E-ISSN: 2708-4523
P-ISSN: 2708-4515
Impact Factor (RJIF): 5.61
AJMC 2025; SP-6(2): 291-296

www.allcommercejournal.com
Received: 27-06-2025
Accepted: 28-07-2025

Nimit Sharma
Research Scholar, School of Commerce, REVA University, Bangalore, Karnataka, India

Dr. Shivasharana
Associate Professor, REVA Business School, REVA University, Bangalore, Karnataka, India

Corresponding Author:
Nimit Sharma
Research Scholar, School of Commerce, REVA University, Bangalore, Karnataka, India

Innovative business models and strategies for reverse logistics

Nimit Sharma and Shivasharana

DOI: https://www.doi.org/10.22271/27084515.2025.v6.i2Sc.710

Abstract
Reverse logistics (RL) is a vital strategic business function of the modern business ecosystem, focusing on promoting environmental sustainability and supporting the circular economy. This chapter explores the evolving landscape of reverse logistics through a comprehensive review of real-world case studies that organisations across various sectors use to enhance their reverse logistics operations, making them more efficient, profitable, and sustainable. The primary objective of this study is to identify and analyse various business models and strategic approaches adopted by the organisations.

Using a literature review methodology, the research synthesises practical implementations of reverse logistics strategies and findings, categorising innovations in business models into closed-loop supply chains, product-service systems (PSS), Take-Back/Buy-Back Programs, and Remanufacturing and Refurbishment Models. It discusses digital-enabled reverse logistics platforms and examines strategic practices, such as collaborative partnerships, green packaging, and return forecasting.

The findings reveal that firms adopting technology-driven and customer-centric reverse logistics strategies are better positioned to reduce operational costs, recover value from returned goods, and achieve sustainability goals. Additionally, integrating circular business models with supply chain functions significantly contributes to competitive advantage and waste reduction.

This research is beneficial for students and scholars in supply chain management and sustainability studies, as it provides a comprehensive understanding of strategic trends in reverse logistics. It bridges the gap between academic theory and business practice by providing actionable insights for industry practitioners aiming to optimise reverse logistics operations. It also guides policymakers in designing sustainable supply chain practices regulations.

Keywords: Collaborative logistics models, deposit-refund systems, recycling-as-a-service, refurbishment, remanufacturing

1. Introduction

The concept of reverse logistics evolved through the Industrial Revolution and became more formalised as industries and transportation networks expanded (Komal Puri, 2022) [8]. The field experienced significant growth due to globalisation and international supply chains, increasing the complexity of managing returns and waste disposal across borders. The rise of e-commerce in the 1990s and 2000s (Singh & Kundu, 2002) [11] further emphasised the importance of reverse logistics, as online shopping resulted in higher return rates and customer expectations for convenient return processes. Today, reverse logistics is recognised as a strategic business function that helps companies reduce costs, improve customer satisfaction, and comply with environmental regulations.(Fernando *et al*., 2023) [5]. It is widely used across various industries, including retail, automotive, electronics, and chemicals, and involves a range of activities such as returns management, repairs, recycling, and remanufacturing.(Ambilkar *et al*., 2022) [1]. While numerous strategies and models have been explored in research literature, there has yet to be a chapter specifically addressing the evolution of reverse logistics. Therefore, this study aims to examine the development of reverse logistics across various industries in the 21st century and analyse the time taken for this transition. The chapter is divided into three timeframes: the first spans the start of the century, i.e., the 2000s; the next is pre-COVID, i.e., 2019; and the last segment covers 2020 to the present. This stage-wise analysis will provide a contextual framework for understanding the shortcomings at present and work on future possibilities to enhance the supply chain to its maximum potential. This research will help practitioners, researchers, and academicians stay up-to-date on the current state of reverse logistics and its evolution to its current stage, and recommend new strategies for the future. However, the limitations of this study include the fact that the models may quickly become outdated due to the rapidly evolving supply chain, making it challenging to maintain the relevance of recommendations.

