customer satisfaction in the UK, where results revealed that "ease of return," amongst other drivers, was quick to get a refund from an unwanted product, was one of the key drivers of customer satisfaction. They also emphasized that good return management is the second important factor in keeping customers happy, and e-commerce actors, therefore, need to apply a customer-friendly return policy (Pham & Ahammad, 2017). Furthermore, the results of a study conducted by Vasić et al. (2019) confirmed that security, information availability, shipping, quality, pricing, and time presented significant predictors of customer satisfaction. Likewise, the results demonstrated that shipping is the most powerful predictor of customer satisfaction (Vasić et al., 2019).

2.3.1 Last Mile Delivery

Online shopping has revolutionized consumers' approach to clothing purchases, allowing them to purchase multiple items in a variety of colors and sizes, with the

option to return items that are not satisfactory. Nevertheless, this convenience has increased shipping volumes, including last-mile (LM) deliveries and returns, adversely affecting the environment (Velazquez & Chankov, 2019). The sustainable aspect of logistics and transportation choices is becoming more evident to consumers. Logistics providers are increasingly required to strive to reduce their carbon footprint continuously. Nevertheless, consumers are often unwilling to pay more or wait longer for their goods in return for a greener service (Gevaers et al., 2014).

A study conducted by Ignat and Chankov (2020) concluded that displaying the environmental impact of the delivery with no additional benefits changes customers' preferred delivery to a more sustainable delivery. As a result, customers are willing to wait longer, pay more, or choose a less convenient location for environmentally sustainable delivery. However, when additional economic benefits are offered, customers seem willing to choose a less convenient location. They seem willing to pay more for environmentally friendly delivery and location benefits when there are cost benefits. Accordingly, customers were more likely to choose a more sustainable last-mile delivery when they were aware of the delivery's environmental and social impacts or when offered economic benefits. In addition, Rausch, Baier & Wening (2021) emphasized the importance and need for better information and education to promote sustainable purchasing. Similarly, Prakash and Pathak (2017) argued in their study that environmental knowledge substantially influences consumers' desire to purchase environmentally friendly products. However, as stated by Ignat & Chankov (2020), e-commerce consumers are likely to choose the most economically convenient delivery option for them, regardless of whether or not they are conscious of environmental or social impacts, as there is no transparent information regarding these issues.

Allen et al. (2017) highlighted pressures on last-mile operators associated with managing high levels of product returns. Retailers often incorporate the delivery

costs for online shopping orders into the item price. Consequently, end consumers are not expressing adequate price signals, leading to the perception that delivery is free. This creates a demand for retailers to provide ever-faster and more responsive delivery arrangements to gain market share. (Allen et al., 2017). This may negatively affect the conscientiousness of e-commerce consumers, and their results indicated that there is a high potential for making last-mile delivery more sustainable by giving consumers the ability to make informed decisions when purchasing online. Notably, an increased level of conscientiousness during online purchases can be linked to a decrease in product returns.

2.3.2 Consumers' Willingness to Pay

Consumers exhibit positive attitudes, social norms, perceived behavior control, willingness to pay, and environmental consciousness that significantly affect their purchase decisions. Specifically, the willingness to pay is essential to the consumer's decision-making process, especially the product price (Kumar et al., 2021). Further, a review by Ketelsen, Janssen & Hamm (2020) examined consumers' willingness to pay and purchase behavior towards environmentally-friendly food packaging. Despite consumers' positive attitudes toward eco-friendly products, their actual behavior is not necessarily reflective of their actual behavior, mainly due to barriers such as higher costs, limited availability, and perceived lower quality (Ketelsen et al., 2020).

A study by Escusell, Llorach-Massana & Roncera (2021) discussed that 77% of consumers are willing to pay an additional 10% for sustainable packaging. Further, their results also revealed that consumers shopping online prioritize other variables, such as price, volume, and delivery time, over sustainability. However, Rausch, Baier & Wening (2021) assessed attributes of sustainable online purchasing and found that consumers prioritize less packaging and more on demand in fair wages and environmentally friendly production processes. It was also stated that customers prefer sustainable packaging, free shipping, and data security when doing online shopping (Rausch et al., 2021).

Even though ethical shopping is gaining popularity, fewer ethically conscientious customers are making ethical purchases (Carrington et al., 2014). Rausch, Baier & Wening (2021) found that female consumers value sustainable attributes more than male consumers, particularly social and environmental aspects. Four aspects were identified by Carrington et al. (2014) as contributing to the discrepancy between ethical intentions and acts. These factors included moral identity, social norms, commitment readiness, and purchasing style (Carrington et al., 2014). For academics, industry, and society, it would be advantageous to have a more excellent knowledge of and capacity to close the gap between ethical purchasing intentions and actual consumption habits (Carrington et al., 2014).

2.4 Utilizing Technology

Consumers today increasingly utilize technology as an effective tool in their shopping experiences (Pookulangara & Koesler, 2011). As for the e-commerce actors, using new technologies can change business strategies and innovation capabilities, resulting in increased opportunities for product and process innovation (Chen et al., 2017). Gustafsson et al. (2021) looked further into return avoidance practices already in the purchasing stage, which aimed to facilitate the customer in their decision-making around which size to order - and in so doing to avoid returns. They tested existing fitting technology on a Scandinavian fashion footwear retailer with e-commerce operations, on the background that 55% of returns are subject to poor fit. However, the results could have been better due to the technology's difficulty in calibrating to that particular type of fashion footwear (Gustafsson et al., 2021).

It is essential to address the customer experiences of the utilization of technologies since the consumers' perceived value and insecurity negatively influence customer perceived value, which again influences customer satisfaction (Pham et al., 2020). Pookulangara & Koesler (2011) highlighted the value of how consumers "perceive the ease of use" and the "perceived usefulness" when

studying consumers' intention to use new technology. Venkatesh & Davis (2000) also studied technology acceptance, where the results indicated that perceived usefulness is influenced by perceived ease of use; the more manageable the system is to use, the more valuable it can be.

A study by Hoyer et al. (2022) describes that customer experience involves cognitive, sensory/emotional, and social aspects. Based on Hoyer et al.'s (2022) description, consumers with a high *need for cognition* are more likely to engage in extensive information processing. In contrast, those with a low desire for cognitive abilities prefer a more simplistic, heuristic approach (Hoyer et al., 2022). Using new technologies benefits those with a lower need for cognitive capabilities. Consumers may also differ according to their need for emotion. A consumer with a high need for emotions will be more sensitive to the emotional aspects of their surroundings and possess higher emotional intelligence (Hoyer et al., 2022). In this case, new technology can be highly beneficial as it provides greater sensory stimulation and a more enriching experience (Hoyer et al., 2022). Furthermore, consumers with a strong desire for socialization may react more favorably to technologies that facilitate more accessible connections with other people, leading to a more fulfilling social experience than those with a lower desire (Hoyer et al., 2022).

2.4.1 Virtual E-Commerce

Ogunjimi, Rahman, Islam & Hasan (2021) found that customers reported frustration, inconvenience, and discomfort due to poor physical conditions, a lack of fitting rooms, and long queues at physical clothing retail stores. There is also evidence that many people are increasingly inclined to purchase products online rather than visit brick-and-mortar stores, with online actors gaining more and more customers in recent years. Moreover, Ogunjimi et al. (2021) specify in their study that the younger generation of customers especially prefers online shopping. Furthermore, a study conducted by Martinez-Navarro et al. (2019) in which they explored how virtual reality (VR), together with other technological innovations,

will affect the future of e-commerce, which they define as "vCommerce". VR can be considered a unique form of experience in which subjects experience the virtual world as if it exists in the real world (Slater, 2009, cited in Martinez-Navarro et al., 2019). Likewise, Hoyer et al. (2022) demonstrate how significantly new technologies, such as Augmented Reality (AR) and Virtual Reality (VR), are revolutionizing the customer experience. As for future developments of new technologies, Martinez-Navarro et al. (2019) conclude in their study that VR technology is a promising advancement for e-commerce, which will revolutionize the shopping experience in the future.

The authors' Cheng, Cohen & Mou (2023) also emphasize the use of AI and how it has been instrumental in advanced e-commerce developments over the last few years by providing solutions for facilitating digital transformation and improving the performance of e-commerce. A positive consumer response is also more likely to be generated by vCommerce than physical stores, as the consumer can place the products in a more natural consumer interaction. This allows them to shop for products in a familiar context, which may enhance their shopping experience, increase purchases (Martinez-Navarro et al., 2019), and contribute to decreasing the likelihood of returning products. In the case of massive amounts of data, technology, such as AI, has more significant problem-solving capabilities, but with the downside that personal data protection may be compromised (Cheng et al., 2022).

2.4.2 Implementation of Technology in E-Commerce

Further research by Wedel et al. (2020) was carried out on how virtual reality can be utilized across different stages of the customer journey in e-commerce. Wedel et al. (2020) describe how VR/AR applications have proven to increase purchase intentions and revenues in the purchase stage. With AR, it is possible to transform stores into showrooms and facilitate planned purchases by allowing customers to locate products in the store through reverse image searches (Wedel et al., 2020). As well as emphasizing the use of VR and AR in personalizing shopping

experiences, improving shopping efficiency, and optimizing product trials, the authors discuss how the technologies can be used in the future (Wedel et al., 2020). A customer's shopping experience could be enhanced, and purchases may be increased by installing in-store VR devices and in-home applications. Martinez-Navarro et al. (2019) maintain that deploying VR devices and applications in-home will allow consumers to interact with them more naturally in familiar contexts. Among the additional uses of these technologies is the creation of virtual retail spaces that simulate retail stores and provide consumers with new user interfaces, such as smart dressing rooms, virtual product displays, and interactive shelf talkers (Wedel et al., 2020).

The further advancement of technologies such as virtual-try-on and smart mirror technology is recognized by Ogunjimi et al. (2021) as innovations that are revolutionizing the retail environment by enhancing the customer experience. Shopper-facing advanced technologies can be vital to creating a different physical shopping experience for consumers and delivering benefits to retailers such as improved traffic, conversion, and baskets or streamlined operational cost. These benefits can only be realized if customers engage with the technologies. To encourage engagement, retailers must consider some critical success drivers of retailing technology (Linzbach et al., 2019). As for the technology in the future, it may facilitate saving personal information (Chang et al., 2023), such as measuring your body, preferences in product types, and style preferences for future purchases in the e-commerce context.

A study by Yang et al. (2020) showed that practitioners and academics must ascertain how online sellers balance minimizing returns and allowing returns. Motivated by the practice of online business, their study focused on exploring two types of operational innovation: offline showrooms and artificial intelligence adoption. Their findings showed that creating offline showrooms may help consumers have opportunities to touch and try products, thus increasing their acceptance of the product. Adopting artificial intelligence may lower product fit

uncertainty and improve after-sales services (Yang et al., 2020). Also, as we continue to develop our understanding of consumer intentions and behaviors, it is imperative to build long-term trust relationships between users and AI technology (Chang et al., 2023). Furthermore, according to Müller et al. (2018), e-commerce has enabled the digitalization and connectivity of industrial processes, resulting in process optimization, enhanced efficiency, flexibility, quality, and customization, which can result in increased efficiency, flexibility, and quality. However, the obstacles to effectively deploying this new technology for small and medium-sized operators must be addressed further (Müller et al., 2018).

2.5 Supply Chain Collaboration

Collaboration in a sustainable context could be defined as organizations sharing their resources and knowledge and collaborating to achieve a common goal, where developing; strategic partnerships, working together on joint projects, and cross-promoting each other's products or services can be part of this process (Savaskan & Van Wassenhove, 2006). Consequently, it is possible to increase efficiency, reduce costs, and improve the organization's overall quality (Savaskan & Van Wassenhove, 2006). Further, when managing supply chains that have become increasingly complex and involve a wide range of stakeholders, collaboration has been adopted as a strategy for organizations to achieve shared goals by working together recursively (Sudusinghe & Seuring, 2022). As a result, supply chain collaboration should improve an organization's competitive advantage (Chen et al., 2017) and improve environmental, social, and economic performance (Gimenez et al., 2012).

It has been found by Kalverkamp (2018) that collaborating with multiple supply chains can allow actors with open-loop supply chains to be integrated into closed-loop supply chains. The three most frequently discussed issues that merge sustainability and collaboration within the supply chain are internal collaboration, vertical collaboration, and horizontal collaboration (Chen et al., 2017). In their review, Sudusinghe & Seuring (2022) discovered that internal SCC is primarily

cross-functional coordination. In contrast, the external collaboration includes sharing information with suppliers and customers, implementing penalties and incentives for sustainable actions, and working with the government (Sudusinghe & Seuring, 2022). External collaboration tries to create relationships with external supply chain players and parties, whereas internal collaboration focuses on operational-level collaboration within the organization (Sudusinghe & Seuring, 2022).

Chen et al. (2017) further emphasize that internal and external collaboration are the two levels for achieving sustainability. Furthermore, regarding collaborating in the supply chain towards a circular economy, Sudusinghe & Seuring (2022) stated that the three most usually suggested CE methods are resale/reuse, remanufacturing, and recycling. Further, the same authors also identified three standard connections between sharing information and other practices in collaborative supply chain management: communication with key suppliers/customers, product development, and process design/modification, since information plays a crucial role in these activities. Green et al. (2012) also emphasize the importance of information sharing in ensuring the efficiency of supply chain networks. Olorunniwo & Li (2010) further specify the importance of collaboration and information sharing in the RLs, where they further explored the coordination and tracking of the return process from customers. Savaskan & Van Wassenhove (2006) emphasize the importance of customer collaboration regarding product returns. They state that some companies work directly with customers to facilitate the return of used products, which are then collected and returned to the manufacturer by the company (Savaskan & Van Wassenhove, 2006).

2.5.1 Promoting Sustainability Through Collaborative Incentives

Policymakers need to utilize appropriate initiatives to reduce waste and contribute to changing consumer behavior in a more environmentally-friendly direction (Cai & Choi, 2020). Lu, Qi & Liu's (2014) focused on how different existing

components can contribute and work together toward sustainability, where government policies extending the producer's responsibility, waste-to-energy programs, and recycling incentives were highlighted for companies to adopt better practices. Likewise, Sudusinghe and Seuring (2022) emphasize the importance of setting penalties and incentives for sustainability-related actions and sharing responsibility for product recovery as two practices that ensure product return. As shown in efforts to reduce dependence on fossil fuels and to promote electric vehicles, considerable measures have been taken to increase public awareness and acceptance (Xu et al., 2020). The central and local governments in China have introduced a series of policies to encourage the adoption of electric vehicles (Wang et al., 2018). Other financial incentives have been implemented to promote sustainability efforts, such as the exemption of purchase tax, value-added tax, and road tolling taxes (S. Wang et al., 2017).

Research shows that e-commerce actors could incentivize customers to make reliable orders with better practices in the purchasing stage. If customers were willing to invest more effort in the purchasing stage, such as engaging with product fit information, less effort would be needed in the post-sales stage (Gustafsson et al., 2021). For the SDGs to succeed, everyone must contribute to the goals, including government officials, businesses, civil society organizations, and individuals (Cai & Choi, 2020). The global plan does not include specific subgoals in the years before 2030; the individuals or the industry set the plans for the next several years to determine whether the primary goals can be achieved by 2030. Because the plan is flexible and provides little guidance regarding approaching the issue (Gimenez et al., 2012), the motivation must be well communicated to the general public. Cai & Choi (2020) further clarifies that collaboration across industries, the disclosure of sustainability reports, and the firm's actions are crucial to success.

2.5.2 Outsourcing to Third-party Logistics Providers

Outsourcing logistics functions to a third-party reverse logistics provider has been a resource of competitive benefits for most companies (Azadi & Saen, 2011). Kaynak et al. (2014) studied the adoption of reverse logistics, where the findings revealed that the inclusion of RL activities such as coordination and cooperation, centralization, consolidation, third-party RL collaboration, and integration were functions that can benefit the organization. According to Wang et al. (2021), 3PL refers to the process by which a manufacturer accomplishes cross-docking, door-to-door distribution, and product packaging through a 3PL provider. The 3PL providers business is developed due to the emerging demand for advanced logistics services. Du & Evans (2008) state that typical services outsourced to 3PL providers are transportation, warehousing, inventory, value-added service, information services, and supply chain reengineering. Furthermore, Azadi & Saen (2011) found that most companies quote greater flexibility, operational efficiency, enhanced customer service levels, and a better center on their core businesses as part of the advantages of appealing to the services of 3PL providers.

According to a study by Wang et al. (2021), 3PL services have been gaining popularity worldwide with a continuous increase in demand from businesses due to globalization, and consumers' demand for fast and free shipping also increases. However, a further study by Ngah et al. (2021) in Asia, which covers approximately 50% of the global e-commerce market, also shows that having the proper logistic provider to support e-commerce actors is crucial. This study explored the factors contributing to consumer satisfaction, whereas if the consumer would order from the e-commerce actor again based on their experience with the 3PL provider. As stated by Ngah et al. (2021), the reliability and flexibility of the 3PL provider were the two most important factors for achieving a positive customer satisfaction rating. This further also strengthens the relationship between e-commerce actors and their 3PL providers and enables the e-commerce actors to continue to use the 3PL providers. In addition, collaboration and trust become mandatory in the sustainable supply chain management

scenario, which De Paula et al. (2019) strongly emphasized. Their study revealed that it is hard to implement any practice without the stakeholders' collaboration, mainly considering practices involving logistics issues, which demand from supply chain level of integration, commitment, trust, and information sharing (De Paula et al., 2019).

Research by Lam and Dai (2015) revealed that the two traditional and essential logistics services, 1) transportation and 2) inventory and warehousing, form the most crucial quality characteristics required for the logistics service providers to develop their environmental sustainability performances. It was also shown that firms emphasizing sustainability as a competitive priority will benefit by communicating sustainability efforts to customers (Lam & Dai, 2015). Moreover, it is shown that to reduce the inventory level in the system, fast and reliable transportation is needed, which may escalate the transportation costs, thus calling for the service of 3PL providers. As shown, the efficient utilization of 3PL is expected to bring benefits in reducing total costs (Qureshi, 2022).

2.6 Barriers of Implementing RLs

The emergence of stricter environmental regulations and the growing environmental consciousness of customers have forced industries to be more aware of their environmental operations management with the help of reverse logistics (Govindan & Bouzon, 2016). In order to implement RL systems, an overview of research on the barriers that hinder RL must be taken (Bouzon et al., 2016). Both external and internal barriers can withhold firms from implementing RLs. External barriers involve impediments from outside of firms that disrupt the adoption of green activities, whereas internal barriers are the hindrances that exist within the company itself that obstruct the adoption of green efforts (Hillary, 2004, cited in Govindan & Bouzon, 2018).

Rogers and Tibben-Lembke (2001) defined reverse logistics practices and barriers to implementing good reverse logistics practices. Their study identified barriers:

lack of awareness, lack of top management commitment to introduce RL in the firm, and financial constraints (Rogers & Tibben-Lembke, 2001). Their findings revealed inattention and the lack of importance placed on reverse logistics, which also is related to corporate strategy regarding disposition.

More recently, Naseem et al. (2021) found 14 barriers to implementing effective reverse logistics in developing countries like Pakistan. Undoubtedly, returns in e-commerce businesses can make a difference between the success and failure of a company, and it directly affects the company's reputation and buyer experience. Due to the adoption and implications of reverse logistics still being in their early stages in many developing countries, and the e-commerce companies giving more attention to forward logistics and ignoring logistics' upstream flow in the supply chain, they saw the need to identify the barriers and obtain the solutions to those identified barriers (Naseem et al., 2021). They categorized the identified barriers into; management-related, infrastructure, coordination, policy, and financial and economic barriers. As possible solutions to the identified barriers, the authors demonstrated the following possible strategies for reverse logistics adoption;

Demonstrated Solutions for Barriers of Reverse Logistics Adoption		
Increase top management support and awareness	Developing infrastructure and facilities for supporting reverse logistics activities	Providing visual details of actual products on e-commerce platform
Determining clear policies and processes	Establishing e-collaboration with third-party logistics providers	Improving quality issues with customer coordination

Table 1: *Strategies for Barriers of Reverse Logistics Adoption. Source: Naseem et al. (2021)*

Furthermore, other studies conducted in Asia demonstrate similar barriers to implementing RL. A study conducted by Prakash et al. (2015) indicated that the lack of coordination with 3PL providers, lack of systems to monitor returns, and customer perception towards reverse logistics were the key barriers to reverse logistics execution in the electronic business of India. It was also found that top

management was unwilling and less interested in RL and that legal rules were one of the most influential drivers for implementing RL (Prakash et al., 2015).

