Sustainable reverse logistics in fast fashion e-commerce: A literature review

Impact of sustainable practices on customer satisfaction

Bachelor thesis for International Logistics Program

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CHALMERS UNIVERSITY OF TECHNOLOGY
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PREFACE

As part of our studies at Chalmers University of Technology, we have written this thesis. This degree project corresponds to 15 of the 180 credits we study for the program International Logistics and is one of the last things we complete before we earn our bachelor's degree.

We would like to express our gratitude to our supervisor Kent Salo for spending a lot of time helping us to create a report that was suitable and well-written. We want to thank Kent Salo for his valuable contributions to this study, guidance, inspiring ideas, and constant enthusiasm.

It is our hope that you will find the results of our study interesting and that you will learn something new.

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SAMMANDRAG

Fast fashion har blivit ett särskilt populärt segment inom e-handelsbranschen de senaste åren. På grund av detta har fast fashion fått kritik för sin miljöpåverkan. *Reverse logistics* är processen att hantera produktreturer, det är ett område där e-handelsföretag inom fast fashion kan förbättra sin hållbarhetsprestanda.

Specifikt undersöker den här studien hur e-handelsföretag inom fast fashion kan införliva hållbara metoder i sin logistikverksamhet och vilken inverkan dessa metoder kan ha på miljön och socialt ansvar. Syftet med denna litteraturgenomgång är att undersöka hur företag inom e-handel och fast fashion kan införliva hållbara metoder i reverse logitics för att minska miljöpåverkan, samt hur dessa hållbara metoder påverkar kundnöjdheten.

Studien identifierar olika hållbarhetsmetoder som kan tillämpas på fast fashion branschens leveranskedja, såväl som motiv och hinder för att implementera hållbara metoder inom reverse logistics. Resultaten tyder på att hållbar reverse logistics kan påverka kundnöjdheten positivt genom att bygga förtroende och förbättra den övergripande kundupplevelsen. Företag som visar ett engagemang för hållbarhet är mer benägna att bygga upp kundlojalitet och uppmuntra upprepade köp. I resultatet av studien lyfts möjligheter för att föra fram kunskap och metoder angående reverse logistics inom fast fashion och e-handel och hur företag kan implementera dessa.

Keywords:

E-commerce; Reverse Logistics; Returns; Sustainability; Circularity; Fast Fashion

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ABSTRACT

Fast fashion has been a particularly popular segment of the e-commerce industry in recent years. Due to this, the fast fashion industry has been criticized for its environmental impact. Reverse logistics, the process of managing product return and disposal is an area where fast fashion e-commerce companies can improve their sustainability performance. Specifically, this literature review examines how fast fashion e-commerce businesses can incorporate sustainable practices into their reverse logistics operations and the impact that these practices may have on the environment and social responsibility. This study provides an overview of methods to implement sustainable practices in reverse logistics within the e-commerce and fast fashion sectors.

It is the purpose of this literature review to examine how fast fashion e-commerce businesses can incorporate sustainable practices into their reverse logistics operations to reduce environmental impact, as well as how these sustainable practices affect customer satisfaction. The study identifies various sustainable practices that can be applied to the fast fashion industry's supply chain, as well as the motivations and barriers associated with implementing sustainable practices in reverse logistics.

The results suggest that sustainable reverse logistics practices can positively impact customer satisfaction by building trust and enhancing the overall customer experience. Businesses that demonstrate a commitment to sustainability are more likely to build customer loyalty and encourage repeat purchases. As a result of the study, opportunities are highlighted for advancing knowledge and practice in sustainable reverse logistics in the field of fast fashion e-commerce and how businesses can implement these.

Keywords:

E-commerce; Reverse Logistics; Returns; Sustainability; Circularity; Fast Fashion

Table of Content

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND TERMINOLOGY

Artificial intelligence - Computers and machines function in a similar way to the human brain in terms of their ability to solve problems and make decisions.

Blockchain - It is an advanced technology for storing and sharing information that facilitates the sharing of transparent information within business networks.

Circular economy - As opposed to manufacturing, purchasing, then disposing of things, circular economies make use of everything. When items are no longer useful, they are reused and recycled.

CSR – Corporate Social Responsibility. Taking responsibility for how a company affects society from both an economic, environmental, and social perspective is called corporate social responsibility, or CSR.

E-commerce - Electronic transfer of data for the purpose of buying and selling goods and services.

Fast fashion - An approach used by the fashion industry to produce large quantities of clothing in a short period of time, to get products to market as soon as possible.

Non-biodegradable materials - Biologically inert materials that cannot be decomposed by nature.

Package-free returns - Transshipping returns in reusable boxes.

PSS - The primary objective of the Product-Service System is to produce value through the combination of tangible products and intangible services.

Re-commerce - The process of reselling previously owned, new, or used products on online marketplaces or in person to buyers who reuse, recycle, or resell them.

Return credits - A return credit refers to the maximum amount of purchases that can be returned free of charge by the consumer.

Take-back - Retailers accept returns, and the products are recycled or resold.

Throwaway culture - Throwaway culture refers to disposing of items after a single use. The term also includes items that end up in landfills after a short time.

1. INTRODUCTION

The electronic transfer of data for the purpose of buying and selling goods and services (e-commerce) industry has experienced significant growth in recent years, with fast fashion being a particularly popular segment. Fast fashion offers rapidly changing collections at affordable prices and during the past decade, a significant increase has been seen (McCormick et al., 2014). Due to this, clothing quality has decreased as well as the amount of textile waste produced by the industry has increased. According to Hayes (2022) buying clothes was once a special occasion, with consumers saving up for new clothes at specific times of the year and style-conscious individuals getting a glimpse of upcoming fashions through fashion shows. This changed in the late 1990s as shopping evolved into a form of entertainment and clothing spending increased. Fast fashion emerged, offering cheap and trendy imitations of high-end designs produced at low cost, allowing consumers to keep up with runway styles or celebrity outfits (Hayes, 2022).

The fast fashion model is characterised by the rapid production of trendy, low-cost clothing and accessories on a weekly or even daily basis; however, it has been criticised for its negative impact on the environment and society (Wren, 2022). Hayes (2022) argues that the textile industry has a greater impact on the environment than is initially apparent. With an annual water consumption of 93 billion cubic meters, the production of a pair of jeans alone uses 3,781 liters of water. Additionally, 20 percent of all wastewater generated by textile dyeing is toxic and is often disposed of without proper regulation in countries where clothes are manufactured (Hayes, 2022). In light of these concerns, there is an increasing need to consider sustainability in all aspects of fast fashion e-commerce companies' operations including reverse logistics (Ratchford et al., 2022). Reverse logistics refers to the processes involved in the management of returns, repair, refurbishment, and disposal of products (Lambert & Cooper, 2000). The objective of reverse logistics is to recapture the costs incurred in the process, ensure profits, or dispose of material appropriately by effectively planning, controlling, and transporting raw materials, inventory, finished goods, and relevant information from the point of consumption back to the point of origin (Lamba et al., 2020). E-commerce has dramatically changed the retail industry and has brought new challenges in supply chain management, especially in terms of reverse logistics (Risberg, 2023).

Reverse logistics in e-commerce, according to Agrawal et al. (2015), can present several challenges, including returns management, customer satisfaction, environmental impact, and increased costs. The study indicates that reverse logistics and returns management can be a complex, costly, and multifaceted process in e-commerce, requiring efficient coordination and management of multiple stakeholders. The returns process can also have an impact on customer satisfaction, as customers can face difficulties and delays in returning products.

Towards promoting sustainability in the fashion industry, Brydges (2021) highlights the importance of investigating circular economy practices. A circular economy promoting sustainable consumption and production practices is emphasised in the article as an alternative to the linear economic model of take, make, and waste. Fast fashion companies generate a large amount of waste, which contributes to the negative environmental impact of the fashion industry. By utilising circular economy practices, the fashion industry can reduce

its environmental impact, including the large amount of waste it generates. In addition to exploring new methods to reuse, repurpose, and recycle clothing items, along with designing more sustainable business models and supply chain practices that prioritise sustainability.

The article by Wren (2022) provides insight into efforts and practices in sustainable supply chain management in the fast fashion industry to reduce environmental impact. The article highlights the urgent need to transition from linear to circular supply chain practices, which prioritise waste reduction, recycling, and reuse of products. There is a need to identify and implement sustainable supply chain practices that will address the environmental impact of fast fashion, including product returns and reverse logistics. This involves exploring new strategies for the design, packaging, transportation, and distribution of products that prioritise sustainability and circularity, as well as exploring new business models and supply chain partnerships that encourage waste reduction and promote sustainability throughout the supply chain.

1.1 AIM

This study aims to explore reverse logistics in fast fashion e-commerce business and to identify opportunities for improvement from an environmental sustainability perspective. This with a focus on reducing waste, having a lower environmental impact, and promoting a circular economy. The study is based on a literature review on reverse logistics, sustainability, and fast fashion, and considers the challenges and opportunities facing fast fashion e-commerce companies.

The study examines the reverse logistics practices of fast fashion e-commerce companies, the challenges they face in incorporating sustainable practices, and the opportunities and strategies for implementing sustainable reverse logistics practices. Furthermore, it is the purpose of this study to examine the relationship between sustainable practices and customer satisfaction as well as the impact of reverse logistics.

1.2 RESEARCH QUESTIONS

- How can fast fashion e-commerce businesses incorporate sustainable practices into their reverse logistics operations to reduce the environmental impact?
- How do sustainable practices in reverse logistics affect customer satisfaction?

