

# **IMPACT OF REVERSE LOGISTICS PRACTICES ON CUSTOMER SATISFACTION IN E-COMMERCE PLATFORMS IN COIMBATORE- AN INVESTIGATIVE STUDY**

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## **ABSTRACT**

This study examines the influence of reverse logistics management (RLM) practices on customer satisfaction among online shoppers in Coimbatore, an area experiencing rapid e-commerce growth alongside rising product return rates. While forward logistics receives immense strategic focus, reverse logistics often suffers from inefficiencies. E-commerce consumers frequently face delayed product pickups, slow refund processing, lack of tracking transparency, and poor communication. These gaps lead to customer dissatisfaction, diminished brand loyalty, and increased operational costs for platforms. The research analyzes the systematic process of return handling, inspection, and refund mechanisms across major digital marketplaces (e.g., Amazon, Flipkart, Myntra, Meesho) within the Coimbatore region to evaluate how operational efficiency impacts post-purchase behavior. The findings highlight that efficient reverse logistics is not merely an operational necessity but a strategic, value-creating tool. Optimizing returns minimizes financial losses, rebuilds consumer trust, improves repeat purchase intentions, and ensures sustainable growth in the digital retail landscape.

**Keywords:** Reverse Logistics Management (RLM), Customer Satisfaction, E-Commerce, Product Returns, Refund Processing, Retail Logistics, Coimbatore.

## **PREAMBLE OF THE STUDY**

E-commerce has significantly transformed the modern retail landscape by providing customers with greater convenience, competitive pricing, a wider variety of products, and reliable doorstep delivery services. With the rapid expansion of online shopping platforms such as Amazon, Flipkart, Myntra, and Meesho, consumer purchasing behavior has shifted from traditional retail stores to digital marketplaces. Along with this growth, the volume of product returns has also increased considerably. Customers return products for various reasons, including size mismatch, defective items, incorrect deliveries, quality dissatisfaction, damaged goods during transit, or simply a change of mind. As return rates continue to rise, managing returned goods efficiently has become a major operational challenge for e-commerce companies. Reverse Logistics Management (RLM) refers to the systematic process of moving goods from customers back to sellers or manufacturers for purposes such as return handling, replacement, recycling, refurbishing, resale, or proper disposal. Unlike forward logistics—focused on delivering products to customers—reverse logistics requires careful coordination, timely pickups, inspection processes, and quick refund mechanisms. When reverse logistics is managed efficiently, it reduces operational losses and plays an important role in enhancing customer satisfaction, strengthening brand loyalty, and

supporting long-term competitive advantage. In a rapidly developing city like Coimbatore, which has a strong industrial base and increasing digital adoption, online shopping has witnessed considerable growth. Customers in Coimbatore expect smooth return procedures, prompt pickup services, faster refund processing, and transparent communication from e-commerce platforms. Any delay or inconvenience in the return process may negatively affect customer trust and repeat purchase intentions. Therefore, analyzing the influence of reverse logistics management on customer satisfaction in Coimbatore is essential for improving service quality and ensuring sustainable business performance. This study examines the effectiveness of reverse logistics practices and their impact on customer satisfaction among online shoppers in Coimbatore.

## **STATEMENT OF THE PROBLEM**

E-commerce companies are currently facing increasing challenges in managing product returns efficiently and cost-effectively. While many organizations invest heavily in forward logistics to ensure fast and reliable delivery, reverse logistics often receives relatively less strategic focus. Ineffective reverse logistics management can result in delayed product pickups, slow refund processing, improper handling of returned goods, lack of clear communication, and overall customer dissatisfaction. These issues not only create operational inefficiencies but also harm the brand image of e-commerce companies. In a growing commercial city such as Coimbatore, customers increasingly rely on online platforms like Amazon, Flipkart, Myntra, and Meesho for purchasing electronics, fashion items, groceries, and household products. As online transactions increase, so do return rates. However, customers frequently report problems such as delayed refunds, inefficient pickup services, limited real-time tracking updates, and weak customer support during the return process. Such experiences reduce customer trust, satisfaction, and loyalty, ultimately impacting repeat purchase behavior. Additionally, return-related inefficiencies increase operational costs linked to transportation, warehousing, inspection, and restocking. If reverse logistics is not properly managed, it may become a financial burden rather than a value-adding function. Hence, the central problem addressed in this study is to examine whether reverse logistics management practices significantly influence customer satisfaction in the e-commerce sector among customers in Coimbatore.

## **NEED FOR THE STUDY**

The need for this study arises from the rapid expansion of e-commerce activities, which has led to a significant increase in product return rates in recent years. Since more consumers prefer online shopping for convenience, variety, and competitive pricing, the number of returned goods has grown substantially. This has made reverse logistics a critical operational function in e-commerce businesses. Managing returns efficiently involves costs related to transportation, inspection, warehousing, and refund processing, and restocking. If these activities are not handled properly, they may increase operational expenses and reduce profitability. At the same time, customer satisfaction in online shopping is strongly influenced by the effectiveness of return and refund systems. Quick refund processing, simple return procedures, clear return policies, and convenient pickup services strongly shape customer perceptions. Any delay or inconvenience in reverse logistics may negatively affect customer trust and long-term loyalty. Despite its growing importance, limited local-level studies specifically examine reverse logistics management and its impact on customer satisfaction in Coimbatore. Understanding customer perceptions regarding return policies and refund systems can help e-commerce companies improve their reverse logistics strategies and enhance overall service quality. Moreover, efficient reverse logistics supports environmental sustainability by promoting recycling, refurbishing, and proper disposal of returned products.

Therefore, this study aims to identify gaps in existing reverse logistics practices and provide recommendations to improve customer satisfaction in the e-commerce sector.

### **SCOPE OF THE STUDY**

The scope of the study is limited to customers residing in Coimbatore who have experience purchasing products through online platforms. The study focuses on individuals who have participated in return or refund processes after making online purchases, thereby offering relevant insights into reverse logistics practices. The study covers major e-commerce platforms operating in the region, including Amazon, Flipkart, Myntra, Meesho, and other prominent online retailers. It primarily examines key reverse logistics factors that influence customer satisfaction, such as:

- Clarity of return policies
- Efficiency of pickup services
- Speed of refund processing
- Transparency in communication during the return process
- Promptness in product replacement

By analyzing these variables, the study aims to understand how effectively reverse logistics management contributes to overall customer satisfaction in the e-commerce sector.

The study is confined to evaluating customer perceptions, experiences, and satisfaction levels related to return and refund services. It does not extend to financial performance, cost structure, or profitability analysis of e-commerce companies. The study also does not include offline retail returns or logistics systems outside Coimbatore. Thus, the research is geographically restricted to Coimbatore and analytically focused on customer-centric aspects of reverse logistics management in e-commerce.

### **OBJECTIVES OF THE STUDY**

The study is conducted with the following objectives:

1. To study the concept and components of Reverse Logistics Management in e-commerce.
2. To examine customer perception toward return policies of e-commerce companies.
3. To analyze the effectiveness of reverse logistics practices in Coimbatore.
4. To measure the level of customer satisfaction with return and refund processes.
5. To identify the relationship between reverse logistics efficiency and customer satisfaction.

### **FRAMED HYPOTHESES**

- **H<sub>01</sub>:** There is no significant relationship between reverse logistics management practices and customer satisfaction in e-commerce.
- **H<sub>02</sub>:** There is no significant association between refund processing time and customer satisfaction level.