Govindan & Bouzon (2018) classified 36 selected barriers into seven clusters, which, among others, encountered; technology and infrastructure related- and market and competitors related issues. The technology and infrastructure-related issues cover the availability of specific IT systems for RL to be successful. This cluster also involves the absence of technical skills (Govindan & Bouzon, 2018). The market and competitors-related issues include how many companies do not recognize RL as a factor for creating competitive advantage (Govindan & Bouzon, 2018). Firms might get a competitive advantage from RL implementation, e.g., higher profits or lower costs, more significant market share, and differentiation. However, it is also essential for companies to face pressure from competitors to induce them to adopt environmental initiatives (Govindan & Bouzon, 2018).

2.7 Conceptual Framework

Figure 5: *Conceptual Framework*

In Figure 5, the authors illustrate how they built their theory based on the reviewed literature. This master's thesis examines the relationship between Triple Bottom Line (TBL) concepts and reverse logistics (RLs) with mutual influence. As a result, it is necessary to identify the integration of reverse logistics practices according to TBL. In addition, it discusses the effects of technology, collaborative relationships, and outsourcing operations to 3PL providers on developing strategies for initiatives to reduce returns. The thesis also identifies barriers that may hinder the implementation of these initiatives. As a means of improving reverse logistics, the authors have emphasized RL methods, SDGs, as well as TBL.

3.0 Research Methodology and Design

In this chapter, the authors discuss the methodological choices they have made in order to answer the research question: ”*How can Norwegian e-commerce actors implement strategic initiatives to effectively enhance the sustainability of their reverse logistics operations?*”. It will elaborate on the methods used, their reasoning, and how they were conducted. The authors understood that planning, structuring, and providing sufficient data for analysis was essential. Accordingly, the authors explained in their paper what research strategy and design they chose, how they collected their data, thus primary and secondary data, and how they analyzed the data. Lastly, trustworthiness and authenticity are discussed, as well as ethical and social considerations.

3.1 Research Strategy and Design

For the research strategy, the authors believed a mixed-method research approach was the best way to gather the necessary information and data they needed. Using methodological triangulation and incorporating a quantitative study, it was possible to obtain data on customer behavior and how it affects the RLs. The two methods have different epistemological principles, whereas a quantitative analysis involves collecting numerical data and portraying the relationship between theory and research as deductive (Bell et al., 2019). On the other hand, a qualitative study emphasizes words and images instead of numbers (Bell et al., 2019). It is necessary to gain a closer look into the relevant e-commerce actors involved. This mixed-method allowed the authors to gain in-depth insight into the different RLs processes and prospective initiatives for adopting sustainable operations.

The authors have in this research used a descriptive case study on e-commerce actors, where the authors believed that an abductive approach would suit the mixed method the most. Descriptive case studies are recommended to expand on trends and themes discovered by survey research (Bell et al., 2019). Norwegian e-commerce actors are the focus of the study, where several of these actors have spoken out about their commitment to a sustainable business model, from

production to consumption and sale. This has especially gained traction since the pandemic's start, where the "COVID-19 pandemic accelerated e-commerce growth years into the future" (Berthene, 2022). The abductive approach combines deductive and inductive reasoning (Awuzie & McDermott, 2017). Researchers saw abduction as the systemized creativity and intuition to develop "new" knowledge (Kovács & Spens, 2005). As e-commerce is a relatively new phenomenon, the authors found that both inductive and deductive research reasoning was lacking when used alone. Abductive reasoning allowed the authors to apply existing theories on RLs to a new field of research and test if existing theories and literature are suitable to identify initiatives and recommendations for improving the return aspect of today's RLs. Abductive reasoning allowed the authors to seek to identify conditions that would make the return problem less puzzling, ensuring that surprising facts become expected (Bell et al., 2019).

3.2 Data Collection

The authors' data collection was divided into two sections: primary and secondary data. Interviews with representatives of e-commerce companies, 3PL providers, experts and researchers, and a consumer survey formed the basis of the primary data. The authors also preferred secondary data because it often gave researchers greater access to information than possible with primary data (Vartanian, 2011).

3.2.1 Primary Data

The primary source of data was interviews conducted by the authors themselves. Interviews were organized and planned at an early stage with representatives of several different e-commerce actors. After acquiring extensive knowledge from these interviews, the authors explored other possible interview objects to explore a broader aspect of the research question from a perspective other than the actors'. In order to investigate ways to operate reverse logistics operations with a focus on transportation and sustainable processes promoted to their customers, the authors partnered with a leading Norwegian 3PL provider, PostNord. PostNord and the authors communicated via email prior to the official interview.

Moreover, the authors contacted another 3PL company, LettButikk AS, which focuses on outsourcing operations and collaborating with other 3PL companies, such as PostNord, on obtaining transport services effectively. In addition, the authors interviewed representatives from Meta Living, a company specializing in 3D technology, to gain a deeper understanding of the technological aspects of reverse logistics processes. A representative from Elmera Group was interviewed with the purpose of gaining a better understanding of the role that the Norwegian government plays in reverse logistics operations.

As a final step in obtaining a field expert interview that was not directly related to the business operations, the authors interviewed a professor from NHH in addition to representatives from the Institute of Transport Economics (TØI), who have researched the objective and purpose of this thesis and therefore are capable of contributing. Lastly, the authors used quantitative data, consisting of a survey, to collect data directly from the consumers.

3.2.1.1 Sampling

For both the qualitative and quantitative parts of the research, the authors believed that purposive sampling was the best way to answer the research question. One then has to be able to use their judgment to select the best cases suitable for their research and objective, sometimes called “judgemental sampling” (Saunders et al., 2015). This means the sample population is not chosen randomly but carefully thought out to maximize the information needed to answer the questions and research. It should be noted that Bell et al. (2019) emphasize that purposive sampling is widely used in qualitative research. Therefore quota sampling is another term that could be used to describe it when connecting it to quantitative research. According to Saunders et al. (2015), there are different types of purposive sampling strategies, and heterogeneous and snowball sampling was chosen as the strategy that gave the information the authors sought. A heterogeneous strategy picks participants with diverse characteristics in order to

maximize the variation in the data collected (Saunders et al., 2015), and enables them to detect patterns among the observed participants.

During the first round of data collection, a sample of four interviews was conducted, with three interviews conducted with Norwegian e-commerce actors and one interview conducted with an NHH professor who is an expert in digital innovation for growth. In addition, a survey was sent out to the consumers of e-commerce in order to obtain the opinions of consumers themselves. As a result of the consumer survey, 98.5% of 265 respondents referred to Norway as their country of residence. Based on the data obtained, it appears that the authors were targeting the correct audience, considering the limitations associated with the Norwegian e-commerce market. As part of the second round of data collection, a sample of five interviews was conducted, with two of the objects operating as 3PL providers to e-commerce actors. Further, two of the objects were conducted with experts in different fields, the first of whom was a provider and expert within technology, and the second was a law expert. Finally, the second round involved a presentation and interview with researchers and experts from The Institute of Transport Economics.

3.2.1.2 Representatives of the Interviews

Semi-structured interviews were constructed to interview representatives of the e-commerce actors and the 3PLs. The authors constructed questions to initiate a direction using semi-structured interviews but were also flexible enough to omit questions to adapt to different interviewees (Saunders et al., 2015). This strategy allowed the interviewees to influence the direction of the interview and encouraged two-way communication where both parties could ask questions (Doyle, 2020). This made it possible to adjust or add questions after each interview when new data was collected. The questions asked were open-ended, and by this, it was possible to further expand on themes that arose (See Appendix A, Table A.1 & A.2). The objective of the interviews was to gather as much data and information about the cost-and sustainable aspect of today's RLs in the

e-commerce industry. Further, their reverse logistics processes were described, and potential future initiatives were emphasized. RL's sustainability side is heavily influenced by how e-commerce actors manage returned products and what they can do up front to make the process more sustainable.

Since representatives from the interviews were located in different places in Norway, most interviewees were conducted through video conference, where the meetings ranged from 45 minutes to 90 minutes. The interviewees' names remain anonymous to outsiders to strengthen the credibility and quality of the information and respect ethical considerations. However, the organization's names are mentioned to maintain the integrity of our data. This will be discussed further in 3.4 Quality of Research. The participants were also made aware of the limits to the anonymity the authors could offer, as well as the challenges that can be posed to maintaining anonymity (Saunders et al., 2015b).

Throughout the data collection process, the authors formally presented their findings to the NHH professor, an expert in digital innovation growth, and research representatives from TØI. The authors also gathered data by engaging in a physical meeting at the TØI office in Oslo with their respective researchers from the project "KONTAKTFRI," including participants from PostNord and Eirill Bø from the Department of Accounting, auditing, and corporate finance at BI Oslo. The authors formally presented their findings to the research group and received constructive feedback accordingly. A further discussion of the findings was conducted during an interview with Tech-experts from Meta Living and with a representative from Elmera Group. This allowed them to discuss the issue further in-depth and get alternative perspectives from a broad view of expertise. The exact basis for the meeting was used for the interview with Meta Living and Elmera Group. However, it focused on their area of expertise, hence the technological and legal aspects of the thesis. This was done to gather opinions on barriers and perspectives regarding implementing such an initiative in a broader merchandise context. Finally, the authors were invited to the final seminar for the

"KONTAKTFRI" project at PostNord's head office in Oslo. A meeting with a representative of PostNord was arranged in advance for their findings to be presented on their behalf since the authors could not attend. In Table 2, the authors provide an overview of the representatives, using the term "object" later in the thesis to facilitate reading.

Interview Object	Organization		Interview Type and Length	Date	Interview Style
Object 1	NHH	Expert: Digital Innovation Growth	Video Conference 90 minutes	May 8th, 2023	Semi-structured / Open
Object 2	Guideline	E-commerce actor	Video Conference 60 minutes	March 7th, 2023	Semi-structured Interview
Object 3 Object 4	Komplett AS	E-commerce actor	Video Conference 75 minutes	March 21st, 2023	
Object 5	Apotek1 Netthandel	E-commerce actor	Video Conference 60 minutes	May 10th, 2023	
Object 6	Lettbutikk AS	3PL	Video Conference 60 minutes	March 16th, 2023	
Object 7	PostNord AS	3PL	Video Conference 60 minutes	March 17th, 2023	
Object 8 Object 9 Object 10	The Institute of Transport Economics (TØI)	Expert: Researchers	In-person Conference 45-60 minutes	May 8th, May 15th, June 1st, 2023	Semi-structured / Open
Object 11 Object 12	Bonum Utvikling AS	Expert: Technology	In-person 60 minutes	May 25th, 2023	Semi-structured / Open
Object 13	Elmera Group	Expert: Legal	In-person 45 minutes	May 31st, 2023	Semi-structured / Open

Table 2: *Overview of the Objects in the Quantitative Data Collection*

3.2.1.3 Survey to Consumers

The second target for the primary data collection was a survey, or questionnaire, given out to Norwegian consumers (See Appendix A, Table A.3). Surveys are one of the most common methods of observation that are used in the social sciences today, where the options for creating questionnaires can be either open-ended or closed-ended questions (Babbie, 2016). In this master thesis, the authors gave the respondents the same set of questions in a predetermined order, making it an efficient way of collecting responses before a quantitative analysis (Saunders et al., 2015). The majority of the questionnaires were closed-ended, with Likert Scales utilized (Babbie, 2016). This format made it possible to determine the degree to which the respondent agreed or disagreed with a particular statement. Two open-ended questions were also included in the survey to obtain information about the respondent's country of origin and what additional comments the respondents had regarding potential changes they would like to see to increase the sustainability of e-commerce.

The authors sought to understand consumer response toward new implementation of initiatives for more sustainable reverse logistics processes. Given the importance of sustainability and the origin of apparel, the authors sought to determine how this affects consumer behavior. Also, the results of the consumer questionnaires were required to validate that Norwegian e-commerce consumers intentionally purchase several products due to lenient return policies or in the absence of sufficient information, which diminished the consumer's confidence in the purchase. It allowed the authors to get a broader picture alongside the qualitative data. The survey was published on different Facebook groups, LinkedIn and sent to friends and acquaintances.

As a further step to ensuring that the author's purpose for the survey was intact, a pre-test for the survey was conducted to determine whether respondents understood the questions in order to prevent potential issues, such as unclear questions, misspellings, or unfamiliar words (Perneger et al., 2015).

3.2.3 Secondary Data

Internal validity, sometimes called measurement validity, refers to the ability to construct questionnaires and interviews to measure what is intended to measure (Saunders et al., 2015). To get an accurate analysis, knowing the reality of what is supposed to be measured is crucial. This introduces a problem; if it is known what is supposed to be measured, questionnaires would be unnecessary (Saunders et al., 2015). To address this problem, secondary data collected from previous literature and research were utilized to increase reliability further. The intention was to gather necessary data about the e-commerce industry and return rates that can further be analyzed and support the need for new initiatives to make the reverse logistics processes more sustainable.

The existing data can then be analyzed to generate new hypotheses or answer critical research questions. Also, data from extensive sample surveys may be of higher quality and representative of the population (Tripathy, 2013). Secondary data includes data from other researchers, records from organizations and companies, and company websites. These data types can provide additional or different knowledge, interpretations, or conclusions (Saunders et al., 2015).

3.2.3.1 Literature Review

The authors provided a solid theoretical foundation for the thesis framework using previous literature. Furthermore, the authors have used previous literature to construct interview guides to obtain valuable and relevant data that will be useful to build on previous research in the future. Webster & Watson (2002) state that a comprehensive review concentrates on concepts. Further, it must cover relevant literature on the topic and not be restricted to a particular methodology, journal, or geographical region. In light of this, the authors did not limit their research and instead sought to undertake a broad literature search first, followed by a more focused literature search later. It was explicitly from this literature that the authors could understand how far the industry had come regarding sustainability and business models, as well as further towards the technological aspect of the

research. Therefore, it was necessary to find research and studies focusing on the consumer, the main object of returns within e-commerce, and the reason for the attitude toward returns. The authors also recognized the potential of outsourcing in the e-commerce industry in the literature review, which can contribute to a more sustainable practice for the industry.

A comprehensive review of the academic literature has been conducted based on a variety of publications, including *the International Journal of Sustainable Engineering, Journal of Operations Management, International Journal of Production Economics, Journal of Electronic Commerce Research, International, Journal of Logistics Management, International Journal of Physical Distribution & Logistics Management, Journal of Business Logistics, Resources, Conservation & Recycling, Journal of Cleaner Production, International Journal of Supply Chain Management, Sustainable Production & Consumption, Journal of Theoretical & Applied Economic Commerce, Journal of Retailing and Consumer Services, International Journal of Production Research, Sustainability and Technological Forecasting & Social Change.*

A summary of all the data sources and collection methods is shown in Table 3:

Type of Data	Data Collection Method
Primary Data	**1 - Consumer Survey** **2 - Semi-structured interviews:** • E-commerce actors • 3PL providers • Expert within Digital Innovation Growth: Professor (NHH) • Expert/Researchers: The institute of Transport Economics (TØI) • Expert within Technology • Expert within Law
	Seminar: KONTAKTFRI • PostNord, TØI, SwipBox, Unloc and Eirill Bø
Secondary Data	**Official documents:** Official statistics, annual reports, market research reports, news articles, white papers
	Academic literature from Journals: Literature reviews, research papers

Table 3: *Data Collection Method: Primary- and Secondary Data*

3.3 Data Analysis

When analyzing qualitative data, it is essential to make sense of the subjective and socially constructed meanings behind the participants' answers (Saunders et al., 2015). Social constructionism refers to people's interpretations of what occurs around them, and qualitative data is acquired through more social interaction (Saunders et al., 2015). A thematic approach to analyze the qualitative data was used. This means the authors looked out for themes and patterns, then arranged them into categories to make it easier to analyze and comprehend large sets of qualitative data (Saunders et al., 2015). However, the authors also obtained their own qualitative data from customer surveys. Together with the quantitative data also obtained from the consumer survey, these will be incorporated with the data obtained from the interviews.

Data analysis began with secondary data and a literature review, which provided the basis for constructing interview guides based on what the authors considered relevant and what areas needed further investigation. Additionally, two separate

sessions were conducted during the interviews, as illustrated in Figure 6. It was evident from the first round of interviews that the thematic approach fitted into the semi-structured interviews, given that several of the objects brought up the same topics and problems related to the research question. As part of adequately analyzing the quantitative data, the authors transcripted all of the conversations following each interview. Relevant quotes were highlighted according to the specific focus areas established by the authors early in the study. Also, summarized interview reports were prepared and sent to the interview object for their approval if any misunderstandings had occurred or if there were any additional points the object wished to add to the report. This further gave the authors further clarification in the analysis when communicating at a second stage with the objects.

Upon conducting the first round of interviews and the consumer survey, the authors developed three hypotheses based on their observations of key findings, patterns, and similarities. These hypotheses are presented in 4.3 Verification of Hypothesis.

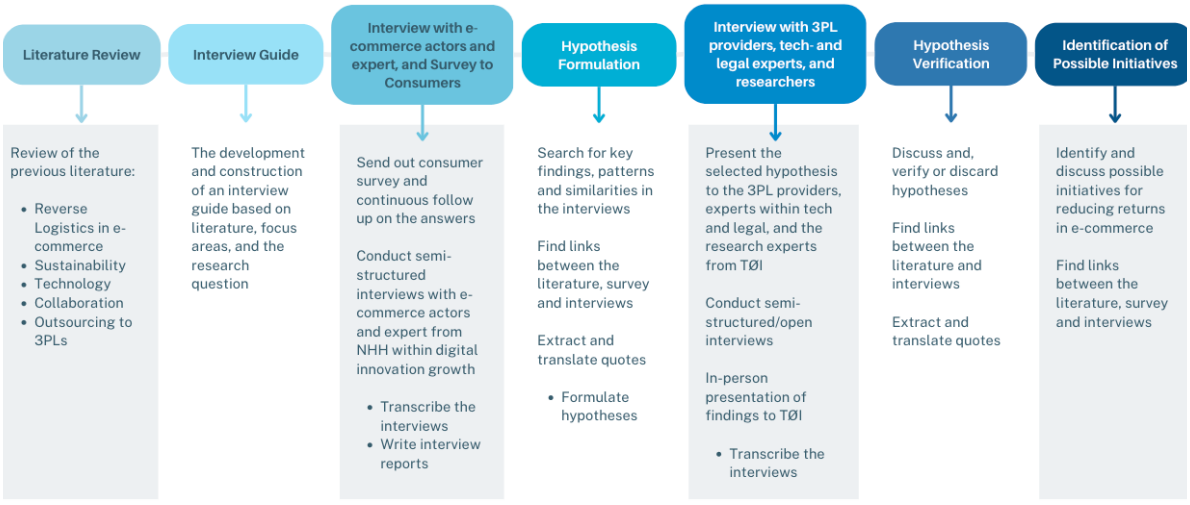


Figure 6: *Illustration of Data Analysis Process.*

3.3.1 Overview of Data Analysis Approach

The authors will further clarify in this section how the data analysis approach in this thesis has been conducted, including who was included in the formulation of the hypothesis and further verification of the hypothesis. These parts of data analysis are the focus of this section, as illustrated in Figure 7.