1.3 DELIMITATIONS

The study on the handling of sustainable reverse logistics in fast fashion e-commerce is carefully crafted to provide a comprehensive understanding of the subject at hand. As part of the study, the focus is on the impact of environmentally sustainable practices on customer satisfaction. It is important to note that the study is not exhaustive in its approach and contains certain delimitations.

The scope of this study is limited to articles searched in the Chalmers Library service The Library catalogue and discovery tool EDS and Scopus database only. Despite the fact that the Chalmers Library service The Library catalogue and discovery tool EDS and Scopus database contains a large number of peer-reviewed scientific articles that have been used for many systematic review studies, other databases may have also covered this field, which this study does not take into account. This study has a time limit of approximately 400 hours, which is

not sufficient time to review all literature. As a result, the study is limited to articles published between 2012 and 2023. The authors, however, consider that the information gathered, and the literature analysed are sufficient to understand the concept. It should be noted that the findings may not necessarily be applicable to earlier or later time periods.

The study is limited in its scope and only examines a specific aspect of return logistics, such as reverse logistics, and the sustainable practices associated with reverse logistics. The study also limits its focus to specific types of e-commerce, such as fast fashion, and excludes others.

Finally, the study's examination of the environmental impact of e-commerce is restricted to only considering factors such as waste generation and resource consumption, without considering other impacts such as carbon emissions. These limitations are crucial in understanding the context and limitations of the study's findings.

2. THEORETICAL FRAMEWORK

As a theoretical foundation for this study, the following section will provide a background of the fast fashion e-commerce industry. This theoretical background will provide an overview of these key areas of the industry. It starts with a brief introduction to fast fashion and e-commerce. Additionally, the background will delve into reverse logistics in this industry, including the definition, challenges, and opportunities associated with it. Moreover, the background will also highlight sustainable practices and the environmental impacts of reverse logistics.

2.1 Fast fashion and e-commerce: An overview of the industry

There has been significant growth in the fashion industry in recent years, particularly in the e-commerce sector which has become the major channel for fashion retailing (McCormick et al., 2014). A significant contributing factor to this growth is the enthusiastic adoption of online shopping by consumers of all ages and social groups. As fast fashion becomes increasingly popular, there is an increased need for fast-paced production and logistics (Fung et al., 2020).

In addition to introducing fast fashion, the fashion industry has also become increasingly concerned about sustainability. Since fashion mindsets and low-price policies still make it feasible to produce using the cheapest methods possible, consumerism has become an increasing problem (Thorisdottir & Johannsdottir, 2020). It is common for many online retailers to offer free returns. This encourages customers to purchase clothes to try on at home and then return the items that do not suit them. There is an average return rate of around 25% for clothing purchased online in Europe (Cullinane et al., 2019). The availability of free returns may appeal to consumers, but it does not necessarily indicate a loss of profit for the company. As a result, some companies increase their prices in order to cover the return costs (Cullinane et al., 2019).

Due to the fast fashion supply chain, new styles are generated more frequently, causing fashion cycles to move more quickly than before. Yang et al., (2017) state that consumers are able to purchase the trendiest clothing at a lower price with fast fashion's optimization of the supply chain. Buying and disposing of garments more frequently is encouraged by faster cycling fashions at affordable prices. This creates a demand for cheap clothing. As a result, massive quantities of textile waste are produced and increasing the impact on the

environment. E-commerce has further enabled fast fashion growth by providing a convenient and efficient platform for consumers to shop online (Yang et al., 2017; McCormick et al., 2014). E-commerce is highly competitive, which makes that overstocking is often recommended in order to minimise lead times and avoid negative responses to orders. The disadvantage of overstock is the capacity to take up valuable storage space and increase holding costs, making disposal an attractive alternative if overstock volumes are significant and units remain unsold for an extended period of time (Roberts et al., 2023). The fast fashion model of production and distribution often creates excess inventory and waste (Wong & Ngai, 2021; Hjort et al., 2019). This can increase the complexity and cost of returns management, as noted by Hjort et al. (2019). This has led to sustainable supply chain management becoming a critical concern for retailers (Brandenburg & Rebs, 2015).

2.2 Reverse logistics in fast fashion e-commerce: Definition, challenges, and opportunities

Reverse logistics is one of the most important supply chain management processes, according to Panigrahi et al. (2019). The term reverse logistics has been defined in some studies to refer to the process by which customer returns goods to the origin or disposal point (Bozzi et al., 2022; Roberts et al., 2023; Risberg, 2023). The reverse logistics process is the management of returns, as well as their disposition and postponement (Panigrahi et al., 2019). Service, repair, refurbishment, remanufacturing, and recycling are all included, with a view to proper disposal by the manufacturer at the end of the process. In other definitions, it refers to the planning, implementation, and control of goods, services, and information from the point of consumption to the point of origin in order to recover value, dispose of it properly, or recycle it (Panigrahi et al., 2019; Yang et al., 2017). Reverse logistics processes in e-commerce are unique in that companies deal directly with end-customers (Bozzi et al., 2022). Regardless of how reverse logistics is defined, it is evident that reverse logistics plays a vital role in managing the flow of goods within the fashion industry and reducing waste production (Baden & Frei, 2022). The high volume of returns generated by customers presents a unique challenge for fast-fashion e-commerce businesses. As a result of the increase in returns in the fashion industry, increases in sales do not necessarily translate into increases in profits. The increase in product returns will require businesses to invest in reverse logistics supply chains. This is likely to be both costly and complex. However, it has been shown that effective management of reverse logistics can also result in cost savings and a reduction in the environmental impact of the fashion industry. Fast fashion requires reverse logistics, as consumers can only determine if they are satisfied with the product once it has been received and tried on. Consumers are often unaware of the complexity and impact of reverse logistics (Bozzi et al., 2022).

Bozzi et al. (2022) discuss the impact of returns on e-commerce in the fashion industry and the importance of mapping the returns process to develop more sustainable practices. The article highlights the challenges e-commerce retailers face in managing returns, including issues such as environmental impact and disposal of unsold products. The authors argue that a more sustainable approach to returns management is necessary to reduce the environmental impact of e-commerce in the fashion industry. Bozzi et al. (2022) also discuss the challenges of implementing sustainable practices in reverse logistics, such as the lack of infrastructure for recycling and repurposing materials, and the high cost of implementing sustainable practices. The authors argue that retailers need to work together to develop more sustainable

practices in reverse logistics. More sustainable solutions can be developed by collaborating with other stakeholders, such as logistics providers and waste management companies.

Cano et al. (2022) argue that sustainable logistics are required to mitigate e-commerce's environmental impact. However, the fast fashion model of production and distribution often prioritises low cost and convenience over environmental sustainability (Thorisdottir & Johannsdottir, 2020). This can make it difficult for companies to implement sustainable practices. One challenge with reverse logistics that Bozzi et al. (2019) mention is that customers often purchase multiple sizes or colours of a product and return any that are not satisfactory to increase the likelihood of meeting their expectations. Several aspects of e-commerce are detrimentally affected by this practice, including the supply chain and the environment.

2.3 Sustainable practices in reverse logistics

Sustainable practices refer to the strategies and actions that aim to minimize the negative environmental, social, and economic impacts of business operations while maximising positive outcomes (Peleg Mizrachi & Tal, 2022; Bozzi et al., 2022; Yang et al., 2017). In the context of fast fashion e-commerce businesses, sustainable practices involve various aspects, such as product design, sourcing, production, distribution, marketing, and disposal (Roberts et al., 2023). In reverse logistics, re-commerce is one emerging concept that involves the resale or exchange of used products as a means of reducing waste generation and promoting sustainable practices (Arman & Mark-Herbert, 2021).

Sustainable packaging is one of the most significant sustainable practices in reverse logistics. In terms of sustainable packaging, these materials are sourced and produced sustainably, as well as capable of being recycled or composted once they are no longer needed. It involves the use of environmentally friendly packaging materials and the reduction of waste throughout the supply chain (Morashti et al., 2022). The fashion industry is increasingly adopting circular supply chain models in which products are reused and recycled instead of discarded (Baden & Frei, 2022). This type of model reduces waste and promotes resource efficiency while creating new business opportunities. In order to encourage sustainable practices in reverse logistics, it is also important to disclose and report sustainability practices effectively (Garcia-Torres et al., 2017). Such reporting helps create transparency in the supply chain, which promotes accountability and encourages sustainable practices. Yang et al. (2017), note that sustainability has become a major issue for consumers and companies, with a growing demand for environmentally friendly and socially responsible products. In addition, according to Nilsson and Göransson (2021), it has become increasingly important for consumers to know the origin of the products, the materials they were made from, and the working conditions of the people who produced them. In response, companies have begun to provide additional information regarding their supply chains and production processes.

In terms of sustainable supply chain innovation, it is defined as the development of new processes, products, and services that incorporate environmental, social, and economic considerations into the supply chain as a whole (Nilsson & Göransson, 2021). Sustainable practices are integrated throughout the entire supply chain, including product design, material sourcing, manufacturing, transportation, and distribution.