2. Research Methodology

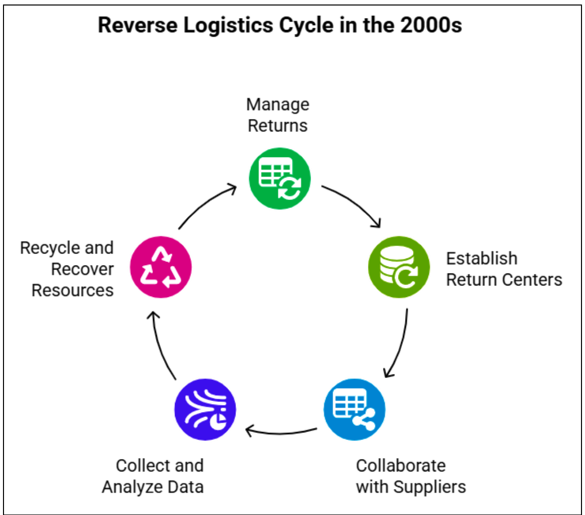
The nature of this study is qualitative, utilising the most pertinent and reliable information from the secondary data sources, such as a range of academic journals, industry reports, case studies, and relevant blogs. The analysis will be conducted through methods such as thematic review or content analysis, allowing for an in-depth understanding of the evolution of reverse logistics and the changing strategies associated with it.

3. Evolution of Reverse Logistics: A Three-Stage Framework

3.1. Stage I: Reverse Logistics in the 2000s

The initial stage of reverse logistics, which gained prominence in the 2000s, was primarily driven by the need to manage product returns, particularly in sectors such as retail and electronics. The focus was on handling damaged or unwanted goods efficiently and cost-effectively. The returns for select categories of products, along with decisions on their disposition, location, and capacity of facilities, as well as the flows of returned products, were studied (Srivastava & Srivastava, 2006) [12].

3.1.1. Strategies



Returns Management and Processing: Retail and electronics companies established clear procedures for handling returns, including receiving, sorting, and inspecting returned goods. Processes such as return initiation, routing determination, receiving, disposition selection, customer crediting, and performance measurement were formalised.

Definitions of various terms used

Return Initiation

The point at which a customer starts the return process, typically via an online portal or customer service.

Routing Determination

Identifying where the returned product should be sent—repair centre, warehouse, vendor, or disposal.

Disposition Decision

Choosing the final action for returned goods: restock, refurbish, recycle, resell, or scrap.

Customer Credit Processing

Issuing refunds or store credits after verification of return eligibility and condition

Performance Metrics (KPIs)

Standard metrics include Return Rate, Time to Disposition, Credit Issuance Time, and Recovery Value.

Centralised Return Centres: To streamline the returns process, many companies established centralised return centres. These facilities were designed to consolidate returns from various locations, allowing for more efficient processing and management. This was especially important as return volumes grew with the rise of e-commerce, improved sorting accuracy, reduced processing times, and maximised value recovery.

Supplier Collaboration: Recognising the importance of the supply chain in reverse logistics, companies began to collaborate with their suppliers. This collaboration enabled smoother product recovery and reuse cycles, as suppliers could provide insights into product design and materials that facilitated easier refurbishment or recycling. It also helped in managing recalls, defects, and excess inventory more effectively.

Data Collection and Analysis: Companies began using data to identify root causes of returns, enabling them to adjust product design, sales strategies, and logistics processes to reduce future returns and improve efficiency

Recycling and Resource Recovery: Businesses increasingly adopted recycling programs, especially in industries where material recovery was economically viable (e.g., electronics, automotive, and publishing). Private networks focused on recycling economically attractive materials, while public networks handled broader but less profitable streams of materials.