Figure 7: *Zooming in on the Data Analysis Approach.*

In formulating the hypothesis, the authors collected data following the previously mentioned focus areas, where each hypothesis was formulated and correlated with a specific focus area. The purpose here is to make predictive statements and manipulate the data to determine whether the hypothesis will minimize return rates and increase sustainability. The authors, therefore, considered observations and data from the consumer survey sent out by the authors; the first round of interviews with actors in e-commerce and an expert from NHH within digital innovation growth were considered. For further verification of the hypothesis, the authors conducted a second round of interviews with two specific 3PL providers, a legal- and tech expert, and the experts from TØI (Appendix A, Table A.2). Figure 8 shows an illustration and further clarification of the authors' data analysis approach.

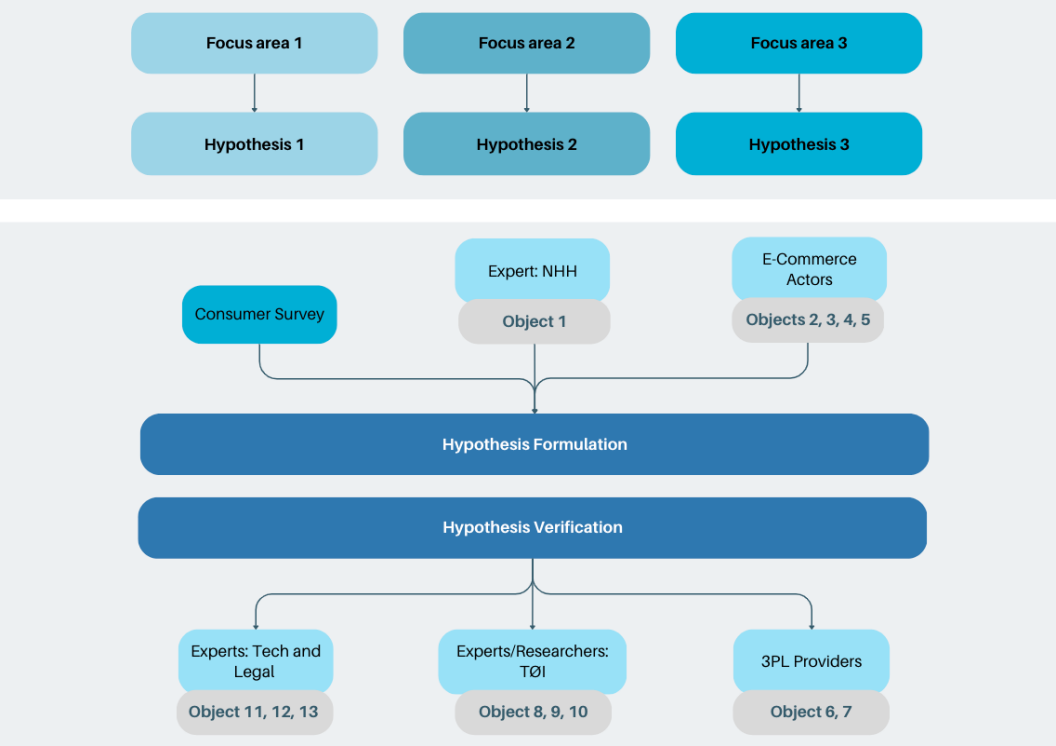


Figure 8: *Further Clarification of Data Analysis Approach by the Authors'.*

3.4 Quality of Research

This research has some limitations considering the choice of a *qualitative methodological approach* with in-depth interviews of the e-commerce actors, 3PL providers, experts, and researchers. As part of the qualitative research process, it is essential to consider two significant limitations: (1) the selection of the interviewees and (2) the difficulty of assessing the honesty and veracity of their responses (Biot & Mouhcine, 2020). The qualitative study covers a limited number of e-commerce actors operating and geographically located in Norway, which limits the scope of the number of actors on the market. Furthermore, the difficulty of verification of the statements from the 3PL providers due to the minimal amount of further information on this way of operating besides the demand for collaboration and previous literature. However, the authors believe that this study can provide a fair illustration of the costs associated with the current return policies of various Norwegian e-commerce companies and

contribute to a better understanding of how sustainable initiatives may be implemented in the future.

The quantitative analysis the authors have conducted examines Norwegian consumers of e-commerce actors with restricted information. The limitations may be that the sample is biased since the respondents may not represent the entire population of Norwegian e-commerce consumers. Additionally, although the authors have conducted a pre-test of the survey, the authors have limited control over how respondents interpret and respond to the questions.

Empirically and practically analyzing the effects on RLs regarding returns within e-commerce and how sustainability can be enhanced by implementing strategic initiatives is context specific. Several of the e-commerce actors operate in different markets, and the reasons for return, volume, and product life-cycle differentiates. Therefore, it can be hard to grasp a precise examination of how the actors operate based on the context-specific appearance.

3.4.1 Trustworthiness and Authenticity

Law (2002, as cited in Curtin & Fossey, 2007) suggests that establishing the trustworthiness of research increases the reader's confidence that the findings are worthy of attention. Appraising quality and trustworthiness criteria include quantitative analysis, not only qualitative studies, supporting the author's choice of a mixed-method approach in this master's thesis. An illustration by Jackson (2002, as cited in Curtin & Fossey, 2007) states that trustworthiness refers to establishing the validity and reliability of qualitative research. As quantitative studies are concerned with the generalizability and reproducibility of findings, the concepts of reliability and validity are also seen as appropriate criteria to use when evaluating the adequacy of quantitative research (Ryan et al., 2007). Where the authors have considered the consumer survey as generalized, and where the answers indicate that the right respondents have been targeted.

Further, to verify the research process, the authors are responsible for making judgments about the quality of data collection. In addition to this, following Lincoln & Guba (1985), there are five criteria to enable the trustworthiness of the research conducted; *(1) credibility, (2) dependability, (3) transferability, and (4) confirmability.* The authors have chosen these criteria to illustrate trustworthiness in this thesis.

Credibility corresponds roughly with the positivist concept of internal validity (Rolfe, 2004). This strategy is rooted in the truth value, which asks whether the researcher has developed and articulated confidence in the findings based on the phenomenon under investigation. Mainly related to qualitative research, it is essential to recognize that the truth might derive from the participant's lived experiences which do not necessarily lead to universal truths (Lemon & Hayes, 2020). In the authors' research process, particularly the qualitative data collection, consideration of political, social, and economic agendas that might influence the interview response have been evaluated. Therefore, the choice of anonymity of the object, and only including organization, intentionally strengthen credibility intending to acquire honesty.

Dependability relates more to reliability or consistency in qualitative research. Data consistency will be achieved when the steps of the study are verified by examining such items as raw data, data reduction products, and process notes (Campbell, 1996, as cited in Golafshani, N., 2003). It also substitutes reliability and asserts that findings are distinctive to a specific time and place, and explanations are consistent across the data (Lemon & Hayes, 2020). In order to achieve a complete record and transcription of everything said during the interviews, the authors of this thesis divided the tasks by having one lead the interview, and the other take notes. It should be noted, however, that the interviews were conducted in Norwegian, where there is a risk of the translation needing to reflect the quality and context. In order to achieve the highest level of

quality, a great deal of attention was paid to quality proofreading and ensuring as accurate a translation as possible.

Transferability is a form of external validity and provides the lens for evaluating qualitative research findings. (Golafshani, N., 2003). Precise attention to detail in the research was done when the authors conducted the analysis. The transferability of the study was measured in terms of how the findings can further be applied in other contexts or studies. The authors needed to find out the sites that may wish to transfer the results; however, they were responsible for providing thick descriptions so that those seeking to disseminate the findings to their site could judge transferability (Lincoln & Guba, 1985). As the authors were working within a limited time frame, they conducted an extensive investigation, inquiring into possible initiatives and contacting experts to verify how far technology has come in implementing such initiatives during the purchasing process. Furthermore, the authors also conducted research on the legal aspect of implementing initiatives in light of current laws and incentives.

Confirmability is established when credibility, dependability, and transferability are achieved (Lincoln & Guba, 1985). Confirmability gets to the objectivity of the phenomenon under investigation and addresses whether the interpretations and findings from the participants' lived experiences do not include the researcher's biases (Lemon & Hayes, 2020). Peer debriefing sessions are, therefore, to be included in the research. As part of this process, the transcripts, findings, and interview reports sent out to all objects are evaluated to determine the validity of the findings. In order to ensure the quality of context, the interview reports were sent to the objects in English, which allowed them to clarify any statements or misunderstandings that may have arisen.

3.4.1.1 The Principle of Authenticity

In addition to the four criteria presented by Guba and Lincoln, the principle of authenticity also improves trustworthiness and ethical standards in a research

process. Schwandt, Lincoln & Guba (2007) argue that authenticity extends the trustworthiness criteria because it enables questions to be asked about how interpretations are made and how this process has evolved (Johnson & Rasulova, 2017). The authors seek to make the study authentic by emphasizing validity in the design, method, and discussion by capturing multiple perspectives from several Norwegian customers in the quantitative analysis. The research question, and study in general, will intentionally be nondiscriminatory and objective.

3.4.2 Ethical & Societal Considerations

3.4.2.1 Ethical Considerations

In qualitative research, the most common tools used for data collection are interviews and participant observations (Ryan et al., 2007). Since anonymity is impossible, assuring that the participants' identities will not be revealed is vital for ethical considerations. The privacy ordinance in this master thesis will be under GDPR by harmonizing privacy in the processing of personal data. The emphasis will be placed on six general data protection principles by Goddard (2017), illustrated in Figure 9.

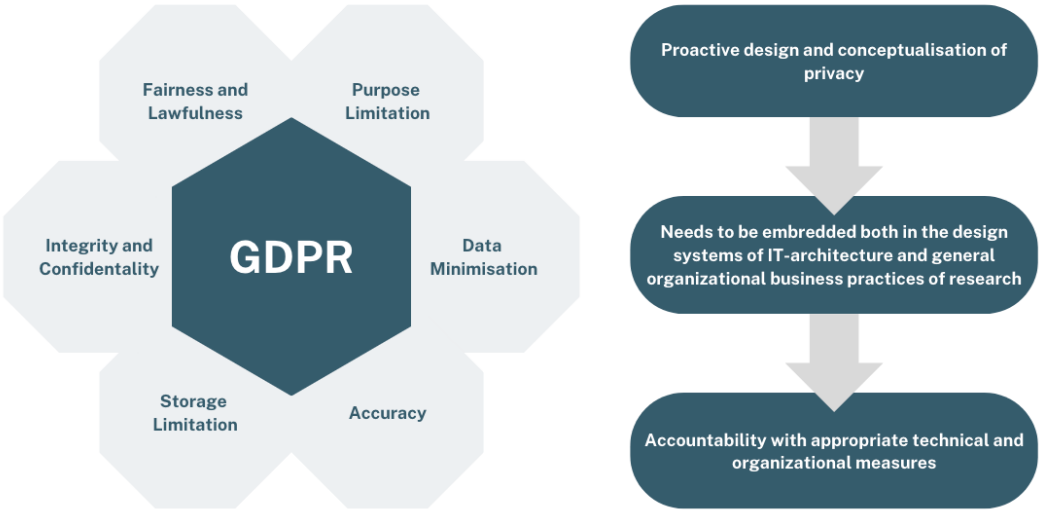


Figure 9: *Core Privacy Principles and Operationalizing the Principles. Source: Goddard (2017)*

Consequently, the authors did not include personal information and assessments associated with individuals in the study but only included job titles to indicate the interviewees' points of view. In addition, an agreement containing permission for conducting the interview, allowing publication and storage of private data, was included. The authors strictly emphasized The Privacy Act (Personvernloven, 2018), as this regulation protects fundamental rights and personal data.

3.4.2.2 Societal Considerations

On the 30th of March 2022, the European Commission presented a package of bills and initiatives to promote sustainable products and sustainable product choices (Godal et al., 2022). In the long run, this package aims to cover the whole European market with eco-design regulations. New requirements are proposed to make the products more reliable, reusable, upgradeable, repairable, easier to maintain, refurbish and recycle, and energy and resource-efficient (Godal et al., 2022). One of the requirements focuses primarily on the longevity of the products, which reduces the risk of the garments ending up in landfills. Besides this, the proposals are mainly about the production of sustainable textiles. There is no focus on the process between returns of used or new products and the apartment of remanufacturing or recycling. Therefore, the research is illuminating the importance of environmental challenges regarding the disposition of returned products.

4.0 Empirical Findings

The findings of the research are presented in this section. As shown in Appendix A, Table A.1 & A.2, the structure of the findings is consistent with the interview guide for qualitative interviews. This section has been divided into three parts; results from interviews with e-commerce actors, data collected from consumer surveys, and an interview with an expert within digital innovation for growth. The next part contains three hypotheses based on these findings and previous research theories. The last part features the verification of the three hypotheses, where two experts in the field of technology have verified the first hypothesis. A legal expert has verified the second hypothesis. A research group and two third-party logistics providers verified the final hypothesis. In chapter three, the authors summarized the methodology and structure of the collection of empirical findings, as illustrated in Figure 10.

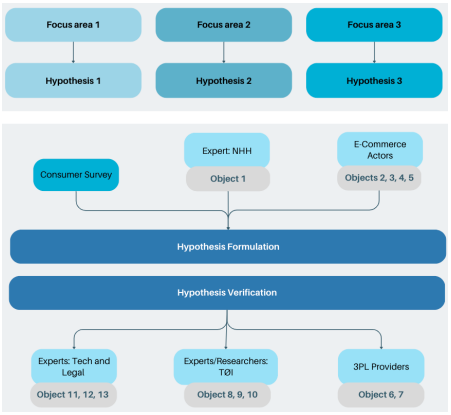


Figure 10: *Miniature of Clarification of Data Analysis Approach.*

4.1 Expert within Digital Innovation for Growth, E-commerce Actors and Consumer Questionnaire

The purpose of the interviews with e-commerce actors was to gain a better understanding of the current state of return processes and how this affects costs and sustainability. In order to add more perspective and depth to the findings, an expert within digital innovation for growth was consulted, setting the stage for the next section of the thesis. Further, as implementations of new strategies and practices affect e-commerce consumers, the findings from consumer surveys were utilized to supplement the findings from the interviews with e-commerce actors and the interview with the expert within digital innovation for growth.

4.1.1 The Existing Landscape of Reverse Logistics Operations

In order to optimize costs and sustainability, it was essential to address the existing landscape of how the returned actors handle the e-commerce products, mainly focusing on the processes associated with human labor. In order to minimize the time required for inspecting returned products, most e-commerce respondents stated that contacting the customer before the return is an integral part of their practice.

> *When customers report their reason for return, typically through e-mail and by providing photographic evidence, we take their honesty into account and do not devote much time to exploring alternative solutions. (Object 2)*

> *When customers decide to return a product, it must be approved by the company beforehand. (...) We prefer to get the information about the reason for return where the customer is located, i.e., at their home, and then assess whether the customer has the right to a refund.* (Objects 3 & 4)

> *(...) Requiring documentation of the returned product reduces the uncertainty and the manual work involved in receiving a returned item.* (Object 5)

However, although information sharing may minimize the time for part of the reverse logistics process, a growing concern regarding the increased amount of product returns within the e-commerce industry was expressed;

> *This is also based on the fact that it is extremely easy to return goods today. There is a high level of ignorance in society today, which means that customers do not think about the consequences of the choices they make. (...) If you think about the main motives for shopping online, this is often impulse action or inconvenience.* (Object 1)

Due to an increased fraction of returns, and the less conscious nature of online shopping, several interview respondents indicate that a challenge concerning reverse logistics is the costs associated with managing the return being made.

> *Based on the impressions I have after dialogue with different actors working the handling returns, logistics carriers, master's students, and others, the highest cost is to handle and sort the returned products.* (Object 1)

> *We have descriptions of how we handle the different returns, but not a clear manual.* (Objects 3 & 4)

As observed, the majority of the processes still heavily rely on manual procedures due to the varied reasons behind returns. Since some of the products require different reverse logistics procedures, it is making it difficult for the e-commerce actors to fully develop an automated system that can accommodate a wide range of options.

> *(...) We must decide whether the product should be refurbished, recycled or repaired, resold or disposed of. When we receive the returned product, it is received at the service reception and further distributed according to the product type and grounds for return (...) If the product has a fault or defect, we replace the part that needs to be replaced while also inspecting whether other parts of the products can be used in other defective products. We disassemble the product, sort according to the product category and EU regulations, and reuse parts of the products if possible* (Objects 3 & 4).

It is also evident that the return process can be quite complex for some business domains. A careful inspection according to the EU regulations is displayed as an absolutely essential part of the inspection process, as accurate assessment avoids

errors. Consequently, it is shown that it is necessary in some circumstances to perform the tasks manually with a lot of competence to ensure that the products are handled correctly.

> *When dealing with returned products such as waders, we spend approximately 10-15 minutes for each pair of trousers. Most of the time is spent unpacking the item and examining the seams and tapes (...) Considering that around 4.000 swimming trunks are sold annually, and approximately 3% are returned by the consumers, it becomes evident that the handling process will require a severe amount of time and attention to detail.* (Object 2)

> *The time can vary from several hours, often caused by technical errors, to just a few minutes (...) In addition, we must spend time mapping out whether there is a user or production error.* (Object 3)

> *The handling time for merchandise is approximately around 15 minutes, while for prescription drugs, it extends to around 25-30 minutes in total.* (Object 5)

The findings related to the existing landscape of reverse logistics operations revealed that the practices of how the returned products are handled vary due to how certain products require distinctive expertise and how other products do not have an equally extensive evaluation process for inspection. Moreover, the findings displayed the complexity of the different reverse logistics processes and how they can vary based on the type of industry, which thus also affects which costs the e-commerce actors are exposed to. Despite low return rates, it becomes apparent that human labor accounts for a significant portion of the associated costs when considering the time spent handling and inspecting each product. Returns require human intervention, in which personnel are responsible for opening the packages, inspecting the items, identifying any defects or errors, and

then deciding on their disposition. The manual processes demonstrate the necessity for skilled labor, which also consumes a great deal of time and resources.

4.1.2 Utilizing Technology

In the literature review chapter of this thesis, the authors elaborated upon how VR/AR technology can be used as an advantage in the purchasing process. The interview asked explicitly about the actors' perceptions of this phenomenon. The interviews showed a positive attitude toward implementing technology in the purchasing process to minimize the insecurity around purchasing online. The answers given in the interviews were primarily focused on how this implementation would increase customer confidence and meet their expectations.

> *In the future, we see that size and customers buying the right product are essential. Technology within the size guide is something we look into more closely; a "virtual fitting room".* (Object 2)

> *The company's website also provides a solution for the customer via augmented reality, where they can use their smartphones to visualize the product in their environment at home. This aims not only to promote the product but to ensure that it meets the customer's expectations.* (Object 3)

In addition, the consumer questionnaire revealed that Norwegian e-commerce consumers are optimistic about a shift towards implementing new technology. When asked about what changes they would like to see in the current return policies of Norwegian e-commerce stores to make them more sustainable, i.e., due to the reduction of product returns, the responses indicate that the consumers are eager to feel more confident in online purchases.

Some virtual technology is needed to prevent us consumers from intentionally purchasing multiple sizes. It becomes too silly to gamble on online shopping.

Virtual fitting rooms or more accurate sizing charts could potentially decrease uncertainty when buying clothes.

Virtual fitting rooms or more accurate sizing charts could potentially decrease uncertainty when buying clothes.

I would prefer to know about the fit in advance. As an example, I could place my measurements on a user's thighs, waist, etc., and then test them in augmented reality.

Additionally, the survey further confirmed these statements, where 27.1% of the respondents indicated that virtual try-on technologies (including clothing, furniture, equipment, electronics, etc.), and 30.5% could be implemented by e-commerce actors in order to reduce consumer returns. As illustrated in Figure 11, the results also indicate that better product descriptions, images, and more accurate sizing charts score highly among Norwegian e-commerce consumers.

