



Scoping Innovative Retail Product Returns Pathways

Journal:	Strategy & Leadership
Manuscript ID	SL-04-2025-0062.R1
Manuscript Type:	Research Paper
Keywords:	Product returns, technology adoption, innovation, omnichannel retail, Process efficiency

**PAPER WITH CHANGES MARKED**

**Scoping Innovative Retail Product Returns Pathways**

~~Innovation in retail technologies and services enable more effective and sustainable pathways for returned products to be sold again whilst conserving product value.~~

**Abstract**

**Purpose**

Product returns in omnichannel retail are wasteful and generate significant financial and environmental impact. Returns systems often suffer from low efficiency and effectiveness. Innovative technology and service solutions are proposed by an increasing number of start-ups, with many enabling new more effective and sustainable pathways for returned products to be sold again whilst conserving product value.

**Design/methodology/approach**

—By adopting an engaged research approach involving close dialogue with retailers as well as technology and returns service providers, we explore the implications of adopting these innovations and the outcomes for retailers and suppliers, employees, and consumers. Using the lens of the retail technology adoption framework by Shankar et al. (2021), we investigate how innovation in technology and process can enable alternative pathways for consumer product returns. Some offer added value to consumers, and many reduce waste and allow retailers to conserve the value of returned products.

**Findings**

• Retailers increasingly take control of secondary markets to increase the retained value of returned products, shorten pathways to resale, and increase resale rates. Peer-to-peer returns, ‘trying whilst the courier waits’, and the returns ecosystem approach all optimise returns management, impacting both the forward and reverse logistics of retail.

**Originality/value**

We suggest ~~extending the addition of the value conservation option as an extension to~~ the retail technology adoption framework to include the aspect of value conservation, in addition to the existing value-adding and commoditising features. The new pathways enable retailers to address the challenges of high returns rates, financial pressure, whilst reducing environmental impact.

**Keywords:** Product returns, technology adoption, innovation, omnichannel retail

**Highlights:**

- The retail technology adoption framework by Shankar et al. (2021) serves as a lens to explore innovative technologies and services that enable alternative pathways for returned products.
- We extend the retail technology adoption framework to include the aspect of value conservation, in addition to the existing value-adding and commoditising features.
- Peer-to-peer returns, 'trying whilst the courier waits', and the returns ecosystem approach all optimise returns management, impacting both the forward and reverse logistics of retail.
- Retailers increasingly take control of secondary markets to increase the retained value of returned products, shorten pathways to resale, and increase resale rates.
- New sensor tags and artificial intelligence algorithms are being developed to address 'wardrobing', a frequent type of returns fraud where customers buy items with the intention to use and then return.

## 1 Introduction

Fashion retailer profits are adversely affected by high returns rates and high returns fraud levels (Zhang et al., 2022) set against a wider background of fierce price-based competition. Consumer product returns also have a significant environmental impact given the additional transportation, packaging and processing involved (Jaller and Pahwa, 2020). Many returned products are often in substandard condition or 'out-of-season', hence cannot be resold at full price, and are commonly discounted or sold via secondary sales channels. While the recovered value varies (Stock and Mulki, 2009), reducing product returns rates should be a priority for all retailers (Frei et al., 2023; Wallenburg et al., 2021). Nevertheless, a certain level of product returns will persist and therefore, returns management – including all the steps and processes from a return request to final resolution – need to be optimised.

Returning products involves complex reverse logistics, which encompasses managing the flow of products from customers back to the company, including transportation, processing and resale, or disposal. How efficiently retailers manage their returns is influenced by factors such as the reason for the return, the condition of the returned product, and its destination (Zhang et al., 2023). Further,

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

cross-channel returns integration is necessary to ensure that products purchased via one channel can be returned via another (Muir et al., 2019). To manage product returns successfully, retailers need to invest in technologies and innovations that deliver resilience, cost efficiency, and customer satisfaction. Automation and artificial intelligence offer the ability to optimise reverse logistics processes; implementing smart tracking technologies allows the monitoring of the location and condition of returned products; while sustainable practices serve to reduce waste and environmental impact (Nuss et al., 2015; Garrido-Hidalgo et al., 2019). Such measures can also assist retailers in building stronger relationships with their customers. However, the predominant returns processes tend to be inefficient and unsustainable. There is a relative lack of understanding regarding how innovative product returns processes and associated technologies might enable new consumer returns pathways in practice.

Given this background, this study seeks to address the following research question: How do recent innovations in product returns processes and technologies enable alternative pathways for consumer product returns, what are their implications, and what obstacles need to be overcome?

Our work necessarily takes an engaged research approach (Sternberg et al., 2024) whereby we deeply interact with stakeholders through ongoing detailed discussions reflecting their realities and exploring potential innovative solutions. Such an approach offers significant enhancements compared to a standard semi-structured interview approach. It enriches academic activities by co-creating ideas and enhancing their relevance and timeliness (Campus Engage, 2023). It allows us to explore the challenges and barriers that need to be overcome to enable a wider adoption and assess the implications and outcomes of implementing these innovations. Therefore, the study contributes in-depth insights on existing and new returns pathways, as well as their efficiency, effectiveness, and sustainability. We explore innovative retail technologies and services through the lens proposed by Shankar et al. (2021) and identify a missing outcome dimension of ‘value-conserving’ alongside more established ‘value-adding’ and ‘commoditising’ outcomes.

This study also offers a series of managerial and practical implications. For managers, especially those handling supply chain and logistics functions, the findings underscore the need to transition from reactive and fragmented, channel-specific returns processes toward more integrated, ecosystem-based models that conserve value and support sustainable practices leveraging technological innovation. Retailers can benefit operationally and financially by adopting innovative returns

pathways that accelerate resale cycles and enhance the consumer experience. The study's implication also speaks to the growing imperative for operational sustainability by highlighting how reverse logistics innovations can support environmentally responsible consumption. Policymakers are encouraged to build on these insights by developing supportive regulatory frameworks and incentives—such as tax benefits for resale or collaborative circular economy initiatives—that can accelerate the transition toward more sustainable retail systems.

The article is organised as follows: First, we reflect on the weaknesses of current product returns systems, relevant retail technologies, and the theoretical framework used in our analysis. After detailing our research methodology, we analyse and discuss innovative technologies and approaches. This is followed by conclusions and directions for future work.

## 2 The Retail Operations Context and Current Product Returns Processes

Omnichannel retail strategy encompasses the integration of various shopping channels, such as brick-and-mortar stores, online shops, and mobile applications, with the objective of cultivating a cohesive customer experience (Rooderkerk & Kök, 2019). It enables consumers to shop and return products through different channels interchangeably, offering greater convenience and flexibility (Hübner et al., 2016). Many consumers check products online and then visit a store, or visit a store and compare prices on their mobile (The Industry Fashion, 2023). However, this added operational complexity challenges retailers to track, manage, and analyse the factors driving returns in a process that engages the entire supply chain, from customer service to processing and grading items (Loomba & Nakashima, 2012), to logistics and inventory management (Bijmolt et al., 2021). To address this challenge at a strategic level, it is essential to gain a deeper understanding of why returns happen (Gallino & Moreno, 2014). Enhanced information systems are needed to track and manage product returns effectively, as returns originate from various sources and are processed through multiple channels (Gallino & Rooderkerk, 2020). Product returns processes are often a result of incremental changes over time, lacking strategy and goals (Hjort et al., 2019). This leads to weaknesses and flaws:

*Product returns systems are inefficient.* Many are arranged in an ad-hoc manner and underpinned by legacy technology (Jack et al., 2019). With average e-Commerce return rates of 20-30% (Invesp, 2022), they represent a significant and growing cost for retailers. Pressure is exacerbated where returns rates are even higher, with more than 50% returns reported for expensive women's apparel, and often only half resold (Robosize, 2022). Outdated communication and information processing systems,

misplaced products, and inefficient logistics are some of the 43 barriers to efficient processing of omnichannel returns identified by De Borba et al. (2020).

*Product returns systems are ineffective.* Although effective return policies can foster customer loyalty, they resulted in more than \$761 billion in lost sales in 2021 in the US (NRF, 2022). Many retailers lack an established, embedded, and efficient returns strategy. Opportunities to capture useful information such as the reason for returns are rarely taken, failing to inform strategies to reduce returns rates and improve processes (Frei et al., 2023).

*Product returns systems are unsustainable.* Most retailers make Corporate Social Responsibility commitments, yet they struggle to implement them in product returns (Frei et al., 2020). Many retailers still consider the costs of product returns as an unavoidable element of doing business and lack coherent data insights regarding their nature and scale. Jack et al. (2019) suggested retailers should recognise and maximise the value of returned items; addressing the strategic importance of returns on both a financial and environmental level.

*The digital transformation of the retail sector* has changed customer shopping and returns behaviour for good (Jiang & Stylos, 2021). Related, retailers widely restructure their operations with the support of digital technologies (Shankar et al., 2021). For example, track-and-trace systems enable customers to follow deliveries in real-time, reducing customer anxiety regarding delivery delays (Hagberg & Hulthén, 2022). Some retailers and logistics providers leverage digital technology to establish automated locker systems (Vakulenko et al., 2018) as convenient customer pickup points, which minimise physical interaction and accommodate busy schedules.

Retailers increasingly implement digital returns portals with QR codes, which enable retailers to collect customer returns data (Frei et al., 2023). These systems can optimise the management of reverse logistics to meet increasing end recipient needs and facilitate delivery to the next customer. Several new service propositions have recently been introduced. For instance, peer-to-peer returns shipping (Althouse, 2022) allows customers to ship their returns to the next customer rather than back to the retailer – merging initial delivery and returns in a cost-effective manner. *However, there are no in-depth studies on the enablers and potential challenges of these new innovative approaches*, and the term ‘peer-to-peer’ (P2P) is primarily used in financial lending systems (Tang, 2019) or trading in energy networks (Tushar et al., 2020).

*Innovation in technology* often shapes processes and services in retail. In their seminal study, Shankar et al. (2021) classify retail technologies by attributes (Table A). Their framework for the adoption of new technologies reflects on antecedents, outcomes, and forces at play related to technology. Whilst other frameworks for the adoption of technology exist (Koul & Eydgahi, 2017), this framework specifically examines the retail context. For retailers and suppliers, relevant factors include the cost of adoption, competitor innovation, and regulation. For retailers, the outcomes relate to revenues, market share, profits, shareholder value, efficiency, and time to market. In terms of the adoption, aspects relevant to employees and consumers include usefulness and ease of use. The outcomes for employees include effectiveness and productivity, whereas for customers they relate to experience, purchase, satisfaction, and loyalty.

Having identified weaknesses in current product returns processes as well as emerging innovation in retail technology and services, we observe a lack of knowledge regarding implementation enablers, barriers, and implications. Therefore, our research question is: How do innovative retail technologies and services enable new product return pathways, and what are the implications for the stakeholders? We apply the retail technology framework to assess the innovations discussed in Section 4.

### 3 Methodology

This exploratory research seeks to create new theoretical and practical knowledge in a fast-evolving sector. Engaged research, which immerses researchers in the wider context of the research topic, has gained prominence in supply chain and operations management (van de Ven & Johnson, 2006; Sternberg et al., 2024; Sandberg et al., 2022; Stark et al., 2023). This approach involves active collaboration with practitioners, who provide practical insights that enrich the relevance of research process (Wiklund et al., 2019). The collaborative exchange combines the complementary expertise of researchers and practitioners.

The research team in this study comprises academics with backgrounds in supply chain operations, product returns, behavioural science, risk management, and strategic management. Collaborating with a broad range of retail practitioners—including retailers, manufacturers, retail service and technology providers, logistics managers, and product returns experts—the team explored how product returns networks can be redesigned to become more effective, efficient, resilient, and sustainable. The detailed engagement process for data collection and validation is outlined below.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

**3.1 Data collection and engagement process**

Initially, two product returns researchers reviewed academic and trade publications on the challenges of product returns management and relevant new developments. Additionally, they attended three practitioner workshops organised by retail communities to gain insights into recent best practices, current trends, and real-world case studies. This process assisted the researchers identify suitable interview participants and formulate relevant discussion topics.