## RESEARCH METHODOLOGY

S.No	Particulars	Description
1	Research Design	Analytical Research Design to examine the relationship between reverse logistics management and customer satisfaction in e-commerce
2	Nature of Data	Primary Data and Secondary Data
3	Primary Data Source	Structured questionnaires distributed to online shoppers in Coimbatore
4	Secondary Data Source	Journals, research articles, company websites, books, magazines, and online publications
5	Sampling Method	Convenience Sampling
6	Sample Size	120 respondents ( <i>or 200, if that is the final confirmed value</i> )
7	Area of Study	Coimbatore City
8	Tools for Analysis	Percentage Analysis, Reliability Test, Chi-Square Test, Correlation, Regression, ANOVA, and Structural Equation Modeling (SEM)

### SHORT COMINGS OF THE STUDY

1. The study is limited to Coimbatore city only.
2. The sample size is restricted to selected respondents who use platforms such as Amazon, Flipkart, Myntra, and Meesho.
3. Findings are based on customer perceptions, which may vary among individuals.
4. Time constraints limited the depth of analysis.
5. The study focuses only on e-commerce returns and does not cover offline retail returns.

### REVIWE OF LITERATURE.

The rapid expansion of e-commerce has transformed reverse logistics from a peripheral concern into a strategic imperative. Recent literature highlights its multi-dimensional impact on customer satisfaction, sustainability, cost control, and technology.

**Reverse Logistics and Customer Satisfaction:** A core theme in the literature is the direct link between efficient returns and customer loyalty. Ardra et al. (2025) found that return process efficiency accounts for 58.82% of customer satisfaction variance, while Thu et al. (2024) identified customer service responsiveness as its strongest predictor on Vietnamese platforms. Similarly, Adebayo (2022) and Tandon and Ertz (2022) confirmed that timely return handling significantly boosts online shopping satisfaction in India. Conversely, Ferdous and bin Ahsan (2024) noted that slow refunds, misrepresented items, and opaque policies are primary drivers of dissatisfaction.

**Sustainability and Green Logistics:** Sustainability has emerged as a parallel operational priority. Dabees et al. (2023) introduced a framework to measure reverse logistics through a triple-bottom-line lens, while Uddin (2025) identified its role in resource recovery and circular business models. In the Philippines, Jou et al. (2024) found that technology strongly

fosters green logistics adoption. Additionally, Clement and Spinler (2025) demonstrated that machine-learning return prediction algorithms can achieve up to 20% reusable packaging and cut costs by up to 4.7%.

**Implementation Barriers:** Scholars have heavily cataloged the obstacles to effective implementation. Tran et al. (2024) identified unclear organizational structures and poor customer coordination as critical barriers in Vietnam. Naseem et al. (2021) and Silva et al. (2025) highlighted that emerging economies face severe constraints due to shortages of qualified personnel, insufficient government policies, and limited financial incentives. These structural challenges are mirrored across European e-commerce (Ahlén & Johansson, 2023).

**Cost Optimization and Operational Models:** Minimizing operational expenses remains a dominant objective. Saravanan et al. (2026) showed that clear communication and transparent policies strongly support cost control in Tamil Nadu, India. To optimize logistics networks, Kundu et al. (2024) utilized binary integer programming, while Sivaparthipan et al. (2024) combined clustering and genetic algorithms to reduce routing times and costs. Furthermore, Luong et al. (2024) developed a multi-objective linear model to balance cost minimization with job creation.

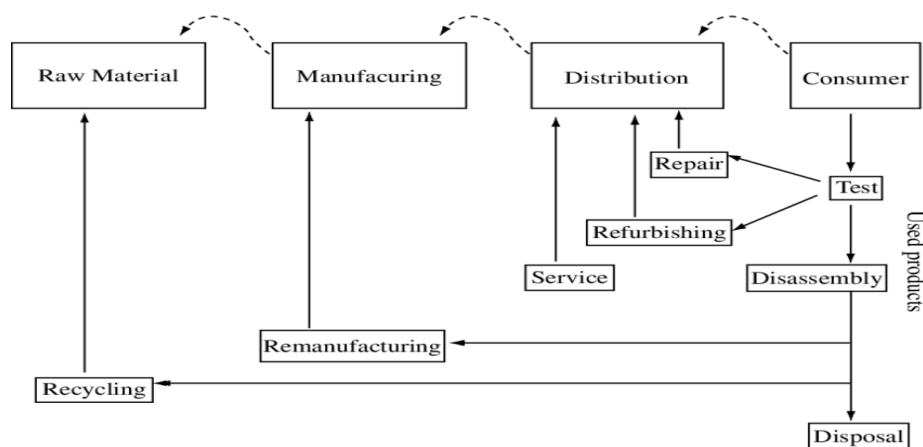
**Technology Integration and Policy:** Technological innovation is reshaping contemporary supply chains. Wanganoo (2020, 2021) proposed IoT, RFID, and blockchain frameworks to enhance real-time visibility and traceability in cross-border reverse logistics. To combat return fraud, Shih et al. (2021) introduced blockchain-based smart contracts, while Alkhorasani and Alawag (2025) highlighted AI's growing capability in predicting returns. Finally, supply chain coordination is heavily tied to policy. Barman (2025) found that profit-sharing contracts enhance dual-channel supply chain profitability. While Ren et al. (2021) concluded that money-back guarantees are optimal under non-negative residual values, Beranek (2020) and Hashmi (2023) demonstrated that supportive government policies and strategic customer return fees effectively reduce overall return volumes and boost business performance.

## RESEARCH GAP

Despite the steady growth of literature surrounding reverse logistics, several critical gaps continue to limit its theoretical and practical advancement. **Regional and Methodological Limitations:** Existing studies remain heavily concentrated in a narrow set of developed geographies. There is limited empirical representation from rapidly expanding e-commerce hubs in Africa, South Asia, and Southeast Asia (beyond Vietnam and Indonesia). This leaves the unique operational dynamics of these high-growth markets largely unexplored. Furthermore, the field suffers from a predominance of cross-sectional research designs. These approaches capture only a single snapshot in time, failing to account for temporal dynamics or the evolutionary trajectories of reverse logistics networks. To remedy this, there is an urgent need for rigorous longitudinal investigations. **Fragmented Sustainability Frameworks:** While the discourse around sustainability and "green logistics" has gained momentum, few analytical frameworks successfully integrate economic, social, and environmental outcomes simultaneously. The lack of a coherent Triple Bottom Line (TBL) measurement approach results in fragmented assessments that obscure the systemic impact of reverse logistics operations. **Behavioral and Technological Disconnects:** The intersection of consumer behavior analytics and supply chain operations remains sparse. Very little research connects predictive purchasing behavior with active return-rate reduction strategies, despite the clear potential for behavioral data to drive proactive logistics. Technologically, while Artificial Intelligence (AI) has penetrated forward logistics, its

application within reverse supply chains remains nascent. Specific gaps persist in the deployment of deep learning techniques for real-time route optimization, decision-making, and block chain-enabled tracking transparency. The Frontier of Inquiry: This review identifies a compelling research gap in the development of holistic, region-specific, and technology-integrated frameworks. Bridging these gaps requires interdisciplinary methodologies that can simultaneously optimize sustainability, cost efficiency, and customer loyalty within the unique behavioral contexts of emerging e-commerce markets. Concept of Reverse Logistics: Reverse logistics is a critical component of modern supply chain management focused on the backward flow of goods. Unlike forward logistics—which manages the linear pipeline from manufacturer to end consumer—reverse logistics handles the operational complexities of moving products from the point of consumption back to the point of origin