2.4 Environmental impact of fast fashion e-commerce

In a rapidly growing fashion market, one of the by-products is the disposal of fashion products after use. The amount of used clothing discarded every year exceeds 30 tonnes, with most of these items going directly to landfills (Fung et al., 2020). As fast fashion continues to grow, large volumes of clothing are produced and discarded quickly, many of which are made from non-biodegradable materials, such as polyester. Since these clothes are almost non-recyclable, burying or burning them will prove more cost-effective than putting in additional human labour or recycling programs to recycle them, which results in environmental pollution. There is a substantial amount of textile waste generated by returned items that are not resold but rather disposed of, adding to the growing problem of textile waste (Peleg Mizrachi & Tal, 2022). In accordance with Roberts et al. (2023), e-commerce activities in the fashion industry may contribute to the degradation of the environment by disposing of unsold inventory. A growing number of consumers are becoming accustomed to a "throwaway culture", which contributes to the disposal of outdated and unsuitable clothing in landfills, leading to the generation of considerable amounts of textile waste. Over the last four decades, the amount of textiles disposed of in landfills has increased by 800 percent. This issue, however, extends beyond consumer behaviour, as it also affects the fashion industry's reverse logistics process, where the high volume of textile waste generated contributes to the industry's significant environmental and economic costs (Peleg Mizrachi & Tal, 2022).

In the fast fashion industry, e-commerce has a significant impact, and the environmental impact of e-commerce can be seen in the increase in packaging waste (Cano et al., 2022). The authors argue that sustainable logistics are needed in the e-commerce industry to reduce environmental impact. As a result of the non-recyclability of many of these packaging materials, significant quantities of waste are generated that pollute the environment. In terms of waste generation, returns have a significant impact on the environment (Morashti et al., 2022). As a factor contributing to environmental degradation, Meherishi et al. (2021) have identified an increase in packaging materials used in transporting and delivering products. Packaging for supply chains is an inherently complex process involving multiple stakeholders with conflicting objectives that relate to survival and profitability, it is challenging to justify and implement the adoption of returnable secondary packaging across different supply chain tiers and the associated waste management. According to Bozzi et al. (2022), the return journey for a product can often be longer and more complex than its outbound journey, thereby increasing the industry's environmental impact. Moreover, Li et al. (2022) emphasize that return credits can facilitate the purchase of additional products, which can further exacerbate the environmental impact of e-commerce. E-commerce packaging materials, such as plastic bags and cardboard boxes, contribute to the waste stream of the industry. According to the authors, a trend toward package-free returns could help mitigate the environment's impact from e-commerce by reducing the need for additional packaging and transportation. Ahlström et al. (2020) highlight the fact that there are currently few key performance indicators for textile reverse logistics, thus making it difficult to assess the effectiveness of sustainable initiatives such as packaging problems. As a package-free return program requires businesses to establish a vast network of returns, which involves substantial expenditures, firms should take caution when making their decisions. (Li et al., 2021)

Returns and unsold inventory generate a high level of waste, which has negative social and economic implications, such as the loss of livelihood for communities (Baden & Frei, 2022). In order to tackle these issues, the authors point out that sustainable business models and consumption models are lacking in the fashion supply chain. A systematic review conducted by Thorisdottir and Johannsdottir (2020) emphasises the importance of Corporate Social Responsibility (CSR) in promoting sustainability. The industry's supply chain, however, is often characterized by exploitative practices and a lack of transparency, thereby hindering efforts to reach this goal. As pointed out by Brandenburg and Rebs (2015), the supply chain of the industry is complex, and sustainability requires a holistic approach that takes into account the entire chain from the source of raw materials to the final disposal of discarded materials. There is a particular need for this in the case of fast fashion, where products have a negative impact that extends beyond environmental concerns (Yang et al., 2017). In addition, Arslan (2020) points out that exploitative practices and lack of transparency in the supply chain can also have negative social impacts. Hjort et al. (2019) mention how tracking and tracing products can be problematic due to a lack of transparency. Inefficiencies can result from this, resulting in a higher frequency of returned products. Additionally, if supply chain partners don't coordinate, products get moved and handled unnecessarily, increasing the industry's environmental impact.

3. METHODS

For this study, a systematic literature review was selected as the research method. This study follows a deductive research approach, based on Spens and Kovács (2006) framework. The study has drawn on the existing body of literature to identify sustainable practices that can be incorporated into reverse logistics operations to reduce environmental impact. The research methodology for this study follows the principles of Creswell's and Creswell's (2018) research design, which includes a thorough literature review, data collection, and analysis to answer the research questions. Additionally, an analysis of the different approaches and strategies used to manage reverse logistics was conducted based on Creswell's and Creswell's (2018) research design, along with an assessment of their impact on customer satisfaction.

3.1 Material Collection

Based on a systematic literature analysis and review, this study identifies and synthesizes the relevant studies published from 2010 to 2023 regarding reverse logistics in e-commerce and fast fashion (the search was conducted in February 2023). The study was limited to documents published between 2010 and 2023. This enabled the researchers to examine the latest strategies, challenges, and practices in reverse logistics within that timeframe. The search was conducted in February 2023, and it was selected as the end date to incorporate recent findings available at the time. The study's limited time period enabled it to be comprehensive, contemporary, and reflective of reverse logistics in e-commerce and fast fashion. To conduct a systematic literature review, it was necessary to establish eligibility criteria that were consistent with the purpose of the study. For the purpose of presenting transparent and reliable results and supporting decision making, it was imperative to explicit the document search methods used in the research (Karolinska Institutet Universitetsbiblioteket, 2023).

Step 1.

In order to conduct a literature review, it is essential to gather relevant materials. The first

step in this study was to define and delimit the research questions and to identify the major concepts within the questions. As Creswell and Creswell (2018) explain, identifying the appropriate search terms and conducting a systematic literature search of the literature is critical in ensuring that the review is comprehensive and informative. The process of collecting materials for a literature review involves evaluating and collecting appropriate sources and organizing them accordingly. Identifying the relevant keywords that correspond with the research questions is the first step in the literature search.

Searches were conducted in Chalmers library service The Library catalogue and discovery tool EDS and Scopus database for articles that included the concepts of reverse logistics, e-commerce or fast-fashion, and sustainability (or similar terms) in their titles, abstracts, or keywords. The objective of this study was to identify the literature that has been published on this topic within the last 15 years. All types of English-language documents were considered, including articles, reviews, conference papers, and book chapters, as long as they had been peer-reviewed. The following search equation was used to perform the first document search in the Scopus database: TITLE-ABS-KEY (reverse logistics AND sustainability OR circularity AND e-commerce OR fast fashion AND Sweden), obtaining 80 documents. In the second search on Scopus database, the following search equation was used: (reverse logistics AND customer satisfaction OR return rate AND e-commerce or fast fashion AND Sweden OR Europe), obtaining 91 documents.

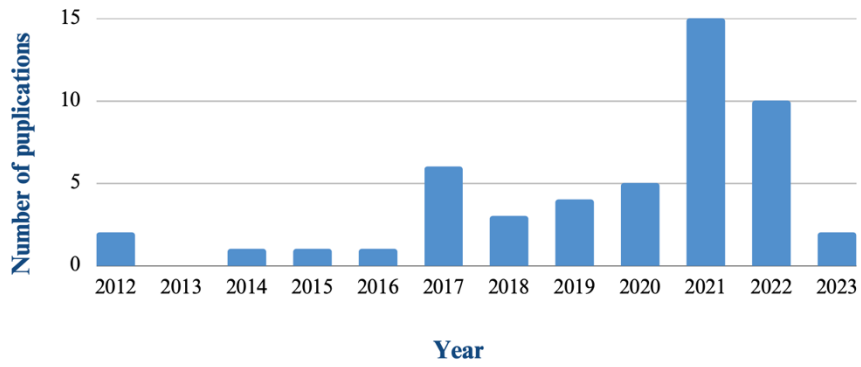
Likewise, the following search equation was used to perform the first search of documents on Chalmers library service The Library catalogue and discovery tool EDS: (reverse logistics AND e-commerce AND sustainable practices AND Sweden AND environmental impact), obtaining 56 documents. In the second search, the following search equation was used: (reverse logistics AND customer satisfaction AND Sweden AND return rate AND e-commerce), obtaining 165 documents. To achieve an equivalent search in each search monitor, the controlling words had to be adjusted and adapted. A total of 392 documents were found.

During the search for documents, the research questions contained the words Sweden and return rates. After that, the study questions were revised due to a lack of information regarding reverse logistics in Sweden and return rates within the subject matter. In addition, return rates were excluded in order to narrow down the research question.

Step 2.
After conducting the search, it was determined whether the sources were relevant to the research questions by reviewing the abstract and keywords. The purpose of this was to determine if the documents should be included in the overview of quality assurance. This resulted in a base of 87 documents. Then duplicates were removed, documents that were found both at Chalmers Library service The Library catalogue and discovery tool EDS and Scopus database. This resulted in a base of 74 documents. The 74 documents from Chalmers Library service The Library catalogue and discovery tool EDS and Scopus database were selected as qualifying criteria to address issues related to reverse logistics, sustainable practices, or customer satisfaction in the e-commerce and fast fashion industries. As a result of the application of these criteria, 25 articles that were irrelevant to sustainable practices in reverse logistics or dealt with other issues such as last-mile transportation, carbon emissions, garment industry, and production. Documents that were only focused on a specific country or

area were excluded from the scope of this study. The base of 49 documents was sorted in an Excel sheet in order to provide a brief overview of the sources as well as a description of the article's focus. It also discussed the purpose of the source and its key findings. A comparison was made between the articles retrieved from the final obtaining documents and the literature review research questions. As shown in Figure 1, the review of 49 articles published between 2012 and 2023 indicates that interest in the topic has significantly increased in recent years. This trend indicates a growing awareness of the importance of sustainable practices in reverse logistics. After the initial selection process was complete, the main selection phase occurred in which the sources were compared to the criteria set out in 3.3.