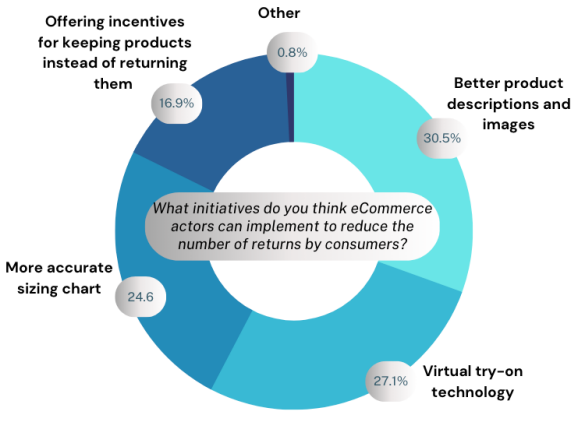


Figure 11: *Findings from Survey to Consumers (1).*

On the subject of understanding consumer intentions in the purchasing stage of buying online, the consumers were asked if they had ever ordered multiple sizes of the same product with the intention of returning some of them. Approximately 50.8% of respondents indicated that they had ordered multiple sizes with the intention of returning some of them prior to responding to this survey (See Figure 12).

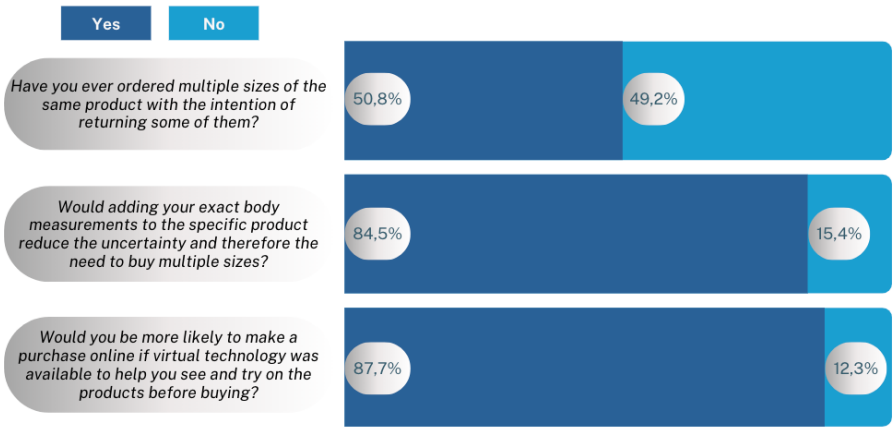


Figure 12: *Findings from Survey to Consumers (2).*

The authors also found it essential to discover how consumers feel about providing their body measurements before purchasing and if this could reduce the likelihood of purchasing multiple items with different sizes. Based on the results illustrated in Figure 12, it is apparent that consumers would be more confident in their purchase if personal characteristics, such as body measurements, were included. A further 87.7% of the respondents expressed an interest in purchasing online if a virtual buying experience was available to enable them to see and try on the products prior to making their purchase.

4.1.3 Addressing Barriers for Sustainable Initiatives

As part of focusing on new strategies that can reduce the frequency of returns, the authors sought to understand consumers' attitudes toward sustainable return practices and their willingness to pay for such implementations. Concerning the sustainable aspect of doing business, although some actors contribute to

initiatives, consumers' willingness to pay is still one of the main barriers. It has been observed that some actors are required to shoulder the costs of more sustainable initiatives themselves since consumers express a willingness to support the green shift. However, there is a lack of contributions and willingness to pay for it in practice.

> *A study done with 60-70 participants showed that everyone was concerned with sustainability around online shopping, but very few were actually willing to pay or contribute towards a change.* (Object 1)

> *Customers are concerned about the environment but are not always willing to pay for more expensive, environmentally friendly products (...). If the price increases more than 10%, most customers do not want to choose the more environmentally friendly product.* (Object 2)

Since consumers lack the willingness to participate in addressing this issue, it would be prudent to create an intensive structure that would work as a collaboration toward preventing the return of consumer products continuously.

> *Everyone benefits from cooperation, but no intensive structure requires cooperation. It requires the authorities to create an intensive structure to make it work.* (Object 1)

The consumer survey also revealed that Norwegian e-commerce consumers' attitudes toward sustainable practices are slightly unconcerned. The majority of the respondents, 38.5%, clarified that sustainable practices are somewhat important, and 32.3% are indifferent.

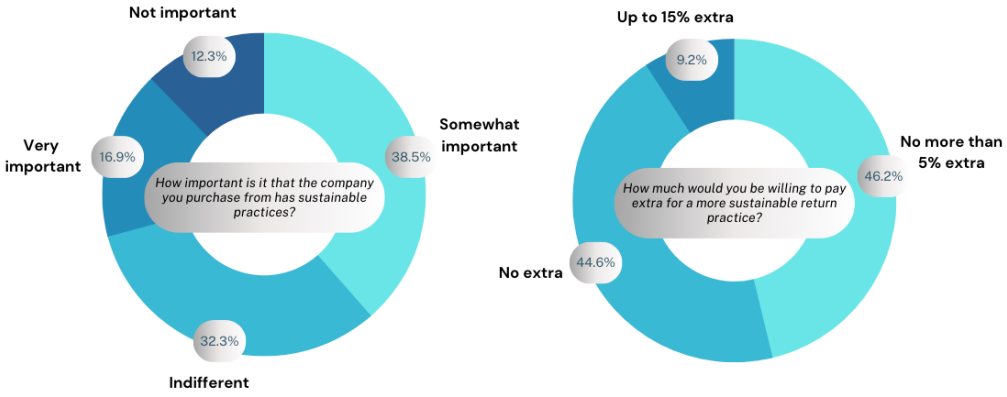


Figure 13: *Findings from Survey to Consumers (3).*

To investigate the consumers' willingness to pay, the results corresponded to the consumers' attitudes toward sustainable return practices. 44.6% of the respondents stated they were unwilling to pay more than 5% extra for more sustainable return practices. Additionally, 46.2% answered that they were unwilling to make any additional payments. Given how irrelevant sustainable practices are when making purchases, it is not surprising that consumers are unwilling to pay for them.

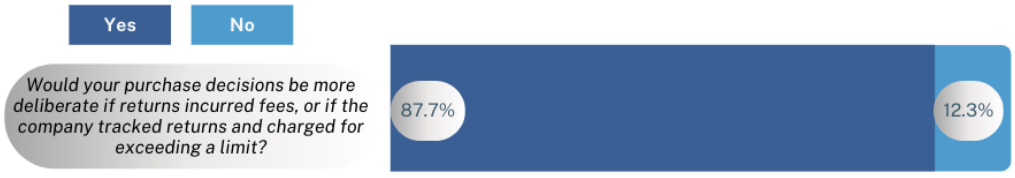


Figure 14: *Findings from Survey to Consumers (4).*

Moreover, it seems that the consumers would be more deliberated if they were aware that a fee would be imposed for each return made or if the e-commerce actor monitored their returns and charged them on a per-return basis, that is, if the number of returns exceeds a specific limit.

4.1.4 Sustainability

A tendency emerged through the interviews that KPI indicators, including measures of CO2 emissions, are more easily tracked on sendings in the forward logistics, namely sending from factory to warehouse and warehouse to consumer, than in the reverse logistics, namely shipping back to the actor from the consumer. However, the actors are measuring other factors, such as the amount of recycled material used in the product.

> *The transport of the product sent out is measured, but the return is not measured to the same extent (...). There is a more significant focus on getting the products out than getting the products back.* (Object 5)

> *We could have integrated a better return solution with our partners, but such solutions also require tech integration. Furthermore, our low return rate indicates that this is not our high priority.* (Object 3)

> *We have measurements of C2O emissions on the inbound logistics, on the inbound logistics from the factory to our warehouse.* (Object 2)

> *We primarily focus on environmentally friendly outbound transport, but then we have the return logistics under the same network to the same extent. We want to increase green transport, e.g., filling the cars as much as possible, using electric cars, etc.* (Object 4)

Further, it has been recognized that sustainability focuses primarily on forward logistics because of the large number of products that are handled this way; however, due to the increasing number of packages returned in the last decade, better practices must be developed before non-optimal and non-sustainable practices become the "normal."

> *There are cases where it is cheaper to destroy the products than actually to handle it. In a sustainable discussion, such practices are condemned to have to be changed.* (Object 1)

The authors further found that disposition decisions in reverse logistics play a significant role in how the actors conduct operations, as seen from the findings and exposition of industries such as fast fashion. According to this research, actors have developed a variety of initiatives and projects centered on disposition decisions in a more sustainable manner, and these initiatives are still in development.

> *We have developed new production methods if part of a product is damaged. This is so that parts can be sent to the consumer quickly, avoiding the entire product needing to be replaced or disposed of. There is not much profit in this, but rather it is a service we offer to ensure the products have a longer shelf life over time and are easier to repair for customers.* (Object 2)

> *We try to secure a "kick-back agreement" with the suppliers when possible. This means that we are responsible for the return, i.e., we do not return damaged products to the supplier. Instead, it means that we are responsible for returning the items and that we can reuse the reusable parts.* (Object 4)

> *We have a collaboration in Sweden that builds new products from existing products so that we can resell them. This does not generate much profit, and there is actually a high cost linked to this, but we do what we can to minimize the impact on the environment and nature.* (Object 2)

Finally, it was imperative for the authors to understand the process involved in achieving sustainable solutions through collaborations. This entailed examining procedures that facilitated coordination with 3PL providers;

> *We mainly use PostNord QR solutions (...) We collaborate with Porterbuddy, where new solutions are needed to return the processes. The absence of something may hamper the goal of achieving efficient return solutions.* (Object 3)

> *The return process should be designed to provide a positive customer experience, thereby making an important and profitable investment. For example, we can see that same-day deliveries and outbound transport, when combined with fast delivery, have almost become a matter of course for customers. We strive to focus on which intensives we can lay the foundation for so that the customers will be even more satisfied, pushing their expectations even higher. Our goal is to be one step ahead of the competition.* (Object 4)

The expert interview with Object 1 also revealed concerns regarding the potential cost and environmental implications of collaborating with 3PLs due to the increased scale of returns;

> *Working with 3PLs is a temporary solution that can act as a "breather" until a permanent solution can be found for more sustainable solutions. There is still a need for government regulation regarding reverse logistics and returns, as well as the awakening of the populace to make people less ignorant regarding these issues.* (Object 1)

Although the object expressed concerns regarding collaboration with 3PLs and outsourcing operations, positive thoughts were also expressed if certain

constraints were met. It was also noted that the interview respondent did not possess a great deal of information regarding the use of 3PLs in Norway;

> *Aside from the platform "Turnr" launched by Schibsted, I am not familiar with this field. Although the return problem can be gradually reduced if the returned products are collected and distributed in an efficient manner while at the same time working actively to increase consumer awareness, I believe it will gradually help reduce the return problem. Also, this requires the right equipment and investment in technology in order to optimize the processes correctly for sorting and handling, etc.* (Object 1)

The findings indicate that, in general, the e-commerce actors do indeed place considerable effort into contributing to the sustainability of their operations practices. However, it has also revealed that sustainable practices are more concerned with forward than reverse logistics. Based on these findings, the authors found that most of these initiatives were not primarily concerned with profit since there are indeed extra costs associated with many of these initiatives. Instead, they were motivated to contribute toward protecting the environment and improving the company's sustainable image.

4.2 Hypothesis Formulation

The authors' data collection through the interviews found three specific focus areas they wanted to explore further. This is because they wanted to incorporate the customer further also itself to be able to find a solution to the return aspect of reverse logistics. The three main focus areas are as follows:

1. What strategies can be employed during the purchasing stage to minimize the frequency of returns?
2. How can long-term perspectives and practices be utilized to reduce the occurrence of returns?

3. How can collaborative relationships contribute to reducing the frequency of returns in reverse logistics operations?

Based on these focus areas, the authors formed three hypotheses to explore further, based on their findings, while incorporating the consumer's answers on the surveys sent out. See Figure 15 for further clarification of where the authors are in the data analysis process explained in Chapter 3.

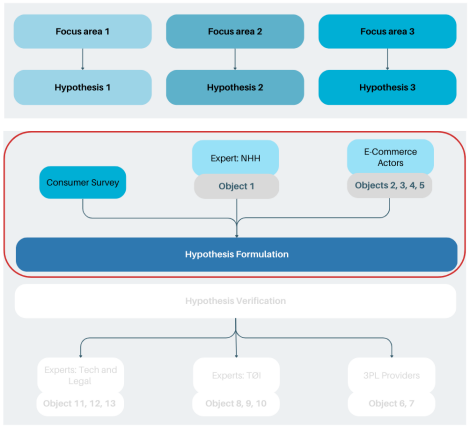


Figure 15: *Hypothesis Formulation - Clarification of Data Analysis Approach.*

1. *Virtual technology, such as virtual try-on, can decrease the number of returns from consumers by reducing uncertainty about fit and style.*

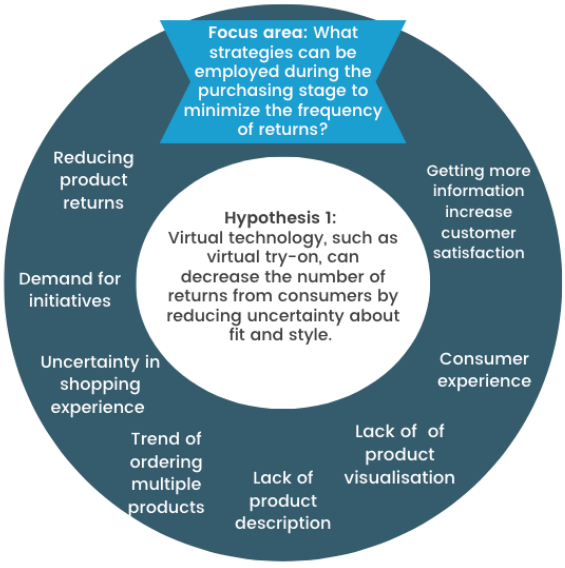


Figure 16: *Formulation of Hypothesis 1 Based on Findings.*

This hypothesis is based on the assumption that consumers may be more likely to purchase products online if they can virtually try them on, reducing the likelihood of returns due to incorrect sizing or dissatisfaction with the product's appearance. Returns in e-commerce are influenced by various factors, including uncertainties surrounding how products actually look and fit. The inability to physically interact with products prior to purchase leads to uncertainty, especially in areas such as sizing, style, and overall appearance. This uncertainty contributes to higher return rates as consumers tend to order multiple sizes or variations of the same product to ensure a satisfactory purchase.

However, this may also lead to more returns if the virtual technology does not accurately represent the product, leading to consumer disappointment.

2. *A law or intensive that requires e-commerce actors to pay a tax or fee on high return frequencies. This will help to reduce the number of returns and enhance the sustainability of RLs in the Norwegian e-commerce industry.*

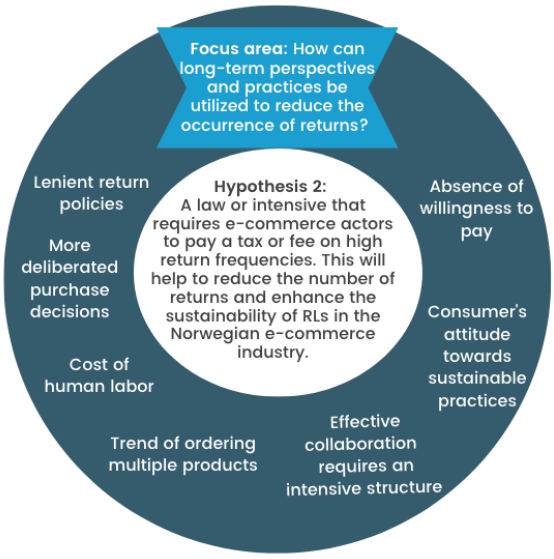


Figure 17: *Formulation of Hypothesis 2 Based on Findings.*

The hypothesis proposes that implementing a law or intensive that mandates e-commerce actors to pay a tax or fee on high return frequencies can reduce the

number of returns and minimize the environmental impact associated with reverse logistics in the Norwegian e-commerce industry. E-commerce has experienced significant growth in recent years, providing consumers with convenient access to a wide range of products.

However, this convenience has also increased the frequency of returns, which can negatively affect both businesses and the environment. Lenient return policies and low costs associated with returns have made it easier for consumers to return products, resulting in higher return rates.

3. *By leveraging the services of 3PL providers who prioritize sustainability, Norwegian e-commerce actors can effectively mitigate costs and enhance sustainability through a reduction in return rate.*

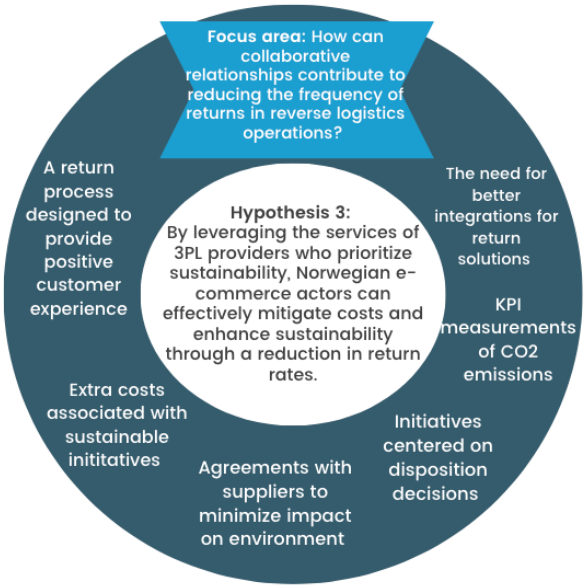


Figure 18: *Formulation of Hypothesis 3 Based on Findings.*

It is suggested in hypothesis 3 that Norwegian e-commerce actors can benefit from partnering with third-party logistics providers to reduce costs and environmental impact, which will, in turn, result in a reduction in return rates. In

order to assess the validity and practical implications of all the hypotheses, prior empirical research and case studies were necessary.

4.3 Verification of Hypothesis

In order to evaluate and verify the hypotheses developed above, the authors conducted interviews with experts from the fields of technology and law, an expert/research group from TØI, and two 3PL providers. See Figure 19 for further clarification of where the authors are in the data analysis process explained in Chapter 3.

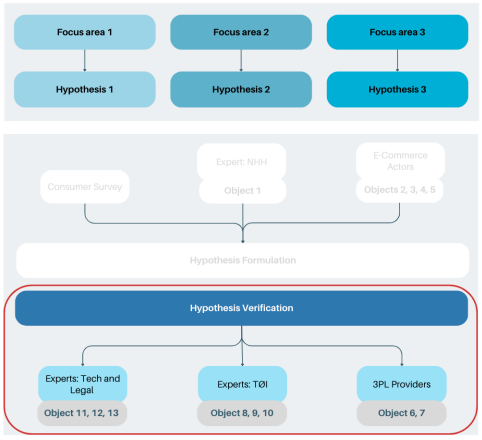


Figure 19: *Hypothesis Verification - Clarification of Data Analysis Approach.*

4.3.1 Hypothesis 1

First hypothesis is the following:

Virtual technology, such as virtual try-on, can decrease the number of returns from consumers by reducing uncertainty about fit and style.

Based on the hypothesis, interviews were held with experts within technology (Objects 11 & 12). It appears that virtual technology can reduce the number of returns from consumers by reducing uncertainty about fit and style. Despite this, it has been suggested that the Norwegian market may not be ready yet, which may result in more negative consequences than positive features, such as high costs for e-commerce actors and poor user experience for consumers. Thus, artificial intelligence (AI) was suggested as a viable alternative.

Initially, to better understand their expertise and capabilities, the authors allowed the objects to elaborate on how they utilize 3D modeling and technology in the context of new housing projects.

> *The immersive 3D environment allows customers to experience home selection with virtual walkthroughs in a fully interactive 3D environment. The new concept is powered by Unreal Engine, dynamic lighting and textures that creates a lifelike atmosphere, fully capturing the materials, lightning, and shadows. These features are providing an unparalleled representation of the properties and their interiors.* (Object 11)

When asked about customization, and how their solution can be tailored to specific needs, and how this can affect the consumers buying experience more positively.