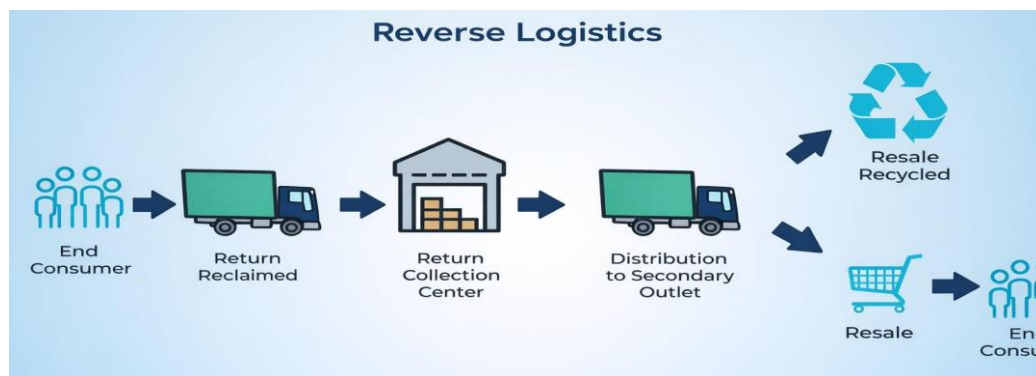
**EXHIBIT NUMBER: 01**



**Non-used Products, Packing or Waste**

**EXHIBIT: 02**

**Reverse Logistics**



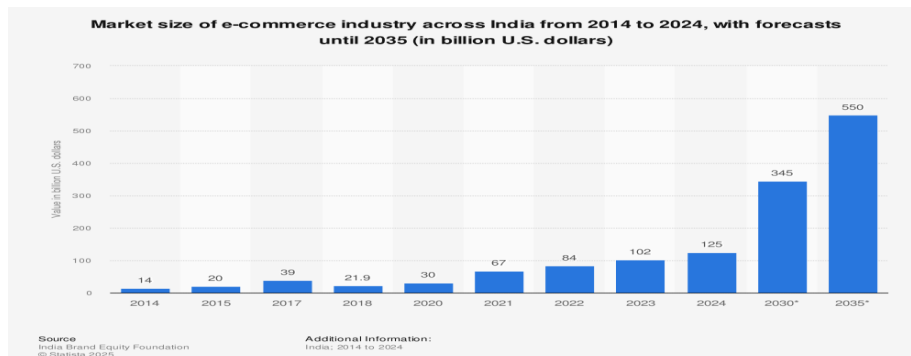
**EXHIBIT: 03**

**Service Parts Management**



**CHART: 01**

**E-COMMERCE: EVOLUTION**



**PROFILE OF THE STUDY AREA**

The study area selected for the present research is Coimbatore City, one of the major industrial and commercial centers in Tamil Nadu. Coimbatore, often referred to as the “Manchester of South India,” is well known for its textile industries, engineering units, educational institutions, and rapidly growing IT sector. The city has experienced significant economic development over the past decade, leading to increased urbanization and higher disposable income among residents. With the expansion of internet connectivity, smart phone usage, and digital payment systems, Coimbatore has witnessed a substantial rise in online shopping activities. Consumers across different age groups and occupations increasingly rely on e-commerce platforms such as Amazon, Flipkart, Myntra and Meesho for purchasing electronics, fashion products, groceries and house hold items. The convenience of door step delivery and competitive pricing has contributed to the rapid growth of e-commerce in the region. At the same time, the increasing volume of online transactions has also led to a rise in product returns, making reverse logistics management an important aspect of customer service in the city. Customers in Coimbatore expect timely pickups, quick refunds, and transparent communication during the return process. Therefore, selecting Coimbatore as the study area provides relevant insights into how reverse logistics practices influence customer satisfaction in a fast-developing urban market.

**GEOGRAPHICAL PROFILE**

Coimbatore is situated in the western part of Tamil Nadu at an elevation of approximately 411 meters above sea level. The district covers around 4,723 square kilometers, while the Coimbatore Corporation area extends over approximately 257 square kilometers. The city lies at the foothills of the Western Ghats and benefits from moderate climatic conditions due to the Palakkad Gap. The Noyyal River flows through the city and supports agricultural and domestic water needs. The climate is tropical semi-arid with hot summers,

moderate monsoons, and pleasant winters. The average annual rainfall ranges between 600–700 mm. The moderate weather conditions make the city favorable for industrial activities and residential settlement.

**Table: 01**  
**Geographical Characteristic**

Particulars	Details
Location	Western TamilNadu’s
District Area	4,723sq.km
Corporation Area	257 sq.km
Elevation	411 meters
Major River	Noyyal River
Average Rainfall	600–700mm

**Source: Secondary Data – District Collectorate – Coimbatore**

### DEMOGRAPHICPROFILE

Coimbatore has experienced steady population growth due to rapid industrialization and urban migration. The population has increased significantly over the last two decades, reflectingitseconomicexpansion.The literacyrateofthecityisapproximately84%, indicating a well-developed educational structure. Tamil is the primary language spoken, and English is widely used for business and academic communication.

**Table: 02**  
**Population Growth**

Year	Population(Approx.)
2001	1.45Million
2011	1.61Million
2023 (Est.)	2.2Million

**Source: Secondary Data- District Statistical Handbook–Coimbatore**

The city has a strong working-age population, which supports industrial productivity and service sector growth.

**Table: 03**  
**Sector-wise Economic Contribution**

Sector	Contribution (%)
Manufacturing & Engineering	45
Textile Industry	25
Services &IT	20
Agriculture	10

**Source: Secondary Data- District Statistical Handbook–Coimbatore**

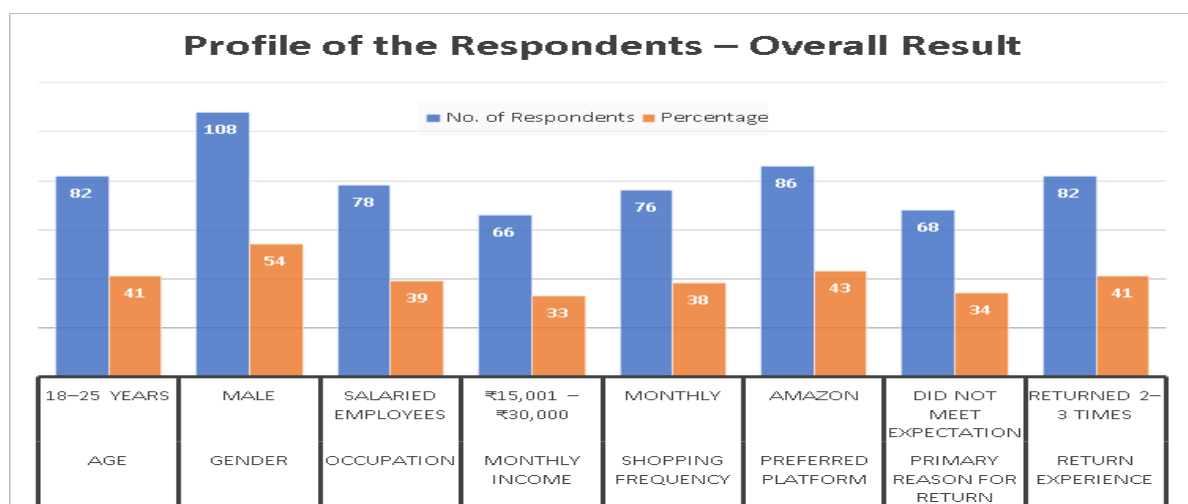
**Table: 04**  
**Educational Institutions**

Type of Institution	Approximate Number
Universities	7
Engineering Colleges	100+
Arts & Science Colleges	50+
Medical Colleges	10+