Between 2021 and 2023, 32 semi-structured interviews were conducted with 40 product returns experts (Appendix A). Sample questions included: *“Might you consider implementing a P2P shipping solution in your company?”*, *“Do you think working with local resellers to avoid shipping all returns back to the warehouse can reduce costs and increase resale rates?”*. These interviews provided in-depth information on existing and emerging returns pathways, their benefits, challenges, and barriers to implementation. We employed a purposive sampling approach, a non-probability technique designed to gather in-depth knowledge rather than make broad statistical inferences (Higginbottom, 2004). Interviewing experts is a highly effective technique in empirical research (Bogner et al., 2009), and it yielded valuable data from retail managers, industry experts, and technology providers. Retail managers offered perspectives on practical product return strategies, while industry experts provided independent viewpoints. Discussions with retail service and technology providers—ranging from start-ups to SMEs and large enterprises—enabled us to track innovations in real time and across different sizes of retail operation. Many practitioners also sought our feedback on their technology, products, and services, facilitating an insightful interactive dialogue.

In addition to formal interviews, we held follow-up online meetings with three retailers and two technology providers, conducting 2-3 additional sessions per participant outside the formal structure. These meetings allowed for ongoing discussions about the effectiveness of new returns pathways and helped validate emerging findings. All interviews, conducted online, were recorded and transcribed, with sessions lasting between 45 to 90 minutes, averaging about one hour. Follow-up discussions, typically around 30-45 minutes were more concise and focused, with supplementary notes taken throughout.

To further validate our findings and deepen engagement with broader audiences (Sandberg, 2005), we participated in online meetings of retailer associations’ (ECR Retail Loss Group, ORIS Forums, and



the Reverse Logistics Association (RLA)), and face-to-face presentations and subsequent bilateral discussions at the Reverse Logistics Association's European Summit in Amsterdam in June 2022 and 2024. These interactions provided valuable feedback and initiated ongoing dialogue with industry experts. We also shared our preliminary findings with practitioners via email for validation and feedback, ensuring accuracy and incorporating any necessary updates.

Overall, our data collection process combined semi-structured interviews, interactive meetings, presentations, and a validation phase. This cross-checking and iterative feedback approach ensured the robustness and relevance of our findings, which is further detailed in subsequent sections.

### **3.2 Data analysis**

We applied thematic analysis (Braun and Clarke, 2006) to identify, analyse, and report key themes related to emerging product returns pathways and innovations in the retail industry. As a well-established qualitative research method (Cassell et al., 2017), thematic analysis enabled us to recognise patterns and themes within the data. Our approach followed a structured three-stage coding process, widely adopted in qualitative research (Corbin & Strauss, 1990).

In the first stage, we conducted open coding (Charmaz, 2006), segmenting the data into discrete units to identify processes and key actors within the returns system. We specifically labelled passages relevant to our research questions, with a focus on areas such as technological innovations, service improvements, and new returns pathways. Subsequently, sub-codes were applied to enable deeper analysis, distinguishing specific types of innovations. For instance, passages discussing technological developments were sub-coded to capture specific developments in that area (e.g., sensor tags). In the second stage, axial coding was used to establish relationships between categories and their subcategories (Corbin & Strauss, 1990). That is, we reviewed, refined, compared, and grouped the initial codes into related categories (e.g., innovations targeting returns fraud, purchasing processes, or the secondary market), examining their interconnections. This stage allowed us to reassemble the data around central phenomena, providing a clearer understanding of the core elements within the returns system. In the final stage, we performed selective coding to integrate the categories into a cohesive analytical framework by identifying core themes and building a connected narrative, as shown in Appendix B (Figure 1). Examples of quotes pertaining to the codes are shown in Appendix C.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

All coding and data analysis processes were conducted manually by three researchers: two with expertise in product returns who handled the initial coding, and a third researcher with strategic and management expertise who reviewed the coding and analysis. This multi-coder approach, aligned with qualitative research best practices (Patton, 2002), strengthens the reliability and validity of our findings. To ensure the robustness of our analysis, we had regular group meetings to discuss the data analysis and outcomes, checking for any discrepancies until final agreement (Vollstedt & Rezat, 2019). As detailed in the engagement process, we presented our analysis and key findings to a range of practitioners through follow-up meetings with retailer associations. For example, presentations at the RLA clarified and validated our initial categorisation of innovations and pathways. The feedback received from these sessions helped refine our classification and supported the relevance of new pathways in broader retail contexts. In one instance, practitioner feedback highlighted overlooked issues of risk and customer trust, offering new insights into the enablers and challenges of adopting P2P pathways that technology providers had not initially highlighted. Thus, this iterative feedback process allowed us to refine our findings further (Sandberg, 2005; Sandberg et al., 2022).

**4 Analysis and discussion**

Based on the emergent findings from our data collection, in Section 4.1, we review product returns innovations structured by whether they address the purchasing and returning process, increase resale rates through secondary channels, or prevent returns fraud. Following Shankar et al. (2021), we explore attributes, the adoption implications and likely outcomes of each innovation, and find that product value conservation is missing in the framework. Subsequently, Section 4.2 discusses the returns pathways enabled by the reviewed innovative technologies and services.

**4.1 Innovative technologies and services**

New ideas and technologies for omnichannel returns are developed and implemented by service providers and retailers. All require capable IT systems and effective multichannel integration (Saghiri and Mirzabeiki, 2021). A common prerequisite is customers pre-registering their returns online. Knowing that a return is coming allows the retailer or returns service provider to analyse the case, select and plan the most suitable or most sustainable returns route, and instruct the customer accordingly (Frei et al., 2023). This includes providing a shipping label, details of a local store that agrees to accept the item, a request to visit a brand store within the next few days, or to drop the item at a local parcel hub for return to the distribution centre. This may include a packaging-free returns

option (Li et al., 2022). Subsequently, we discuss new technologies and services that either target a reduction of product returns or reduce product returns as a significant side-effect.

#### *4.1.1 Innovations addressing the purchasing and returning processes*

##### **Try whilst the courier waits**

Some high-end retailers address the inefficiencies and high costs of the returns process by avoiding them entirely. Instead, they essentially bring the store to the customer, who pays a fee for the service, as explained by LP12 (as listed in Appendix A). A combined delivery and returns solution can create service innovation in the luxury apparel industry (Atwal & Heine, 2022), going further than the “try before you buy” offering which provides items to try on and then requires the customer to pay for the items they keep and return the others. With the more advanced offering, a service provider waits during the trying-on process, meaning that there is no additional returning effort for the customer. Customers can also choose the option of getting items delivered in additional sizes, or receiving alternative items upon the retailer’s suggestion. The unwanted items are taken back immediately, meaning they return to the retailer without delay, and the customer need not wait for a refund. There is no opportunity for wardrobing, where customers order, use and then return items for a refund (Phau et al., 2022). The courier can verify that the correct items are delivered in pristine condition and returned in the same state, hence reducing the likelihood of various types of returns fraud. This approach, characterised in Table B, combines the benefits of in-store shopping with those of eCommerce, for customers willing to pay the fee.

##### **P2P returns**

A potentially even more disruptive innovation is P2P returns (Table C), where returned items are offered directly and with a discount to other customers who have registered their wish for such an item. In this variant, the buyer waits until a suitable item is returned, or the request expires, which brings a risk that a willing buyer may remain emptyhanded. In other variants, the returner registers their desire to return an item and waits a few days until either a corresponding purchase is being made, and the item can be sent to the customer, or is otherwise returned to the warehouse. In this case, the new buyer only gets offered to buy via P2P if such an item is available immediately and buys through standard channels otherwise. For both P2P variants, the aim is to eliminate return shipments to the warehouse.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

*‘[The plan is to] slide into the international retailer market, allowing them to maintain their products in a country and then just ship it directly from the returning customer to the purchasing customer in a way that would bypass international shipping and having to redo that, and then any cross-border customs fees.’ S2*

Such approaches are not risk-free, and some are difficult to assess prior to large-scale implementation. For instance, challenges related to a returning customer sending damaged or counterfeit items and blaming the receiving customer are pertinent. It would be challenging for the retailer to assess such a situation reliably; even asking both customers to submit pictures of the item before shipping and upon receipt would not be foolproof. However, technology providers are working on better image analysis methods to verify the authenticity and condition of an item remotely, and electronic tags (RFID or other) could be used to uniquely identify it. Furthermore, most P2P return service providers consider the moral barrier to cheating as relatively strong, and plan to ban problematic customers from further P2P transactions. As these technologies and services are not widely tried and tested yet, customer acceptance is yet to be proven. Initially, they will likely be a service offered to loyal customers only, based on a data analysis of customer history.

**Retail ecosystem solutions**

The aims of innovative returns processes are to reduce waste and shipping costs as well as to save customer time. The pre-registration of returns offers an opportunity to further engage with the customer. This might see the retailer encouraging the customer to avoid the return; regift the product; donate the item; or identify the most sustainable returns path. This is what a pioneer (S3) in the returns service space does: they leverage the *retail ecosystem*. Using artificial intelligence for advanced dynamic decision-making algorithms, the returns path can be optimised for any objective, such as minimal carbon footprint or maximum resale value.

Customers of participating retailers can return anywhere, and local shops naturally become hubs for processing, inspecting, and reselling returned items. The authentication, inspection and potential refurbishment processes can be supported through digital technology (Table D), with clear instructions and visual confirmation, to determine whether it warrants a full refund and can be resold at full price.

*‘We enable local partners to intercept the return. The local partners might be a recycler, they might be a refurbisher, they might be [a charity receiving] a donation, but they are local. Say,*

*you bought jeans from Levi's and want to return. In your neighbourhood, there are five independent stores that sell Levi's. Bring your jeans into there and they will inspect it, validate and resell it via our local ecosystem.'* (S3)

Many of these innovations have the potential to revolutionise return systems and contribute to efficiency, effectiveness, resilience, and sustainability. Future studies are needed to explore how far they can deliver this in practice.

#### *4.1.2 Secondary markets to increase reselling rates*

There are countless resellers of products on the market, but only few have access to premium-brand items. We interviewed two industry leaders (S13, S14) reselling high-quality furniture, fashion, and other items. Both have established relationships of trust with many well-known brands who usually do not allow other resellers to use their brand-names on the items being repaired, refurbished, and resold. Allowing brand names to be retained is essential in improving the reselling price and the desirability of the item on a discount/local market.

Some manufacturers and retailers are taking control of the secondary market themselves (Table E), offering repaired and remanufactured items. This can increase the efficiency and effectiveness of reselling returned or otherwise damaged items. For instance, S8 explained that a European sports retailer recently launched their second-life programme, a multinational furniture retailer introduced circular hubs in their stores, and an international electronics retailer and manufacturer has refurbished their photocopiers for decades, selling them back to customers under a product-as-a-service contract. Despite the considerable potential for economic and ecological benefits, most brands do not yet engage in secondary markets.

#### *4.1.3 Innovations addressing returns fraud*

Wardrobing, often incorrectly perceived by some customers and even some retailers as simply stretching returns policies (Zhang et al., 2023), is inherently difficult to prove unless the item shows clear signs of wear and tear. For the fashion sector, technological innovation can potentially mitigate this, using artificial intelligence (LP2, LP5) or a tag combining several sensor types that will reliably detect when an item is being worn (Table F). Prototypes were tested at the time of writing (2024), according to technology provider S7. Similar sensor tags could be developed for other product types,

to show whether the product has been used - for example, by indicating for how long electricity has passed through the device, or how many times the wheels of a bike have turned.

**4.2 Returns pathways enabled by innovative technologies and services**

The reviewed innovations enable alternative returns pathways from a customer returning a product to another customer buying the item (Appendix D).

**4.2.1 Avoiding warehouses and the need for returns portals**

P2P shipping is the most direct path for a returned product to reach a new customer, although there is a certain risk of the product not being pristine or counterfeit. Two other pathways are almost as efficient: First, a return to a brick-and-mortar store sees the product sold again immediately either at full price, if in mint condition, or otherwise at a reduced price. In some cases, store employees transfer returned items from a smaller store with a limited product assortment to a larger nearby store that offers range breadth (Jack et al., 2019).

Second, environmentally aware service providers (S3, S12) are intercepting returns before shipping and arrange local solutions. Instead of being returned to the original seller, some products are taken to a local store for inspection, potential repair, and resale. Returns portals enable the optimisation of returns pathways and inventory management.