> *Our 3D visualizing feature allows the customers to change colors and materials to furnishing and decor options. Also, it allows customers to visualize and experiment with various design possibilities. We believe that this level of customization also fosters a sense of ownership and connection, increasing the likelihood of purchase and long-term satisfaction (...) It also streamlines the decision-making process, resulting in a more efficient and enjoyable buying experience*". (Object 12)

In terms of cost reduction, the company is asked to explain how the implementation of 3D platforms and VR/AR technologies can help reduce costs for e-commerce operators in the long run;

> *The use of 3D platforms and VR/AR technologies can eliminate travel-related constraints and associated costs. A contractor, especially when working on real estate projects, will therefore spend less time showing everything to the customer since 3D modeling makes it easier for the customer to visualize the project.* (Object 11)

> *In the property industry, in which we operate, we see that our concept helps to reduce the use of time with each individual customer. We see that our partners, such as a furniture store, do not have to spend as much time*

with the end users as the sales go through our concept. (Object 12)

Even so, some actors or industries may find it challenging to invest in VR/AR technology because of the high costs and processes required to utilize it;

In the case of a well-known chain, such as Zalando, they offer a wide variety of both shoes and clothing. All products would have been scanned in so slowly that by the time they are completed, they would already be out of range. Additionally, this requires a significant amount of manual labor and is extremely expensive. Sorting the clothes, moving them to the studio, adjusting the lighting, and fixing the camera are among the necessary steps (...) Additionally, there are many technical steps necessary to align the 3D model with the person who is visualizing it. Object 12)

When it comes to luxury brands, such as Gucci, they have the budget, they do not replace items as frequently as Zalando, they have time, and their catalog is smaller and more stable. In this case, quality is placed above mass production. A solution of this type is likely to be of greatest benefit to luxury brands. As a result of the higher prices, customers are taking more care when making their purchases. (Object 11)

During the discussion of sustainability within the e-commerce industry and how technological advancements can enhance consumer confidence when purchasing products, it became evident that technological advancements play a key role.

The integration of technology can, as previously mentioned, reduce the need to physically try-on the products, and, consequently, the environmental impact associated with transport to physical stores. It is important to note that the disposal and processing of electronics and hardware must be handled in an environmentally friendly manner. (Object

11)

> *It is always beneficial for the customer to view a product in a more natural setting prior to purchasing it, regardless of whether it is an apartment or a dress. The clothes may look good on a model, but we cannot always tell if they will fit our body type. Real estate development projects today allow customers to visualize homes in 3D, where they can choose colors and furnishings that will complement their surroundings.* (Object 12)

In addition, it was also important to address potential barriers related to the implementation of virtual fitting rooms in the Norwegian e-commerce industry;

> *One issue is that the hardware is not yet ready for this type of technology (...) When it comes to products such as clothing, which do not cost much, this is unlikely to be particularly profitable (...) It is important for the hardware to reach a point where it can display nice 3D images. We can view 3D images at the present time, but in my opinion, it is not good enough to attract customers to shop with them in the future.* (Object 11)

> *Realistically, most companies do not want their products to be marketed with a poor resolution that does not accurately represent the product (...) Furthermore, such integration also requires advanced technical skills and resources to function efficiently.* (Object 12)

Moreover, barriers related to GDPR compliance were addressed;

> *Companies should comply with the GDPR rules imposed by the EU (...) And consumer data must be accessible somehow, and have the option of being deleted if required.* (Object 12)

> *To comply with the law, the company must clearly indicate what kind of information it has on its customers, and the customer must confirm that such information is collected.* (Object 11)

Further, when asked about market perceptions of these solutions in terms of their user-friendliness;

> *Some individuals may find it difficult to navigate a 3D environment. The quality of the service can be adversely affected by a poor connection to the servers on which it is hosted. This is a source of frustration for customers, as they naturally wish for everything to operate smoothly. The dress you are viewing, for example, may appear pixelated as a result. (...) It is probably too early for the market to be ready for it at this time.* (Object 12)

> *In my opinion, the next step should be the development of artificial intelligence (AI). The application of artificial intelligence enables customers, for example, to upload a picture of themselves in order to see what their body shape looks like and propose products based on this information. This is probably much more convenient for customers now. On the other hand, the downside of artificial intelligence is that there is no guarantee that it will be precise.* (Object 11)

4.3.2 Hypothesis 2

The second hypothesis is the following:

A law or intensive that requires e-commerce players to pay a tax or fee on high return frequencies. This will help to reduce the number of returns and the environmental impact of reverse logistics in the Norwegian e-commerce industry.

Based on the hypothesis, interviews were held with a legal expert (Object 13). Objects supported the hypothesis and confirmed that e-commerce players could be required to pay a tax or fee, which is likely to impact the scale of returns positively. A discussion of the barriers associated with current laws and structures was required due to the complexity of the global e-commerce market.

For further verification, the first step toward implementing a new law or introducing a new incentive was to identify some of the essential factors. As a result, the object was asked if there was any conflict between existing law;

> *The main issue here, which is difficult for you to bypass, is the consumer perspective. There are several elements to consider regarding consumers if a tax is to be imposed. Firstly, there's the Consumer Purchase Act (Forbrukerkjøpsloven, 2002), and secondly, the Right of Withdrawal Act (Angrerettloven, 2014). The right of withdrawal allows consumers to return both services and products within 14 days after delivery. The contractual relationship between the parties doesn't arise until after 14 days, once the withdrawal period has expired. In some cases, e-commerce actors also have information obligations towards consumers, and failing to meet them may extend the withdrawal period. Implementing such a system that imposes on consumers, who haven't legally entered into a contractual relationship, would be challenging.* (Object 13)

A further objective of the authors is to investigate alternative approaches to reducing the increased scale of returns, where a fee is not directly imposed on the consumer, but on the e-commerce entity;

> *I don't see an immediate barrier to this. This can be related to the aviation tax, where airlines were imposed a fee that resulted in higher airfare prices. I primarily work with the consumer segment and not so much with tax regulations. Legally speaking, it shouldn't be a problem for the*

> *government to introduce taxes as long as they don't contradict existing laws.* (Object 13)

A new law or an incentive may also be able to contribute to more sustainable return practices in the e-commerce sector in Norway;

> *In my opinion, such a measure would be an easier way to address the issue of returns and would probably be more politically acceptable. Regulations that restrict consumer rights are difficult to implement. In any case, it should be noted that customers are not eligible to exercise their Right of Withdrawal free of charge, unless the cancellation relates to a purchase.* (Object 13)

It was also noted that political and environmental factors were important barriers to consider when discussing the implementation of the measure;

> *The implementation of such a measure would require a good CRM system that is capable of handling returns. As a result, the actors involved incur an investment cost. There is generally a lag in the adoption of cloud-based solutions by Norwegian businesses, including CRM that is up to date. It is important to note that many of the systems are outdated (...) Although larger companies are unlikely to have any issues with this, smaller physical stores with an online store may experience the burden of the expense (...) I also do not see any immediate environmental barriers; expanding consumer rights often comes at the expense of the environment, without taking into account the environmental costs involved.* (Object 13)

4.3.3 Hypothesis 3

The third hypothesis is the following:

By leveraging the services of 3PL providers who prioritize sustainability, Norwegian e-commerce players can effectively mitigate costs and environmental impact through a reduction in return rates.

Based on the hypothesis, interviews were held with PostNord AS (Object 7), Lettbutikk AS (Object 6), and Expert-researchers from The Institute of Transport Economics (Objects 8, 9 & 10). This hypothesis was supported by the objects, which argued that the collaboration of 3PL providers with e-commerce actors positively impacted sustainability. Further, barriers and risks associated with collaborating with 3PL providers were discussed.

In the literature review of this thesis, the authors elaborated upon how e-commerce actors outsource their operations, such as warehouses and transportation, to 3PL providers. Therefore, the authors have included questions regarding the method of operation to obtain a comprehensive overview directly from the source, as well as from experts within the field.

To be able to understand the benefits and how 3PL providers negotiate in terms of economies of scale as a key factor, the 3PL providers further elaborates how their consumers see the utility value of using them;

> *We collect a larger volume of packages, and give our customers access to our agreement with the carriers. The more customers we get, the higher volume discounts we can offer to our customers. A larger proportion of customers will give us a greater and better basis for negotiations when we enter into agreements with our carriers. This will then be more favorable than if the customers go directly to the carrier (...) We also have agreements with several carriers, such as PostNord, Instabox, Helthjem, DHL, UPS and Bring. We want to have agreements with several carriers to be able to offer our customers a wide selection of delivery methods.* (Object 6)

> *Transport-services is our livelihood (...) Our department deals with customer environments and business development. As part of this area, you will find all of the products and digital services, such as apps, portals, the store network, collection points, as well as parcel machines. The green shift and environmental operations are also a major part of our work.* (Object 7)

The key role of sustainability in the 3PL providers current and future operations were emphasized;

> *Our goal is to achieve zero emissions by 2030. This will require a lot of work and changes in policies. It should be noted, however, that the plan is set in accordance with The Paris Agreement. Our agenda places a high priority on this issue.* (Object 7)

Further, the interview with the 3PL provider of transport and logistics indicates that they are able to contribute significantly to the development of more sustainable decisions by working closely with their collaboration partners, such as 3PLs, and e-commerce actors.

> *We are continuously working with individual customers to reduce both the air in the packaging, but also to be able to help customers make the right choices when it comes to e.g. reusable packaging (...) We also have to carefully consider how to set up the return transport for customers to make it as sustainable as possible.* (Object 7)

Table 4 illustrates the significant results that have been achieved by Object 7 through their involvement in internal projects with their customers;

PostNord: Some of the customer cases of the 130 projects per year...			
Company 1 (2022)	**Company 2 (2022)**	**Company 3 (2020)**	**Company 4 (2022)**
Conducted periodic transport analyses on all group companies. In the case of acquisitions, analysis was done after 3-6 months of operation. Identified potential for improvement (frequency, optimal flow of goods and packaging methods) across the group. With continuous control and analysis, we ensured that there is little potential that has not been exploited at all times.	When Company 2's recipients suddenly started commenting that the packages were damaged, PostNord found out that the company had started with a new eco-friendly paper packaging. These often cracked and led to great discontent and spoiled products. Company 2 then changed to other environmentally friendly packaging, damage was reduced and the customer experience increased.	The customer's B2C volume increased rapidly, but did not have the suitable area or process for e-commerce in their warehouse. Which presented major challenges at volume peaks in the form of long lead times. consulting designed a new storage area, shelving system and process for e-commerce. This resulted in more efficient order processing and less vulnerability during hectic periods.	Some of Company 4's customers demanded zero-emissions deliveries. Consulting built routes in the major cities using route optimization to meet the requirements of the recipient and have the greatest possible environmental impact on the total volume of the company. The effect corresponds to about 181.000 km by car or 107 sqm of sea ice in the Arctic from melting.
Achieved result **Reduced transport costs by 7.7%**	Achieved result **Improved customer experience from CSI of 4.3 to 4.7**	Achieved result **Order processing time reduced by approx. 50% and -1 FTE in stock handling.**	Achieved result **Reduced CO2 emissions by 8.5% = 36.000 kg**

Table 4: *PostNord's results for some of the customer cases. Source: PostNord AS, 2022.*

Also, they provide sustainable return procedures with great environmental and financial benefits compared to other actors operating with similar operations;

> *Competitors focus more on picking up returned products at the consumer's residence. While it is more convenient to place the return on the doormat and in the letterbox, it is not environmentally friendly. Consolidation at the place of submission is more desirable, from both an environmental and a financial standpoint.* (Object 7)

By simultaneously reducing transportation costs in terms of collecting several e-commerce actors under one roof with 3PLs, collaborating with transport- and logistics providers, and actively working towards sustainable operations in regards to reversal logistics by consolidating the transportation services, it is

evident that this will have significant benefits for e-commerce actors in terms of cost reduction and environmental impact.

> *We have an agreement with our customers to reduce their transport costs by 5% each year. We see this solution as a collaboration and partnership, where we have a common goal of what we want to achieve together (...) The advantage of outsourcing warehouses lies in consolidating pick-up and delivery operations into a single streamlined process. This will eliminate the need to distribute the delivery across smaller warehouses.* (Object 7)

With the benefits mentioned, there are still challenges associated with being a 3PL provider that has to handle multiple and different e-commerce actors, and barriers of collaborating with 3PLs;

> *It is a challenge to sit as a third party, and have contact as well as delivering at both ends (...) The biggest challenges lie in this. None of the carriers, or the business models of the carriers, are set up to involve a third party. After all, they have created these models so that there will be a 1:1 customer relationship (...) There is nothing in the infrastructure that says that the way we operate should actually work, but then you find solutions along the way, and work together.* (Object 6)

> *EU rules must be taken into account. To reduce returns, a research project is underway. This may require organizations to change their business practices. Political factors affect the economy, both nationally and regionally. Europe is vulnerable to conflicts, such as the conflict between Ukraine and Russia, from an economic and political standpoint. Most drivers originate from Ukraine or White Russia. In spite of PostNord only hiring Norwegian truck drivers, the reduced availability of truck drivers results in increased competition for Norwegian employers. Therefore, both*

> *outgoing and incoming logistics costs are affected. Technological factors should also be considered. Using technology to further reduce returns would be beneficial, since the customers have a low rate of returns (...) If you implement new solutions such as reducing the need for the returned product to be sent back to the e-commerce actor, but rather in between the customer that is returning the product, and a new customer ordering the returned product, it is necessary to have a platform and software solution that will allow you to handle such processes simultaneously. It is also necessary to determine who will ensure that such products are controlled and quality checked.* (Object 8)

Finally, as the hypothesis focuses on how e-commerce actors can mitigate costs and environmental impact through a reduction in return rates, the authors sought to understand 3PL providers role in regards of decreasing returns;

> *The 3PL providers charge the e-commerce actors for the transportation of returns, but they do not charge the customer, i.e. the e-commerce actors' policies are too lenient.* (Object 9)

> *For the 3PL provider, in-store delivery is the most cost-effective and environmentally friendly solution. Unfortunately, this is not the preferred choice of the customers.* (Object 10)

5.0 Analysis and Discussion

The purpose of this section is to analyze and discuss the findings in light of the theoretical background. Analyzing the relevant findings in accordance with the literature review will lead to a clarification of the authors research question: *"How can Norwegian e-commerce actors implement strategic initiatives to effectively enhance the sustainability of their reverse logistics operations?*". In order to assess how the different initiatives can contribute to sustainability, Elkington's Triple Bottom Line (1994) has been emphasized. As a final step in their analysis and discussion, the authors employed the PESTEL framework to identify potential barriers.

5.1 How VR/AR Technology Can Decrease the Number of Returns

As Martinez-Navarro et al. (2019) and industry trends demonstrate, virtual try-on technology is effective in addressing uncertainties in online shopping and, therefore, in reducing returns. The findings showed that incorporating technology can effectively reduce the number of returns from consumers by mitigating uncertainties related to fit and style in online shopping. By providing enhanced visual representations, increasing consumer confidence in purchase decisions, and offering time and cost savings, virtual technology addresses the underlying causes of uncertain returns. Previous studies show that implementing virtual try-on features can significantly decrease return rates, enhance customer satisfaction, and improve purchase accuracy, where Wedel et al. (2020) also concluded with this in their study.

The growing adoption of virtual technology by e-commerce actors across various industries further underscores its potential to reduce return frequencies. As the findings indicated, all actors are eager to implement newtype of technology but remain silent until the technology becomes available for adoption. The significance of this can be seen in the light of the need to face more pressure from

competitors to encourage them to adopt environmental initiatives to gain a competitive advantage (Govindan & Bouzon, 2018).

Nevertheless, the authors can imply that collaboration between the actors should be established from their findings. As the initial investment can be a high cost, the findings show that luxury brands can benefit the most from technologies, such as VR/AR, as they have the budget, time, and smaller, more stable catalogs. The emphasis on quality over mass production aligns well with 3D modeling and VR/AR for showcasing products. It also reflects Müller et al. (2018) study findings where there are obstacles to successfully deploying this type of technology in small and medium-sized companies.

Virtual try-on features streamline the shopping process by eliminating consumers' need to order multiple sizes or variations of a product to assess fit and style. This saves time, effort, and potential return shipping costs for both consumers and e-commerce actors. Based on the author's findings, consumers are optimistic about applying VR/AR technologies, and by implementing new features that allow consumers to view the products in their entirety, whereas the uncertainty associated with ordering online will be reduced considerably. The authors identified uncertainty as one of the most prominent reasons consumers intentionally purchase more of the same products, as well as lenient refund policies. As virtual technology reduces uncertainty, consumers are more likely to feel more confident when making online purchases. The ability to virtually try on products can mitigate the risk of dissatisfaction upon receipt, leading to more informed and deliberate purchases. The findings also show that the increased confidence customers get by being able to use this tool can lead to a decrease in returns. As previously mentioned, most of the respondents in the consumer survey stated that they would feel more confident in their purchase if the products were thoroughly described and visualized.

Moreover, Yang et al. (2020) found that AI would contribute to lower product fit uncertainty and improve after-sales services. Virtual try-on technology offers a more accurate and immersive representation of products, allowing consumers to see how items appear on themselves or in their surroundings. By virtually trying or seeing products, consumers gain a clearer understanding of fit, size, color, and style, thus reducing the likelihood of ordering multiple sizes or variations and returning them. Nevertheless, the findings of the authors based on their discussions with experts within the tech sector indicated that consumers and the Norwegian market, in general, are not ready for VR/AR technologies as of today, because the technology is still in its infancy and too advanced to be user-friendly at this stage for the average household.

The findings further indicated that,in comparison with AR/VR technologies, AI is instead something that would have more potential for consumer acceptance and may be, to a greater extent, more user-friendly. The use of artificial intelligence can also be more realistic in terms of the investment costs associated with e-commerce actors. In Cheng et al.'s study (2023), it was emphasized that artificial intelligence has facilitated digital transformation and enhanced e-commerce performance in recent years. However, the findings also indicate that AI has significant capabilities for solving problems, but with the potential risk that personal data may be compromised as a result. It is vital to establish trust between the user and the technology in order to guarantee long-term consumer trust in AI (Cheng et al., 2023) and other types of technology. Otherwise, it may be possible for personal data to be compromised and potentially shared without the consumer's permission.

A ripple effect of incorporating technology into consumers' purchasing process will contribute to realizing goal number 12, stated in the SDGs set by the EU, which sets forth a more sustainable consumption model.

5.2 How a Law or new Intensive Can Reduce the Number of Returns

The findings show that economic incentives can influence consumer behavior and business practices. Sudusinghe & Seuring (2020) and Chen et al. (2017) have demonstrated that imposing financial costs on returns can lead to reduced return rates and increased purchase deliberation among consumers, where it is emphasized that external collaboration with the government is a level for achieving sustainability. Additionally, research has shown that e-commerce companies implementing stricter return policies experience lower return rates, whereas Mondal & Giri (2022) clarify that actors can make their return policies more sustainable to reduce their environmental impact.

By applying similar principles through the proposed taxation or fee system, it is plausible to anticipate a similar impact on the Norwegian e-commerce industry. A more environmentally-friendly consumer behavior can be achieved by implementing initiatives, as previously stated by Cai & Choi (2020). By introducing a law or intensive that requires e-commerce players to pay a tax or fee on high return frequencies, it will become economically less favorable for consumers to return products frequently. This financial disincentive aims to discourage excessive or frivolous returns, ultimately reducing the overall number of returns. Incentives provided by governments in the past have shown to be effective in encouraging consumers to adopt more environmentally friendly habits, as demonstrated by Xu et al. (2020). This is also supported by the authors' findings, which demonstrate that it is a competitive market for offering favorable return policies, which the literature describes as initiatives for consumers that serve as insurance when shopping online.