Source: Secondary Data –Coimbatore District Profile –coimbatore.nic.in

**RESULTS AND DISCUSSION OF THE STUDY**

**Chart: 02**  
**Profile of the Respondents - Overview**



**Table: 05**

**Summary of Framework of Analysis–Independent and Dependent Variables**

Sl. No	Tools	Dependent Variable	
1	Reliability Test	Reverse Logistics Management(RLM), Refund Processing Time (RPT), Customer Satisfaction (CS), Customer Barriers, Customer Expectations, Factors Causing Product Returns	
2	Weighted Average(WA)& Weighted Percentage Score (WPS)	Reverse Logistics Management, Refund Processing Time, Customer Barriers, Customer Expectations, Factors Causing Product Returns, Customer Satisfaction	
3	Simple Ranking	Factors Causing Product Returns	
		<b>Independent Variable</b>	<b>Dependent Variable</b>
4	Chi-Square	Profile of Respondents	Reverse Logistics Management, Refund Processing Time Customer

			Satisfaction
5	ANOVA	Profile of Respondents, Reverse Logistics Management, Refund Processing Time	Customer Satisfaction
6	Correlation	Reverse Logistics Management, Refund Processing, Time	Customer Satisfaction
7	Regression	Reverse Logistics, Management, Refund Processing Time	Customer Satisfaction
8	Factor Analysis	Reverse Logistics Management, Items Refund Processing Time Items, Customer Satisfaction Items	Extracted Factors influencing Customer Satisfaction
9	Structural Equation Model (SEM)	Reverse Logistics Management, Refund Processing Time	Customer Satisfaction

**RELIABILITY TEST–Cronbach’s Alpha**

Cronbach’s Alpha is used to measure the internal consistency of the research instrument.

**Factor Rate– Reliability Interpretation**

**Table: 06**  
**Factor Rate– Reliability Interpretation**

Factor Rate	Reliability
Greater than 0.90	Very High Reliability
0.70 to 0.90	High Reliability
0.50 to 0.70	Reliability
Less than 0.50	Low Reliability

**Table: 07**  
**Case Processing Summary**

	Number	Percentage
<b>Cases</b>		
Valid	200	100
Excluded (a)	0	0
<b>Total</b>	<b>200</b>	<b>100</b>

**Table: 08**

Sl.No	Particulars	Cronbach's Alpha Based on Standardized Items	No. of Items
1	Reverse Logistics Management	0.870	4
2	Refund Processing Time	0.850	3
3	Customer Barriers	0.820	10
4	Customer Expectations	0.880	10
5	Factors Causing Product Returns	0.860	10
6	Customer Satisfaction	0.900	4

Source: Computed data

**Table: 09**  
**Distribution on Weighted average score for Customer Satisfaction**

Sl.No	Factors	5	4	3	2	1	Total	WA	WPS	Rank
1	Customer Loyalty	420	272	78	28	8	806	4.03	80.60	2
2	Trust & Security	350	288	90	36	10	774	3.87	77.40	8
3	Service Quality	380	280	84	32	10	786	3.93	78.60	6
4	Delivery Performance	320	296	96	36	12	760	3.80	76.00	9
5	Reverse Logistics	440	256	72	28	10	806	4.03	80.60	2
6	Brand Image	360	304	84	32	8	788	3.94	78.80	5
7	Communication	340	280	96	36	12	764	3.82	76.40	8
8	Pricing & Value	300	312	90	40	12	754	3.77	75.40	10
9	Convenience	480	256	66	24	6	832	4.16	83.20	1

10	Website/App Usability	400	288	72	28	10	798	3.99	79.80	4
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**Source: Computed Data**

The above table presents the distribution of customer satisfaction factors based on Weighted Average (WA), Weighted Percentage Score (WPS), and Rank.

**Table: 10**  
**Distribution on Weighted average score for Customer Barriers**

Sl.No	Factors	5	4	3	2	1	Total	WA	WPS	Rank
1	Lack of Trust & Security Concerns	200	216	144	72	8	640	3.20	64.00	8
2	Poor Product Quality Perception	360	304	90	12	4	770	3.85	77.00	1
3	Complicated Return & Refund Process	340	280	108	20	2	750	3.75	75.00	2
4	High Delivery/Hidden Charges	300	272	120	24	4	720	3.60	72.00	4
5	Payment Difficulties	180	208	144	80	8	620	3.10	62.00	10
6	Lack of Customer Support	260	248	150	28	4	690	3.45	69.00	6
7	Language & Accessibility Issues	220	240	150	44	6	660	3.30	66.00	7
8	Past Negative Experiences	280	256	120	36	8	700	3.50	70.00	5
9	Delivery Issues	320	272	126	20	2	740	3.70	74.00	3
10	Website/App Usability Problems	220	240	150	44	6	660	3.30	66.00	7

**Source: Computed Data**

The above table presents the analysis of customer barriers based on Weighted Average (WA), Weighted Percentage Score (WPS), and Rank.

**Table: 11**  
**Distribution on Weighted average score for Customer Expectations**

Sl.No	Factors	5	4	3	2	1	Total	WA	WPS	Rank
1	Product Quality &	600	248	36	4	2	890	4.45	89.00	3

	Accuracy									
2	Transparent Pricing	520	296	36	6	2	860	4.30	86.00	6
3	Secure Payment Systems	480	304	48	6	2	840	4.20	84.00	9
4	Timely Delivery	560	272	36	6	2	876	4.38	87.60	4
5	Flexible Return & Refund Policy	620	260	16	2	2	900	4.50	90.00	1
6	Effective Customer Support	500	284	54	10	2	850	4.25	85.00	8
7	Multiple Payment Options	460	288	66	14	2	830	4.15	83.00	10
8	Fast Order Processing	540	276	36	6	2	860	4.30	86.00	6
9	Authentic Reviews & Ratings	580	264	30	6	4	884	4.42	88.40	2
10	Quick Refund for Cancellations	580	264	30	6	4	884	4.42	88.40	2

**Source: Computed Data**

The above table shows the analysis of customer expectations based on Weighted Average (WA), Weighted Percentage Score (WPS), and Rank.

**Table: 12**  
**Distribution on Weighted average score for Factors Causing Product Returns**

Sl.No	Factors	5	4	3	2	1	Total	WA	WPS	Rank
1	Size & Fit Issues	500	252	54	10	4	820	4.10	82.00	5
2	Product Quality Issues	580	256	30	4	0	870	4.35	87.00	1
3	Description Mismatch	560	268	24	4	0	856	4.28	85.60	2
4	Wrong Product Delivered	460	264	54	10	2	790	3.95	79.00	7
5	Damaged During Delivery	520	252	30	6	2	810	4.05	81.00	6
6	Better Price/Alternative Found	300	240	108	28	4	680	3.40	68.00	10
7	Ordering Errors by Customer	320	248	90	32	10	700	3.50	70.00	9
8	Poor Packaging	420	260	72	14	4	770	3.85	77.00	8

9	Technical/Functional Issues	540	268	30	6	2	846	4.23	84.60	3
10	Hygiene/ Safety Concerns	560	252	24	4	0	840	4.20	84.00	4

**Source: Computed Data**

The above table presents the analysis of factors causing product returns based on Weighted Average (WA), Weighted Percentage Score (WPS), and Rank.