Figure 1. *The yearly distribution of papers found in the study*



3.2 Category and organisation

Once all the literature was reviewed and the key concepts, ideas, and themes were identified, the material was organised into categories. A categorical approach was used, which involves allowing categories to emerge from the data rather than imposing preconceived categories. The categories were selected and organised based on common and contested findings, significant trends, and influential theories. As noted by Creswell's and Creswell’s (2018), organising materials based on common themes and emerging categories is an effective way to synthesise and analyse the literature. The documents were arranged under three subheadings: "Reverse logistics”, “Sustainable practices" and "Customer satisfaction". When the categories were identified, a review of the different articles' focus and findings were made and comparing them for similarities and differences.

3.3 Material evaluation

As noted by Creswell and Creswell (2018), it is important to evaluate the quality and credibility of the sources as part of the process of selecting relevant materials for the

literature review. In this section, several criteria are presented for selecting the sources for the results. Selections have been made in accordance with a source review instrument that considers four factors: currency, relevance, authority, accuracy, and purpose (CRAAP) (University of the West of Scotland, 2022).

Currency; Our assessment of currency is based on whether the information presented in the source is both up-to-date and relevant to our research questions. Based on our findings, it seems that the 2000s are particularly relevant to these research questions, which is why we examined sources over a longer time period.

Relevance; The relevance of the sources has been determined by assessing whether it is relevant to the research questions or topic being investigated. We evaluated the relevance of the sources in light of factors such as the scope of the sources, the intended audience, and the relevance of the sources to the study in general.

Authority; The credibility and expertise of an author or publisher have been considered when evaluating the authority of a source. As part of this evaluation, the author's qualifications, institutional affiliations, and reputation within the field have been examined. Furthermore, the reputation and history of the publisher in producing high-quality academic publications have been examined.

Accuracy; The accuracy of a statement has been demonstrated by citing sources that have been fact-checked and verified by experts in the relevant field. The objective of maintaining the standard of accuracy is to ensure the credibility, reliability, and validity of the findings of our research study.

Purpose; The reason for creating or publishing the source has been evaluated. According to this criterion, a source must provide objective and unbiased information, rather than being biased or promoting a particular agenda or ideology. Further, the purpose criteria evaluate whether the source meets the specific needs of the research project or question. The purpose of the publication has been evaluated in light of the intended audience, the type of publication or format, and the language and tone used.

4. RESULTS

The following section summarises the literature review results. The selected articles from the literature review are discussed and analysed in this section to provide a comprehensive overview.

4.1 The Importance of Supply Chain Innovations in Sustainable Reverse Logistics Operations

Based on a systematic literature review conducted by Nilsson and Göransson (2021), critical factors were identified for achieving sustainable supply chain innovations, including the incorporation of sustainability into reverse logistics operations. Taking a holistic view of value chains and addressing their sustainability challenges on a systemic level is suggested by the authors to develop sustainable supply chains. In addition, Panigrahi et al. (2019) emphasises the importance of sustainable supply chain management, including the use of green logistics and reverse logistics as methods for reducing waste generation.
Arman and Mark-Herbert's (2021) article on re-commerce highlights the possibilities of a circular economy in reverse logistics. As a result of re-commerce, the authors argue that

reverse logistics can reduce the environmental impact by promoting reuse and reducing waste generation, which is consistent with Cao's (2021) exploration of the management of end-of-life clothing, as well as the importance of sustainable reverse logistics practices such as recycling and upcycling to reduce fashion industry waste. According to Li et al. (2022), reverse logistics plays a critical role in e-commerce businesses, and it is imperative that e-commerce businesses develop effective reverse logistics strategies to reduce environmental impact and enhance customer satisfaction as online shopping and returns increase. As Arman and Mark-Herbert (2021) point out, the use of technologies can also increase consumer trust and confidence in re-commerce and reverse logistics operations. A lack of customer awareness and acceptance was identified as one obstacle to sustainable practices in reverse logistics by Pal et al. (2019) as part of their exploration of circular fashion supply chain management.

The article by Abideen et al. (2021) provides an in-depth analysis of the current state of research on the use of technology in circular supply chains as a basis for developing circular business models. According to the authors, technology can facilitate circularity in supply chains in several ways, including using advanced analytics, blockchain, and artificial intelligence, among others. By tracking products through the supply chain, enabling the reuse and recycling of materials, and reducing waste, these technologies can enable more sustainable practices in reverse logistics. A particular emphasis is placed on integrating circular economy principles into the design and implementation of these technologies, as well as the importance of collaboration and coordination among stakeholders. Additionally, Abideen et al. 's (2021) review highlight the potential benefits of circular business models, including cost reduction, increased efficiency, and better environmental results. Using technology to create circular supply chains, businesses can transition away from traditional linear models and towards more sustainable practices that protect the environment and conserve resources.

4.2 Framework and business models for improving reverse logistics sustainability in supply chains

The literature review shoes several different frameworks to implement sustainable practices in reverse logistics as presented in Table 1. Pal (2017) examines the value created through reverse logistics in used clothing networks, focusing on the benefits of recycling and repurposing used clothing. The authors highlight the importance of sustainability in reverse logistics operations and argue that businesses can create value by adopting sustainable practices. They investigated value creation through reverse logistics in used clothing networks and found that customer satisfaction plays a significant role in the decision to return products. They suggested that satisfied customers are less likely to return products, and it can increase the overall profitability of reverse logistics. In addition, Ahlström et al. (2020) examine reverse logistics in textiles but focus on developing performance indicators to measure the effectiveness of reverse logistics operations. The authors argue that such indicators can help businesses to identify areas for improvement and to implement more sustainable practices. Furthermore, when developing performance indicators for reverse logistics, the authors noted that customer satisfaction is one of the crucial factors affecting the success of reverse logistics. Based on the findings of these studies, different frameworks regarding sustainable practices in reverse logistics can be developed as shown in Table 1. It has been demonstrated that circular economy business models, re-commerce promotion, and

re-designing reverse logistics networks can lead to a greater level of sustainability in the fashion industry (Hultberg & Pal, 2021; Arman & Mark-Herbert, 2021)

Natural resource-based view; The conceptual framework presented by Rotimi et al. (2021) in the article is known as the natural resource-based view (NRBV). As part of the NRBV, practices are included that are relevant to securing sustained competitive advantages. As a first step, education and engagement are essential components of the other practices of the framework. For recycling to be successful, customer education regarding the end-of-life cycle of clothing is essential. The second practice involves recovering and redistributing, reusing, and recycling. Clothing can be reused, recycled, or recovered and repurposed almost in every case. It is possible to recycle worn-out or ripped clothes into fibres that can be used as fillings in other industries, such as mattresses and automotive interiors. It may be possible to prevent clothes from being disposed of in landfills by educating and engaging customers in this area. Additionally, education and engagement extend to consumers, retailers, and broader supply chain agents, which is the third practice in this framework. Retailers play a crucial role in this framework by retrieving used clothing and working with other supply chain agents to recycle it and find sustainable alternatives. According to this conceptual model, in order to achieve sustainable competitive advantage within the fashion industry, strategic capabilities for end-of-life garments need to be considered. By implementing these practices, the fashion industry is able to overcome the challenges associated with reclaiming waste, converting it into resources, reducing waste sent to landfills, and gaining a sustained competitive advantage (Rotimi et al., 2021).

Access-based economy model; Baden and Frei (2022) argue that product returns present an opportunity for fast fashion businesses to shift towards an access-based economy, where consumers pay for access to products rather than owning them outright. This model can help reduce waste and increase the lifespan of products, but its implementation requires significant changes in business models and consumer behaviour. A circular economy strives to extend the life of a product by reusing, refurbishing, and recycling it as long as possible (Baden & Frei, 2022).

Circular supply chain model; The article by Pal and Sandberg (2017) examines the potential for sustainable value creation through new industrial supply chains in the apparel and fashion industry. The authors argue that traditional linear supply chains in the fashion industry, which are characterized by a take-make-dispose model, are not sustainable and have negative environmental and social impacts. Therefore, the authors propose the development of new circular supply chains in the fashion industry to create sustainable value. The authors argue that sustainable value creation requires a fundamental shift in the industry's business model, moving away from the traditional linear model to a circular one.

Hybrid circular economy framework; Jain et al. (2021) proposed a framework for a closed-loop hybrid business model to improve the efficiency of used clothes recycling systems. The closed-loop business model involves the collection, sorting, cleaning, and reselling of used clothing. The authors suggest that this model can create shared value by providing affordable clothing, reducing waste, and creating employment opportunities. The authors argue that a streamlined structure of clothing consumption systems and the adoption of sustainable practices can improve the circularity of fashion supply chains.

Circular business models; A circular economy model aims to reduce waste and promote resource reuse and recycling to make the products and material to stay longer in the loop. According to Coscieme et al. (2022), to develop and scale circular business models successfully, a must is to align different types of technical, social, and business-model innovation, supported by policy initiatives that change consumer behaviour. In their framework, the authors present these critical elements of transforming a system into a tool for systematically analysing circular business models. Through the mapping of innovations and enablers, the framework can be used to define coherent strategies for textile collection and resale from distribution to the end-of-life stage. They contend that sustainable supply chain innovations can facilitate the transition from a linear economic model to a circular economy model.

Hultberg and Pal (2021) propose a conceptual model for the scalability of circular economy business models in the fashion retail value chain. The authors argue that circular business models can improve the efficiency and sustainability of fashion supply chains and provide a competitive advantage for businesses. The authors propose a conceptual model that involves designing circular products, implementing circular supply chains, and developing circular business models. The authors suggest that this model can lead to increased profitability, reduced environmental impact, and improved social outcomes.