As previously stated by Ketelsen et al. (2020) and Carrington et al. (2014), despite the increasing popularity of ethical shopping, fewer ethically conscientious customers are completing ethical shopping transactions. These results can also be attributed to the returns that are being made. Upon reviewing the author's findings, it is evident that consumers' willingness to pay for sustainable options is

at most 5-10 %. Additionally, this statistic is supported by findings from Escusell, Llorach-Massana & Roncera (2021). In addition, this can also be correlated with the customer's actions, in that they do not hesitate to return products following their ethical obligations. As a result of this, it is clear that there is no specific demand for the consumer or e-commerce actor to pay additional tax or fees. However, the adverse environmental effects that consumption, and subsequently its returns, has on specific industries, it is necessary to implement an initiative involving the government to prevent long-term environmental damage. In accordance with the authors' findings, product returns are highly influenced by human labor, which can be further emphasized by Agrawal & Singh (2019), who see disposition decisions as critical decisions that have a profound impact on reverse logistics sustainability. It is also evident from the findings that sometimes, it may be more economical to simply destroy the products rather than use one of the more sustainable methods. When the probability of returns is minimized at an early stage set by the government, it becomes possible to achieve sustainable initiatives within the operations to maintain acceptable initiatives for choosing the best disposition decision. It refers to improving the reverse logistics process, also elaborated in Figure 4 by De Brito & Dekker (2002).

The authors' findings show that including the government in the solution can be seen as a worthwhile initiative, as seen from past initiatives, where it is observed that humans are creatures of habit in terms of the smoking law in Norway (Tobakkskadeloven, 1973), the Air Passenger Tax (Skatteetaten, n.d.), and the penalties imposed on those who incorrectly source. Given these examples, we can discern how effective they are, and given that the demand for this proposal is close to non-existent, this can further enable consumers to change their shopping patterns and help contribute to a more sustainable "normal" long-term. This is also relevant for e-commerce actors, who will be pushed to carry out initiatives following a potential law, where they must adopt initiatives that enhance the shopping experience for consumers and reduce the need for returns. Additionally, involving the government to this extent, the findings show that this process will

need to be carefully considered concerning consumer rights when purchasing products in general, which are outlined in Norway as the Consumer Purchase Act (Forbrukerkjøpsloven, 2002) and the Right of Withdrawal (Angrerettloven, 2014). Additionally, new requirements proposals for e-commerce actors must not conflict with those established by the EU. A ripple effect will lead to the development of a more sustainable "normal," as outlined in the Sustainable Development Goals of the EU, particularly goal number 12, which seeks to move toward more sustainable consumption patterns.

5.3 How Collaboration with 3PL Providers Can Reduce the Number of Returns

In order to enhance the sustainability of reverse logistics operations within e-commerce, the authors explored how 3PLs could reduce product returns; their findings indicated that 3PLs had some limitations in their ability to influence. The 3PLs do not have the authority to decide the return practices of the different e-commerce actors. However, they can advise their customers in making more accurate judgments and appropriate decisions regarding return policies, ultimately leading to enhanced sustainability. As the 3PLs charge their customers for their services, such as transportation of returned products, it was evident that the e-commerce actors, in most cases, intentionally chose not to charge their e-commerce consumers. The reason for this is that, as Allen et al. (2017) state, retailers have incorporated the delivery costs into the item price as a result of the pressure of last-mile operations.

A previous review by Ketelsen, Janssen & Hamm (2020) demonstrated that consumers' actual attitude does not necessarily reflect their actions, primarily because of higher costs. This may also reflect the free return policy of e-commerce actors. The results of Pham and Ahammad (2017) also revealed that "ease of return" was one of the most important factors influencing customer satisfaction. Consequently, it is reasonable to state that it is difficult for the 3PLs to take action directly to reduce the increased scale of returns. Moreover, it was

also evident that the 3PLs focused more on outbound logistics rather than reverse logistics operations, as this accounts for the most significant proportion of services. E-commerce actors giving more attention to forward logistics and ignoring logistics' upstream flow in the supply chain has also been addressed as a barrier in previous research by Naseem et al. (2021).

Furthermore, Escusell, Llorach-Massana & Roncera (2021) state that price, volume, and delivery time are emphasized over sustainability to achieve customer satisfaction. Also, the consumer survey indicated that consumers were either indifferent to sustainable practices or considered them somewhat essential but were not willing to pay much extra for them. As willingness to pay has been shown to be essential to the consumer's decision-making process (Kumar et al., 2021), it is imperative for the 3PLs to prioritize services that facilitate consumer satisfaction in a highly competitive market.

However, the authors identified efforts concerning the environmental impact of returned products, such as achieving high levels of truck utilization during transportation, using electric cars, and promoting sustainable packaging agreements. The findings indicate that 3PLs are able to obtain better deals with other suppliers, such as packaging tool suppliers. These mentioned efforts comply with SDG 12 and contribute to more sustainable consumption patterns. Finally, the authors noted the Transparency Act, which requires organizations to publish a report on the due diligence assessments in accordance with paragraph §4 (Forbrukerkjøpsloven, 2002, § 4). It is intended to promote trust and transparency among large Norwegian enterprises that offer goods and services in or outside Norway (Åpenhetsloven, 2021). The law will also encourage 3PLs, and e-commerce actors, in general, to develop even more sustainable practices in the following years. The authors' findings show that greater openness can contribute to reducing greenwashing when it comes to the 3PL providers that offer sustainable services to the e-commerce actors, where it is possible to verify the sustainability of the 3PL providers' practices carefully.

5.4 The Sustainable Aspect of the Initiatives

5.4.1 Economic Dimension

The findings revealed that the first hypothesis requires an initial investment in technology, which can be costly for e-commerce actors to prioritize, especially in a time of increased inflation. However, further findings also showed that implementing new technology potentially decreases costs, where virtual try-on technology can help reduce costs associated with returns for both consumers and e-commerce actors. By reducing the number of returns, retailers can save on logistics expenses, restocking fees, and potential product damage. Where the authors' findings revealed that the return process requires human labor, noting that the cost involved with this can be minimized to a greater extent. Further, consumers can save on return shipping costs, potentially increasing customer satisfaction and loyalty. Additionally, there is potential for increased sales and conversion rates; by reducing uncertainty about fit and style, virtual technology can positively impact sales and conversion rates. Data collected from the consumer survey show that consumers with a more accurate understanding of how a product looks and fits are more likely to complete their purchase, resulting in higher sales for e-commerce actors.

According to the authors, implementing a new law or incentive could also adversely affect e-commerce actors with a high return frequency, where they may face a financial burden. This can encourage e-commerce actors to improve their return policies and processes, reducing return costs. However, the findings also revealed that e-commerce actors may suffer high investment costs as a result of outdated systems. The larger corporations with greater economic power will be able to adapt more quickly to necessary arrangements, such as investing in CRM systems and software development. A burden may be associated with initial investments for small and local physical stores with websites.

The authors saw from the findings that a collaboration between 3PL providers could be remarkably valuable for e-commerce actors in terms of cost reduction. One of the key benefits of collaboration with 3PL identified by the authors lies in consolidating the transport services, which streamlines the delivery operations into one single process. Kaynak et al. (2014) illuminated that an organization could benefit from integrating reverse logistics functions by consolidating and collaborating with third-party. Cullinane & Cullinane (2021) also identified measures to reduce energy use and costs and improve environmental sustainability by increasing the level of cross-company consolidation and reducing the distance to and between consolidation points. The consolidation of the transportation processes will also lead to a reduction in the overall transportation costs while at the same time increasing truck utilization rates.

Further, it was also evident that collaboration with 3PL providers allowed their customers to obtain quantity discounts for more sustainable options since agreements often are volume-based. A 3PL's costs, however, may be affected by external factors. The influence of external factors, such as regulations relating to sustainable procedures, may require the 3PLs to adjust their practices, which again will result in an increase in costs.

5.4.2 Environmental Dimension

The findings show that when there are fewer returns, it is correlated with resourcing efficiency. This means that fewer products require repackaging, refurbishing, or disposal. This reduction in reverse logistics activities helps conserve energy, materials, and water that would otherwise be utilized during the return process. However, a tax or fee for returning products does not directly address other environmental concerns, such as packaging sustainability. By reducing resource consumption, virtual technology and an eventual law from the government will contribute to a more sustainable and resource-efficient e-commerce industry.

Additionally, the findings reveal that minimizing returns within e-commerce can reduce emissions, where returns in e-commerce contribute to reverse logistics operations involving the transportation, handling, and processing of returned products. These processes have a significant environmental impact, including increased carbon emissions, packaging waste, and energy consumption. Providing incentives to consumers and e-commerce actors for reducing returns will contribute to reducing the overall environmental footprint of the e-commerce sector. In regards to implementation of new technologies, one can also see the downside of implementing technology, which can contribute to a negative environmental impact, such as energy consumption associated with running virtual try-on platforms or producing devices required to access them. A conscious effort must be made to manage the disposal and processing of electronics and hardware used in VR/AR technology in an environmentally friendly manner.

In terms of collaboration with 3PLs, the previously mentioned quantity discounts may influence their customers to choose more sustainable packaging options at a lower price, thereby promoting more sustainable operations. Collaboration with 3PLs also facilitates the development of environmentally-friendly practices, as evidenced by their goal of achieving zero emissions by 2030. However, the authors recommended carefully examining 3PL providers' sustainability profiles and environmental reputations in order to assess whether their business models align with the company's environmental goals as illustrated by Nosratabadi et al. (2019) The intended benefits may be undermined by greenwashing or inadequate environmental practices.

5.4.3 Social Dimension

The findings showed that implementing virtual technology can have the potential to improve the overall online shopping experience, and enhance the customer experience, by reducing uncertainty and improving convenience. Consumers are enabled to make more informed purchasing decisions, increasing satisfaction and

reducing frustration associated with returns. This positive experience strengthens the relationship between consumers and e-commerce retailers. Likewise, e-commerce businesses will be financially motivated to address the issue of high return frequencies due to the potential financial implications associated with paying taxes or fees. E-commerce players can implement various initiatives to prevent increased costs, such as improving product descriptions, providing accurate sizing information, improving product visuals, investing in customer support, and reducing the likelihood of returns, which can be considered a positive attribution to customer experience. Furthermore, consumers will bear additional costs when returning products by imposing taxes or fees on high return frequencies. This financial burden can serve as a deterrent, making customers more thoughtful and deliberate in purchasing decisions, ultimately decreasing returns.

Additionally, virtual try-on technology can make online shopping more accessible to individuals with specific needs or limitations. For example, individuals with physical disabilities or mobility issues may find it challenging to try on products in physical stores. Virtual technology provides a more inclusive shopping experience by enabling them to visualize products from the comfort of their own homes. As virtual technology within e-commerce is not as widespread yet, some consumers may not be comfortable relying on the technology.

The findings also showed that implementing a tax or fee for returning products can lead to customers being unfairly penalized, where the reason for the return may be due to quality issues or dissatisfaction. The use of lenient return policies of the different e-commerce actors combined with customers' expectations of a pain-free trade has been shown to increase the customers' impulse purchases. The positive aspect of this is that it may promote a greater degree of thoughtfulness and reduce impulse purchases. In the event that the company implements appropriate policies in accordance with the tax or fee, its financial performance is likely to improve. Additionally, it enhances its reputation by appealing to

environmentally conscious consumers (Cullinane & Cullinane, 2021). This will result in more deliberate consumption on the part of consumers. It is also possible that the fee imposed on actors in the e-commerce sector will result in a greater focus on quality rather than mass production of clothing of low quality, thus improving the overall customer experience.

The collaboration with 3PLs has been shown to benefit e-commerce actors concerning sustainability and, last but not least, increase customer satisfaction. The authors, therefore, highlight a solid commitment to customers as a critical element of enabling their e-commerce actors to remain engaged with them. Furthermore, the findings demonstrate the ability to be flexible in terms of collaborating with and handling products for a wide range of e-commerce actors under the same roof. It has also been shown that the 3PL's flexibility ability is critical to achieving positive customer satisfaction (Ngah et al., 2021).

It was also demonstrated that the 3PL's profiles are affected by the consumer as well. Likewise, it can be found that the reputation of e-commerce actors' social responsibility also affects their consumers' consciousness. Outsourcing operations typically significantly impact the reverse logistics processes; the way returned products are collected, sorted, and disposed of. Last but not least, promoting their sustainable responsibility by obtaining agreements through their collaboration with 3PL-providers. It is also important to note that the e-commerce actors will have access to sustainable agreements, as previously mentioned. As a final result, sustainable practices will have a positive impact on consumers' social awareness when they are promoted to them. In spite of this, the more e-commerce actors the 3PLs have to manage, control, and supply services to, the more complex it becomes to nurture each relationship. Further, because outsourcing operations require the e-commerce actors to relinquish some control over their reverse logistics operations, they must consider the compatibility between their objectives.

In Figure 20, the authors have summarized the effects of the initiatives in relation to the TBL model.

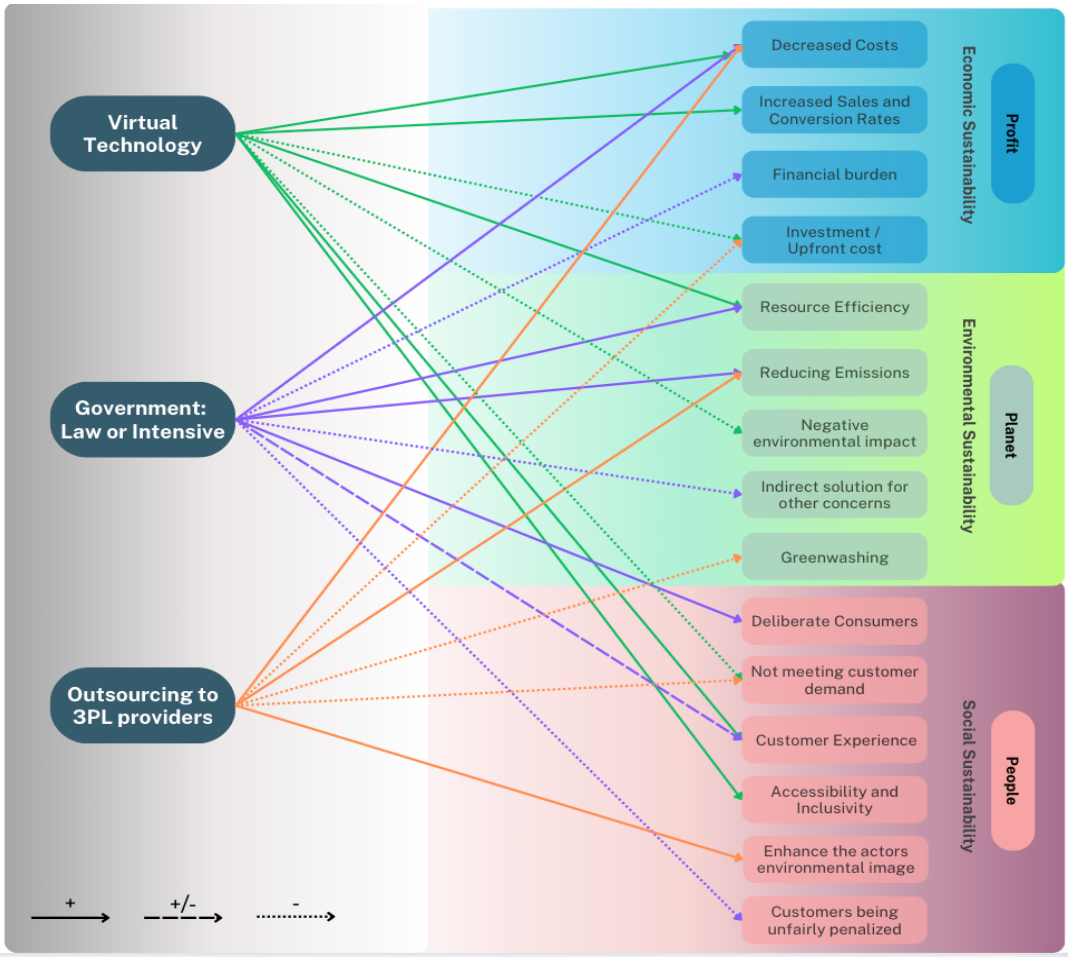


Figure 20: *Illustration of How the Initiatives Can Affect the TBL.*

5.5 Identified Barriers Based on Findings

Identifying barriers to the proposed initiatives to enhance the sustainability of reverse logistics operations was deemed necessary by the authors. It is important to note that the identified barriers may vary depending on each actor's specific context and abilities. Based on the PESTEL framework, the authors identified advantages and opportunities and minimized threats associated with adopting these measures (Issa et al., 2010).

Barriers of Implementing the Proposed Measures			
	Virtual Technology	**Government: Law or Intencive**	**Outsourcing to 3PL-providers**
P	• Government regulations. • Policies related to virtual technology and e-commerce. • Insufficient physical infrastructure.	• Opposition from e-commerce actors. • Government support.	• Affected by conflicts in the EU. • Labor shortage.
E	• Consumers' willingness to pay. • Cost of virtual try-on implementation can make the final solution non-profitable. • Difficult to integrate,	• Impact on profitability. • Consumer behavior. • Financial burden for small- and medium sized companies due to outdated systems,	• Cost considerations (market demand and uncertain economic conditions). • Increased competition. • The pricing structure of the contract is contingent upon volume, thereby granting advantageous contract agreements to lager market participants characterised by a greater share of goods and sales.
S	• Consumer preferences and experiences for advanced technology.	• Consumer perception and expectations. • Behavioural change challenges. • Consumer's shopping preferences are unpredictable.	• Trust and relationship building. • Population demographics.
T	• Technological compatibility and integration. • Immature technologies. • Needs reliable backup-systems. • Shortage of skilled employers due to technological complexity. • Acceptance towards new purchasing processes.	• Technological compatibility and integration of CRM-systems. • Infrastructure capacity limitations.	• Technological compatibility and integration. • Ensuring control and quality check.
E	• Sustainability considerations. • Waste management (disposal of electronic waste).	• Environmental consciousness. • Environmental impact assessment	• Lack of pressure from customers. • Insufficient emphasis on prioritising reverse logistics processes, with a greater emphasis on outbound logistics. • Greenwashing.
L	• Data privacy and security.	• Compatibility with existing laws and regulations. • Compliance and ensuring consumer rights. • Gradual transitions.	• Lack authority to determine environmental decisions for e-commerce actors. Offering guidance towards the appropriate course of action, without contractual obligations to enforce compliance.

Table 5: *The Authors' PESTEL Framework for Identifying Barriers*

The authors identified several barriers in relation to the implementation of the proposed initiatives, including the implementation of VR/AR technologies, the implementation of incentives for high return frequencies, and the use of collaboration with 3PL providers. The results showed that legal, economic, and political-related barriers were among the most critical. The authors found that lenient return policies, which again affected consumer preferences, perception, and awareness, were the most prominent barrier to all proposed initiatives. The authors also underline that there were findings of external barriers related to

governmental pressures, whether the absence of policies or incentive legislation (Kaviani et al., 2020).

The findings emphasized significant barriers associated with the integration of VR/AR technologies in the current state of the market. The most significant barriers were the economic-related factors, such as the costs of implementation and the consumers' willingness to pay for utilizing the investment. Concerns have been raised regarding the market readiness for advanced technology, such as VR/AR, which forces the e-commerce actors to consider heavy investments in technology with caution. On the one hand, the consumers show a positive attitude towards such implementations. However, there are a lot of considerations that need to be assessed carefully. The authors, therefore, saw the need to recognize and remain aware of the degree to which e-commerce consumers adopt VR/AR technologies. VR/AR devices and AI hardware must also be manufactured, used, and disposed of in a way that complies with environmental factors. Lastly, ensuring compliance with GDPR regulations regarding personal data protection is also essential to include as a potential barrier.

Regarding hypothesis 2, which was associated with legislation or incentives requiring e-commerce companies and consumers to pay a tax or fee on high return frequencies, it was evident that political- and economical factors weighed the heaviest. The findings displayed how government support was essential, which may lead to an environmental impact assessment of the reverse logistics processes in order to quantify the scale of returns. Moreover, the authors also saw barriers respecting e-commerce actors and consumer behavior. Initially, concerns regarding opposition from e-commerce actors and how this will affect profitability as they operate in a global market. Consumer behavior was also addressed, as such drastic changes can lead to challenges. Finally, it is noted that new legislation or incentives must be compatible with existing regulations in Norway.