**Observed Frequencies (O)**

**Table: 13**

Refund Processing Time\ Satisfaction	High	Moderate	Low	Total
Fast	85	32	15	132
Moderate	22	16	10	48
Slow	7	6	7	20
<b>Total</b>	<b>114</b>	<b>54</b>	<b>32</b>	<b>200</b>

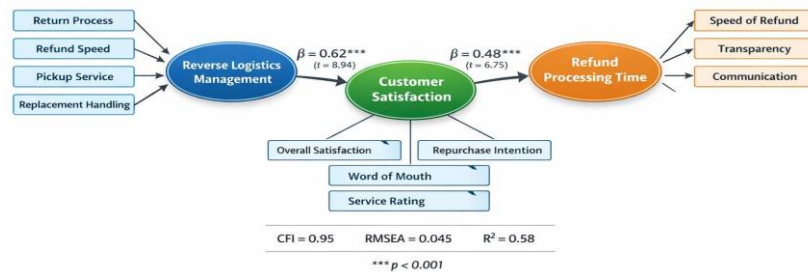
**Expected Frequencies (E)**

**Table: 14**

Refund Time\Satisfaction	High	Moderate	Low
Fast	75.24	35.64	21.12
Moderate	27.36	12.96	7.68
Slow	11.40	5.40	3.20

Variables	N	Mean	Std. Deviation	rValue	Sig. (p-value)
Reverse Logistics	200	4.03	0.82	0.68	0.000
Customer Satisfaction	200	4.05	0.79		

**Diagram: 01**  
**SEM Path Model**



## OBSERVATIONS OF THE STUDY

"Reverse Logistics Management and Its Influence on Customer Satisfaction in E-Commerce with Special Reference to Coimbatore." Based on data collected from e-commerce customers and logistics stakeholders, it highlights key insights into the effectiveness of reverse logistics and its impact on customer satisfaction. The findings reveal meaningful patterns between return management practices, operational efficiency, and customer experience. Practical suggestions are provided to improve reverse logistics processes, enhance service quality, and build customer trust. The chapter concludes by emphasizing the critical role of reverse logistics in driving customer satisfaction and overall business performance.

**Profile of the Sample Unit:** The majority of respondents (41%) belong to the 18–25 years age group, followed by 32% in the 26–35 years category, 19% aged 36–45 years, and only 8% above 45 years, indicating that 73% of participants are below 35 years and the study is primarily influenced by younger respondents. In terms of gender, 54% of respondents are male, 44% are female, and 2% belong to the other category, reflecting a fairly balanced gender distribution with a slight male dominance. Regarding occupation, 39% are salaried employees, 35% are students, 15% are business owners, and 11% are homemakers, suggesting that the study mainly reflects the perspectives of working professionals and young individuals. In terms of income, 33% earn ₹15,001–₹30,000, 27% earn ₹30,001–₹50,000, 24% earn below ₹15,000, and only 16% earn above ₹50,000 per month, placing the majority within the middle-income group. With respect to shopping frequency, 38% shop monthly, 27% weekly, 18% frequently, and 17% once in three months, indicating that regular monthly shopping is the most common pattern among respondents.

**Platform Preference and Return Behavior:** Among the preferred e-commerce platforms, 43% of respondents favour Amazon, 32% prefer Flipkart, 15% prefer Myntra, and 10% prefer Meesho, confirming that Amazon and Flipkart dominate as the most widely used platforms. Regarding reasons for product returns, 34% cited unmet expectations as the primary reason, followed by damaged products (26%), change of mind (21%), and receipt of the wrong item (19%), indicating that product quality and accuracy of delivery are the leading triggers of returns. In terms of return frequency, 41% of respondents have returned products 2–3 times, 37% have returned products once, and 22% have returned products more than three times, confirming that product returns are a common and recurring experience among online shoppers.

**Weighted Average Score Analysis — Customer Satisfaction:** The weighted average score analysis of customer satisfaction factors revealed that Convenience secured the highest rank (Rank 1) with a Weighted Average (WA) of 4.16 and a Weighted Percentage Score (WPS) of 83.20%, indicating that customers are most satisfied with the ease and convenience of the platform. Customer Loyalty and Reverse Logistics jointly hold the second rank, each with a

WA of 4.03 and WPS of 80.60%, reflecting strong positive customer perception toward loyalty programmes and reverse logistics services. Website/App Usability (WA = 3.99, WPS = 79.80%) ranks fourth, while Brand Image (WA = 3.94, WPS = 78.80%) and Service Quality (WA = 3.93, WPS = 78.60%) are ranked fifth and sixth respectively. Trust & Security and Communication show moderate satisfaction levels with WPS values of 77.40% and 76.40%, while the least ranked factors are Pricing & Value (WA = 3.77, WPS = 75.40%) and Delivery Performance (WA = 3.80, WPS = 76.00%), indicating that pricing and delivery remain areas requiring managerial attention and improvement.

**Customer Barriers:** The analysis of customer barriers indicated that Poor Product Quality Perception is the most significant barrier, securing the first rank with a WA of 3.85 and WPS of 77.00%. The Complicated Return and Refund Process (WA = 3.75, WPS = 75.00%) and Delivery Issues (WA = 3.70, WPS = 74.00%) rank second and third respectively, highlighting that operational and post-purchase service gaps significantly affect customer experience. High Delivery and Hidden Charges (WA = 3.60, WPS = 72.00%) and Past Negative Experiences (WA = 3.50, WPS = 70.00%) are ranked fourth and fifth, while moderate barriers include Lack of Customer Support (WA = 3.45, WPS = 69.00%) and Language & Accessibility Issues (WA = 3.30, WPS = 66.00%). The least significant barriers are Payment Difficulties (WA = 3.10, WPS = 62.00%) and Lack of Trust & Security Concerns (WA = 3.20, WPS = 64.00%), suggesting that customers face comparatively fewer issues related to payment systems and security. Overall, managers should priorities improving product quality assurance, simplifying return policies, and strengthening delivery systems to effectively reduce customer barriers.

**Customer Expectations:** The analysis of customer expectations revealed uniformly high scores across all dimensions, with all WPS values exceeding 83%. Flexible Return & Refund Policy secured the first rank with the highest WA of 4.50 and WPS of 90.00%, indicating that customers place the greatest importance on an easy and accessible return system. Product Quality & Accuracy ranks third (WA = 4.45, WPS = 89.00%), while Authentic Reviews & Ratings and Quick Refund for Cancellations jointly hold the second rank (WA = 4.42, WPS = 88.40%), reflecting strong expectations for transparency and prompt financial settlements. Timely Delivery ranks fourth (WA = 4.38, WPS = 87.60%), followed by Transparent Pricing and Fast Order Processing at the sixth rank (WA = 4.30, WPS = 86.00%). Effective Customer Support (WA = 4.25, WPS = 85.00%), Secure Payment Systems (WA = 4.20, WPS = 84.00%), and Multiple Payment Options (WA = 4.15, WPS = 83.00%) complete the ranking. The overall findings confirm that meeting customer expectations across return policies, product authenticity, refund speed, and delivery performance is essential for sustaining satisfaction and loyalty.

**Factors Causing Product Returns:** The analysis of factors causing product returns identified Product Quality Issues as the primary driver, securing the first rank with a WA of 4.35 and WPS of 87.00%. Description Mismatch (WA = 4.28, WPS = 85.60%) ranks second, followed by Technical and Functional Issues (WA = 4.23, WPS = 84.60%) and Hygiene and Safety Concerns (WA = 4.20, WPS = 84.00%), highlighting that product performance and safety standards are critical in minimizing returns. Size and Fit Issues (WA = 4.10, WPS = 82.00%) and Damaged During Delivery (WA = 4.05, WPS = 81.00%) are ranked fifth and sixth, while moderate contributors include Wrong Product Delivered (WA = 3.95, WPS = 79.00%) and Poor Packaging (WA = 3.85, WPS = 77.00%). The least significant factors are Ordering Errors by Customer (WA = 3.50, WPS = 70.00%) and Better Price or Alternative Found (WA = 3.40, WPS = 68.00%), confirming that the majority of returns are attributable

to company-side failures rather than customer error. Improving quality control, accurate product descriptions, and efficient delivery handling can significantly reduce return rates.