Table 1. *Frameworks suggested in the literature for the implementation of sustainable practices*

Framework	Sources	Description
Natural resource-based view	Rotimi et al. (2021)	As part of a conceptual framework for sustainable practices at the garment end of the lifecycle, they propose recycling, upcycling, and reusing clothes. Nevertheless, these practices must be implemented in cooperation with various stakeholders in the supply chain, and more research is required on their economic feasibility and practicality.
Access-based economy model	Baden and Frei (2022)	As an alternative to purchasing a product, access-based business models allow customers to borrow or rent it. Customers' needs, business success, and sustainability are being aligned through the use of this model.
Circular supply chain model	Pal and Sandberg (2017)	The circular supply chain model involves reusing and recycling materials and products, thereby reducing waste and extending the lifespan of products.
Hybrid Circular Economy framework	Jain et al. (2021)	A framework for used clothes recycling systems is within the scope of the Hybrid Circular Economy. It emphasizes the importance of creating shared value by providing affordable clothing, reducing waste, and creating employment opportunities.
Circular business models	Coscieme et al. (2022); Hultberg and Pal (2021)	Circular business models for fashion and textiles involving technical and social innovation, which are key components of sustainable fashion planning.

4.3 Drivers of sustainable practices: Motivations and barriers for implementing sustainable practices

To implement sustainable practices in reverse logistics, several barriers exist where the different sources of information align, as shown in Table 2. The lack of awareness,

understanding, and guidelines regarding sustainability hinders the incorporation of sustainable practices into reverse logistics operations by fashion companies (Meherishi et al., 2021; Fung et al., 2020). According to Fung et al. (2020), consumers lack trust in sustainable fashion because of its low visibility; thus, designers and manufacturers need to understand sustainable practices. Including consumers in the analysis is essential to establishing a shared vision and transparent guidelines for the company and its supply chain partners (Thöni & Tjoa, 2017; Fung et al., 2020). In online retailing, Nguyen et al. (2018) found that sustainability is a significant factor influencing consumer behaviour. According to them, companies can leverage this motivation in order to gain an edge over their competitors. Moreover, implementing sustainable practices can be expensive, which may deter companies from adopting them (Fung et al., 2020). In addition, retailers have little incentive to change their business models if consumers continue to demand low-priced products in large quantities (de Aguiar Hugo et al., 2021).

The implementation of sustainable reverse logistics practices by companies is motivated by a variety of factors, including environmental concerns, cost reductions, social responsibility, regulatory compliance, and consumer demands for sustainable products (Yang et al., 2017; Roberts et al., 2023; de Aguiar Hugo et al., 2021; Thöni &Tjoa, 2017). Regulatory pressures, environmental concerns, and financial incentives all play a critical role in motivating organizations to adopt sustainable reverse logistics practices (Panigrahi et al., 2019). Laws and regulations that are outdated and hinder sustainable practices in supply chains must be updated. Government regulations are necessary to reduce environmental impacts (Panigrahi et al., 2019). To address the barriers to implementation, Fung et al. (2020) suggest that supply chain partners can collaborate to develop sustainable planning strategies that incorporate environmental, social, and economic factors, such as using sustainable materials and implementing circular economy models to reduce waste production. As identified by both Bozzi et al. (2022) and Pal and Sandberg (2017), the lack of awareness and knowledge about the benefits of reverse logistics is a significant barrier to the implementation of sustainable practices. Legal requirements and technical challenges can also pose significant obstacles to sustainable reverse logistics practices. Furthermore, Bozzi et al. (2022) point to inadequate infrastructure and inadequate funding as significant obstacles.

Among the factors identified by Meherishi et al. (2021), sustainable practices are essential for product and packaging decisions, with motivations such as cost savings, customer satisfaction, and regulatory compliance identified, as well as barriers such as inadequate infrastructure and lack of consumer awareness. Morashti et al. (2022) examine the issue of sustainable packaging and identify barriers such as the cost of sustainable packaging, the lack of knowledge and education, the lack of support from regulatory authorities and guidelines, the lack of technological infrastructure, and the absence of standards. Further, the author highlights a concern regarding consumers' perceptions of plastic, since this material tends to attract the most criticism, and therefore, businesses may shift to alternative packaging that is not always environmentally friendly. Alizadeh-Basban and Taleizadeh (2020) and Morashti et al. (2022), identify barriers that include the difficulty of coordinating reverse logistics activities with suppliers, retailers, and customers, as well as the high implementation costs. The lack of collaboration between supply chain partners can hinder efforts to implement sustainable practices throughout the reverse logistics process (Meherishi et al., 2021). Nevertheless, Meherishi et al. (2021) suggest that firms can overcome barriers by taking into

consideration the entire supply chain when making product and packaging decisions. Abbasi (2017) identifies motivations as improving reputation and complying with regulatory requirements, while also highlighting obstacles such as a lack of stakeholder engagement, limited resources, and competing priorities. Bag et al. (2020) propose that businesses can minimise losses, mitigate risks, and meet demand and supply requirements in fashion by utilizing smart management of available resources within reverse logistics. This can result in more satisfied customers, a more sustainable business environment, and drive business growth. It is also possible for businesses to gain a competitive edge by enhancing their remanufacturing and green manufacturing capabilities.

A lack of employee education and incentives for sustainable behaviour can impede the implementation of sustainable practices in reverse logistics, according to Adam (2018). By investing in employee training and motivation, retailers can cultivate a more sustainable culture within their organizations and improve their sustainability performance. Brandenburg and Rebs (2015) and Yang et al. (2017), emphasize the importance of environmental and social concerns, regulatory pressures, and collaboration among supply chain partners as drivers of sustainable supply chain management. However, there are challenges facing retailers due to the absence of government policies and incentives. Businesses should consider the potential advantages of implementing sustainable practices, such as increased customer loyalty and reduced supply chain risks when balancing short-term costs with long-term benefits. Wong and Ngai (2021), indicate that for businesses to implement sustainable practices in reverse logistics, especially in the fashion industry, they must be motivated by environmental goals and values. As a result of fast fashion trends, a limited supply of sustainable materials, and a lack of consumer awareness, the fashion industry faces several challenges (de Aguiar Hugo et al., 2021). Even so, Thorisdottir and Johannsdottir (2020) conclude that CSR can motivate businesses to adopt sustainable practices in the fast-fashion industry, such as the use of sustainable materials, to improve their reputation, attract environmentally conscious consumers, and reduce their environmental impact. Similarly, Garcia-Torres et al. (2017) state that the demand for increased CSR has forced fast fashion companies to accelerate their search for sustainability, which incorporates all three dimensions of economic, social, and environmental sustainability.

According to Garcia-Torres et al. (2017), the main barriers to adopting sustainable practices in the fast-fashion industry include a lack of transparency and communication between stakeholders, differing perceptions of sustainability, and insufficient incentives and regulatory pressure. Although there are obstacles to adopting sustainable practices, implementing these practices can have long-term benefits. These benefits include improved reputation, customer loyalty, and cost savings. Similarly, Sarkis (2012) emphasises that green supply chain management can improve environmental performance, risk management, and financial performance.

By leveraging technology to create circular supply chains and circular business models that incorporate sustainable practices, the fashion industry can play a significant role in promoting sustainable reverse logistics practices (Coscieme et al., 2022). Using information technology, such as decision support systems and enterprise resource planning, can contribute to the development of sustainable practices (Thöni & Tjoa, 2017). A well-developed IT infrastructure can assist in implementing sustainable practices effectively, as well as collaboration between supply chain partners, however a lack of information technology

infrastructure may hinder the tracking and monitoring of reverse logistics processes (Thöni & Tjoa, 2017). While consumer behaviour (Hjort & Lantz, 2012), logistics management performance measures (Wudhikarn et al., 2018), facility location (Ghadge et al., 2016), and handling customer returns (Hjort et al., 2019; Lysenko-Ryba & Zimon, 2021) are not directly motivating or prohibiting the implementation of sustainable practices, these factors can indirectly affect their implementation.