3.1.2. Business Models

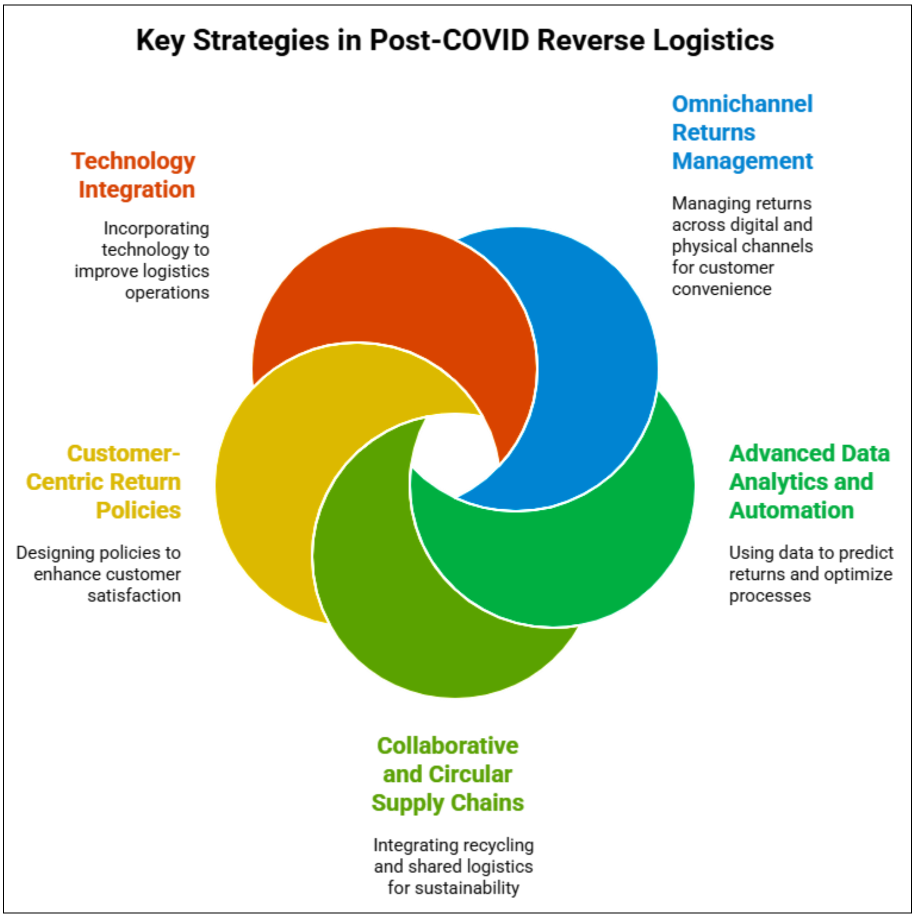
Product Returns and Refurbishment: The growth of e-commerce in the 2000s significantly transformed product returns and refurbishment processes across various industries. This phenomenon necessitated the development of sophisticated returns management strategies and refurbishment processes to mitigate financial losses and enhance operational efficiency ("Returns Policies and Smart Salvaging," 2019). The refurbishing model promoted environmental sustainability by extending the product life cycle and reducing waste. Companies worked on revitalising returned items, allowing them to recover value that would otherwise be lost and increasing profitability without the need for new manufacturing. This approach also attracted conscious customers seeking high-quality items at lower prices, thereby expanding the customer base and fostering loyalty.

However, managing the inspection and refurbishment process proved resource-intensive, requiring skilled labour and time. Despite thorough inspections, a risk remained that refurbished items might not meet the same standards as new products, potentially leading to customer dissatisfaction and returns. Such drawbacks could also divert companies from other critical areas, such as product development or marketing, which could hinder overall growth (Stevenson & Rieck, 2024) [13].