Online purchases are typically returned via courier or postal service. Returning via in-store drop-off boxes, sister stores or stand-alone lockers in urban environments, means products are picked up by a courier service. They are shipped to a (returns) processing centre, including returns that were handed over to physical stores that cannot resell them. Upon arrival, items may take a variety of different pathways onwards. If they are in pristine condition, they may return to eCommerce, via an e-commerce fulfilment centre or via an online outlet channel and then shipped out to customers. Some items, again in mint condition, may be sent to a distribution centre from where they go to physical stores or outlet channels. Certain types of products, including most consumer electronics, are returned to the manufacturer for inspection, testing and, if necessary, refurbishing before the product is sent out again to primary or outlet sales channels.

Alternatively, items may also go to a third-party reseller that operates online or to physical stores. Items on this path may proceed via a third-party repair service and/or potentially via a jobber (selling

in bulk at extremely low prices) or a targeted auction (achieving better prices for better specified goods). The operations of jobbers remain insufficiently explored, as these companies typically act discreetly, shunning the spotlight.

#### 4.2.1 *Conserving value*

Fast and direct reselling retains the most value in pristine items. Repackaging, minor repairs, refreshing, refurbishing, or remanufacturing are worthwhile for products above a certain minimum value. These activities may occur at a third-party reseller, at a physical store (for very minor repairs), at a return's distribution centre, or at a manufacturer's warehouse. In Figure 2 (Appendix D), these locations are marked with a thicker frame. Items that cannot be resold or are not worth processing due to their low value are typically channelled to recycling, downcycling (e.g. textiles are shredded to make insulation or filler materials), or disposal via landfill or incineration. According to S5 and S8, charities will usually resell donated items by weight, which leads to them being processed by other third-party resellers and/or recyclers, with some items being downcycled or destroyed.

#### 4.2.3 *Enablers, risks and barriers*

Table G discusses the various returns pathways, with preconditions or enablers, risks and barriers, advantages, and disadvantages. Some aspects are not exclusive to these pathways. For instance, selling items via online platforms means the seller gets to know the buyer's name and address, and this is generally accepted.

Deciding which returns path to choose for which returned item is not always easy or simple. There is an opportunity for innovative returns portals to automatically choose suitable solutions for diverse situations. For a customer returning more than one item, this may mean returning one item to a local store and sending the second one directly to another customer, whereas the third item needs to be posted to a returns distribution centre that deals with imperfect items. If the item is of low value, retailers may decide to let the customer keep the item and encourage them to regift it to a friend or donate it to charity.

Based on the need to interact with customers in the returns process, what are the consequences for delivery and returns arrangements? All solutions identified in Table H are more effective and sustainable than returning products sold via ecommerce to the warehouse as a catch-all solution. All of the alternative models provide combined delivery and returns solutions. Option 1 (buy online,

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

return to store) has been practiced for a long time, whereas Options 2 (try whilst the courier waits) and 3 (P2P returns) are recent innovations. Some retailers have implemented aspects of Option 4 (buying and renting options). Added suggestions resulting from this study have been discussed with retailers and service providers. Retailers have been discussing Option 5. As an alternative to conventional stores, which inevitably carry a limited product range, showrooms or trial hubs could provide spaces for customers to socialise and try on products they pre-ordered, with the possibility to return immediately on-site. This would contribute to the sustainability of local high streets, reduce traffic, opportunities for returns fraud, as well as reduce packaging and transportation of individual items.

**5 Discussion and Conclusion**

Product returns area complex issue that has wide-ranging impacts on the economy, society, and the environment (Frei et al., 2020). However, amidst these challenges, there is an opportunity to re-evaluate and reshape consumption models, which is gradually being acknowledged by retailers that recognise the negative impact of product returns on their profitability. Meanwhile, consumers are increasingly aware of the environmental consequences of unwanted returns, due to the extensive coverage of this topic in mainstream media following the pandemic (Tait, 2023; Davis, 2024). This growing awareness has led consumers, activists, policymakers, and even investors to demand greater sustainability in the realm of product returns.

This study asked: How do recent innovations in product returns processes and technologies enable new pathways for consumer product returns, what are their implications, and what obstacles need to be overcome?

To address this, our study employed an engaged research approach (Sternberg et al., 2024), conducting semi-structured interviews with 40 individuals representing various stakeholders, including retail experts, retailers, service providers and technology providers, including start-ups, who offer a range of innovative solutions for addressing returns challenges and enabling new returns pathways. The gained insights offer a comprehensive understanding of the interests, needs, and constraints of the various stakeholders as well as the innovative ideas emerging. Our research makes the following contributions to retail operations research:



First, this research is the first to explore emerging innovative solutions to retail returns, such as P2P returns and trying whilst the courier waits. Such integrated solutions and the associated technology expand into the realm of product returns-related logistics, focusing on effectiveness, sustainability, and product value conservation. Furthermore, the findings highlight the significant advantages in prioritising local solutions over long-distance reverse transportation and complex returns processes. Local solutions can minimise environmental impacts and enhance operational efficiency in returns processes, and consequently this study contributes to the growing literature on sustainable practices in returns management (Frei et al., 2020; Nanayakkara et al., 2022). Moreover, this research advances retail operations research by suggesting the dual focus on customer convenience and environmental responsibility, aligning with current priorities in sustainable and customer-centric operations management (Zhang et al., 2023, 2024; Baldi et al., 2024).

Second, we explore different returns pathways and technological advancements, expanding the current understanding of the complex dynamics in product returns (Mandal, et al., 2021; Frei et al., 2022). This comprehensive examination – including returns pathways, along with enablers, risks, and barriers, adoption implications and likely outcomes for retailers and suppliers, employees, and consumers, based on Shankar et al. (2021) – provides a valuable contribution to understanding the intricacies of the returns process and highlights the diverse pathway options available for managing returns. ~~A better understanding of various returns pathways also provides practical implications for supply chain managers who are responsible for optimising forward and reverse logistics solutions.~~ We propose to add a third option for the 'outcomes' ~~outcomes~~ category, which must move beyond 'value-adding' or 'commoditising' to also include 'value-conserving.'

Practical implications for supply chain managers who are responsible for optimising forward and reverse logistics solutions derive from a deeper understanding of returns pathways and the importance of conserving product value. The conventional 'divide and conquer' approach is not suitable for managing the complex flows of products, services and data in an omnichannel retail environment. Instead, the retail ecosystems approach should be adopted, where flexible and dynamic solutions can be found through collaboration between a variety of actors. Simplifying and shortening returns processing pathways can increase the likelihood and speed of a product resale as well as protect the profit margin, whilst also reducing waste and emissions. Moreover, the consumer experience can be positively impacted by a better shopping experience, making an additional case for

developing customer-centric retailing and supply chain management as an area of growing attention in the business and operations literature (Confente et al., 2021; Merlano et al., 2024).

Innovative returns pathways can bring operational and competitive advantages to retailers and are highly relevant in the societal context as they reflect current developments and ways of living, where people are increasingly environmentally conscious but also under economic pressure. The discussed models, such as localised returns and 'try whilst the courier waits', can help retailers align with shifting consumer expectations by balancing affordability and sustainability. As such, they strengthen brand trust and enhance competitive advantage in a values-driven marketplace.

Policymakers and governments can also leverage the results of this study to promote regulation and ecosystems that incentivise organisations to use innovation to improve their reverse logistics operations and environmental footprint. For example, policymakers should create conditions that are conducive to responsible production and consumption, favouring circular solutions that conserve value. This could include tax relief for resold items, and legal frameworks that facilitate collaboration between different business entities in retail ecosystems, and support for shared-use returns hubs, joint resale channels, and unified technological platforms for tracking and grading returns.

### **5.1 Limitations and future work**

The study focused particularly on fashion items, but also offered relevance for household items, furniture, sports equipment, and other items with similar characteristics. The situation likely varies for consumer electronics which have specific safety requirements, such as Portable Appliance Testing before they can be resold.

There are significant opportunities for applied scholarship in the field of retail returns. Future studies should further explore more circular and more sustainable product returns systems. This may include an in-depth investigation of P2P returns and the arrangement of local solutions for returned products, to reduce shipping and packaging as well as to increase the probability that the item will be resold quickly. In the future, retail systems could be designed as a function of how the returns will operate, to reduce transportation, accelerate resale, maximise the retained value and minimise waste, similar to how the best product buyback and trade-in policies are calculated for remanufacturing (Cole et al., 2017). Further opportunities for research present themselves at the intersection of retail operations,

reverse logistics and waste management, both in terms of theoretical foundations and practical complexities.

Wardrobing, whereby an item is purchased, used and then returned, is one of the key issues with product returns. If incentivised or pressured, customers who engage in wardrobing behaviours might choose an affordable rental option instead. Some providers offer add-on technology for retailers to advertise a rental option next to their “buy” button. Rather than offering their clothes for renting via a separate platform, which requires customers to think of this option and search for it, the add-on technology offers an alternative solution to customers who would potentially buy an item they only need for a short time, and then either sell, donate or fraudulently return the item. Research is required to assess how effective such solutions are at reducing wardrobing, and whether there is a reduction in sales as retailers fear.

Another way to potentially reduce returns is through offering customers a variation of gamification – namely, through a price negotiating tool, as proposed by a retail technology innovator. This tool aims at the space between regular full-price sales, promotions, and price reductions at end-of-season sales where retailers attempt to reduce the unsold stock. Customers get a rating for making fair offers, and the better their score, the higher the chance that a retailer will accept a bid. Research is needed to explore how much of a discount retailers should accept for a positive outcome and the effectivity of such approaches, as there might also be a potential of creating more unwanted retail returns where customers end up bidding on items because they get caught up in bargain hunting rather than the purchase being driven by any real need.

Finally, product returns allow retailers to engage with customers to solicit positive and negative feedback on products and returns strategies. For instance, sometimes a slight change in design, packaging or description might make a product significantly less likely to be returned. Many retailers overlook potentially valuable opportunities for responding to feedback due to a lack of internal interdepartmental communication, insufficient resources, or an excessively siloed organisational structure. Deeper and meaningful engagement with stakeholders is needed to identify potential improvements in this sensitive but ultimately wasteful domain of retail returns. For academics, this also demands continued committed industry and consumer engagement and, equally, open-mindedness.

References

Althouse, M. (2022). This Falls Church startup wants to rethink online returns, Technical.ly, 24 March 2022. Available at: <https://technical.ly/startups/greenlist-online-returns/> (Accessed 16 May 2023)

Atwal, G., & Heine, K. (2022). Luxury, entrepreneurship, and innovation. *Strategic Change*, 31(3), 273–274.

Baldi, B., Confente, I., Russo, I., & Gaudenzi, B. (2024). Consumer-centric supply chain management: a literature review, framework, and research agenda. *Journal of Business Logistics*, 45(4), e12399.

Bijmolt TH, Broekhuis M, De Leeuw S, Hirche C, Rooderkerk RP, Sousa R, Zhu SX (2021) Challenges at the marketing–operations interface in omni-channel retail environments. *Journal of Business Research*, 122:864-874.

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert interviews—An introduction to a new methodological debate. In *Interviewing experts* (pp. 1-13). London: Palgrave Macmillan UK.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Campus Engage (2023). Engaged research for impact; A policy briefing for higher education institutions. Available at: <https://www.iua.ie/wp-content/uploads/2023/12/Campus-Engage-Engaged-Research-Policy-Briefing-for-HEIs-Published-3.pdf> (Accessed 21 October 2024)

Cassell, C., Grandy, G., & Cunliffe, A. L. (2017). *The SAGE handbook of qualitative business and management research methods*.

Cole, D., Mahapatra, S. and Webster, S. (2017), A Comparison of Buyback and Trade-In Policies to Acquire Used Products for Remanufacturing. *Journal of Business Logistics*, 38: 217-232.

Confente, I., Russo, I., Peinkofer, S. and Frankel, R. (2021), "The challenge of remanufactured products: the role of returns policy and channel structure to reduce consumers' perceived risk", *International Journal of Physical Distribution & Logistics Management*, Vol. 51 No. 4, pp. 350-380.  
<https://doi.org/10.1108/IJPDLM-03-2020-0089>

Corbin, J., & Strauss, A. (1990). *Basics of qualitative research* (Vol. 15). Newbury Park, CA: sage.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. sage.

Davis, E. (2024). Many unhappy returns. *BBC Radio 4: The Bottom Line*, 25 January 2024. Available at: <https://www.bbc.co.uk/programmes/m001vlj4> (Accessed 1 March 2024)

de Borba, J. L. G., Magalhaes, M. R. D., Filgueiras, R. S., & Bouzon, M. (2020). Barriers in omnichannel retailing returns: a conceptual framework. *International Journal of Retail & Distribution Management*, 49(1), 121-143.