Table 2. *Motivations and Barriers for implementing sustainable practices*

Drivers	Motivations	Barriers	Sources
Environmental concerns	Adoption of sustainable practices. Appropriate policy responses to encourage sustainable practices. Collaboration among supply chain partners. Firms must be motivated by their environmental goals and values to implement sustainable practices. Government regulations.	Lack of awareness, knowledge, and skills.	Panigrahi et al. (2019); Cullinane et al. (2019); Roberts et al. (2023); de Aguiar Hugo et al. (2021); Meherishi et al. (2021); Fung et al. (2020); Roberts et al. (2023); Bag et al. (2020); Coscieme et al. (2022); Thöni and Tjoa (2017); Wong and Ngai (2021); Adam (2018); Sarkis (2012)
Cost reduction	Financial benefits.	Lack of resources. High implementation costs before reaching cost reduction.	Panigrahi et al. (2019); Cullinane et al. (2019); Sarkis, (2012); Meherishi et al. (2021); Fung et al. (2020); Nguyen et al. (2018); Abbasi (2017); Brandenburg and Rebs (2015)
Social responsibility	Environmental impact reduction. Knowledge sharing and communication. Investing in employee education and incentives for sustainable behaviour. Social responsibility awareness among consumers	Cultural barriers within the organisation. Lack of awareness and education. A limited amount of research has been conducted on social sustainability in supply chains	Sarkis (2012); Pal and Sandberg (2017); Adam (2018); Brandenburg and Rebs (2015); Yang et al. (2017); Thöni and Tjoa (2017)
Regulatory compliance	Compliance with regulations and policies. Businesses are obligated to comply with environmental and ethical standards. All companies are subject to the same terms and conditions.	Lack of standards and certifications. Stakeholder resistance, technical challenges, and legal requirements. Can limit an organisation's economic performance. In order to comply with legislation, businesses may need to change their supply chain models.	Panigrahi et al. (2019); Yang et al. (2017); Roberts et al. (2023); Pal and Sandberg (2017); Meherishi et al. (2021); Abbasi (2017); Aguiar Hugo et al. (2021)
Consumer demand	Adoption of sustainable practices. Implementing recycling programs, product take-back initiatives, and the use of sustainable materials.	Lack of transparency and communication between stakeholders. Consumer demand for cheap clothing and returns poses a barrier to	Yang et al. (2017); Peleg Mizrachi and Tal (2022); Garcia- Torres et al. (2017); Thöni and Tjoa (2017); Nguyen et al. (2018); Meherishi et al. (2021); Bag

	Increasing public awareness, understanding and demand for sustainability.	implementing sustainable practices.	et al. (2020); Panigrahi et al. (2019)
Circular economy business models	Opportunities for scaling up sustainable practices. Reduce the amount of waste.	Inadequate infrastructure and funding, lack of collaboration across the supply chain.	Hultberg and Pal (2021); Coscieme et al. (2022); Baden and Frei (2022); de Aguiar Hugo et al. (2021)
Re-commerce	Promotion of circular economy. CSR can motivate companies to implement sustainable practices, such as product take-back initiatives and the use of sustainable materials.	Fast fashion trends, lack of consumer awareness, and limited supply of sustainable materials.	Arman and Mark-Herbert (2021); Bozzi et al. (2022); de Aguiar Hugo et al. 2021); Thorisdottir and Johannsdottir (2020); Bag et al. (2020)
Redesigning sustainable revers logistics networks	Closing the loop in uncertain supply chains.	Lack of data and metrics to measure sustainable practices' environmental and social impacts. Difficulties in coordinating reverse logistics activities with suppliers, retailers, and customers, and the high cost of implementation.	Yang et al. (2017); Alizadeh-Basban and Taleizadeh (2020); Bag et al. (2020)
Supply chain innovations	Advancement of sustainable supply chain innovations. Collaboration among supply chain partners, involving trust, communication, interdependence, and knowledge sharing.	Lack of collaboration across the supply chain Inadequacies in information technology infrastructure. Lack of knowledge.	Nilsson and Göransson (2021); Fung et al. (2020); Brandenburg and Rebs (2015); Thöni and Tjoa (2017)
Implementation of sustainable packaging practices	Consumer awareness, government policies and reduced environmental impact. Innovations within the industry. Development of environmentally friendly materials in the industry. Companies can increase their profits by reducing packaging usage.	Lack of awareness and education, high initial investment cost, lack of regulatory support, inadequate technological infrastructure, and lack of standardisation.	Morashti et al. (2022); Meherishi et al. (2021)
Technology	Product and supplier sustainability can be enhanced through IT-driven processes. New innovations to support sustainability in reverse logistics. Businesses in the fashion industry adopt technologies that reduce their environmental impact.	Inadequate technological expertise contributes to the challenge of developing internal recycling policies. There is limited research on how technology can impact sustainability in supply chain management.	Aguiar Hugo et al. (2021); Thöni and Tjoa (2017); Coscieme et al. (2022)

4.4 Application of sustainable practices in the fashion industry

Adam (2018) highlights the role of human resource management in the implementation of sustainable product-service systems (PSS) in the fashion industry. PSS involves a shift from the traditional linear model of production and consumption to a circular model, where products are designed for reuse, recycling, or remanufacturing. The adoption of PSS requires a significant investment in research and development and a strong commitment to sustainability from all stakeholders in the supply chain.

Bozzi et al. (2022), discusses the need for retailers to use data analytics to map the returns process. This will enable them to understand the product journey from the consumer back to the retailer. By understanding the returns process, retailers can identify areas where they can improve their sustainability practices and reduce their environmental impact. The authors suggest that e-commerce retailers can use data analytics to identify trends in returns, such as the most commonly returned items or the reasons why customers return products.

A comprehensive overview of sustainable practices that can be implemented within the fast fashion industry supply chain is provided in Table 3. Presented in Table 3 are 15 different sustainable practices along with their respective descriptions, advantages, and disadvantages.

Table 3. *Sustainable practices that can be applicated in the fast fashion industry*

Sustainable Practices	Description	Advantages	Disadvantages	Sources
Extended Producers Responsibility	Producers take responsibility for the entire lifecycle of a product, including post-consumer waste management.	Reduces environmental impact, conserves resources, encourages producers to design products with a longer lifespan and encourages them to adopt a closed-loop system.	Can lead to increased costs for producers, which may be passed on to consumers.	Bozzi et al. (2022); Yang et al. (2017); Rotimi et al. (2021); Morashti et al. (2022); Sarkis (2012); Panigrahi et al. (2019)
Sustainable Packaging	Packaging that has a lower environmental impact, reusable, or recyclable.	Reduces waste and environmental impact. Enhances brand image, meets consumer demand for sustainability.	May require additional costs for materials and production, may require changes in supply chain infrastructure.	Morashti et al. (2022); Li et al. (2022); Meherishi et al. (2021)
Take-Back Programs	Retailers accept returns and recycle or resell the products. Providing return areas.	Reduces waste and can generate revenue from reselling. In exchange for vouchers for future purchases, consumers are encouraged to recover and recycle their end-of-lifecycle garments.	Can be costly for retailers to implement and may require a change in business model. It is not guaranteed that recycled or reused items will not be disposed of in landfills by their subsequent owners. May be misleading, as consumers are offered vouchers to dispose of their textile waste in collection bins, which can lead to increased	Rotimi et al. (2021); Cullinane et al. (2019); Risberg (2023); Adam (2018); Pal et al. (2019)

			purchases and consequently an increase in textile waste generation.	
Circular Business Models	Business models that prioritise resource efficiency, waste reduction, and closed-loop systems.	Reduces waste, creates new revenue streams, and can improve brand reputation.	Can require significant investment and may require a change in business model.	Baden and Frei (2022); Coscieme et al. (2022); Hultberg and Pal (2021); Jain et al. (2021); Pal et al. (2019)
Sustainable Supply Chain Management	Managing supply chains to minimise environmental impact and prioritise sustainability.	Reduces waste, improves efficiency, and can improve brand reputation.	Can be challenging to implement and may require significant investment.	Fung et al. (2020); Thorisdottir and Johannsdottir (2020); Garcia-Torres et al. (2017)
Eco-Friendly Materials	Using materials that has a lower environmental impact, such as organic cotton or recycled fabrics.	Reduces environmental impact and can improve brand reputation.	Can be more expensive than traditional materials.	Bozzi et al. (2022); Pal and Sandberg (2017); Rotimi et al. (2021); Fung et al. (2020), Coscieme et al. (2022); Pal et al. (2019)
Green Logistics	Using sustainable transportation methods, such as electric or hybrid vehicles, to transport products.	Reduces environmental impact and can improve efficiency.	Can be more expensive than traditional transportation methods. May require additional investment in equipment and infrastructure. May require changes to supply chain processes and relationships.	Fung et al. (2020); Abideen et al. (2021); Alizadeh-Basban and Taleizadeh (2020); Brandenburg and Rebs (2015)
Sustainable Human Resource Management	Human resource policies that prioritise sustainability and ethical practices, such as fair labour practices and employee training on sustainability.	Improves employee morale and can improve brand reputation.	Can require a change in organisational culture and may be challenging to implement.	Adam (2018)
Donation Programs	Retailers donate returned items to charitable organisations or other beneficiaries instead of disposing of them.	Reduces waste, helps people in need and can improve brand reputation.	Can be costly for retailers to implement and may require a change in business model. May require additional costs for logistics and storage, may not be suitable for all products. It is not guaranteed that recycled or reused items will not be disposed of in landfills by their subsequent owners.	Thorisdottir and Johannsdottir (2020); Rotimi et al. (2021); Jain et al. (2021); Yang et al. (2017); Pal et al. (2019)
Remanufacturing	A process of refurbishing used products to their original specifications and	Reduces waste, conserve resources, reduces manufacturing costs, creates new jobs.	Requires a complex and expensive reverse logistics system, may result in	Rotimi et al. (2021); Alizadeh-Basban and Taleizadeh (2020); Pal (2017);