Further, the authors identified several barriers to collaborating with 3PLs, whereas the political, economic, and legal barriers were the most prominent. The findings show that the Norwegian 3PLs promote sustainable practices. However, there is a lack of authority over final decisions in regards to sustainability. In addition, the findings illustrate that the priorities are more focused on outbound logistics rather than reverse operations. This implies that e-commerce actors have to adhere to certain limits set by 3PLs. However, there is still room for them to decide whether they wish to invest in more expensive environmental alternatives. If the 3PLs were to have too strict contractual agreements regarding environmental actions, 3PL providers might lose e-commerce actors to their competitors. The price of cooperation has also been shown to be affected by economic factors such as market uncertainty. Due to political factors and conflicts, a labor shortage may also occur, again increasing the price of goods and demand for the workforce in Norway.

Moreover, the 3PLs also base their contractual agreements on volume, indicating that enhanced benefits can be more readily available to more prominent e-commerce actors than more minor market participants. According to the authors, among the technological factors, technological compatibility and integration and ensuring control and quality over new implementations were identified as potential barriers. There were also sociocultural barriers since Norway is a widespread country, and its inhabitants, as well as its customers, tend to stay in certain areas. It has therefore been identified that 3PLs are primarily focused on the areas with the largest populations. As a result, the locations of the 3PL terminals are limited to certain parts of Norway.

6.0 Conclusion

This thesis aimed to further investigate the return aspect of the Norwegian e-commerce industry, where the authors had three specific focus areas: (1) What strategies can be employed during the purchasing stage to minimize the frequency of returns? (2) How can long-term perspectives and practices be utilized to reduce the occurrence of returns? (3) How can the reverse logistics of returns in online shopping be enhanced to promote greater environmental sustainability? Therefore, this study's research question was: "*How can Norwegian e-commerce actors implement strategic initiatives to effectively enhance the sustainability of their reverse logistics operations?*".

In conclusion, VR/AR technologies can potentially reduce returns by mitigating uncertainty, but their limited accessibility and high investment costs complicate widespread adoption. However, artificial intelligence (AI) is emerging as a viable alternative that can effectively address e-commerce consumers' uncertainties. With AI-powered solutions, businesses can enhance customer experiences, minimize returns, and contribute to a more sustainable and efficient e-commerce ecosystem. In the Norwegian e-commerce industry, the proposed tax or fee on high return frequencies can act as a catalyst for change, providing an opportunity to address the sustainable and economical challenges that are associated with excessive return rates. Creating economic disincentives and promoting responsible consumption, this initiative can contribute to the establishment of a more sustainable e-commerce ecosystem that balances consumer needs with environmental considerations. Moreover, it may encourage e-commerce actors to take additional steps to improve the online shopping experience.

The approach of adopting new technology and implementing an economic disincentive will ultimately contribute to the long-term viability and success of the Norwegian e-commerce industry, ensuring its continued growth while enhancing its sustainable impact. While collaboration with 3PL providers offers sustainability and cost reduction benefits, addressing reverse logistics challenges

and promoting environmental sustainability requires a combined effort from e-commerce actors, 3PL providers, and regulatory initiatives. Through continued collaboration, transparency, and a shared commitment to sustainable practices, the e-commerce industry can make significant strides in minimizing the environmental impact of reverse logistics operations.

6.1 Practical and Social Implications

The findings of this master's thesis have both practical and social implications for Norwegian e-commerce's sustainability in reverse logistics operations. Practical implications include the potential use of VR/AR technologies and artificial intelligence to reduce returns by removing uncertainties and providing personalized recommendations. By imposing a tax or fee on high return frequencies, responsible consumption can be encouraged, and the environmental impact minimized. Lastly, collaboration with 3PL providers can optimize transportation routes and improve return processing.

Socially, the tax or fee encourages responsible consumption, while environmental sustainability is promoted through strategic initiatives. The environmental impact of e-commerce actors can be reduced through the optimization of transportation, the reduction of packaging waste, and the improvement of the return process. By promoting responsible consumption, these practices contribute to developing a more sustainable e-commerce industry.

This thesis aimed to provide insight into this research topic to actors within the Norwegian e-commerce industry. It was evident from the interviews that the interviewees were very interested in the research topic and emphasized that the author's research question was relevant.

> *I find this topic to be very interesting. The consequences of the choices we make now will have an impact on future generations; therefore, measures must be taken now to minimize those effects.* (Object 1)

> *I believe that this is an interesting subject that deserves further investigation.* (Object 3)

6.2 Theoretical Implications

The authors believe this thesis offers exceptional insight into how e-commerce actors can implement effective initiatives to enhance the sustainability of their reverse logistics operations. This thesis differs from previous literature and research as a whole with the focus areas presented and the thesis's objective. Firstly, previous literature significantly focuses on reverse logistics in general, with the circular economy strongly emphasized. However, the author's findings regarding specific initiatives that could be undertaken to decrease returns within e-commerce are very significant, particularly in light of the focus areas and the research the authors have undertaken in this instance. As a second point, there needs to be more research on the Norwegian market, specifically from the consumers, where the country of origin plays a vital role in understanding what consumers require to minimize the number of returns they incur. In addition, this includes the consumer's willingness to pay, where previous publications have examined what consumers in other countries are willing to pay and what they are willing to pay for.

The research done by the authors is also unique in terms of exploring further collaborations with the government in e-commerce. In contrast, previous research has focused on the circular economy within other areas such as product recovery, for instance, recycling of bottles or facilitation of transportation. This thesis explores the collaboration with the government in return in e-commerce, a growing problem these days and must be addressed accordingly. Additionally, literature concerning collaboration, specifically with 3PL providers, indicates that this type of collaboration is beneficial. However, the literature does not consider the lack of human labor associated with such collaborations, whereas this thesis does precisely that.

As the authors obtained further data collection in the interviews of specifically VR/AR technologies, the authors also found the significant issue of user-friendliness for the consumer, where the technology is too advanced for a typical household as for today. In contrast, the literature within this study category discusses the technical part of use, where the focus lies on how it can potentially be used in the different purchasing stages. In contrast, this thesis explores further the issues associated with it.

To conclude, this thesis involved further experts who worked in different sectors but were able to complement each other in the issues discussed to address the scope of the study as a whole adequately.

6.3 Limitations

The authors acknowledged that the scope of the research is limited, particularly concerning the process of returning products. Although reverse logistics covers the entire process of managing returned products, the dissertation did not devote considerable time to the transportation component. It is important to consider this limitation since transportation is an integral part of the efficient and cost-effective management of returned products. Nevertheless, the authors did focus on some aspects of transportation, including consolidation, routing, carrier selection, and coordination with 3PL providers. Additionally, a limitation arises from the verification process of hypothesis 3, which involved two Norwegian 3PL providers. It is possible that relying on these companies to verify the hypothesis introduces bias, as they have vested interests in promoting their services. To overcome this limitation, the authors included counterarguments from the interview with the expert on digital innovation and growth, indicating that using 3PLs may be better suited as a temporary rather than a long-term solution. This alternative perspective aimed to mitigate the potential bias introduced by the involvement of the 3PL providers.

In addition, the authors acknowledged the lack of opportunities to quantify the financial impact of adopting new initiatives in Norway, specifically in regards to the proposed incentive or law imposing a fee on e-commerce actors with a high return rate. The lack of empirical data and precedents in the Norwegian context made it difficult to estimate the potential financial consequences for businesses and consumers accurately. Last but not least, the thesis focused primarily on strategies that could be implemented before consumers make an online purchase rather than post-purchase processes, with the exception of the collaboration with 3PL providers. To develop a deeper understanding of the challenges and potential optimization in managing returned products effectively, future research should consider these limitations and further explore the transportation aspect in Norway, as well as the post-consumer phase of reverse logistics operations.

6.4 Further Research Guideline

Research in the future should seek data from a variety of markets in order to generalize the findings of this study beyond the Norwegian market. In order to analyze potential similarities and trends in the practices of e-commerce, it is helpful to include consumers from diverse geographical regions. Researchers can comprehensively understand how return policies and costs differ across markets and organizations by examining the return policies and costs of e-commerce actors worldwide. In addition, it is recommended to cross-check the interview responses provided by the e-commerce actors with cooperating organizations or with additional e-commerce actors in the market.

Given the significance of political and legislative changes in the retail industry, it is important for future research to closely follow the development of the political initiatives by the European Commission as discussed in 3.4.2.2 Societal Considerations. Tracking political agendas can provide valuable insight into potential reorganization requirements and structural changes that may affect the retail industry. Researchers can also conduct case studies on prominent e-commerce players, such as Zara and its revised return policy in Spain in the

future (Henriksen, 2023). In order to gain insight into the implications for online shopping behavior and overall market dynamics, researchers can analyze the effects of introducing return fees and shipping costs on consumer behavior.

Future research may also include the examination of the impact of the development of a new 3PL warehouse by PostNord in Norrköping, Sweden (Ludt, 2023), on the efficiency and customer benefits offered by the market leader in the provision of 3PL services. Further, it has been noted that same-day delivery and perhaps artificial intelligence will shape the future of e-commerce (Ingaldi & Ulewicz, 2019). Taking advantage of e-commerce is now a new reality that must be addressed, and companies that are unable to meet this challenge will find themselves at a disadvantage (Idiano, 2021). Retailers' operations and profits are also profoundly affected by the number of returns made on online purchases. Online consumers are increasingly using artificial intelligence (AI) to assist them in making purchases. Previous and existing virtual fitting technologies focus on letting consumers ascertain the effectiveness of matching different clothing items in order to minimize the matching uncertainty associated with online clothing sales (Yang et al., 2020). A comprehensive and practical solution to this problem requires further research and guidelines.

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Appendix A

Table A.1 Interview Guide for Qualitative Interview

Research from Panigrahi et al. (2018) has suggested some interview questions in their study of strategic initiatives for successful reverse logistics management in the retail industry. We have used their interview guide as a starting point of our qualitative interview questions to get an overview of the different e-commerce actors´operations in relation to RLs.

"Company X" will be used as a common term in our interview guide, as this guide will be used for several e-commerce actors. The common term of "Company x" will be changed to the specific company ahead of the interview.

Generelle spørsmål

1. Kan du fortelle oss kort om hva dine arbeidsoppgaver går ut på i Bedrift X?
2. Hva er de viktigste tjenestene dere tilbyr som nettbutikk, og hva skiller dere ut fra andre nettbutikker i samme bransje?

Kartlegging av interne prosesser for håndtering av returer

3. Hvordan er deres nåværende tilnærming til håndtering av returnerte varer fra deres kunder?
    a. Hvor lang tid ca. Disponerer en ansatt i gjennomsnitt for håndtering og sortering av de enkelte returnerte varene?
4. Hva er de største kostnadsdriverne forbundet med håndtering av returnerte varer?

Returvilkår

5. Hvordan håndterer dere kundenes forventninger av returvilkår, og hvilke skritt tar dere for å sikre en positiv kundeopplevelse i forbindelse med returer?

Miljø- og bærekraft

6. Hvordan oppfatter Bedrift X den miljømessige påvirkningen av returer, og hvilke trender ser dere for dere som fremtredende i dette området?

7. Hvilke konkrete målinger (KPIer) bruker dere for å fastslå om den omvendte logistikk-styringen er vellykket eller mislykket?

Kundenes forventninger og betalingsvilje for miljø- og bærekraft

8. Hvordan er deres opplevelse av kundenes forventninger til Bedrift X når det gjelder miljø- og bærekraft?
    a. Har dere tanker rundt betalingsvilje for mer bærekraftige produkter, leveranser, returer?

Bruken av fremtidsrettet teknologi

9. Hvilke spesifikke teknologier eller prosesser bruker Bedrift X for å optimalisere sine omvendte logistikkoperasjoner og redusere kostnader?

10. Hva er deres tanker rundt bruken av teknologi i kjøpsprosessen i fremtiden? *Sett fra kundenes perspektiv.*
    a. Har dere noen spesifikke meninger rundt bruken av VR- og/eller AR-teknologi i kjøpsprosessen?

Samhandling på tvers av sektorer

11. Hvordan samarbeider Bedrift X med andre bedrifter, leverandører eller interessenter?
    a. Hvordan vil et samarbeid på tvers av e-handelsøkosystemet bidra til å redusere returer fra kunder?

12. Har dere iverksatt samarbeid med andre nettbutikker, leverandører eller samarbeidspartnere for å redusere retur-problematikken vi opplever i dag?

Tredjeparts logistikkleverandører

13. Hvordan ser Bedrift X på outsourcing av lagerstyring og transporttjenester?

14. Sett bort ifra hvilke tiltak som er implementert hos dere når den returnerte varen er i deres disposisjon, hva er deres tiltak for å sørge for at prosessen videre holdes så miljøvennlig som mulig?
    (f.eks. transport)

Kartlegging av potensielle barrierer

15. Hva er de største utfordringene Bedrift X står ovenfor i håndtering av omvendt logistikk, og hvordan håndterer selskapet disse utfordringene?

Oppsummering

Vi har nå presentert en rekke spørsmål relatert til vårt forskningsområde.

Er det noe vi har utelatt eller er det spørsmål du mener vi burde ha stilt angående dette emnet? Ønsker du å tilføye noe annet til slutten av dette intervjuet?

Table A.2 Interview Guide for Hypothesis Verification

Generelle spørsmål

1. Kan du kort forklare hva din bedrift jobber med, og hva din/deres rolle er i Bedrift X?

Hypotese 1

Virtuell teknologi, som for eksempel virtuell prøverom, kan redusere antall returer fra forbrukere ved å redusere usikkerheten rundt passform og stil.

1. Hvordan kan deres tjenester være med på å møte kundenes behov i dag?
2. Hvordan tenker dere at bruken av VR/AR teknologi kan bidra til å redusere kostnader forbundet med omvendt logistikk?
3. Hvordan kan bruken av teknologi, som for eksempel VR/AR teknologi, være med på å forbedre det bærekraftige aspektet av omvendt logistikk?
4. Hva anser dere som de største utfordringene forbundet med slik teknologi?
    a. Har dere noen tanker rundt brukervennligheten av slik teknologi?
5. Hva er de mest fremtredende barrierene for bruk av slik teknologi i fremtiden?

Hypotese 2

En lov eller intensiv som pålegger e-handelsaktører å betale skatt eller avgift på høye retur-frekvenser. Dette vil bidra til å redusere antall returer og miljøbelastningen av omvendt logistikk i det norske e-handelsmarkedet.

1. Hva er din umiddelbare tanke rundt en slik implementering?
2. Hvordan tenker du at en slik lov ville bidratt til mer miljøvennlige prosesser når det gjelder omvendt logistikk?
3. Vil en slik innføring være i konflikt med eksisterende lovverk?
4. Hvordan ville en slik innføring påvirket det norske markedet og aktørene som opererer i Norge?
5. Hvilke barrierer anser du som mest fremtredende når det gjelder innføring av nye lover eller intensiv?

Hypotese 3

Ved å utnytte et samarbeid med en tredjeparts logistikkleverandør som prioriterer bærekraft, kan norske e-handelsaktører effektivt redusere kostnader og miljøpåvirkning gjennom en reduksjon i andel returer.

1. Hvordan anser deres kunder, her e-handelsaktører, deres tjenester som viktige når det kommer til omvendt logistikk?
2. Har dere spesifikke resultater dere har oppnådd når det kommer til miljø- og bærekraft?
3. Hva anser dere som de største utfordringene av å være en tredjeparts logistikkleverandør?
4. Hva er de mest fremtredende barrierene ved å samarbeide med en tredjeparts logistikkleverandør?

En oppsummering avslutningsvis

Hypotesene er blitt presentert, og vi har nå fått deres tanker rundt slike implementeringer basert på det norske markedet. Er det noe dere ønsker å legge til, eller noe du/ dere mener vi har glemt å legge vekt på under dette emnet?

Table A.3 Survey Guide for Customers

1. What is your age and gender? (a) Female (b) Male (c) Prefer not to say
2. What is your age? (a) Under 18 (b) 18-24 (c) 25-34 (d) 34 or older
3. Please indicate your country of residence. *(Which country do you call home? Please state your answer in english, ex. Norway)* *Open-ended:* _____
4. Which of the following best describes your current status? (a) Full-time student (b) Part-time student (c) Employed full-time (d) Employed part-time (e) Unemployed and looking for work (f) Other
5. How often do you purchase products online? (a) Less than 2 times a month (b) 2-5 times a month (c) 5-8 times a month (d) More than 8 times a month
6. How frequently do you return products that you have purchased online? (a) Very frequently (more than 75% of the time) (b) Often (50-75% of the time) (c) Sometimes (25-30% of the time) (d) Rarely (less than 25% of the time) (e) Never
7. Have you ordered multiple sizes of the same product with the intention of returning some of them? (a) Yes (b) No
8. How often do you order multiple sizes of the same product with the intention of returning some of them?

(a) Very frequently (more than 75% of the time)
(b) Often (50-75% of the time)
(c) Sometimes (25-30% of the time)
(d) Rarely (less than 25% of the time)
(e) Never

9. How important is it that the company you purchase from has sustainable practices?
   (a) Very important
   (b) Somewhat important
   (c) Indifferent
   (d) Not important

10. How much would you be willing to pay extra for a more sustainable return practice?
   (a) No extra
   (b) No more than 5% extra
   (c) Up to 15% extra
   (d) More than 15% extra

11. What initiatives do you think e-commerce companies can implement to reduce the number of returns by customers?
   (Select one or more)
   (a) Offering incentives for keeping products instead of returning them (ex. Loyalty points or discounts for future purchases)
   (b) Better product descriptions and images
   (c) Virtual try-on technology (including clothes, furniture, equipment, electronics, etc.)
   (d) More accurate sizing chart
   (e) Other: _____

12. Have you ever chosen to keep a product that you did not want because you did not want to go through the hassle of returning it?
   (a) Yes
   (b) No

13. Would you be more likely to make a purchase online if virtual technology was available to help you see and try on the products before buying?
   (a) Yes
   (b) No

14. Would your purchase decisions be more deliberate if returns incurred fees, or if the company tracked returns and charged for exceeding a limit?
   (a) Yes
   (b) No

15. What changes would you like to see in the current return policies of Norwegian e-commerce stores to make them more sustainable?

    Open-ended: _____

Appendix B

Interview Report B.1: NHH Professor, Expert

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions.

Date: May 8th, 2023

Tor W. Andreassen, a professor at the Norwegian School of Economics (NHH), focuses on creating value through service quality and innovation. Andreassen is part of the research center "Digital Innovations for Sustainable Growth," which is funded by large companies and the Research Council of Norway, and includes around 35 researchers.

Andreassen sees a significant problem with the way returns are handled today. Some companies find it cheaper to destroy products than to handle returns, and he believes there is a high level of ignorance among consumers that leads to a significant number of returns. He suggested several solutions to this problem, including collaboration between industry stakeholders to establish a common sizing standard, introducing taxes on returns and distribution to reduce the number of returns, including these costs in the product price, and raising consumer awareness about the environmental impact of returns.

Regarding challenges related to standardizing sizes for clothing and shoes across all retailers, Andreassen mentioned that different sizing systems across countries pose a challenge. If the government were to implement a law that required cooperation, there would be a dilemma as there is no incentive structure in place to encourage it. Therefore, it would be necessary for the government to create an incentive structure to make cooperation work. He also suggested raising awareness among consumers about their choices and noted that taxes and fees on both consumers and retailers could play a role in promoting sustainable practices. As an example Andreassen suggested that a solution could be, informing the consumers that a return may incur a fee of 150 NOK which can be an effective way to raise awareness. He also noted that taxes and fees on both consumers and retailers could play a role in promoting sustainable practices.