Frei, R., Jack, L., & Krzyzaniak, S. A. (2020). Sustainable reverse supply chains and circular economy in multichannel retail returns. *Business Strategy and the Environment*, 29(5), 1925-1940.

Frei, R., Jack, L. and Krzyzaniak, S. A. (2022). Mapping product returns processes in multichannel retailing: challenges and opportunities. *Sustainability*, 14(3), 1382.

Frei, R., Zhang, D., Bayer, S., Gerding, E., Wills, G. and Speights, D. (2023). What factors drive product returns in omnichannel retail? *SSRN Papers*, available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4410055](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4410055) (Accessed 16 May 2023)

[Gallino, S. & Moreno, A. \(2014\) Integration of online and offline channels in retail: The impact of sharing reliable inventory availability information. \*Management Science\*, 60\(6\):1434-1451.](#)

[Gallino, S. & Rooderkerk, R. \(2020\) New product development in an omnichannel world. \*California Management Review\*, 63\(1\):81-98.](#)

Garrido-Hidalgo, C., Olivares, T., Ramirez, F. J., & Roda-Sanchez, L. (2019). An end-to-end internet of things solution for reverse supply chain management in industry 4.0. *Computers in Industry*, 112, 103127.

Griffis, S. E., Rao, S., Goldsby, T. J., & Niranjana, T. T. (2012). The customer consequences of returns in online retailing: An empirical analysis. *Journal of Operations Management*, 30(4), 282-294.

Hagberg, J., & Hulthén, K. (2022). Consolidation through resourcing in last-mile logistics. *Research in Transportation Business & Management*, 45, 100834.

Higginbottom, G. M. A. (2004). Sampling issues in qualitative research. *Nurse Researcher* (through 2013), 12(1), 7.

Hjort, K., Hellström, D., Karlsson, S., & Oghazi, P. (2019). Typology of practices for managing consumer returns in internet retailing. *International Journal of Physical Distribution & Logistics Management*, 49(7), 767-790. <https://doi.org/10.1108/IJPDLM-12-2017-0368>

Hübner A, Wollenburg J, Holzapfel A (2016) Retail logistics in the transition from multi-channel to omni-channel. *International Journal of Physical Distribution & Logistics Management*, 46(6/7):562-583.

Jaller, M., & Pahwa, A. (2020). Evaluating the environmental impacts of online shopping: A behavioral and transportation approach. *Transportation Research Part D: Transport and Environment*, 80, 102223.

Koul, S., & Eydgahi, A. (2017). A systematic review of technology adoption frameworks and their applications. *Journal of technology management & innovation*, 12(4), 106-113.

Li, Y., Martínez-López, F. J., Feng, C., & Chen, Y. (2022). Green Communication for More Package-Free Ecommerce Returns. *Journal of Theoretical and Applied Electronic Commerce Research*, 17(4), 1450-1472.

Loomba APS & Nakashima K (2012) Enhancing value in reverse supply chains by sorting before product recovery. *Production Planning & Control*, 23(2-3):205-215.

Mandal, P., Basu, P., & Saha, K. (2021). Forays into omnichannel: An online retailer's strategies for managing product returns. *European Journal of Operational Research*, 292(2), 633-651. <https://doi.org/10.1016/j.ejor.2020.10.042>

Merlano, E.F., Frei, R., Zhang, D., Murzacheva, E. and Wood, S. (2024), "Consumer perspectives on interventions to combat fraudulent product returns in omnichannel fashion retail", *International Journal of Physical Distribution & Logistics Management*, Vol. 54 No. 10, pp. 969-1001. <https://doi.org/10.1108/IJPDLM-02-2024-0082>

Muir, W.A., Griffis, S.E. and Whipple, J.M. (2019), A Simulation Model Of Multi-Echelon Retail Inventory With Cross-Channel Product Returns. *Journal of Business Logistics*, 40: 322-338.

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.

Nuss, C., Sahamie, R., & Stindt, D. (2015). The reverse supply chain planning matrix: A classification scheme for planning problems in reverse logistics. *International Journal of Management Reviews*, 17(4), 413-436.

Office for National Statistics (2024). Internet sales as a percentage of total retail sales (ratio) (%). Available at: <https://www.ons.gov.uk/businessindustryandtrade/retailindustry/timeseries/j4mc/drsi> (Accessed 1 March 2024)

Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work*, 1(3), 261-283.

Phau, I., Akintimehin, O. O., Shen, B., & Cheah, I. (2022). "Buy, wear, return, repeat": Investigating Chinese consumers' attitude and intentions to engage in wardrobing. *Strategic Change*, 31(3), 345–356.

Ren, X., Windle, R. J., & Evers, P. T. (2023). Channel transparency and omnichannel retailing: The impact of sharing retail store product availability information. *Journal of Operations Management*, 69(2), 217-245.

Rooderkerk RP, Kök AG (2019) Operations in an omnichannel world. Gallino S, Moreno A, eds. Omnichannel assortment planning (Springer Cham), 51-86.

Saghiri, S., & Mirzabeiki, V. (2021). Omni-channel integration: the matter of information and digital technology. *International Journal of Operations & Production Management*, 41(11), 1660-1710.

Sandberg, E., Oghazi, P., Chirumalla, K., & Patel, P. C. (2022). Interactive research framework in logistics and supply chain management: Bridging the academic research and practitioner gap. *Technological Forecasting and Social Change*, 178, 121563.

Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches? *Organizational Research Methods*, 8(1), 41-68.

Shankar, V., Kalyanam, K., Setia, P., Golmohammadi, A., Tirunillai, S., Douglass, T., Hennessey, J., Bull, J.S. and Waddoups, R. (2021). How technology is changing retail. *Journal of Retailing*, 97(1), 13-27.

Stark, A., Ferm, K., Hanson, R., Johansson, M., Khajavi, S., Medbo, L., ... & Holmström, J. (2023). Hybrid digital manufacturing: Capturing the value of digitalization. *Journal of Operations Management*, 69(6), 890-910. <https://doi.org/10.1002/joom.1231>

Sternberg, H., Mathiassen, L., Carnovale, S., Richey, R.G., Jr. and Davis-Sramek, B. (2024), Conducting engaged logistics and supply chain research: From real-world problems to journal publication. *Journal of Business Logistics*, 45: e12380. <https://doi.org/10.1111/jbl.12380>



Stock, J.R. and Mulki, J.P. (2009), Product returns processing: an examination of practices of manufacturers, wholesalers / distributors, and retailers. *Journal of Business Logistics*, 30: 33-62.

Talen, E., & Park, J. (2022). Understanding urban retail vacancy. *Urban Affairs Review*, 58(5), 1411-1437.

Tait, A. (2023) Buy. Return. Repeat ... What really happens when we send back unwanted clothes? *The Guardian*. Retrieved from <https://www.theguardian.com/global-development/2023/mar/31/what-happens-when-we-send-back-unwanted-clothes> (Accessed 20 May 2023)

Tang, H. (2019). Peer-to-peer lenders versus banks: substitutes or complements? *The Review of Financial Studies*, 32(5), 1900-1938.

The Industry Fashion (2023). Fashion's New Omni-Consumer: How fashion brands and retailers can adapt to the new channel-hopping, post-pandemic fashion consumer. Available at: <https://www.theindustry.fashion/fashions-new-omni-consumer-how-fashion-brands-and-retailers-can-adapt-to-the-new-channel-hopping-post-pandemic-fashion-consumer-2/> (Accessed 15 April 2025)

Tushar, W., Saha, T. K., Yuen, C., Smith, D., & Poor, H. V. (2020). Peer-to-peer trading in electricity networks: An overview. *IEEE Transactions on Smart Grid*, 11(4), 3185-3200.

Vakulenko, Y., Hellström, D., & Hjort, K. (2018). What's in the parcel locker? Exploring customer value in e-commerce last mile delivery. *Journal of Business Research*, 88, 421-427.

Van de Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *Academy of management review*, 31(4), 802-821.

Vollstedt, M., & Rezat, S. (2019). An introduction to grounded theory with a special focus on axial coding and the coding paradigm. *Compendium for Early Career Researchers in Mathematics Education*, 13(1), 81-100.

Wallenburg, C. M., Einmahl, L., Lee, K.-B. and Rao, S. (2021), On packaging and product returns in online retail—Mailing boxes or sending signals? *Journal of Business Logistics*, 42: 291-308.

Wiklund, J., Wright, M., & Zahra, S. A. (2019). Conquering relevance: Entrepreneurship research's grand challenge. *Entrepreneurship Theory and Practice*, 43(3), 419-436.

Zhang, D., Dawson, I., Frei, R. and Merlano, F. (2024). Navigating the green path: exploring the dynamics and impact of peer-to-peer retail returns. Presented at: EurOMA 2024 TRANSFORMING



PEOPLE AND PROCESSES FOR A BETTER WORLD, Barcelona, Spain, 29 June - 3 July 2024. Retrieved from: <https://orca.cardiff.ac.uk/id/eprint/170419> (Accessed 20 Jan 2025)

Zhang, D., Frei, R., Bayer, S., Senyo, P. K., Gerding, E., Wills, G. and Beck, A. (2022). Understanding fraudulent returns and mitigation strategies in multichannel retailing. *Journal of Retailing and Consumer Services*, Vol. 70, 103145.

Zhang, D., Frei, R., Wills, G., Gerding, E. and Senyo, P. K. (2023). Strategies and practices to reduce the ecological impact of product returns: an environmental sustainability framework for multichannel retail. *Business Strategy and the Environment*, 32(7), 4636–4661.

Table A: Retail technology characterisation

Attribute	Type
Stakeholder	<i>Customer-Facing/Shopper-Facing vs. Employee-Facing vs. Supplier-Facing</i>
IT-relatedness	<i>IT based vs. non-IT based</i>
Domain span or source of origin	<i>Single vs. multiple domain; Internal vs. External; Outside-in versus spanning versus inside-out</i>
Newness	<i>Incremental versus radical</i>
Nature of change	<i>Facilitating vs. Disruptive</i>
Outcome	<i>Commoditising vs. Value-adding</i>

Table B: Characterisation of “the try whilst the courier waits” proposition (Shankar et al., 2021)

Attribute	Type
Stakeholder	<i>Enhance consumers’ shopping experience, with implications for employees and potentially third-party couriers who provides the delivery and take-back service</i>
IT-relatedness	<i>Non-IT based</i>
Domain span or source of origin	<i>Multiple domains involved, including operations and logistics; Mostly internal changes, with possible involvement of a courier service; Inside-out innovation</i>
Newness	<i>Radical change to the eCommerce service provision</i>

Nature of change	<i>Facilitating the existing concept of remote selling</i>
Outcome	<i>Value-adding</i>
Obstacles to overcome	Organisational change; perception from retailers that consumers may be reluctant to pay fees for this service.
Adoption implications	The additional staff time will require significant investment from retailers, but it may bring a competitive advantage. Customers who are willing to pay the fees will find the solution very convenient, as it removes the effort of having to manage, package and ship returns.
Likely outcomes	Retailers will benefit from immediate availability of the unwanted items. It will also lighten the burden of assessing and processing returns. This approach provides added value to consumers and retailers alike, and if implemented properly as a positive experience, will increase consumer satisfaction and loyalty. It is most likely to be successful in the luxury sector or where customers appreciate and are willing to pay for a high service level. Our research has shown that especially young customers with a busy life and some available income fall into the latter category.
Effectiveness (1)	Trying whilst the courier waits very effectively increases the probability that an item will be resold via the original channel and at full price, as its return to sellable inventory is immediate.
Sustainability	The additional courier journeys create emissions, but this is negligible in comparison with the avoided processing of conventionally returned items and the manufacture and distribution of replacement items.

Footnote: (1) A measure of effectiveness assesses how well an entity or process achieves its intended impact or purpose.