**Chi-Square Test:** The chi-square analysis established a statistically significant relationship between reverse logistics management and customer satisfaction, indicating that effective reverse logistics practices — including return handling, refund processing, and post-purchase services — have a meaningful and positive influence on customer satisfaction levels. Additionally, a statistically significant association was found between refund processing time and customer satisfaction, confirming that faster and more efficient refund mechanisms enhance customer confidence and overall satisfaction. Both findings reinforce the importance of operational responsiveness in post-purchase service delivery.

**Correlation and Regression Analysis:** The correlation analysis revealed a statistically significant and strong positive relationship between reverse logistics management practices and customer satisfaction, leading to the acceptance of the alternative hypothesis that effective return and refund management significantly enhances satisfaction levels. Similarly, a significant and positive association was confirmed between refund processing time and customer satisfaction, with faster and more transparent refund mechanisms strengthening customer trust. The regression analysis further validated these findings, confirming that reverse logistics significantly predicts and positively influences customer satisfaction, and that faster refund speed directly leads to higher satisfaction levels. Both alternative hypotheses were accordingly accepted.

**ANOVA Results:** The ANOVA results confirmed the statistical significance of the regression model, with an F-value of 168.32 ( $p = 0.000$ ) for reverse logistics and an F-value of 112.54 ( $p = 0.000$ ) for refund processing time, both well below the 0.05 significance threshold. In both cases, the null hypotheses were rejected, establishing that reverse logistics and refund processing time each have a significant impact on customer satisfaction. Furthermore, the  $R^2$  value of 0.58 indicates that 58% of the total variation in customer satisfaction is jointly explained by reverse logistics management and refund processing time, with the remaining 42% attributable to other factors not included in the model. This demonstrates that the model possesses strong explanatory power and that these two variables are central determinants of customer satisfaction in the e-commerce context.

## RECOMMENDATIONS OF THE STUDY

To enhance operational efficiency and customer satisfaction, e-commerce platforms should adopt several actionable steps focused on the pre- and post-purchase experience. On the front end, businesses must improve product pages by providing accurate specifications, genuine images, clear size charts, and highlighted customer reviews to minimize the gap between customer expectations and reality. These measures can be paired with advanced technologies like AI-driven recommendation tools, virtual try-on features, and proactive customer education programs that guide users on sizing and usage instructions. To directly minimize product issues, companies must tighten quality control through strict inspections before dispatch and utilize durable, eco-friendly packaging materials to prevent damage during transit. Furthermore, continuously monitoring third-party vendor performance ensures that consistent product quality and service standards are met across the marketplace. For handling unavoidable returns, platforms need to upgrade their logistics and support infrastructure. This involves building a well-organized return pickup system with real-time tracking to maintain transparency, alongside clearly communicated return policies regarding eligibility and deadlines to eliminate confusion. When processing returns, implementing automated refund systems and instant wallet credits will significantly reduce customer waiting times, though

companies should actively encourage product exchanges over refunds to safeguard revenue and retain customers. Finally, these efforts must be supported by 24/7 customer assistance combining chatbots and live agents, while backend teams regularly analyze return data and customer feedback to root out recurring supplier or operational flaws.

## KEY STRATEGIC RECOMMENDATIONS

Based on the comprehensive analysis of reverse logistics and refund timelines, several core strategies are recommended for long-term growth and brand loyalty. First, e-commerce companies must invest heavily in building a strong, efficient reverse logistics network that speeds up product pickups, replacements, and general return handling. In tandem with physical logistics, cutting refund wait times through faster payment mechanisms—such as instant bank transfers, UPI refunds, and digital wallet credits—is essential for building consumer trust and financial security. Platforms must also commit to lowering overall return rates at the source by prioritizing strict quality assurance and maintaining highly accurate online listings to align customer expectations with physical products. Operational improvements should also rely on data-driven and customer-centric management. Companies should regularly track return data and analyze transactional patterns to solve recurring operational breakdowns or penalize non-compliant third-party sellers who fail to meet quality thresholds. Embracing technological innovations, such as predictive analytics and advanced AI integration will further streamline logistics and eliminate unnecessary steps in the chain. Ultimately, maintaining clear, transparent communication regarding policies and keeping a strictly customer-centric approach will ensure a hassle-free return experience that builds lasting customer retention and a distinct competitive advantage.

## CONCLUSION OF THE STUDY

This study looked at how return management (reverse logistics) and refund speeds affect customer satisfaction. The data shows that the typical online shopper is young, working or studying, and falls into the middle-income bracket—representing a highly tech-savvy group. For these consumers, online shopping is a regular routine (weekly or monthly), and returning items is a common part of the experience. The top reasons for returns are products failing to meet expectations and items arriving damaged. An ANOVA analysis confirmed that both return management and refund processing times significantly impact customer satisfaction. Notably, the efficiency and transparency of the return process (reverse logistics) matter the most to customers. While refund speed is slightly less critical, it is still vital for building trust and financial security. Post-purchase service is a major business strategy, not just an operational chore. Managing returns well protects brand reputation and keeps customers coming back. In a competitive digital market, long-term success relies on smooth return systems and fast refunds just as much as low prices and wide product choices.

## REFERENCES

1. Ardra, T. B., Sree Sai, V. G., & Harikrishnan, R. (2025, February). Sustainability in Reverse Logistics: Enhancing Customer Satisfaction and Loyalty in E-Commerce. In *International Conference on Communication and Computational Technologies* (pp.79-91)
2. Thu, H. T. T., Nguyen, K. H., Vu, M. H., & Cong, P. T. (2024). Impact of reverse logistics on customer satisfaction: A research on e-commerce platforms in Vietnam. *J Infrast Policy Dev*, 8(5), 4577.
3. Dabees, A., Barakat, M., Elbarky, S. S., & Liseć, A. (2023). A framework for adopting a sustainable reverse logistics service quality for reverse logistics service providers: A systematic literature review. *Sustainability*, 15(3), 1755.

4. Adeniran, A. O., Olorunfemi, S. O., & Akanmu, A.A. (2025). Exploring sustainable E-commerce logistics services for customer satisfaction. In *Transport Services Management in Africa* (pp. 74-103).
5. Abdelhamid, M. (2024). The Relationship Between E-Commerce Last-Mile Logistics and.
6. Tran, T. H., Ngo, T. D., & Pham, T.A. T. (2024). Analyzing barriers to reverse logistics systems for e-commerce in Vietnam. *Engineering and Technology For Sustainable Development*, 34(3), 56-64
7. Uddin, M. P. (2025). Sustainable reverse logistics on B2C platforms for the circular economy: Strategies, consumer engagement, and challenges.
8. Ezmigna, I., Alghizzawi, M., Alqsass, M., Abu-AlSondos, I. A., Abualfalayeh, G., & Aldulaimi, S.H. (2024, December). The Effect of Digital Marketing on Reducing Reverse Logistics Costs in Saudi Arabia's E-commerce Market: A Qualitative Study. In *2024 International Conference on Decision Aid Sciences and Applications (DASA)* (pp. 1-6).
9. Kalkha, H., Khiat, A., Bahnasse, A., & Ouajji, H. (2023). The rising trends of smart e-commerce logistics. *IEEE Access*, 11, 33839-33857.
10. Desticioglu, B., Calipinar, H., Ozyoruk, B., & Koc, E. (2022). Model for reverse logistic problem of recycling under stochastic demand. *Sustainability*, 14(8), 4640
11. Saravanan, S., Vasudevan, A., & Mohammad, S.I. (2026). A Study on the Influence of E-commerce Reverse Logistics on Cost Control in Tamil Nadu, India. *Architecture Image Studies*, 7(1), 205-216.
12. Zennaro, I., Finco, S., Calzavara, M., & Persona, A. (2022). Implementing E-commerce from logistic perspective: Literature review and methodological framework. *Sustainability*, 14(2), 911.
13. Barman, A. (2025). Return-refund strategy with coordination contracts in the e-commerce supply chain: a study under effects of digitalization and sustainable manufacturing. *Electronic Commerce Research*, 25(5), 3981-4033.
14. Himanshu, Chandel, S. S., & Bhagwat, K. (2022). Forward and Reverse Logistics in E-Commerce Firms. In *CHANGING FACE OF E-COMMERCE IN ASIA* (pp. 205-226).
15. Alkhorasani, H., & Alawag, A. M. (2025, August). The AI Revolution in Industry: A Review of Its Usage in Reverse Logistics Returns Prediction. In *2025 5th International Conference on Emerging Smart Technologies and Applications (eSmarTA)* (pp. 1-8).
16. Luong, T.K., Danh, P.N.T., Nguyen, D.T., Thu, H.T.A., & Nguyen, D.D. (2024, December). A Multi-Objective Model for Sustainable Reverse Logistics Networks in E-commerce. In *2024 International Conference on Logistics and Industrial Engineering (ICLIE)* (pp. 1-6).
17. González Romero, I., Ortiz Bas, Á., & Prado Prado, J. C. (2025). The perspective of key stakeholders on the sustainable design of reverse logistics in e-commerce: an interpretive sensemaking review. *International Journal of Production Management and Engineering*
18. Tandon, U., & Ertz, M. (2022). Customer satisfaction towards online shopping by empirical validation of self-determination theory. In *Handbook of Research on the*