Remanufacturing: Remanufacturing is "1) An industrial process in which worn-out products are restored to like-new condition. In contrast, a repaired product typically retains its original identity, and only those parts that have failed or are severely worn are replaced or serviced. 2) The manufacturing environment where worn-out products are restored to like-new condition"(Drake, n.d.) [4]. It had been adopted earlier in the automotive and heavy machinery industries. Remanufactured products offered a cost-effective alternative for consumers and businesses, while also reducing waste and resource consumption. This led to remanufacturing being particularly prevalent in the automotive and heavy machinery sectors, which helped conserve raw materials and reduce energy consumption. However, this model struggled with a steady supply chain of returned goods. Additionally, not all products were suitable for remanufacturing, and there were limited options available in the market at that time (Zong, 2013) [15].

Reuse and Redistribution: A prevalent and eco-friendly practice in packaging and pallet management involves repurposing and redistributing materials. This process involves gathering used packaging or pallets, assessing their condition, and making them available for reuse. As a result, this method effectively reduces waste and lowers the expenses related to acquiring new packaging materials. Tracking and managing used packing was complex. Following the different regulations of Various industries regarding packaging materials, logistically, the collection, coordination, and distribution of used packaging materials become difficult.

3.2. Stage II: Post-COVID Shift (2020s)
3.2.1. Strategies



- **Omnichannel Returns Management:** Facilitated effortless returns through both online and in-store channels. As e-commerce expanded, businesses had to handle returns across digital and physical platforms. Omnichannel returns management allowed customers to start the return process online and drop off items at retail locations, or vice versa, ensuring a smooth and convenient returns experience.
- **Advanced Data Analytics and Automation:** Enhanced forecasting of returns and streamlined processes. The use of data analytics and automation significantly contributed to better forecasting of returns and increased process efficiency. Businesses utilised data to anticipate return volumes, pinpoint frequent reasons for returns, and enhance the returns process with automation technologies like robotic sorting and automated inspection systems.
- **Collaborative and Circular Supply Chains:** Partnerships with recycling organisations and collaborative logistics have become a priority. Efforts have turned towards developing more cooperative and circular supply chains. This includes working with

recycling partners to ensure effective recycling of returned products and recovery of materials for reuse. Additionally, shared logistics networks have started to take shape, enabling companies to pool transportation and warehousing resources, thereby lowering costs and minimising environmental impact.