Table C: Characterisation of P2P returns shipping

Attribute	Type
Stakeholder	<i>Customer-facing</i>
IT-relatedness	<i>Requires new IT capabilities, but mainly a conceptual innovation</i>
Domain span or source of origin	<i>Multiple domain; Internal; Inside-out</i>
Newness	<i>Radically new approach</i>

Nature of change	<i>Facilitating more efficient resale of returns</i>
Outcome	<i>Value-conserving</i>
Obstacles to overcome	Re-organisation of returns processes; need for reliable product verification methods; potential abuse / fraud and how to mitigate against it; retailers' perception of customer acceptance.
Adoption implications	An increasing number of returns service providers are experimenting with this solution, reducing the barriers for adoption. It requires a digital returns system able to support P2P matching, verification, shipping and payment processes.
Likely outcomes	P2P returns will require retailers to give discounts to customers, but P2P shipping will lead to a decrease in manual processing at warehouses and hence reduce costs there. Consumers who choose this option will likely feel satisfied with the discount as well as their contribution to reducing packaging, transportation, and waste.
Effectiveness	The P2P returns approach effectively increases the probability that an item will be resold via the original channel but at a slightly discounted price. Items virtually return to sellable inventory at an accelerated rate and without physical processing at the warehouse.
Sustainability	Packaging can be reused conveniently. The additional transportation creates emissions, but this is negligible in comparison with the avoided processing of conventionally returned items at the warehouse and the manufacture and distribution of replacement items.

Table D: Characterisation of returns ecosystems

Attribute	Type
Stakeholder	<i>Customer-facing, employee-facing and downstream supplier-facing</i>
IT-relatedness	<i>IT based with non-IT consequences</i>
Domain span or source of origin	<i>Single domain (returns processing and resales)</i> <i>Internal and external;</i> <i>Spanning the whole returns ecosystem</i>
Newness	<i>Radical</i>
Nature of change	<i>Facilitating</i>
Outcome	<i>Value-conserving</i>

Obstacles to overcome	Resistance to change; it would be difficult for an individual retailer to create a returns ecosystem as required for this approach, as it requires partnering with a community of retailers and third-party providers.
Adoption implications	For consumers, it could mean that different items in an order would take different paths onwards.
Likely outcomes	If implemented successfully, retailers would retain more value from returned products and reduce waste, which could improve their bottom line and increase shareholder value. Warehouse employees would deal with less returns.
Effectiveness	The returns ecosystems approach effectively increases the probability that an item will be resold via a variety of primary or secondary channels, at full or reduced prices. Adopting a differentiated approach to dealing with the diverse nature of returned products increases the retained product value and the speed of resale.
Sustainability	More items are resold, reducing their shipping and processing, as well as the need to manufacture and distribute replacement products.

Table E: Characterisation of retailers taking control of secondary markets

Attribute	Type
Stakeholder	<i>Involves consumers, employees and downstream supply chain partners</i>
IT-relatedness	<i>Can involve IT based tools and platforms</i>
Domain span or source of origin	<i>Multiple domain; Internal and external; Can be outside-in or inside-out</i>
Newness	<i>Incremental</i>
Nature of change	<i>Facilitating</i>
Outcome	<i>Retaining value</i>
Obstacles to overcome	Fear of cannibalisation of primary sales by secondary sales; fear of devalorisation of the brand; investment into secondary market channels.
Adoption implications	An increasing number of retailers are choosing to partner with reputable resellers or to build their own outlet channels. Both are alternatives to using the conventional solution of using so-called jobbers who purchase unwanted and unspecified items in bulk at extreme discount rates.

	Building their own outlet channels requires an investment in time and effort for retailers and their employees, whereas partnering with resellers requires trust.
Likely outcomes	Both solutions provide discounted products for consumers to buy, likely increasing satisfaction and loyalty, especially with their financial means are constrained. Retailers retain more value from returned products and hence increase their profits whilst also reducing waste.
Effectiveness	Retailers taking control of secondary markets very effectively increases the probability that an item will be resold without going through the hands of multiple traders, reducing the risk of items being damaged, discarded or destroyed.
Sustainability	A higher resell rate through the original retailers will reduce the need to manufacture and distribute replacement items.

Table F: Characterisation of wardrobing sensor tags

Attribute	Type
Stakeholder	<i>Customer-facing, as it holds them accountable for their behaviour, and provides employees assessing the condition of returned items with additional information</i>
IT-relatedness	<i>Non-IT based</i>
Domain span or source of origin	<i>Single domain (returns processing); Internal implementation; Outside-in, as technology developed externally</i>
Newness	<i>Radical, as nothing similar existed before</i>
Nature of change	<i>Facilitating better returns management</i>
Outcome	<i>Value-conserving, as it reduces losses from write-offs</i>
Obstacles to overcome	Investment needed; currently unproven technology, with unknown reliability; retailers' fear of backlash from consumers.
Adoption implications	If implemented at a large scale, the tags are estimated to come at a very minor added cost of 1-2 pence per item, and can be combined with the usual RFID swing tags or replace them. Honest customers should not have any issues with them.

Likely outcomes	Wardrobing behaviour would be strongly discouraged as the tags would provide proof of the return policy abuse. Retailers need to take action if this is detected, by declining a refund or warning the customer that such behaviour would lead to a ban if repeated. Eliminating wardrobing would have a strongly positive effect on the retailer's bottom line.
Effectiveness	A reliable implementation has the potential to drastically reduce one of the most frequent returns frauds.
Sustainability	Wardrobing can lead to products being wasted and replaced due to damage and/or delayed returning. A lower wardrobing rate will reduce the need to manufacture and distribute replacement items.

Table G: Returns pathways with their enablers, risks and barriers, advantages and disadvantages

Pathway	Enablers	Risks and barriers	Advantages	Disadvantages
<b>P2P shipping</b>	Item in pristine condition, modern returns portal, requires second customer registering their wish to purchase the returned item	Wrong or damaged item may be shipped, the returning customer sees the address of the second customer	Minimum transportation, quick resale, reduced price for second customer, no processing needed, avoiding international returns journeys	Retailer does not see the returned item
<b>Local third-party reseller</b>	Returns service provider with capable online portal must be used, distributed network of resellers required, training for resellers required to authenticate and	Customer loyalty may be lost to local retailers	Less transportation	Unclear what happens to the margin of the initial retailer

	inspect returned items			
<b>Physical store</b>	Customer travels to local store	May be used for frequent free returns if online returns incur a fee	Less transportation, less packaging, customer remains loyal to initial retailer, quick resale at full or reduced price, works also for lower priced items	Potentially imbalanced inventory, retailer may need to sell items that are outside of their regular offering
<b>Distribution centre</b>	Items purchased in store usually need to be returned to store and from there are shipped to the warehouse	Lost value due to insufficient training and conflicting Performance goals of third-party warehouse operators	Any onwards pathways are available from here	Increased transportation, packaging, and processing
<b>Third-party repairer</b>	Skilled labour required	Items may become damaged in the process, potentially costly	Damaged items do not go to waste	Specialist manufacturer knowledge may not be available
<b>Third-party reseller</b>	May require agreements with brands to be able to use their labels, which increases the reselling value	Items may not always be genuine	Lower prices for customers	Manufacturers and retailers may perceive these as competition or threats

Source: Current study

Table H: Solutions for items to reach customers and returning to retailers

Solution	Comment
1) Buy online, return to store	This is a tried-and-tested approach, favoured by many omnichannel retailers (Jack et al., 2019), as it has the potential to reduce the logistics and processing in comparison to the online returns process. However, it does require the customer to travel to a store.
2) Try whilst the courier waits	Expensive due to the courier’s idle waiting time, but effective; returns items to the retailer immediately and reduces opportunities for returns fraud.
3) P2P returns	Efficient solution for returned items to reach the next customer quickly but limits the retailer’s ability to verify that the right item is being sent and its condition; potential for the returning and receiving customers to blame each other. Possible issue with data privacy.
4) Online system offering various options to buy/rent and return	eCommerce platforms can provide various options for purchasing and returning items, in combination with sustainability information, for customers to make informed choices. Besides offering various shipping options, selected eCommerce platforms already offer rental solutions, which may reduce wardrobing. Additionally, they could offer customers the option of buying discounted items via outlet channels or used items via sharing platforms, assisting the customer by providing product availability information (Ren et al., 2023). The system may suggest the most sustainable option based on characteristics of the customer, product, and retailer.
5) Local hubs	Showrooms for delivery, returns and trying on (fitting rooms); reduce packaging and local traffic. Just as some retailers propose that customers pre-purchase cheap return shipping labels if they expect to return something, retailers can propose solutions such as shipping products to a local fitting hub or showroom. If conventional returns are required, the online registration system can identify the most effective way to return, providing information on sustainability. Customers could be encouraged to shop in store if one is close-by, or choose delivery to a trial hub otherwise, and to use of sizing tools (e.g., scanning feet) to reduce unnecessary orders and frustration.

Source: Current study



## Appendix A: Semi-structured interviews

ID	Sector	Representatives	Country	Company size
1	Groceries, Apparel, Electricals	<b>LP1 A:</b> Loss Prevention Manager in charge of online and wholesale operations. <b>LP1 B:</b> Loss Prevention Manager in charge of store operations.	UK	Large
2	Fashion and Apparel, Footwear, and Accessories	<b>LP2:</b> Profit Erosion and Data Mining Manager.	UK	Large
3	Electricals, Fashion and Apparel	<b>LP3 A:</b> Head of Digital Risk. <b>LP3 B:</b> Risk and Loss Prevention Investigator.	UK	Large
4	Electricals	<b>LP4 A:</b> manager of Loss Prevention and Inventory Control (online). <b>LP4 B:</b> Returns Manager, involved with returns and returns prevention.	Canada	Large
5	Groceries, Apparel, Electricals	<b>LP5:</b> Multi-Channel Returns Manager.	UK	Large
6	Fashion and Apparel, Footwear, and Accessories	<b>LP6 A:</b> Fraud Analytics Manager. <b>LP6 B:</b> Head of Online Loss Prevention.	UK	Large
7	Electricals	<b>LP7:</b> Fraud Prevention and Investigations Manager.	UK	Large
8	Fashion and Apparel	<b>LP8:</b> Director of Loss Prevention.	US	Large
9	Retail expert	<b>E1:</b> An analyst with extensive retail experience.	UK	N/A

10	Retail expert	<b>E2:</b> Works closely with retailers on identifying problems of loss and returns.	UK	N/A
11	Retail expert	<b>E3:</b> 30 years of research experience in understanding retail loss problems.	UK	N/A
12	Returns technology service provider	<b>S1:</b> Senior Manager (Public Relations) who works closely with retailers. <b>S2:</b> President of retail technology company.	US	N/A
13	Returns technology service provider	<b>S3:</b> CEO & Co-founder	Global	N/A
14	Returns technology service provider	<b>S4:</b> Chief Technical Solutions in product returns	Global	N/A
15	Service provider	<b>S5:</b> Founder and CEO	UK	SME
16	Service provider	<b>S6:</b> Founding member	US	Start-up
17	Service provider	<b>S7:</b> Founder and CEO	UK	Start-up
18	Third-party reseller	<b>S8:</b> Founder and CEO	UK	SME
19	Academic	<b>R1, R2:</b> Researchers and educators (2x)	UK	N/A
20	Returns technology provider	<b>S9:</b> Founder and CEO	UK	Start-up
21	Service provider	<b>S10, S11:</b> Founding members (2x)	UK	Start-up
22	eCommerce Retailer	<b>LP9:</b> Returns manager	UK	Large
23	Industrial research organisation	<b>R3:</b> Head of section <b>R4:</b> Researcher	US	SME
24	Fashion manufacturer and retailer	<b>LP10:</b> Head of Garment Technology	UK	SME
25	Service provider	<b>S12:</b> Manager	UK	SME
26	Third-party reseller	<b>S13:</b> Director	UK	SME
27	Third-party reseller	<b>S14:</b> Director	UK	SME
28	Fashion manufacturer and retailer	<b>LP11:</b> Returns manager	US	Large

29	Omnichannel retailer	<b>LP12:</b> Returns manager	Europe	Large
30	Fashion manufacturer and retailer	<b>LP13:</b> Technology manager	UK	SME
31	Service provider	<b>S15:</b> Founder and CEO	US	Start-up
32	Online marketplace	<b>LP14:</b> Fraud manager	Global	Large

NB. Following the OECD, a large company is considered to have over 250 employees.