- Platform Economy and the Evolution of E-Commerce (pp. 177-203). IGI global.
19. Wanganoo, L. (2020, June). Streamlining reverse logistics through IoT driven warehouse management system. In 2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO) (pp. 854-858).
  20. Demirdöğen, S. (2020). Digital transition process in logistics. *DATA, Inf. Knowl. Manag.*, 491.
  21. Gomes, A. C., de Lima Junior, F. B., Soliani, R. D., de Souza Oliveira, P. R., de Oliveira, D. A., Siqueira, R. M., ... & de Macêdo, J. J. S. (2023). Logistics management in e-commerce: challenges and opportunities. *Revista de Gestão e Secretariado*, 14(5), 7252- 7272.
  23. Adebayo, T. (2022). An evaluation of reverse logistics responsiveness and customer satisfaction in retailing. *International Journal of Research in*.
  24. Ahlén, A., & Johansson, E. (2023). Overcoming barriers for functional reverse logistics in e-commerce A systematic literature review.
  25. Kapoor, G. (2023). Reducing reverse logistics and return rate of online fashion: A six sigma approach towards a more sustainable and green supply chain (Doctoral dissertation, University Canada West)
  26. Sivaparthipan, C. B., Alabdeli, H., Harshitha, P., Nagendar, Y., & Kulkarni, G. G. (2024, May). An optimization model for logistics services in e-commerce market. In 2024 Second International Conference on Data Science and Information System (ICDSIS) (pp. 1-5).
  27. 26. Kundu, A., Masanta, M., Das, P., & Bhattacharyya, A. (2024). A classical and simulated approach of cost optimisation in reverse logistics process for e-commerce business. *International Journal of Procurement Management*, 21(4), 498-524.
  28. Sousa, C. M., & Dias, O. C. (2020). Markets segmentation and differentiation of reverse logistics offers. *REMark*, 19(4), 862.
  29. Tzeng, S. Y., Ertz, M., Jo, M. S., & Sarigöllü, E. (2021). Factors affecting customer satisfaction on online shopping holiday. *Marketing Intelligence & Planning*, 39(4), 516- 532.
  30. Abdullahi, M. O., Mohamud, I. H., & Mohamud, F. A. S. (2024). Mapping the Research Landscape of Reverse Logistics in E-Commerce: A Bibliometric Analysis from 2003 to 2023. *Journal Européen des Systèmes Automatisés*, 57(3).
  31. Jou, Y. T., Lo, C. Y., Mariñas, K. A., Saflor, C. S., Gutierrez, C. J., Sanchez, C., ... & Bucal, M. J. (2024). Assessing the E-commerce sustainability readiness: A green logistics study on online sellers. *Sustainability*, 16(7), 2954.
  32. Ren, M., Liu, J., Feng, S., & Yang, A. (2021). Pricing and return strategy of online retailers based on return insurance. *Journal of Retailing and Consumer Services*, 59, 102350.
  33. Hashmi, R. (2023). Business performance through government policies, green purchasing, and reverse logistics: business performance and green supply chain practices. *South Asian Journal of Operations and Logistics*, 2(1), 1-10.
  34. Huang, B., Fang, X., Lin, R., & Maalla, A. (2020, June). Construction of new agricultural products E-commerce platform and analysis of its functional requirements. In *Journal*

- of Physics: Conference Series (Vol. 1549, No. 4, p. 042011). IOP Publishing.
35. Dhaigude, S.A., & Mohan, B. C. (2023). Logistics service quality in online shopping: A bibliometric analysis. *Journal of Internet Commerce*, 22(1), 157-188.
  36. Clement, L., & Spinler, S. (2025). From returns to re-usage: A data-driven strategy for sustainable packaging—A case study in e-commerce. *Journal of Cleaner Production*, 510, 145584.
  37. Wilson, M., & Goffnett, S. (2022). Reverse logistics: Understanding end-of-life product management. *Business Horizons*, 65(5), 643-655.
  38. Bakar, S.A., Sidek, N.Z.M., Nordin, N., Hanif, H.M., Shamsimon, N.S., & Sharel, N. I.A.M. (2020). E-Commerce Platform Selection Among UiTM Students by Using Graph Theory and Matrix Approach (GTMA). *Management*, 1, 33.
  39. Chen, J., & Batool, H. (2022). A study on the selection of logistics mode of consumer goods for cross border e-commerce exporting SMEs. *Science, Technology, and Social Sciences Procedia*, 2022(2), CiM07-CiM07.
  40. Turgut, M. (2025). The impact of logistics service quality in e-commerce on satisfaction with online shopping and purchase intention. *Beykoz Akademi Dergisi*, 13(1), 334-353.
  41. Nanayakkara, P.R., Jayalath, M.M., Thibbotuwawa, A., & Perera, H.N. (2022). A circular reverse logistics framework for handling e-commerce returns. *Cleaner Logistics and Supply Chain*, 5, 100080.
  42. Ardra, T. B., Sree Sai, V. G., & Harikrishnan, R. (2025, February). Sustainability in Reverse Logistics: Enhancing Customer Satisfaction and Loyalty in E-Commerce. In *International Conference on Communication and Computational Technologies* (pp. 79- 91). Singapore: Springer Nature Singapore.
  43. Yang, H. J., Fang, M., Yao, J., & Su, M. (2023). Green cooperation in last-mile logistics and consumer loyalty: An empirical analysis of a theoretical framework. *Journal of Retailing and Consumer Services*, 73, 103308.
  44. Ferdous, Z., & bin Ahsan, W. (2024). Customer experiences with e-commerce returns in Bangladesh: effects on satisfaction, trust, and loyalty. *Userhub Journal*.
  45. Shibasaki, R., Watanabe, D., & Kawasaki, T. (2021). Global and international logistics. *Sustainability*, 13(10), 5610.
  46. Beranek, M. (2020, September). Game theoretic analysis of state interventions to reduce customer returns in e-commerce. In *International Conference on Computational Logistics* (pp. 666-681). Cham: Springer International Publishing.
  47. Karl, D. (2025). Forecasting e-commerce consumer returns: a systematic literature review. *Management Review Quarterly*, 75(3), 1-56.
  48. Skurpel, D., & Bakalarczyk, B. T. (2023). Reuse and recovery of products in the reverse logistics process in the omnichannel model on the example of a sports store chain. *Serbian Journal of Management*, 18(2), 315-329.
  49. Karadağ, M., & Gültekin, Y. (2023). The Effect of Reverse Logistics on Re-Purchasing