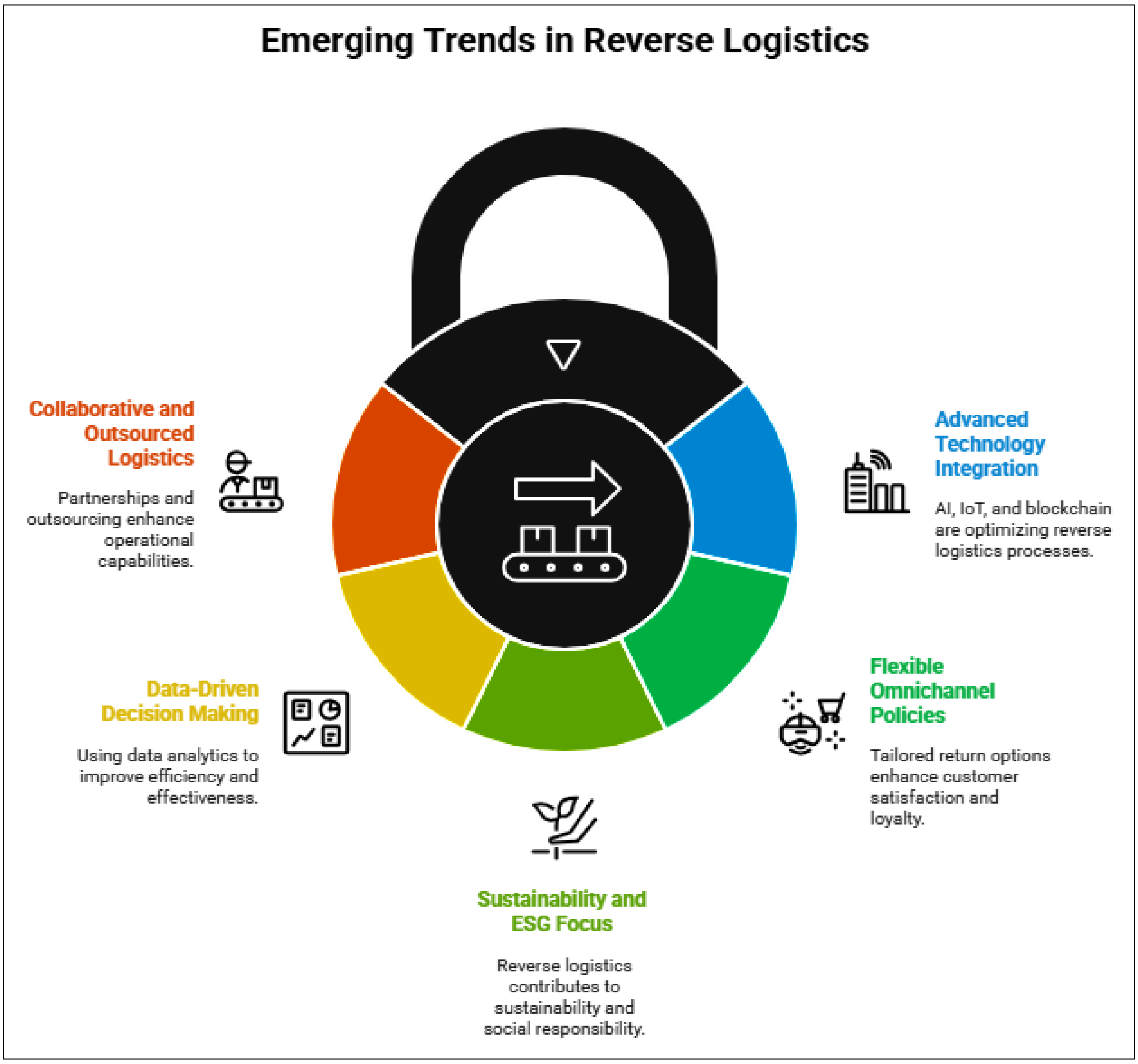
3.2.2. Business Models

- **Customer-Centric Returns Platforms:** There was a growing emphasis on convenience and speed. Companies started to focus on ensuring that the returns process was customer-friendly and efficient. Returns platforms designed with the customer in mind provide features like simple online return initiation, prepaid shipping labels, and prompt refunds or exchanges.
- **Refurbishment and Resale:** The market for certified refurbished goods has grown considerably, thanks to online platforms that specialise in these products. These platforms give consumers the chance to purchase high-quality items at lower prices, while also assisting companies in recouping value from returned merchandise.
- **Remanufacturing and Recycling:** The use of closed-loop systems grew significantly, as companies concentrated on remanufacturing products and recycling materials to reduce waste and decrease dependence on new resources. This strategy was in line with the concepts of the circular economy and assisted companies in enhancing their environmental sustainability.

3.3. Stage III: Current and Emerging Practices (2025)

The present phase of reverse logistics is marked by the adoption of cutting-edge technologies and a significant focus on sustainability, along with environmental, social, and governance (ESG) considerations. Organisations are utilising these technologies to enhance reverse processes and are increasingly recognising reverse logistics as an essential element of their sustainability initiatives.

3.3.1. Strategies



- **Advanced Technology Integration:** The current phase of reverse logistics is defined by the integration of innovative technologies and a heightened focus on sustainability, including environmental, social, and governance (ESG) issues. Businesses are harnessing technology to improve reverse logistics processes and are progressively considering reverse logistics as a vital aspect of their sustainability efforts.
- **Flexible Omnichannel Policies:** Customised policies according to customer profiles. Businesses are increasingly implementing flexible omnichannel strategies tailored to the unique profiles of individual

customers. This approach includes varying return options based on factors such as customer loyalty, purchase history, and the type of product.
- **Sustainability and ESG Focus:** Reverse logistics has emerged as a pivotal element in sustainability reporting, gaining significant traction within Environmental, Social, and Governance (ESG) initiatives. Organisations are now focusing on various metrics, such as the percentage of returned goods that are successfully refurbished or recycled, highlighting their commitment to minimising waste. Additionally, companies are emphasising the reduction of emissions and overall waste through efficient reverse logistics processes. They are also considering the broader social implications of their reverse logistics programs, assessing how these initiatives contribute to community well-being and environmental health. This holistic approach not only enhances transparency in sustainability reporting but also reinforces corporate responsibility in the eyes of stakeholders.