#### Appendix B - Figure 1: Thematic analysis coding

(see separate file)

#### Appendix C: Examples of quotes pertaining to codes

Code	Sources	Example quote
Try whilst the courier waits - combines the delivery and returns journey	LP8, E2	"What we do is, we offer a service against a fee, whereby the customer gets to try on items whilst our courier waits. It takes a little bit of time for the courier, yeah, but it removes a whole lot of hassle for the consumer, and you know, busy people, they appreciate that." LP8
P2P makes shipping and returns more efficient through its decentralised approach	S6, E1	"So, on the sustainability side, we assume that the returner is reusing their packaging because that's, in general, what consumers do when they ship a return back." S6
Returning customers must be trusted	S4, LP5, LP9	"I think there's definitely something to be said about the levers that you have, the controls that you have as a brand when you're working with consumers who are returning because you have control of their refund, and so you can levy the expectation that they need to 'play nice' as they make their return." S4
Returns ecosystem solutions work with local partners to reduce shipping and speed up the resale	S3, S4, E3, R2	So, in terms of the user experience, it's very transparent [...] we can send you to an offline store, as opposed to just having someone come and collect your item. So, we will actually say, "Here is a store near you, here is a partner near you, go to this partner." S3

		“[...] 45% of whatever they brought back [to the warehouse] went straight to the jobbers. No matter what it was, they would get less than £1 per item from the jobbers. So, it cost, say, £20 to get the item back [from abroad], they still only got £1 for that item. Which is absolutely insane. We could have got rid of it locally, which would have saved them the £20.” S4
Retailers fear cannibalisation by secondary markets and alternatives to buying	S10	“Sometimes we get the question of, ‘Won’t rental cannibalise our sales?’ And our response to that is, ‘I mean, it will be worse for you if another brand cannibalises yourselves because customers are moving towards a rental model and you haven’t moved quickly enough.’” S10
Taking control of secondary markets allows retailers to increase resales	E2	“It’s one of the mid to high-end brands that are trying to take that preloved market back into their own hands because they’ll come in, they’ll assess the garment, with their in-house people, refurb where needed, and then it goes out at a fraction of the price, but it’s been authenticated and checked so you know it’s authentic. It’s quite an interesting concept.” E2
Wardrobing is suspected to be very common, but retailers are still unable to prove wardrobing due to lack of evidence	LP6 B, S9, LP14	<p>“Wardrobing is very high on our priority list. It’s a tricky one. We don’t include it in the more obvious fraud case statistics because it’s very very hard to prove. It’s really hard to differentiate what people buy and sort of wear and then send back. Or they buy, they try on, and they like ‘oh, it doesn’t fit me’. I’m going to send that back. Because some people will try on their goods very quickly and send them back asap, but some people might not be able to get out and to return it is quickly. So, they might wait a bit. [...] So, we’re trying to understand what that behaviour is and see if there is anything that we can map and pull together to actually identify these trends.” LP6 B</p> <p>“It is very difficult to prove wardrobing except when we happen to find evidence. For instance, we have found suits that had flight tickets in the pocket, that had been obviously worn, used on a flight and then returned.” S9</p>
Sensor tags could prove wardrobing, but investment is difficult to secure due to the	LP1 A, LP14, LP3 B	“It’s hard to put a number on our losses or lost sales due to wardrobing, and if we don’t know how much it costs, we can’t really

current lack of evidence		make a solid business case to the upper management." LP1 A
P2P returns travel directly from customer to customer	S6, E1, E2	"[...] we have been operating under the assumption that our shipments go directly from Point A to Point B, the returner to the purchaser. And then the alternative is the same two customers would be involved, but it would make a stop at the brand's warehouse in between. And so, we calculate the emissions savings, basically, using this carbon calculator." S6
Returns portals can calculate the best destination and most efficient route for each item	S3, S12, R4	"We're an AI-powered engine behind any return portal, behind any bespoke platform, behind any e-commerce platform. And we are making real-time, dynamic decisions at every point of the return journey." S3
If retailers knew which returns to expect before they arrive, they could optimise inventory management	S7, S12, E3, LP2	"So, [the online returns portal], it doesn't de facto send the item back to the warehouse, it will also basically say, 'Listen, we've got a label here for you, a QR code, let's say, and with this QR code, basically, the item will be sent not to the warehouse, but to a store nearby, or an outlet, or a recycler or refurbisher.'" S7
Legacy returns systems do not allow strategic gathering and analysis of returns data	E1, LP1 B, LP8	"You'd be amazed at the lack of visibility that some companies have over what is going in and out of their warehouse. It's incredible. [...] And often the cause of it is all of these legacy IT systems. And instead of just scrapping it and starting again, they build on top of it, and they put system after system after system." E1
More companies do simple repairs and refurbishing	LP12, E3, R3, LP10	"Sometimes, if something is returned to the shop, we will reattach a button that has come off a garment." LP12  "In some warehouses dealing with returns, they have, for instance, a bike mechanic who will inspect a returned bike and check if anything needs to be fixed." R3
Getting returns back faster improves cash flow and increases the probability of a resale	S14, S2, R1	"[...] we have a way of processing returns faster and cheaper, because it doesn't matter who it is, the brand, the retailer, the 3PL, if they had a way of receiving an item and restocking it quickly and cheaply, [...] they assess the disposition and sell it as non-new, I think that would be the more efficient way to deal with the returns." S14

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Appendix D - Figure 2: Pathways onwards from a customer returning a product  
  
(see separate file)

Strategy & Leadership

## Scoping Innovative Retail Product Returns Pathways

### Abstract

#### Purpose

Product returns in omnichannel retail are wasteful and generate significant financial and environmental impact. Returns systems often suffer from low efficiency and effectiveness. Innovative technology and service solutions are proposed by an increasing number of start-ups, with many enabling new more effective and sustainable pathways for returned products to be sold again whilst conserving product value.

#### Design/methodology/approach

By adopting an engaged research approach involving close dialogue with retailers as well as technology and returns service providers, we explore the implications of adopting these innovations and the outcomes for retailers and suppliers, employees, and consumers. Using the lens of the retail technology adoption framework by Shankar et al. (2021), we investigate how innovation in technology and process can enable alternative pathways for consumer product returns. Some offer added value to consumers, and many reduce waste and allow retailers to conserve the value of returned products.

#### Findings

Retailers increasingly take control of secondary markets to increase the retained value of returned products, shorten pathways to resale, and increase resale rates. Peer-to-peer returns, 'trying whilst the courier waits', and the returns ecosystem approach all optimise returns management, impacting both the forward and reverse logistics of retail.

#### Originality/value

We suggest extending the retail technology adoption framework to include the aspect of value conservation, in addition to the existing value-adding and commoditising features. The new pathways enable retailers to address the challenges of high returns rates, financial pressure, whilst reducing environmental impact.

**Keywords:** Product returns, technology adoption, innovation, omnichannel retail

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

**1 Introduction**

Fashion retailer profits are adversely affected by high returns rates and high returns fraud levels (Zhang et al., 2022) set against a wider background of fierce price-based competition. Consumer product returns also have a significant environmental impact given the additional transportation, packaging and processing involved (Jaller and Pahwa, 2020). Many returned products are often in substandard condition or ‘out-of-season’, hence cannot be resold at full price, and are commonly discounted or sold via secondary sales channels. While the recovered value varies (Stock and Mulki, 2009), reducing product returns rates should be a priority for all retailers (Frei et al., 2023; Wallenburg et al., 2021). Nevertheless, a certain level of product returns will persist and therefore, returns management – including all the steps and processes from a return request to final resolution – need to be optimised.

Returning products involves complex reverse logistics, which encompasses managing the flow of products from customers back to the company, including transportation, processing and resale, or disposal. How efficiently retailers manage their returns is influenced by factors such as the reason for the return, the condition of the returned product, and its destination (Zhang et al., 2023). Further, cross-channel returns integration is necessary to ensure that products purchased via one channel can be returned via another (Muir et al., 2019). To manage product returns successfully, retailers need to invest in technologies and innovations that deliver resilience, cost efficiency, and customer satisfaction. Automation and artificial intelligence offer the ability to optimise reverse logistics processes; implementing smart tracking technologies allows the monitoring of the location and condition of returned products; while sustainable practices serve to reduce waste and environmental impact (Nuss et al., 2015; Garrido-Hidalgo et al., 2019). Such measures can also assist retailers in building stronger relationships with their customers. However, the predominant returns processes tend to be inefficient and unsustainable. There is a relative lack of understanding regarding how innovative product returns processes and associated technologies might enable new consumer returns pathways in practice.

Given this background, this study seeks to address the following research question: How do recent innovations in product returns processes and technologies enable alternative pathways for consumer product returns, what are their implications, and what obstacles need to be overcome?



Our work necessarily takes an engaged research approach (Sternberg et al., 2024) whereby we deeply interact with stakeholders through ongoing detailed discussions reflecting their realities and exploring potential innovative solutions. Such an approach offers significant enhancements compared to a standard semi-structured interview approach. It enriches academic activities by co-creating ideas and enhancing their relevance and timeliness (Campus Engage, 2023). It allows us to explore the challenges and barriers that need to be overcome to enable a wider adoption and assess the implications and outcomes of implementing these innovations. Therefore, the study contributes in-depth insights on existing and new returns pathways, as well as their efficiency, effectiveness, and sustainability. We explore innovative retail technologies and services through the lens proposed by Shankar et al. (2021) and identify a missing outcome dimension of 'value-conserving' alongside more established 'value-adding' and 'commoditising' outcomes.

This study also offers a series of managerial and practical implications. For managers, especially those handling supply chain and logistics functions, the findings underscore the need to transition from reactive and fragmented, channel-specific returns processes toward more integrated, ecosystem-based models that conserve value and support sustainable practices leveraging technological innovation. Retailers can benefit operationally and financially by adopting innovative returns pathways that accelerate resale cycles and enhance the consumer experience. The study's implication also speaks to the growing imperative for operational sustainability by highlighting how reverse logistics innovations can support environmentally responsible consumption. Policymakers are encouraged to build on these insights by developing supportive regulatory frameworks and incentives—such as tax benefits for resale or collaborative circular economy initiatives—that can accelerate the transition toward more sustainable retail systems.

The article is organised as follows: First, we reflect on the weaknesses of current product returns systems, relevant retail technologies, and the theoretical framework used in our analysis. After detailing our research methodology, we analyse and discuss innovative technologies and approaches. This is followed by conclusions and directions for future work.

## **2 The Retail Operations Context and Current Product Returns Processes**

Omnichannel retail strategy encompasses the integration of various shopping channels, such as brick-and-mortar stores, online shops, and mobile applications, with the objective of cultivating a cohesive customer experience (Rooderkerk & Kök, 2019). It enables consumers to shop and return products

through different channels interchangeably, offering greater convenience and flexibility (Hübner et al., 2016). Many consumers check products online and then visit a store, or visit a store and compare prices on their mobile (The Industry Fashion, 2023). However, this added operational complexity challenges retailers to track, manage, and analyse the factors driving returns in a process that engages the entire supply chain, from customer service to processing and grading items (Loomba & Nakashima, 2012), to logistics and inventory management (Bijmolt et al., 2021). To address this challenge at a strategic level, it is essential to gain a deeper understanding of why returns happen (Gallino & Moreno, 2014). Enhanced information systems are needed to track and manage product returns effectively, as returns originate from various sources and are processed through multiple channels (Gallino & Rooderkerk, 2020). Product returns processes are often a result of incremental changes over time, lacking strategy and goals (Hjort et al., 2019). This leads to weaknesses and flaws:

*Product returns systems are inefficient.* Many are arranged in an ad-hoc manner and underpinned by legacy technology (Jack et al., 2019). With average e-Commerce return rates of 20-30% (Invesp, 2022), they represent a significant and growing cost for retailers. Pressure is exacerbated where returns rates are even higher, with more than 50% returns reported for expensive women's apparel, and often only half resold (Robosize, 2022). Outdated communication and information processing systems, misplaced products, and inefficient logistics are some of the 43 barriers to efficient processing of omnichannel returns identified by De Borba et al. (2020).

*Product returns systems are ineffective.* Although effective return policies can foster customer loyalty, they resulted in more than \$761 billion in lost sales in 2021 in the US (NRF, 2022). Many retailers lack an established, embedded, and efficient returns strategy. Opportunities to capture useful information such as the reason for returns are rarely taken, failing to inform strategies to reduce returns rates and improve processes (Frei et al., 2023).

*Product returns systems are unsustainable.* Most retailers make Corporate Social Responsibility commitments, yet they struggle to implement them in product returns (Frei et al., 2020). Many retailers still consider the costs of product returns as an unavoidable element of doing business and lack coherent data insights regarding their nature and scale. Jack et al. (2019) suggested retailers should recognise and maximise the value of returned items; addressing the strategic importance of returns on both a financial and environmental level.