	performance standards.		lower quality products.	Coscieme et al. (2022); Meherish et al. (2021); Panigrahi et al. (2019); Ahlström et al. (2020); Abideen et al. (2021); Pal et al. (2019)
Upcycling	A process of converting waste materials into new products of higher quality or value.	Reduces waste, creates new revenue streams, encourages innovation in product design.	May require additional costs for logistics and production, may result in higher prices for consumers.	Rotimi et al. (2021); Coscieme et al. (2022); Cullinane et al. (2019); J ain et al. (2021); Pal et al. (2019)
Reverse logistics optimization	Use of technology and data analysis to optimise reverse logistics processes.	Reduces costs, improves efficiency, enhances customer satisfaction, reduces environmental impact.	May require significant investment in technology and personnel, may require changes in supply chain infrastructure.	Bozzi et al. (2022), Fung et al. (2020); Brandenburg and Rebs (2015); Alizadeh-Basban and Taleizadeh (2020); Pal (2017); Li et al. (2022); Panigrahi et al. (2019); Abideen et al. (2021); Risberg (2023); Morashti et al. (2022); Hjort et al. (2012); Sarkis (2012)
Closed-loop supply chain	A supply chain model that integrates reverse logistics and remanufacturing processes into the production cycle.	Reduces waste, conserves resource, improves product quality and durability, creates new revenue streams.	May require significant investment in technology and personnel. May require changes in supply chain infrastructure. May require changes in consumer behaviour and business practices.	Abideen et al. (2021); Sarkis (2012); Brandenburg and Rebs (2015); Fung et al. (2020); Jain et al. (2021); Rotimi et al. (2021); Panigrahi et al. (2019)
Refurbishing	The process of restoring used products to a like-new condition, but not necessarily the original condition.	Reduces waste and conserves resources. Can provide cost savings and can extend the life of a product. Reduces the need for new products to be produced, thus conserving natural resources. Creates job opportunities in repair and refurbishing industries	May require specialised equipment and expertise and can therefore be expensive. Can be difficult to control the quality of the finished product. May not be financially viable for all products or industries.	Pal (2017); Fung et al. (2020); Abideen et al. (2021); Panigrahi et al. (2019); Hjort et al. (2019); Mizrachi et al. (2022); Coscieme et al. (2022); Ahlström et al. (2020); Meherishi et al. (2021); Alizadeh-Basban and Taleizadeh (2020); Pal et al. (2019)
Recycling	The process of converting waste materials into new products.	Reduces waste and conserves resources. Can provide cost savings.	May require significant energy to process and transport materials.	Peleg Mizrachi and Tal (2022); Pal (2017); Baden and Frei (2022);

			Some materials may not be easily recyclable. May require significant investment in collection, sorting, and processing infrastructure. May not be financially viable for all products or industries.	Fung et al. (2020); Sarkis (2012); Coscieme et al. (2022); Thorisdottir and Johannsdottir (2020); Morashti et al. (2022); Cano et al., (2022); Cullinane et al. (2019); Yang et al. (2017); Bozzi et al. (2022); Rotimi et al., (2021); Arman and Mark-Herbert (2021); Abideen et al. (2021); Ahlström et al. (2020); Panigrahi et al. (2019); Pal and Sandberg (2017); Pal et al. (2019)

4.5 Customer satisfaction in reverse logistics: Factors influencing satisfaction and loyalty

Lysenko-Ryba and Zimon (2021) examined customer behaviour in response to negative product returns and found that negative experiences such as high return costs, unclear return policies, and a lack of communication with retailers can negatively impact customer satisfaction. Further, the authors indicated that both satisfied and dissatisfied customers will tell their friends about their experience. Dissatisfied customers, however, were more likely to write reviews or post about it on social media. Consequently, Hjort et al. (2019) explore the use of avoidance activities to limit overused returns by consumers. The authors further discuss practices for managing consumer returns in internet retailing and suggested that customer-centric practices such as transparent return policies, easy-to-use return processes, and responsive customer service can help improve customer satisfaction. Sustainable practices in reverse logistics can also have a positive impact on customer satisfaction and return rates. Yang et al. (2017) conducted a systematic literature review of sustainable retailing in the fashion industry and concluded that in order to promote sustainable practices in reverse logistics, customers must be educated and made aware of sustainable alternatives.

Using a comparison of planned and unplanned returners, Rintamäki et al. (2021) examine the perceptions of customers regarding the return of items purchased online. The authors find that planned returners tend to be more satisfied with their return experience and more likely to make repeat purchases. However, unplanned returners are more likely to experience negative emotions, resulting in reduced customer satisfaction and a lower likelihood of repeat purchases. Meherishi et al. (2021) focus on the integration of product and packaging decisions with secondary packaging returns and protective packaging management. The authors propose a mathematical model to optimise packaging decisions and reduce the environmental impact of reverse logistics operations. They suggested that designing products and packaging that are easy to return and managing secondary packaging effectively can improve customer satisfaction.

An analysis of the dynamics of returns and their impact on customer loyalty by Stöcker et al. (2021) provides insights into online fashion retail returns from a customer's perspective. The authors found that high levels of returns can have a negative impact on customer loyalty. However, businesses can mitigate this effect by adopting transparent and customer-friendly returns policies to improve customer satisfaction. The authors found that customer satisfaction with the return process contributes significantly to repeat purchases and customer loyalty. Cullinane et al. (2019) state that consumers should have access to significantly improved product information, as well as be charged an economical return fee in order to reduce returns and environmental impact. Customers who are confident about a company's return policy are more likely to remain loyal to that company and shop there more often. According to the authors, return policies play a significant role in purchase decisions when it comes to online shopping. The authors also state that increased online shopping practices have led to higher demands regarding the delivery and return of products. Customer satisfaction is a key determinant of businesses success, as it leads to higher revenues and profitability.

Martínez-López et al. (2022) investigate the use of return credits in e-commerce in order to decrease returns and enhance customer satisfaction. They argue that return credits can be a powerful tool for reducing returns, and for improving customer satisfaction and increasing customer loyalty. According to existing knowledge, a stricter refund policy for returned products would mean a lower probability of return. However, the authors compared customers operating on different restrictive levels of credit amount for handling returns, and consumers' intentions to keep purchases didn't differ significantly. In both scenarios, participants in their study indicated moderate intentions to keep non-satisfactory purchases. In a context where there is a more restrictive return policy, consumers should be more inclined to keep them since they have less flexibility to return without incurring a fee. An explanation for this finding may be rooted in the fact that, if consumers are provided with a low amount of credit in exchange for returning a product, they may make fewer purchases from the site in the future to prevent being served a penalty for future returns.

5. DISCUSSION

Incorporating sustainable practices into reverse logistics operations is an opportunity for fast fashion e-commerce businesses to reduce their environmental impact. The achievement of this goal can be accomplished through the use of several strategies. Table 3 presents a variety of sustainable practices applicable to the fast fashion industry's supply chain. Based on the literature provided in this study, the table illustrates that some of these sources support the same practices.

Fast fashion e-commerce has gained significant attention in recent years due to its potential to disrupt the traditional retail industry (McCormick et al., 2014). Sustainable reverse logistics has emerged as a potential solution to mitigate these negative impacts, as it enables the recovery, reuse, and recycling of products while reducing waste and environmental pollution (Morashti et al., 2022; Yang et al., 2017). Despite the potential benefits of sustainable reverse logistics, there is a lack of understanding regarding the motivations and barriers to implementing sustainable practices in reverse logistics in the fast fashion e-commerce industry (Garcia-Torres et al., 2017; Sarkis, 2012). In order to ensure that sustainable practices are implemented in supply chains, outdated laws, and regulations must be updated

(Panigrahi et al., 2019). Through policies and regulations that encourage or even mandate environmental responsibility, we see that governments play a critical role as a driver in motivating sustainable practices. However, this is not a suggestion as to how companies may improve their sustainability, rather it is an important factor that can help them move forward in this area. It is possible for governments to foster innovation through the creation of a supportive legal environment, incentivise the adoption of sustainable practices, and provide level playing fields for businesses that engage in sustainable reverse logistics practices.

As a result of incorporating design principles that have a lower environmental impact and using sustainable materials for both the product and its packaging. Further, companies can create products and packages that are easier to recycle or reuse, which will reduce the amount of waste generated as a result of returning items. The literature primarily discusses the materials used in packaging and the methods that can be used to recycle them. Yet, we began to contemplate whether it might be possible to manufacture packages in such a way that they could be reused for subsequent orders if a product is returned. Additionally, while there has been some research on sustainable packaging in the fashion industry, there is still a need for more comprehensive studies that take into account the entire supply chain and the role of reverse logistics in promoting sustainability (Morashti et al., 2022)

The literature discusses the benefits of donation programs as a sustainable practice. As shown in Table 3, the authors contend that it can reduce waste and provide assistance to those in need, but it may be cost-prohibitive for companies. The impact, however, may also be negative in other ways. It is important to note that donation programs may also be utilised for the disposal of broken products. Suppose companies donate a large quantity of clothes to developing countries, but the products are not in proper condition. As a result, these donations will be more burdensome than beneficial. It is also possible for donations to disrupt local markets and affect local production as well. A method like this may provide companies with favourable publicity for donating clothing, but instead causes more difficulties in developing countries. IT infrastructure can play a crucial role in the implementation of sustainable practices in reverse logistics, as discussed by Thöni and Tjoa (2017). In order to achieve sustainable reverse logistics, it is also essential for supply chain partners to collaborate. By facilitating communication, data sharing, and coordination among stakeholders, innovations, and technology enable efficient collaboration. We see that in order to optimise decisions regarding recycling, refurbishing, or reusing returned items, data on product characteristics, condition, and disposition options should be shared. By encouraging collaboration, technology facilitates the implementation of sustainable supply chain practices by bridging the gap between individuals involved in reverse logistics.

In the context of fast fashion e-commerce, we have noticed from the literature that there are a few factors that indirectly influence the implementation of sustainable practices in reverse logistics. The adoption of sustainable practices may not be directly motivated or prohibited by consumer behaviour, logistics management performance measures, facility location, or handling customer returns, but they can play an important role in defining the overall context and feasibility of sustainability initiatives (Hjort & Lantz, 2012; Wudhikarn et al., 2018; Ghadge et al., 2016; Hjort et al., 2019; Lysenko-Ryba & Zimon, 2021). Fast fashion e-commerce businesses need to understand and address consumer behaviour, align logistics performance measures with sustainability objectives, determine the location of their facility

for environmental efficiency, and optimise the return process for customers. Taking steps to mitigate their environmental impact can be achieved by addressing these indirect factors.