3.3.2. Business Models
- **Recommerce Marketplaces**: Online marketplaces such as OLX and Amazon Renewed have gained significant traction as go-to platforms for selling pre-owned and refurbished items. These sites not only offer consumers a diverse selection of products at lower prices, but they also play a crucial role in promoting sustainability. By facilitating the resale of goods, these platforms help companies prolong the lifecycle of their products, ultimately reducing waste and encouraging more eco-friendly consumption habits. This symbiotic relationship between buyers and sellers fosters a circular economy, benefiting both the environment and budget-conscious shoppers.
- **Subscription and Rental Models**: Subscription and rental models are increasingly popular across different sectors, especially for items that are not frequently used or needed only for a limited duration. These approaches enable companies to retain ownership of their products, ensuring they are returned for repeated use. This not only lowers the demand for new production but also significantly lessens waste, fostering a more sustainable consumption pattern. As industries embrace these models, they cultivate a circular economy that benefits both businesses and the environment.
- **Trade-In and Buyback Programs:** Electronics and automotive companies often use trade-in and buyback programs to encourage customers to return their used products. These programs offer customers a discount on new products in exchange for their old ones, which are then refurbished or recycled. This strategy not only helps companies retain customers but also promotes sustainable consumption.

4. Industry-Wise Mapping of Reverse Logistics Models
- **Automotive:** Reverse logistics in the automotive sector is highly structured, driven by environmental regulations and cost-efficiency goals. Core-return policies are widely implemented in the automotive industry, where customers or service centres return used components (like alternators, starters, batteries, engines, transmissions or brake callipers) to manufacturers or remanufacturers. Companies like Ford and General Motors offer incentives such as discounts or credits for returning cores, which are then inspected and either remanufactured or recycled(*Ford-Parts-Return-Policy*, n.d.), (*GM_Parts_Return_Policy*, n.d.) [7]. For instance, electric vehicle (EV) battery return programs are critical for recycling lithium-ion cells to recover materials like cobalt and nickel. Tesla, for example, has invested in facilities to remanufacture lithium-ion batteries, extending their lifecycle and reducing raw material dependency(Conrad Nichols, n.d.) [3].Salvageable parts from end-of-life vehicles (ELVs) are reused in repairs or secondary markets. Auto recyclers like LKQ Corporation dismantle vehicles to sell functional parts, supporting a circular economy(*LKQ Corp - Any Part. Any Repair. Any Where.*, n.d.).
- **Electronics**: Due to the high value and rapid obsolescence of electronic goods, manufacturers and retailers actively deploy trade-in schemes and extended producer responsibility (EPR) programs. Consumers are encouraged to return old gadgets in exchange for discounts. Certified refurbishment has become a thriving segment, with platforms like Amazon Renewed program offering reliable alternatives to new devices, thereby extending product lifecycles and reducing e-waste. Returned devices are evaluated, with functional ones refurbished for resale and non-functional ones recycled for materials. Apple's trade-in program, for instance, processes millions of devices annually, recovering valuable materials like cobalt and rare earth elements(*Apple Trade In - Apple*, n.d.). HP's Planet Partners program facilitates the return and recycling of printers and cartridges globally(*Product Return and Recycling | HP® Official Site*, n.d.).
- Retail: Fast returns, recommerce platforms, reverse pickups.
- FMCG: Packaging return loops, expiry-based reverse flows.
- Apparel: Resale, rental, and return-to-manufacturer systems.