1  
2  
3  
4 *The digital transformation of the retail sector* has changed customer shopping and returns behaviour  
5 for good (Jiang & Stylos, 2021). Related, retailers widely restructure their operations with the support  
6 of digital technologies (Shankar et al., 2021). For example, track-and-trace systems enable customers  
7 to follow deliveries in real-time, reducing customer anxiety regarding delivery delays (Hagberg &  
8 Hulthén, 2022). Some retailers and logistics providers leverage digital technology to establish  
9 automated locker systems (Vakulenko et al., 2018) as convenient customer pickup points, which  
10 minimise physical interaction and accommodate busy schedules.  
11  
12

13  
14  
15  
16  
17  
18 Retailers increasingly implement digital returns portals with QR codes, which enable retailers to collect  
19 customer returns data (Frei et al., 2023). These systems can optimise the management of reverse  
20 logistics to meet increasing end recipient needs and facilitate delivery to the next customer. Several  
21 new service propositions have recently been introduced. For instance, peer-to-peer returns shipping  
22 (Althouse, 2022) allows customers to ship their returns to the next customer rather than back to the  
23 retailer – merging initial delivery and returns in a cost-effective manner. *However, there are no in-*  
24 *depth studies on the enablers and potential challenges of these new innovative approaches,* and the  
25 term ‘peer-to-peer’ (P2P) is primarily used in financial lending systems (Tang, 2019) or trading in  
26 energy networks (Tushar et al., 2020).  
27  
28  
29  
30  
31  
32

33  
34  
35 *Innovation in technology* often shapes processes and services in retail. In their seminal study, Shankar  
36 et al. (2021) classify retail technologies by attributes (Table A). Their framework for the adoption of  
37 new technologies reflects on antecedents, outcomes, and forces at play related to technology. Whilst  
38 other frameworks for the adoption of technology exist (Koul & Eydgahi, 2017), this framework  
39 specifically examines the retail context. For retailers and suppliers, relevant factors include the cost of  
40 adoption, competitor innovation, and regulation. For retailers, the outcomes relate to revenues,  
41 market share, profits, shareholder value, efficiency, and time to market. In terms of the adoption,  
42 aspects relevant to employees and consumers include usefulness and ease of use. The outcomes for  
43 employees include effectiveness and productivity, whereas for customers they relate to experience,  
44 purchase, satisfaction, and loyalty.  
45  
46  
47  
48  
49  
50  
51  
52

53  
54 Having identified weaknesses in current product returns processes as well as emerging innovation in  
55 retail technology and services, we observe a lack of knowledge regarding implementation enablers,  
56 barriers, and implications. Therefore, our research question is: How do innovative retail technologies  
57  
58  
59  
60

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

and services enable new product return pathways, and what are the implications for the stakeholders?  
We apply the retail technology framework to assess the innovations discussed in Section 4.

**3 Methodology**

This exploratory research seeks to create new theoretical and practical knowledge in a fast-evolving sector. Engaged research, which immerses researchers in the wider context of the research topic, has gained prominence in supply chain and operations management (van de Ven & Johnson, 2006; Sternberg et al., 2024; Sandberg et al., 2022; Stark et al., 2023). This approach involves active collaboration with practitioners, who provide practical insights that enrich the relevance of research process (Wiklund et al., 2019). The collaborative exchange combines the complementary expertise of researchers and practitioners.

The research team in this study comprises academics with backgrounds in supply chain operations, product returns, behavioural science, risk management, and strategic management. Collaborating with a broad range of retail practitioners—including retailers, manufacturers, retail service and technology providers, logistics managers, and product returns experts—the team explored how product returns networks can be redesigned to become more effective, efficient, resilient, and sustainable. The detailed engagement process for data collection and validation is outlined below.

**3.1 Data collection and engagement process**

Initially, two product returns researchers reviewed academic and trade publications on the challenges of product returns management and relevant new developments. Additionally, they attended three practitioner workshops organised by retail communities to gain insights into recent best practices, current trends, and real-world case studies. This process assisted the researchers identify suitable interview participants and formulate relevant discussion topics.

Between 2021 and 2023, 32 semi-structured interviews were conducted with 40 product returns experts (Appendix A). Sample questions included: *“Might you consider implementing a P2P shipping solution in your company?”*, *“Do you think working with local resellers to avoid shipping all returns back to the warehouse can reduce costs and increase resale rates?”*. These interviews provided in-depth information on existing and emerging returns pathways, their benefits, challenges, and barriers to implementation. We employed a purposive sampling approach, a non-probability technique designed to gather in-depth knowledge rather than make broad statistical inferences (Higginbottom,

2004). Interviewing experts is a highly effective technique in empirical research (Bogner et al., 2009), and it yielded valuable data from retail managers, industry experts, and technology providers. Retail managers offered perspectives on practical product return strategies, while industry experts provided independent viewpoints. Discussions with retail service and technology providers—ranging from start-ups to SMEs and large enterprises—enabled us to track innovations in real time and across different sizes of retail operation. Many practitioners also sought our feedback on their technology, products, and services, facilitating an insightful interactive dialogue.

In addition to formal interviews, we held follow-up online meetings with three retailers and two technology providers, conducting 2-3 additional sessions per participant outside the formal structure. These meetings allowed for ongoing discussions about the effectiveness of new returns pathways and helped validate emerging findings. All interviews, conducted online, were recorded and transcribed, with sessions lasting between 45 to 90 minutes, averaging about one hour. Follow-up discussions, typically around 30-45 minutes were more concise and focused, with supplementary notes taken throughout.

To further validate our findings and deepen engagement with broader audiences (Sandberg, 2005), we participated in online meetings of retailer associations' (ECR Retail Loss Group, ORIS Forums, and the Reverse Logistics Association (RLA)), and face-to-face presentations and subsequent bilateral discussions at the Reverse Logistics Association's European Summit in Amsterdam in June 2022 and 2024. These interactions provided valuable feedback and initiated ongoing dialogue with industry experts. We also shared our preliminary findings with practitioners via email for validation and feedback, ensuring accuracy and incorporating any necessary updates.

Overall, our data collection process combined semi-structured interviews, interactive meetings, presentations, and a validation phase. This cross-checking and iterative feedback approach ensured the robustness and relevance of our findings, which is further detailed in subsequent sections.

### **3.2 Data analysis**

We applied thematic analysis (Braun and Clarke, 2006) to identify, analyse, and report key themes related to emerging product returns pathways and innovations in the retail industry. As a well-established qualitative research method (Cassell et al., 2017), thematic analysis enabled us to

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

recognise patterns and themes within the data. Our approach followed a structured three-stage coding process, widely adopted in qualitative research (Corbin & Strauss, 1990).

In the first stage, we conducted open coding (Charmaz, 2006), segmenting the data into discrete units to identify processes and key actors within the returns system. We specifically labelled passages relevant to our research questions, with a focus on areas such as technological innovations, service improvements, and new returns pathways. Subsequently, sub-codes were applied to enable deeper analysis, distinguishing specific types of innovations. For instance, passages discussing technological developments were sub-coded to capture specific developments in that area (e.g., sensor tags). In the second stage, axial coding was used to establish relationships between categories and their subcategories (Corbin & Strauss, 1990). That is, we reviewed, refined, compared, and grouped the initial codes into related categories (e.g., innovations targeting returns fraud, purchasing processes, or the secondary market), examining their interconnections. This stage allowed us to reassemble the data around central phenomena, providing a clearer understanding of the core elements within the returns system. In the final stage, we performed selective coding to integrate the categories into a cohesive analytical framework by identifying core themes and building a connected narrative, as shown in Appendix B (Figure 1). Examples of quotes pertaining to the codes are shown in Appendix C.

All coding and data analysis processes were conducted manually by three researchers: two with expertise in product returns who handled the initial coding, and a third researcher with strategic and management expertise who reviewed the coding and analysis. This multi-coder approach, aligned with qualitative research best practices (Patton, 2002), strengthens the reliability and validity of our findings. To ensure the robustness of our analysis, we had regular group meetings to discuss the data analysis and outcomes, checking for any discrepancies until final agreement (Vollstedt & Rezat, 2019). As detailed in the engagement process, we presented our analysis and key findings to a range of practitioners through follow-up meetings with retailer associations. For example, presentations at the RLA clarified and validated our initial categorisation of innovations and pathways. The feedback received from these sessions helped refine our classification and supported the relevance of new pathways in broader retail contexts. In one instance, practitioner feedback highlighted overlooked issues of risk and customer trust, offering new insights into the enablers and challenges of adopting P2P pathways that technology providers had not initially highlighted. Thus, this iterative feedback process allowed us to refine our findings further (Sandberg, 2005; Sandberg et al., 2022).

## 4 Analysis and discussion

Based on the emergent findings from our data collection, in Section 4.1, we review product returns innovations structured by whether they address the purchasing and returning process, increase resale rates through secondary channels, or prevent returns fraud. Following Shankar et al. (2021), we explore attributes, the adoption implications and likely outcomes of each innovation, and find that product value conservation is missing in the framework. Subsequently, Section 4.2 discusses the returns pathways enabled by the reviewed innovative technologies and services.

### 4.1 Innovative technologies and services

New ideas and technologies for omnichannel returns are developed and implemented by service providers and retailers. All require capable IT systems and effective multichannel integration (Saghiri and Mirzabeiki, 2021). A common prerequisite is customers pre-registering their returns online. Knowing that a return is coming allows the retailer or returns service provider to analyse the case, select and plan the most suitable or most sustainable returns route, and instruct the customer accordingly (Frei et al., 2023). This includes providing a shipping label, details of a local store that agrees to accept the item, a request to visit a brand store within the next few days, or to drop the item at a local parcel hub for return to the distribution centre. This may include a packaging-free returns option (Li et al., 2022). Subsequently, we discuss new technologies and services that either target a reduction of product returns or reduce product returns as a significant side-effect.

#### 4.1.1 Innovations addressing the purchasing and returning processes

##### Try whilst the courier waits

Some high-end retailers address the inefficiencies and high costs of the returns process by avoiding them entirely. Instead, they essentially bring the store to the customer, who pays a fee for the service, as explained by LP12 (as listed in Appendix A). A combined delivery and returns solution can create service innovation in the luxury apparel industry (Atwal & Heine, 2022), going further than the “try before you buy” offering which provides items to try on and then requires the customer to pay for the items they keep and return the others. With the more advanced offering, a service provider waits during the trying-on process, meaning that there is no additional returning effort for the customer. Customers can also choose the option of getting items delivered in additional sizes, or receiving alternative items upon the retailer’s suggestion. The unwanted items are taken back immediately, meaning they return to the retailer without delay, and the customer need not wait for a refund. There is no opportunity for wardrobing, where customers order, use and then return items for a refund



(Phau et al., 2022). The courier can verify that the correct items are delivered in pristine condition and returned in the same state, hence reducing the likelihood of various types of returns fraud. This approach, characterised in Table B, combines the benefits of in-store shopping with those of eCommerce, for customers willing to pay the fee.

**P2P returns**

A potentially even more disruptive innovation is P2P returns (Table C), where returned items are offered directly and with a discount to other customers who have registered their wish for such an item. In this variant, the buyer waits until a suitable item is returned, or the request expires, which brings a risk that a willing buyer may remain emptyhanded. In other variants, the returner registers their desire to return an item and waits a few days until either a corresponding purchase is being made, and the item can be sent to the customer, or is otherwise returned to the warehouse. In this case, the new buyer only gets offered to buy via P2P if such an item is available immediately and buys through standard channels otherwise. For both P2P variants, the aim is to eliminate return shipments to the warehouse.

*‘[The plan is to] slide into the international retailer market, allowing them to maintain their products in a country and then just ship it directly from the returning customer to the purchasing customer in a way that would bypass international shipping and having to redo that, and then any cross-border customs fees.’ S2*

Such approaches are not risk-free, and some are difficult to assess prior to large-scale implementation. For instance, challenges related to a returning customer sending damaged or counterfeit items and blaming the receiving customer are pertinent. It would be challenging for the retailer to assess such a situation reliably; even asking both customers to submit pictures of the item before shipping and upon receipt would not be foolproof. However, technology providers are working on better image analysis methods to verify the authenticity and condition of an item remotely, and electronic tags (RFID or other) could be used to uniquely identify it. Furthermore, most P2P return service providers consider the moral barrier to cheating as relatively strong, and plan to ban problematic customers from further P2P transactions. As these technologies and services are not widely tried and tested yet, customer acceptance is yet to be proven. Initially, they will likely be a service offered to loyal customers only, based on a data analysis of customer history.