- Intention in Electronic Commerce and the Mediating Role of the Perceived Risk Variable: A Research in the Apparel Sector. *Bucak İşletme Fakültesi Dergisi*, 6(2), 244-276.
50. Macioszek, Elżbieta, and Irena Jurdana. "Analysis of the development of e-commerce in Poland from 2010-2020 and its impact on the transport sector." *Zeszyty Naukowe. Transport/Politechnika Śląska* (2022).
  51. Lu, S., Yang, L., Liu, W., & Jia, L. (2020). User preference for electronic commerce overpackaging solutions: Implications for cleaner production. *Journal of Cleaner Production*, 258, 120936.
  52. Prayogo, D. H., Domanski, R., & Golinska-Dawson, P. (2024). The key factors for improving returns management in e-commerce in Indonesia from customers' perspectives—An analytic hierarchy process approach. *Sustainability*, 16(17), 7303.
  53. Naseem, M. H., Yang, J., & Xiang, Z. (2021). Prioritizing the solution to reverse logistics barriers for the e-commerce industry in Pakistan based on a fuzzy AHP-TOPSIS approach. *Sustainability*, 13(22), 12743.
  54. Dobroselskyi, M., Madleňák, R., & Laitkep, D. (2021). Analysis of return logistics in e-commerce companies on the example of the Slovak Republic. *Transportation Research Procedia*, 55, 318-325.
  55. Anon, S. Y., Amin, S. H., & Baki, F. (2024). Third-party reverse logistics selection: A literature review. *Logistics*, 8(2), 35.
  56. Tseng, M. L., Bui, T. D., Lan, S., & Lim, M. K. (2024). Data-driven on reverse logistic toward industrial 4.0: an approach in sustainable electronic businesses. *International Journal of Logistics Research and Applications*, 27(10), 1705-1741.
  57. Shih, D. H., Huang, F. C., Chieh, C. Y., Shih, M. H., & Wu, T. W. (2021). Preventing return fraud in reverse logistics—A case study of ESPRES solution by Ethereum. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(6), 2170-2191.
  58. Serravalle, F., Vannucci, V., & Pantano, E. (2022). "Take it or leave it?": Evidence on cultural differences affecting return behaviour for Gen Z. *Journal of Retailing and Consumer Services*, 66, 102942.
  59. Shen, L., Fan, R., & Wang, Y. (2020). Decisions of E-Commerce Supply Chain under Consumer Returns and Different Power Structures. *Mathematical Problems in Engineering*, 2020(1), 8884963.
  60. Shen, Z. (2023). Mining sustainable fashion e-commerce: social media texts and consumer behaviors. *Electronic Commerce Research*, 23(2), 949-971.
  61. Jiang, Y. H. (2020, September). Location and Path Planning of Cross-Border E-Commerce Logistics Distribution Center in Cloud Computing Environment. In *International Conference on Advanced Hybrid Information Processing* (pp. 30-40). Cham: Springer International Publishing.
  62. Silva, A. L., dos Santos, A. P., Silveira, M. B., Gonçalves, A. D. S., & Barros, A. A. C. (2025). Barriers to implementing reverse logistics in companies: A systematic literature review. *Studies in Multidisciplinary Review*, 6(1), e13889-e13889.
  63. Chakraborty, S., Sharma, A., & Vaidya, O. S. (2020). Achieving sustainable operational excellence through IT implementation in Indian logistics sector: an analysis of barriers. *Resources, Conservation and Recycling*, 152, 104506.

64. Jonar, A. N., & Purnomo, A. (2025). Synergy of Consumer Purchasing Behavior Analysis and Return Reason Categorization in Reducing Product Return Rates: A Study at IKEA Indonesia Fulfillment Center. *ICoBITS*, 1, 196-206.
65. Hsu, C. L., & Lin, J. C. C. (2020). Examining social networking O2O apps user loyalty. *Journal of Computer Information Systems*.
66. Shahabi, A. (2025). A white-box decision support model for evaluating the suppliers based on the customer-based and viability dimensions: a case study of the e-commerce business. *Annals of Operations Research*, 1-28.
67. Liu, X., Cui, W., & Zhang, S. (2025). Better e-commerce less carbon emissions in China?. *Energy*, 318, 134820.
68. Shao, S. P., Marjerison, R. K., & Kim, J. M. (2026). The Power of Fit in E-Commerce Platforms: Aligning Customer Service Orientation and Internal Service Quality. *Journal of Theoretical and Applied Electronic Commerce Research*, 21(1), 8.
69. Smith, A. D. (2026). The Future of Brick-and-Mortar in an E-Commerce-Driven Supply Chain. In *Digital Transformation of Supply Chains: Business Objectives and Applications* (pp. 169-189). Cham: Springer Nature Switzerland.
70. Su, M., Zhao, J., Qi, G., Kim, J., & Park, K. S. (2023). Online retailer cold chain physical distribution service quality and consumers: evidence from China during the COVID-19 pandemic. *International Journal of Logistics Research and Applications*, 26(4), 442-459.
71. Arjo, J. G. C., Lasiyono, U., & Afkar, T. (2024). Unraveling the drivers of customer loyalty in Shopee Indonesia: A meta-analysis of brand image, brand trust, e-service quality, and customer satisfaction. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 8(3).
72. Singh, V., Vishvakarma, N. K., & Kumar, V. (2025). Dark patterns, dimmed brands: the erosion of equity through deceptive design in e-commerce. *Internet Research*.
73. Buldeo Rai, H., & Dablanc, L. (2023). Hunting for treasure: a systematic literature review on urban logistics and e-commerce data. *Transport Reviews*, 43(2), 204-233.
74. Şahin, B. (2023). A SWOT Analysis of Turkish e-commerce activities in post COVID-19 era. *Business & Management Studies: An International Journal*, 11(4), 1308-1320.
75. Mu, J., & Zhang, J. Z. (2021). Seller marketing capability, brand reputation, and consumer journeys on e-commerce platforms. *Journal of the Academy of Marketing Science*, 49(5), 994-1020.
76. Jauhar, S., Pratap, S., Lakshay, Paul, S., & Gunasekaran, A. (2023). Internet of things based innovative solutions and emerging research clusters in circular economy: Jauhar et al. *Operations Management Research*, 16(4), 1968-1988.
77. Attri, V., & Kapoor, A. (2021, December). A Relative Study on Existing Models of e-Commerce Sites Based on Analytics. In *2021 10th International Conference on System Modeling & Advancement in Research Trends (SMART)* (pp. 635-639).
78. Hong, X., Wang, L., Gong, Y., & Chen, W. (2020). What is the role of value-added service in a remanufacturing closed-loop supply chain?. *International Journal of Production Research*, 58(11), 3342-3361.

79. He, Y., Zhou, F., Qi, M., & Wang, X. (2020). Joint distribution: service paradigm, key technologies and its application in the context of Chinese express industry. *International Journal of Logistics Research and Applications*, 23(3), 211-227.
80. Santos, M. J., Amorim, P., Marques, A., Carvalho, A., & Póvoa, A. (2020). The vehicle routing problem with backhauls towards a sustainability perspective: A review. *Top*, 28(2), 358-401.
81. Wanganoo, L., Panda, B.P., Tripathi, R., & Shukla, V.K. (2021, March). Harnessing smart integration: Blockchain-enabled B2C reverse supply chain. In 2021 International Conference on Computational Intelligence and Knowledge Economy (ICCIKE) (pp.261- 266).