In this paper, we have outlined some frameworks in Table 1 from the literature, that aim to improve sustainability, that we believe can be applied to the reverse logistic supply chain in fast fashion. It is our belief that by implementing any of these frameworks, companies can become more sustainable in their operations. A variety of business models or frameworks can be implemented for managing returns in order to minimise the environmental impact of reverse logistics. Collaboration and education are important factors that we have found from the literature provided in this study. The promotion of sustainability through education and awareness campaigns is an effective way to engage customers, suppliers, and other stakeholders. It is also possible to reduce the frequency of product returns by collaborating with suppliers to improve product quality and durability. As demonstrated by Rotimi et al. (2021) in their framework (NRBV), businesses should strive to secure their competitive advantage through education and engagement. It is notable, however, that for a literature review with many sources, surprisingly few frameworks are mentioned in the documents. There is still a lot of research on the subject, but not enough on frameworks. Possibly, this is due to the difficulty in generating general frameworks within fast fashion that can be used by a variety of companies due to the complexity of the issue.

Thorisdottir and Johannsdottir (2020) discuss the need for further research regarding the impact of CSR on sustainability in the fashion industry. The authors highlight that CSR is one of many drivers that can motivate sustainable practices While CSR has become increasingly popular in the industry, there is a lack of awareness of how they impact sustainability practices, such as reverse logistics. In order to figure out how CSR initiatives and sustainable reverse logistics are related, how fast fashion e-commerce can use specific technologies to support sustainable reverse logistics, and the potential for access-based economies through returns, more research is needed in our opinion. In the fast fashion e-commerce sector, there are research gaps that provide opportunities for the advancement of knowledge and practice in sustainable reverse logistics. In addition, there is a research gap regarding the opportunity to shift towards an access-based economy through the return of products, as discussed by Baden and Frei (2022). This involves redesigning business models to focus on product access rather than ownership. This can potentially reduce the environmental impact of reverse logistics in the fast fashion e-commerce industry. Despite this, limited research has been conducted on how to facilitate this shift as well as how it might affect customer satisfaction.

Customer satisfaction can be positively impacted by the implementation of sustainable practices in reverse logistics. As consumers become increasingly aware of the environmental impact of their purchase decisions, they seek brands that align with their values (Yang et al., 2017; Nilsson & Göransson 2021). As Garcia-Torres et al. (2017) noted it is imperative for businesses to disclose and report their sustainability practices. Transparency regarding the company's sustainable practices and initiatives in reverse logistics fosters customer trust and enhances the overall customer experience. The authors also point out that one of the main barriers to businesses adopting sustainable practices is a lack of transparency and communication between the different segments of the supply chain. While the implementation process may face obstacles, sustainable practices can have long-term benefits that need to be considered. Among the benefits are improved reputation, customer loyalty,

and cost reductions. Businesses can benefit from analysing return flows and managing them efficiently. The purpose of this is to enable businesses to take a more consumer-oriented approach and to invest in supply chain systems in order to gain a competitive advantage. In addition to obtaining information regarding how their participation contributes to sustainability efforts, customers appreciate transparency regarding the recycling or repurposing of returned items. As fast fashion e-commerce businesses adopt sustainable practices in reverse logistics, they demonstrate their commitment to reducing waste, conserving resources, and aligning themselves with the ethical values of environmentally aware consumers. Cullinane et al. (2019) discussed that enhanced perceptions of the company's environmental responsibilities and social responsibilities may result in a higher level of customer satisfaction through the reverse logistics process. An organisation's reputation and image can be positively impacted by implementing sustainable reverse logistics practices. In order to build customer loyalty and encourage repeat purchases, brands that are perceived to be environmentally responsible are more likely to demonstrate their commitment to the environment.

6. CONCLUSION

In conclusion, the findings of this literature review highlight the importance of incorporating sustainable practices into reverse logistics operations of fast fashion e-commerce businesses in order to reduce their environmental impact. In this study, several strategies, business models and frameworks are suggested that can be applied. Among the various strategies discussed, two key approaches stand out as particularly significant. Firstly, by incorporating design principles that have a lower environmental impact and using sustainable materials, waste can be significantly reduced during the return process. The purpose of this process is to develop products and packages that can be easily recycled or reused. A second important factor is the need for collaboration and communication among supply chain partners. In order to make optimal decisions regarding recycling, refurbishing, or reusing returned items, businesses are encouraged to build strong relationships and share data. A collaborative approach facilitates efficient coordination and contributes to the implementation of sustainable supply chain practices. Moreover, this study emphasises the importance of collaborating with stakeholders. Governments can have an important role to play in promoting sustainable practices by establishing a supportive legal environment and providing incentives to encourage the adoption of these practices. By facilitating communication and data sharing, IT infrastructure facilitates efficient collaboration between supply chain partners. In order to promote sustainability, educational and awareness campaigns can engage customers, suppliers, and other stakeholders.

Our analysis of the literature has led us to conclude that implementing sustainable practices in the reverse logistics process increases customer satisfaction. A reason for this could be the high level of awareness that consumers have today regarding environmental concerns. As a result of incorporating sustainable practices into reverse logistics operations, fast fashion e-commerce businesses are able to reduce their environmental impact and improve customer satisfaction. Businesses can enhance the image of their brand and foster long-term customer loyalty by aligning with their customers' values and providing convenient and transparent return processes. Businesses' transparency, disclosure, and reporting of sustainability practices enhance the customer experience and foster customer trust. The public appreciates information regarding the recycling or repurposing of returned items, and businesses can

benefit from analysing the return flow and investing in a supply chain system that is consumer oriented. Through the adoption of sustainable reverse logistics practices, fast fashion e-commerce businesses demonstrate their commitment to reducing waste, conserving resources, and aligning with the values of environmentally aware consumers. Ultimately, this can improve reputation, customer loyalty, and cost reductions, resulting in a competitive advantage. Incorporating sustainability into reverse logistics operations provides e-commerce businesses in the fast fashion industry with the opportunity to distinguish themselves from their competitors while contributing to a more sustainable future. Businesses should take into account the expectations and demands when discussing how sustainable practices in reverse logistics affect customer satisfaction. Additionally, businesses should educate consumers about sustainable practices and encourage them to participate in this process.

The literature review indicates that many studies take a similar approach to the application of sustainable practices in reverse logistics. The similarities observed in the literature may be attributed to several factors, including industry context and organisational culture. Several factors influence businesses' approaches in the fast fashion e-commerce industry, including its scale, supply chain complexity, and consumer behaviour. Moreover, each organisation's values, priorities, and internal capabilities determine how they approach sustainable reverse logistics. Two other factors are the regulatory environment and stakeholder pressures. Businesses may adopt sustainable practices if supportive laws, regulations, and policies are in place. The regulatory frameworks of different regions or countries may require businesses to adopt different approaches. There is a possibility that businesses are influenced in their approach to sustainability by external pressures such as those from consumers, investors, and advocacy groups. Strategies and frameworks developed by organisations are shaped by stakeholder expectations and demands. In order to collaborate towards a common environmental goal without revealing business ideas, stakeholders can exchange information, form partnerships, and focus on pre-competitive collaboration. As a result of considering these factors and working together, stakeholders can work toward a more sustainable future for the fast fashion e-commerce industry.

6.1 RECOMMENDATIONS FOR FURTHER RESEARCH

The fast fashion e-commerce businesses are actively working on integrating sustainable practices into reverse logistics operations. Yet, further research is still needed on how businesses can incorporate sustainable practices into reverse logistics and how sustainable practices affect customer satisfaction. A number of research gaps, indicate the need for further investigation. First of all, comprehensive studies that examine the entire supply chain and reverse logistics in promoting sustainability are still needed, particularly in relation to sustainable packaging. In recent years, however, there has been a shift towards more research in this area. Fashion industry sustainability can be explored through CSR initiatives, as well as specific technologies that support sustainable reverse logistics. In these areas, there is an opportunity to advance knowledge and practice in the field of sustainable reverse logistics.

In the future, research on customer satisfaction in sustainable reverse logistics can be explored from a variety of perspectives in order to gain a comprehensive understanding. In order to gain a deeper understanding of the factors affecting customer satisfaction as well as the effectiveness of sustainable practices, mixed methods such as combining qualitative and quantitative approaches may be useful. In addition, analysing reverse logistics in specific countries or regions can provide valuable insights into the cultural, economic, and regulatory

factors that shape the process and affect customer satisfaction. In order to develop sustainable reverse logistics strategies and frameworks, it is important to understand the challenges and opportunities faced by businesses in different countries. Additionally, future studies can investigate the impact of regulatory compliance on sustainable practices in certain areas. Understanding the role of regulations and enforcement in promoting or hindering sustainable reverse logistics can guide businesses and policymakers in designing effective regulatory frameworks. As a result of addressing these research gaps, scholars and practitioners will be able to enhance their understanding of customer satisfaction related to sustainable reverse logistics. In addition, it can contribute to the development of relevant strategies and regulations.

Upon reviewing the literature, we concluded that there is a lack of research focusing on developing countries. The majority of the research has been conducted on Western businesses and consumers. Even though the major issue related to fast fashion is occurring in developing countries. In addition, further research could be conducted to better understand sustainable fashion in developing countries, and to provide local businesses with an advantage by introducing sustainable fashion processes into their operations.

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