He pointed out that picking the product, transport, and handling costs are the primary cost drivers for returns in eCommerce. An illustrative example within the food industry in Norway is the service provided by ODA, which offers doorstep delivery of food boxes. It is notable that a significant portion of the overall costs associated with this service are attributed to expenses related to labor and the manual handling of goods. Other companies, such as Amazon, are therefore investing in automating their product-picking process to save on labor costs. Last mile delivery is also a significant cost driver, and being close to the market is essential for reducing these costs. Moreover, Andreassen also mentioned Fjellsport in Sandefjord as an example of a Norwegian eCommerce company

that has implemented successful and sustainable reverse logistics practices to reduce the environmental impact of returns.

In terms of logistics providers and eCommerce retailers, Andreassen suggested that logistics providers typically charge for returns, but retailers do not pass that cost onto customers. He suggested that retailers' policies are too lenient, and some retailers should introduce a small return fee for the customers to pay. Andreassen also discussed the potential of technology in online shopping, such as creating avatars of themselves on their phones to 3D scan their bodies to determine if clothing and shoe sizes are a good fit. Additionally, Rummelhoff and Bø suggested having a system in place, such as a limit on the number of returns per year, rather than blacklisting customers who return large volumes of items. They also noted that good logistics solutions that do not penalize customers for faulty or damaged products are essential, and retailers should work together and take measures such as introducing a return fee.

Appendix C

Interview Report C.1: PostNord AS

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent PostNord's official stance on these matters.

Date: March 17th, 2023

We conducted an interview with the Business Developer in PostNord Norway regarding his responsibilities in the company and the process of its return services. The interviewee is responsible for the customer environment, business development, digital services, app, portals, store network, pick-up points, and package vending machines as well as being a part of the Management Group of PostNord. He also mentioned that he is involved in PostNord´s effort towards zero emissions by 2030, and provides consultancy services for optimal e-commerce warehouses and online shops.

The interviewee stated that 15% of private customers in e-commerce return their packages, with 2% of those packages not collected by the consumers for various reasons. Meanwhile, 11% of the returns are customer-initiated. The return rate varies across industries, with textiles having a much higher return rate than other types of industries. PostNord provides two return solutions: return drop-off and return pick-up. The former allows customers to drop off their returns at the same location where they picked up their packages, while the latter, which is rarer, involves PostNord picking up the package at the customer's address.

Regarding return pick-up, the interviewee stated that companies that follow the law are obliged to provide good return solutions, just like outgoing solutions. This obligation applies to all online purchases that must have return solutions, even though the majority of the items are small packages.

In terms of the different return solutions offered by e-commerce companies, the interviewee noted that about half of the company's outbound volume is imported. Thus, returns outside of Norway must be declared for export. Some companies offer simple solutions where the return label is included in the shipment. Others offer more complex return solutions where consumers must contact customer service and receive a return label by email or mail. PostNord has a solution at its 1600 drop-off locations where customers can print out their return label. Additionally, some e-commerce companies enable consumers to display a QR code at the drop-off point that can be printed out on the spot.

Regarding the green shift concerning the return process for foreign destinations, the interviewee mentioned several solutions. One example is the Green Deal in Vestby, where returns can be sent to be forwarded in Norway to avoid transportation out of the country.

Another solution is the fulfillment center in Langhus, which provides various return services such as repack for resale.

With reference to the pricing of the different label options, PostNord is paid for the shipping. They must also produce a return label for everything shipped. Therefore, including a return label encourages consumers to return items easily, typically with free shipping.

The representative mentioned that they need to consider how they set up return transportation for customers to make it as sustainable as possible. The company consolidates everything when sending returns outside of Norway, such as Sweden, to make it more environmentally friendly and cost-effective. However, there is a lot of concern about the impact of free shipping and free returns, especially on the environment, inflation, and increased operating costs. PostNord has been recruiting people to monitor the van industry to tackle work-related crime that affects the cost of operations. They acknowledge the role of large customers in setting the bar for the industry, and they hope other smaller operators can follow suit.

The representative reported that there have been some changes in the industry lately, with more players testing out minimum value before offering free shipping, and less plastic is being used, with more recyclable material. However, there is still pressure to offer free shipping and free returns, which has resulted in a lot of returns for the company. They also highlighted clothes and textiles as the biggest segment for returns.

The representative mentioned that the company has a margin of about 5%, which is impressive given the intense price competition in the industry. The company's operational costs go towards customer choices in terms of freight services, and the volume of returns.

When asked if PostNord could deliver to more customers if they didn't have to handle returns, the representative mentioned that they have a system that coordinates with stores to collect returns. Thus, the cost is marginal, and it is not a significant issue.

In summary, PostNord has been working on consolidating returns to make it environmentally friendly and cost-effective. They are hopeful that large customers can set the bar high for smaller operators to follow. The company is aware of the challenges posed by free shipping and free returns, and they have been looking at ways to tackle this issue. In conclusion, the interview provided valuable insights into PostNord's responsibilities and the different return options available to customers. The company's efforts to reduce emissions in the return process are commendable.

Interview Report C.2: Lett Butikk

Please note that the answers provided in this interview are based on the employee's personal experiences and opinions as a support staff member and do not necessarily represent Lettbutikk's official stance on these matters.

Date: March 16th, 2023

We had the opportunity to interview the support employee who works in the Quickship department at Lettbutikk. The Quickship department offers an EDI program and shipping services with multiple transporters in Norway. The employee is responsible for support in this department where he currently works alone. The main service offered by Lettbutikk is 3PL, where they manage the entire warehouse operation for Norwegian online and retail stores from their warehouse in Enebakk. The services include stocktaking, pick-and-pack, shipping, and handling returns.

Regarding customizing solutions for customers, Lettbutikk typically grows with the customer's needs. For example, if a customer is a new business and has a small warehouse, they may outsource their logistics to Lettbutikk. When they need to expand their business, they may choose to utilize Lettbutikk's services for larger warehouse operations.They also offer volume discounts to customers, as the number of customers increases. This can be beneficial as they have better bargaining power when negotiating with transporters.

Quickship has a dedicated team that handles returns, and once they are received, they are processed and placed back into the customer's online store. They use ShipHero, a VMS system, to inform customers that their returns are ready to be placed back in their store.
For shipping, Lettbutikk uses an EDI system called Webshipper, which is like a booking system for shipping. It sends messages to transporters to produce a shipping label, whether it is for an outgoing shipment or return.

According to the interviewee, the biggest challenge faced by Lettbutikk is acting as a third-party intermediary between transporters and customers, as the transportation business model is designed for a direct 1:1 relationship between the two parties. The interviewee believes that finding solutions to these challenges is a source of both challenge and pleasure for the company.

When asked about the evolution of the company as a third-party intermediary since its inception in 2016, the interviewee noted that there is now closer cooperation with transporters, and the company offers services with more transporters than ever before. They also have built an environmentally friendly warehouse in Enebakk that is 80% self-operated, which has made their processes more efficient.

Regarding the future of outsourcing inventory management, the representative noted that investing in efficient warehouse management systems, such as Autostore, is proving to be

very effective. Additionally, the representative noted that there is a huge opportunity for e-commerce companies to establish themselves abroad, though there are added complexities such as customs, taxes, and different regulations. The representative stated that Lettbutikk currently has a warehouse in Denmark and is in the process of establishing one in Sweden, and that international transporters must be considered. The representative also noted that there has been a slowdown in the e-commerce market due to Covid-19 and increased competition, which has made it more difficult to operate and maintain competitive prices. However, the representative believed that it would be advantageous for larger e-commerce companies to outsource their inventory management to a third party such as Lettbutikk, as it would streamline transport and costs for the companies involved.

Regarding the costs associated with handling returns, the interviewee highlighted that the largest cost is human labor. However, the interviewee does not see human labor being replaced by robots in the near future, as there is still a need for manual assessment.

On the topic of customer demand for environmentally friendly products, the representative noted that there is an increasing demand for such products, but ultimately price seems to be the most decisive factor for customers. The representative stated that there is a balancing act for e-commerce companies, who also have bills to pay. Start-ups, in particular, tend to opt for cheaper alternatives, while larger companies may have more leeway to offer environmentally friendly options at a slightly higher cost. However, the representative acknowledged that in the past year, direct transport prices have increased by almost 30% due to inflation and uncertainty in Europe, as well as rising fuel costs. This makes it even more challenging for customers to choose more expensive, environmentally friendly options. The representative noted that the only solution to this issue is better competition in the transport market in general.

In summary, the representative from Lettbutikk noted that there is an increasing demand for environmentally friendly products, but price remains the most decisive factor for customers. Efficient warehouse management systems are proving to be effective, and there is a great opportunity for e-commerce companies to establish themselves abroad, though there are added complexities. Overall, the interviewee also emphasized the importance of cooperation and competition in the transport industry to achieve greater efficiency and profitability.

Appendix D

Interview Report D.1: Guideline

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent Guideline's official stance on these matters.

Date: March 7th, 2023

Guideline is a company that primarily sells sports equipment to retailers, which accounts for 98% of its revenue. The company began selling directly to consumers in March 2020 due to the pandemic, but also because they saw an opportunity to offer their products to the market as part of their product portfolio. The sales to consumers only account for 2% of their revenue. The interviewee from Guideline, whose position is Product and Brand Director, is responsible for product development, sourcing, procurement, e-commerce, branding, and marketing.

The most prominent challenges that Guideline faces as an e-commerce company in reverse logistics right now concern e-commerce return handling and selling to the EU. Guideline experience very few returns, as products such as fishing rods and reels are not usually ordered in multiple sizes, and they have few products returned. However, the company sells in all countries in Europe, and when customers return products from a country that has exited the EU, such as the UK, there are challenges regarding customs clearance, tariff rates, and VAT in and out of the EU. In these cases, the company has to clear the product through customs and then deliver it to the customer in the UK, and the customer receives a bill for the tariff rate, VAT on the product's price, and shipping cost. If the product needs to be returned to the EU due to a defect, there is a significant challenge for Guideline. The company must cover the guarantee and manufacturing defects if the return falls within the warranty/purchase law.

Furthermore, Guideline has invested in a new IT platform for e-commerce, where they have added a separate project for complaint and return management. The most important thing for them is to create products that can be repaired and/or replaced. When a complaint or return comes in, it is registered correctly in their systems so that they can create statistics and work towards good product development. In the long run, they therefore want their products to become better. Therefore, Guideline uses specific measurements to determine whether their reverse logistics are successful or unsuccessful. They measure C2O emissions in the incoming logistics from the factory to their warehouse, as well as how many recycled products they have and the proportion of recycled materials in their products.

Regarding measures to ensure that the process remains as environmentally friendly as possible in connection with returns from the customer, Guideline performs a service check on the goods that arrive at their warehouse to ensure product quality and ensure they meet the standard set. The customer must also make an active choice when returning a product and must contact Guideline to receive a return label by email, print out the return label, and attach it to the package before sending it back. Guideline covers the

costs of the return, and if the price is over 2000 NOK, they also cover the shipping costs upon purchase. However, if the return concerns a user error, the customer is responsible for the costs associated with the return process.

When asked about how Guideline views the fact that the customer must mail the return shipment in connection with returns as an environmentally friendly solution, they respond that it can lead to a reduction in the number of returns because the customer must be more active in the return process, and it can make the original purchase more thoughtful.

Regarding changes in societal trends and demand related to quality and sustainability, Guideline has a strategy of not following short-term trends. They want to develop designs and quality that stand the test of time and represent a functional and neutral design that does not change as quickly.

Interview Report D.2: Komplett

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent Komplett's official stance on these matters.

Date: March 21st, 2023

During the interview with representatives of Komplett, various aspects of the company's e-commerce practices, customer patterns, and reverse logistics challenges were discussed. Fossengen is the department manager for PC-pilot, repairs, and returns, while Opheim is the transport manager, responsible for all transportation at Komplett.

Komplett has been engaged in e-commerce for 26 years, with physical stores being its biggest competitors. The company has adjusted its product prices accordingly and differentiates itself by providing fast delivery services. For the past 3-4 years, Komplett has been offering same-day delivery services in the areas between Østfold and Vestfold, including Oslo, which constitutes about half of Norway's population.

Regarding returns and refunds, Komplett first of all has a return rate of approximately 3%, which is relatively low. The overall return rate is 2.19% and is decreasing. They adhere to the law and strive to understand the customer's concerns. In advance of the customer actually returning the product, Komplett determines in collaboration with the customer whether there is a legitimate reason for the return and guides them accordingly. Komplett processes the returned product to verify that it meets the customer's description and tries to issue refunds within 1-2 weeks. If the refund takes more than 30 days, the customer is entitled to a full refund.

One of the challenges that Komplett encounters in their return process concerns the refund procedure, specifically when it comes to transferring funds from the bank to the customers. The company is working on improving this process, especially when dealing with banks that take too long to issue refunds, which has left customers dissatisfied in the past.

The reverse logistics process at Komplett involves several stages. When a customer returns a product, the product is inspected to determine its condition. Depending on the condition of the product, it may be sent to a partner for repair or returned to Komplett. At Komplett, the product is received at the warehouse and sorted based on the type of product and the reason for the return. The employee emphasized that it is important to determine if there is a fault with the product or if it is a user error. If the product has a fault, Komplett has a parts warehouse, where the faulty parts can be replaced. The product is then disassembled, and the parts that can be reused are sorted according to EU regulations. Komplett also receives payment for sorted waste, which is an incentive to sort waste correctly.

Several factors are considered when determining the disposition of returned products. Products that can be repaired are fixed, and the repaired parts can be used in other

products. The company seeks to obtain a "kick back agreement" with suppliers, where the company is responsible for the return of faulty products and can use the components that can be reused. Whenever an item cannot be repaired, it is either recycled or sent to a company that Komplett collaborates with in Sweden for resale, who shares the same values and environmental philosophy. The company evaluates the quality of the product and activities according to reverse logistics management to determine the best disposition for returned products.

The time it takes to handle returned products varies depending on the type of product. Some products can be visually inspected and sorted within a few seconds, while others may require several hours of testing and repair. The company undertakes repairs of products after receiving training from suppliers that ensure product quality and safety, and aligned with this, Komplett are actively striving to improve their internal procedures. Komplett believes that repairing products is profitable in the long run, despite the belief that it may not be worth the time and resources spent on repairs in the past.

Komplett is considering using technology to guide customers with their products at home, ensuring that the product meets the customer's expectations. They have an AR solution on their website that enables customers to use their phone to visualize the product at home. They also aim to improve communication between the return and content departments, provide better product descriptions, and representative images. Additionally, they are working on a service that helps customers feel more confident that the product will fit into their home in terms of size, lighting, etc., and that their settings are tailored to their unique needs. This service will help ensure that the product stays with the customer.

Komplett's primary goal is to promote sustainability in its reverse logistics process. The company seeks to repair and reuse products whenever possible, and recycle or donate products that cannot be reused. The company also wants to obtain kick back agreements with suppliers to help achieve its sustainability goals.

Interview Report D.3: Apotek 1 Netthandel

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent Apotek 1 Netthandel's official stance on these matters.

Date: March 10th, 2023

We conducted an interview with an eCommerce representative from Apotek 1 Netthandel regarding their experience and challenges in eCommerce. When asked about the company's experience with eCommerce, the representative mentioned that it started about 7-8 years ago, and has since expanded due to its growing popularity.

One of the prominent challenges the pharmaceutical eCommerce actor faces in reverse logistics is dealing with returned prescription and non-prescription items. According to Norwegian law, some non-prescription items, such as Paracet, do not have a right of withdrawal. This is a significant problem that the company faces in reverse logistics.

Regarding the company's customers' environmental concerns regarding their products, the representative noted that very few customers are concerned about the environmental impact of their products. However, some customers care about how products are packaged, and the company tries to be sustainable in their practices.

When asked about the typical process of reverse logistics after a customer returns a product, the representative noted that they encourage customers to contact them before returning a product to avoid returns that do not have a right of withdrawal. They also aim to receive documentation from customers, such as when a product is damaged during transport, to receive compensation. Moreover, in terms of improving the reverse logistics process, the representative noted that while there are few complaints about their products, they face more issues with products delivered by external suppliers.

In the pharmaceutical industry, there are regulatory requirements for handling returns. For example, medical consumables such as diapers, diabetes equipment, and wound dressings have no right of withdrawal. The company has chosen to return these products to their warehouse if they have not been in the customer's possession. However, with prescription drugs, there is a right to destruction, and it is illegal to return them to the warehouse if they have been in the customer's possession, regardless of how long.

Regarding how the company decides which pharmaceutical products can be returned and their process for handling returns, the representative noted that trends and market demand often influence product changes. For example, during the outbreak of the conflict in Ukraine, there was a high demand for the non- prescription medicine, JODIX. With the increasing demand for this product, the company received more returns than usual. In this case, the company chose to disable online purchases, so customers had to buy the product in-store, where employees could inform them of the return policy. In addition, on the

subject of ensuring that the products are properly taken care of, and thus avoid the goods ending up as a return due to damage or errors, they have certain policies to follow for particular products such as refrigerated items. In the case of diabetes medicine, customers have to physically pick them up in the store, even if they ordered them online, to ensure the product is properly stored.

Overall, the pharmaceutical eCommerce actor's representative provided valuable insights into the challenges faced by eCommerce companies in the pharmaceutical industry, such as dealing with returns, compliance with strict regulations, and ensuring the proper handling of products during transport.

Appendix E

Interview Report E.1: Meta Living

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent Meta Living's official stance on these matters.

Date: May 25th, 2023

Meta Living is a Norwegian company specializing in project management and marketing services for real estate businesses. They offer personalized assistance throughout the entire process, ensuring optimal results. Their comprehensive marketing services include custom websites, strategic ad placement, printed materials, high-quality prospectus, marketing videos, and social media campaigns.

During the interview, Meta Living representatives discussed their expertise in utilizing 3D modeling and technology for new development projects. They highlighted the immersive 3D environment powered by Unreal Engine, providing customers with realistic virtual walkthroughs and interactive experiences. Customization options allow customers to change colors, materials, and furnishings, enhancing the buying process and overall customer experience.

The cost reduction benefits of implementing 3D platforms and VR/AR technologies were emphasized, enabling contractors to save time and resources by reducing the need for physical demonstrations to customers. This streamlined approach also benefits partners such as furniture stores. Meta Living emphasized the sustainability aspect, highlighting how technological advancements decrease the environmental impact associated with product transportation. Proper disposal and processing of electronics and hardware were stressed.

The representatives acknowledged potential barriers to adopting VR/AR technologies, including high costs, manual labor, hardware limitations for virtual fitting rooms, limited user-friendliness, and GDPR compliance for data handling. Looking ahead, the representatives mentioned the potential of artificial intelligence (AI) development to enhance customer convenience, although precision cannot be guaranteed. Overall, the interview provided valuable insights into Meta Living's expertise in utilizing 3D modeling and technology for real estate development projects. Their personalized project management approach, combined with comprehensive marketing services, positions them as a valuable partner for real estate businesses.

Interview Report E.2: Elmera Group

Please note that the answers provided in this interview are based on the participant's personal experiences and opinions, and do not necessarily represent Elmera Group's official stance on these matters.

Date: May 24th, 2023

The interview participant serves as a corporate legal representative in Elmera Group, which is the parent company in a group of several companies selling counseling, services and computer software to energy companies.

The representative discussed the potential conflict between existing laws and the introduction to a new law imposing obligations on e-commerce actors and consumers. The importance of considering the consumer perspective were emphasized, particularly consumer protection laws such as the Consumer Purchase Act (Forbrukerkjøpsloven, 2002) and the Right of Withdrawal Act (Angrerettloven, 2014). However, it was noted that the respondent did not see any immediate barriers to imposing a fee on e-commerce actors.

Regarding sustainable return policies, the interviewee believed that this approach could be more manageable and politically acceptable. It was noted that customers are not entitled to cost-free returns, unless the purchase involves contract termination. Further, barriers to implementing a new law or a new incentive were identified, including the need for a robust CRM system and potential costs for small businesses. The interviewee also mentioned the environmental impact of greater consumer rights and highlighted the relevance of the Freedom of Information Act and the European Union’s Green Deal.

As a result of the interview with the representative for Elmera Group, the authors were able to gain a deeper understanding of the rights of consumers, and how a potential measure such as a fee might impact Norwegian e-commerce actors.