4. Trends Across Key Sectors
- Rise in product-as-a-service in electronics and fashion.
- Sector-specific AI adoption for returns prediction.
- Increased B2C recommerce activity.
- Shift toward local circular loops to reduce carbon impact.

5. Challenges in Cross-Sector Adoption
- Standardization Gaps: Inconsistent return policies and tracking mechanisms.
- Cost Concerns: Smaller sectors struggle with ROI.
- Technological Readiness: Traditional sectors lack digital infrastructure.
- Regulatory Issues: Complex and varied compliance rules.

6. Comparative Evolution Analysis
- Strategic Shift: From reactive returns handling to proactive lifecycle design.
- Technological Progression: From manual systems to AI-driven platforms.
- Process Integration: Evolved from isolated systems to

embedded supply chain components.

7. Opportunities and Future Directions

- Circular Economy Integration: Reverse logistics as core to resource efficiency.
- Digital Recommerce Growth: AI-powered pricing, quality checks.
- Blockchain Use: Traceability and fraud prevention.
- Policy Support: Subsidies for reverse logistics infrastructure.

5. Conclusion

The evolution of reverse logistics over the past two decades demonstrates a transition from cost-centred recovery operations to strategic, tech-enabled sustainability initiatives. By segmenting the study into three phases—the 2000s, the post-COVID 2020s, and emerging trends in 2025—this research reveals how businesses across sectors have adapted models to meet environmental, economic, and customer demands. The study underscores the need for cross-sector collaboration, investment in technology, and proactive policy frameworks to sustain this momentum**.**

References

1. Ambilkar P, Dohale V, Gunasekaran A, Bilolikar V. Product returns management: A comprehensive review and future research agenda. Int J Prod Res. 2022;60(12):3920-44.
2. Apple. Apple Trade In—Apple. https://www.apple.com/shop/trade-in
3. Nichols C. Second-life Electric Vehicle Batteries 2025-2035: Markets, Forecasts, Players, and Technologies: IDTechEx. https://www.idtechex.com/en/research-report/second-life-ev-batteries-2025/1056
4. Drake MJ. Ann K. Gatewood, CPIM-F, CIRM, CSCP-F, CLTD-F.
5. Fernando Y, Shaharudin MS, Abideen AZ. Circular economy-based reverse logistics: Dynamic interplay between sustainable resource commitment and financial performance. Eur J Manag Bus Econ. 2023;32(1):91-112.
6. Ford-Parts-return-policy [Internet]. [cited 2025 Jul 11]. Available from: https://www.ford.com/parts/return-policy/
7. GM_Parts_Return_Policy. https://www.gmparts.com/returns
8. Puri K. What is reverse logistics? Complete Guide to Reverse Logistics. 2022 Oct 13. https://fareye.com/resources/blogs/reverse-logistics
9. LKQ Corp - Any Part. Any Repair. Any Where. https://www.lkqcorp.com/
10. HP. Product Return and Recycling | HP® Official Site. https://www.hp.com/us-en/sustainable-impact/planet-product-recycling.html?msockid=08e6505dab696188314144ccaac46044
11. Singh N, Kundu S. Explaining the Growth of E-Commerce Corporations (ECCs): An Extension and Application of the Eclectic Paradigm. J Int Bus Stud. 2002;33(4):679-97.
12. Srivastava SK, Srivastava RK. Managing product returns for reverse logistics. Int J Phys Distrib Logist Manag. 2006;36(7):524-46.
13. Stevenson AB, Rieck J. Investigating Returns Management across E-Commerce Sectors and Countries: Trends, Perspectives, and Future Research. Logistics. 2024;8(3):82.
14. Amazon. Welcome to Amazon Seller Central. https://sellercentral.amazon.com/
15. Zong XL. An Evolutionary Game Study on the Sustainable Product Development in Remanufacturing. Adv Mater Res. 2013;712-715:2940-3.