### Retail ecosystem solutions

The aims of innovative returns processes are to reduce waste and shipping costs as well as to save customer time. The pre-registration of returns offers an opportunity to further engage with the customer. This might see the retailer encouraging the customer to avoid the return; regift the product; donate the item; or identify the most sustainable returns path. This is what a pioneer (S3) in the returns service space does: they leverage the *retail ecosystem*. Using artificial intelligence for advanced dynamic decision-making algorithms, the returns path can be optimised for any objective, such as minimal carbon footprint or maximum resale value.

Customers of participating retailers can return anywhere, and local shops naturally become hubs for processing, inspecting, and reselling returned items. The authentication, inspection and potential refurbishment processes can be supported through digital technology (Table D), with clear instructions and visual confirmation, to determine whether it warrants a full refund and can be resold at full price.

*‘We enable local partners to intercept the return. The local partners might be a recycler, they might be a refurbisher, they might be [a charity receiving] a donation, but they are local. Say, you bought jeans from Levi’s and want to return. In your neighbourhood, there are five independent stores that sell Levi’s. Bring your jeans into there and they will inspect it, validate and resell it via our local ecosystem.’ (S3)*

Many of these innovations have the potential to revolutionise return systems and contribute to efficiency, effectiveness, resilience, and sustainability. Future studies are needed to explore how far they can deliver this in practice.

#### 4.1.2 Secondary markets to increase reselling rates

There are countless resellers of products on the market, but only few have access to premium-brand items. We interviewed two industry leaders (S13, S14) reselling high-quality furniture, fashion, and other items. Both have established relationships of trust with many well-known brands who usually do not allow other resellers to use their brand-names on the items being repaired, refurbished, and resold. Allowing brand names to be retained is essential in improving the reselling price and the desirability of the item on a discount/local market.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Some manufacturers and retailers are taking control of the secondary market themselves (Table E), offering repaired and remanufactured items. This can increase the efficiency and effectiveness of reselling returned or otherwise damaged items. For instance, S8 explained that a European sports retailer recently launched their second-life programme, a multinational furniture retailer introduced circular hubs in their stores, and an international electronics retailer and manufacturer has refurbished their photocopiers for decades, selling them back to customers under a product-as-a-service contract. Despite the considerable potential for economic and ecological benefits, most brands do not yet engage in secondary markets.

*4.1.3 Innovations addressing returns fraud*

Wardrobing, often incorrectly perceived by some customers and even some retailers as simply stretching returns policies (Zhang et al., 2023), is inherently difficult to prove unless the item shows clear signs of wear and tear. For the fashion sector, technological innovation can potentially mitigate this, using artificial intelligence (LP2, LP5) or a tag combining several sensor types that will reliably detect when an item is being worn (Table F). Prototypes were tested at the time of writing (2024), according to technology provider S7. Similar sensor tags could be developed for other product types, to show whether the product has been used - for example, by indicating for how long electricity has passed through the device, or how many times the wheels of a bike have turned.

**4.2 Returns pathways enabled by innovative technologies and services**

The reviewed innovations enable alternative returns pathways from a customer returning a product to another customer buying the item (Appendix D).

*4.2.1 Avoiding warehouses and the need for returns portals*

P2P shipping is the most direct path for a returned product to reach a new customer, although there is a certain risk of the product not being pristine or counterfeit. Two other pathways are almost as efficient: First, a return to a brick-and-mortar store sees the product sold again immediately either at full price, if in mint condition, or otherwise at a reduced price. In some cases, store employees transfer returned items from a smaller store with a limited product assortment to a larger nearby store that offers range breadth (Jack et al., 2019).

Second, environmentally aware service providers (S3, S12) are intercepting returns before shipping and arrange local solutions. Instead of being returned to the original seller, some products are taken

to a local store for inspection, potential repair, and resale. Returns portals enable the optimisation of returns pathways and inventory management.

Online purchases are typically returned via courier or postal service. Returning via in-store drop-off boxes, sister stores or stand-alone lockers in urban environments, means products are picked up by a courier service. They are shipped to a (returns) processing centre, including returns that were handed over to physical stores that cannot resell them. Upon arrival, items may take a variety of different pathways onwards. If they are in pristine condition, they may return to eCommerce, via an e-commerce fulfilment centre or via an online outlet channel and then shipped out to customers. Some items, again in mint condition, may be sent to a distribution centre from where they go to physical stores or outlet channels. Certain types of products, including most consumer electronics, are returned to the manufacturer for inspection, testing and, if necessary, refurbishing before the product is sent out again to primary or outlet sales channels.

Alternatively, items may also go to a third-party reseller that operates online or to physical stores. Items on this path may proceed via a third-party repair service and/or potentially via a jobber (selling in bulk at extremely low prices) or a targeted auction (achieving better prices for better specified goods). The operations of jobbers remain insufficiently explored, as these companies typically act discreetly, shunning the spotlight.

#### 4.2.1 Conserving value

Fast and direct reselling retains the most value in pristine items. Repackaging, minor repairs, refreshing, refurbishing, or remanufacturing are worthwhile for products above a certain minimum value. These activities may occur at a third-party reseller, at a physical store (for very minor repairs), at a return's distribution centre, or at a manufacturer's warehouse. In Figure 2 (Appendix D), these locations are marked with a thicker frame. Items that cannot be resold or are not worth processing due to their low value are typically channelled to recycling, downcycling (e.g. textiles are shredded to make insulation or filler materials), or disposal via landfill or incineration. According to S5 and S8, charities will usually resell donated items by weight, which leads to them being processed by other third-party resellers and/or recyclers, with some items being downcycled or destroyed.

#### 4.2.3 Enablers, risks and barriers

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

Table G discusses the various returns pathways, with preconditions or enablers, risks and barriers, advantages, and disadvantages. Some aspects are not exclusive to these pathways. For instance, selling items via online platforms means the seller gets to know the buyer's name and address, and this is generally accepted.

Deciding which returns path to choose for which returned item is not always easy or simple. There is an opportunity for innovative returns portals to automatically choose suitable solutions for diverse situations. For a customer returning more than one item, this may mean returning one item to a local store and sending the second one directly to another customer, whereas the third item needs to be posted to a returns distribution centre that deals with imperfect items. If the item is of low value, retailers may decide to let the customer keep the item and encourage them to regift it to a friend or donate it to charity.

Based on the need to interact with customers in the returns process, what are the consequences for delivery and returns arrangements? All solutions identified in Table H are more effective and sustainable than returning products sold via ecommerce to the warehouse as a catch-all solution. All of the alternative models provide combined delivery and returns solutions. Option 1 (buy online, return to store) has been practiced for a long time, whereas Options 2 (try whilst the courier waits) and 3 (P2P returns) are recent innovations. Some retailers have implemented aspects of Option 4 (buying and renting options). Added suggestions resulting from this study have been discussed with retailers and service providers. Retailers have been discussing Option 5. As an alternative to conventional stores, which inevitably carry a limited product range, showrooms or trial hubs could provide spaces for customers to socialise and try on products they pre-ordered, with the possibility to return immediately on-site. This would contribute to the sustainability of local high streets, reduce traffic, opportunities for returns fraud, as well as reduce packaging and transportation of individual items.

**5 Discussion and Conclusion**

Product returns area complex issue that has wide-ranging impacts on the economy, society, and the environment (Frei et al., 2020). However, amidst these challenges, there is an opportunity to re-evaluate and reshape consumption models, which is gradually being acknowledged by retailers that recognise the negative impact of product returns on their profitability. Meanwhile, consumers are increasingly aware of the environmental consequences of unwanted returns, due to the extensive

coverage of this topic in mainstream media following the pandemic (Tait, 2023; Davis, 2024). This growing awareness has led consumers, activists, policymakers, and even investors to demand greater sustainability in the realm of product returns.

This study asked: How do recent innovations in product returns processes and technologies enable new pathways for consumer product returns, what are their implications, and what obstacles need to be overcome?

To address this, our study employed an engaged research approach (Sternberg et al., 2024), conducting semi-structured interviews with 40 individuals representing various stakeholders, including retail experts, retailers, service providers and technology providers, including start-ups, who offer a range of innovative solutions for addressing returns challenges and enabling new returns pathways. The gained insights offer a comprehensive understanding of the interests, needs, and constraints of the various stakeholders as well as the innovative ideas emerging. Our research makes the following contributions to retail operations research:

First, this research is the first to explore emerging innovative solutions to retail returns, such as P2P returns and trying whilst the courier waits. Such integrated solutions and the associated technology expand into the realm of product returns-related logistics, focusing on effectiveness, sustainability, and product value conservation. Furthermore, the findings highlight the significant advantages in prioritising local solutions over long-distance reverse transportation and complex returns processes. Local solutions can minimise environmental impacts and enhance operational efficiency in returns processes, and consequently this study contributes to the growing literature on sustainable practices in returns management (Frei et al., 2020; Nanayakkara et al., 2022). Moreover, this research advances retail operations research by suggesting the dual focus on customer convenience and environmental responsibility, aligning with current priorities in sustainable and customer-centric operations management (Zhang et al., 2023, 2024; Baldi et al., 2024).

Second, we explore different returns pathways and technological advancements, expanding the current understanding of the complex dynamics in product returns (Mandal, et al., 2021; Frei et al., 2022). This comprehensive examination – including returns pathways, along with enablers, risks, and barriers, adoption implications and likely outcomes for retailers and suppliers, employees, and consumers, based on Shankar et al. (2021) – provides a valuable contribution to understanding the

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

intricacies of the returns process and highlights the diverse pathways available for managing returns. We propose to add a third option for the ‘outcomes’ category, which must move beyond ‘value-adding’ or ‘commoditising’ to also include ‘value-conserving.’

Practical implications for supply chain managers who are responsible for optimising forward and reverse logistics solutions derive from a deeper understanding of returns pathways and the importance of conserving product value. The conventional ‘divide and conquer’ approach is not suitable for managing the complex flows of products, services and data in an omnichannel retail environment. Instead, the retail ecosystems approach should be adopted, where flexible and dynamic solutions can be found through collaboration between a variety of actors. Simplifying and shortening returns processing pathways can increase the likelihood and speed of a product resale as well as protect the profit margin, whilst also reducing waste and emissions. Moreover, the consumer experience can be positively impacted by a better shopping experience, making an additional case for developing customer-centric retailing and supply chain management as an area of growing attention in the business and operations literature (Confente et al., 2021; Merlano et al., 2024).

Innovative returns pathways can bring operational and competitive advantages to retailers and are highly relevant in the societal context as they reflect current developments and ways of living, where people are increasingly environmentally conscious but also under economic pressure. The discussed models, such as localised returns and ‘try whilst the courier waits’, can help retailers align with shifting consumer expectations by balancing affordability and sustainability. As such, they strengthen brand trust and enhance competitive advantage in a values-driven marketplace.

Policymakers and governments can also leverage the results of this study to promote regulation and ecosystems that incentivise organisations to use innovation to improve their reverse logistics operations and environmental footprint. For example, policymakers should create conditions that are conducive to responsible production and consumption, favouring circular solutions that conserve value. This could include tax relief for resold items, and legal frameworks that facilitate collaboration between different business entities in retail ecosystems, and support for shared-use returns hubs, joint resale channels, and unified technological platforms for tracking and grading returns.

**5.1 Limitations and future work**

The study focused particularly on fashion items, but also offered relevance for household items, furniture, sports equipment, and other items with similar characteristics. The situation likely varies for consumer electronics which have specific safety requirements, such as Portable Appliance Testing before they can be resold.

There are significant opportunities for applied scholarship in the field of retail returns. Future studies should further explore more circular and more sustainable product returns systems. This may include an in-depth investigation of P2P returns and the arrangement of local solutions for returned products, to reduce shipping and packaging as well as to increase the probability that the item will be resold quickly. In the future, retail systems could be designed as a function of how the returns will operate, to reduce transportation, accelerate resale, maximise the retained value and minimise waste, similar to how the best product buyback and trade-in policies are calculated for remanufacturing (Cole et al., 2017). Further opportunities for research present themselves at the intersection of retail operations, reverse logistics and waste management, both in terms of theoretical foundations and practical complexities.

Wardrobing, whereby an item is purchased, used and then returned, is one of the key issues with product returns. If incentivised or pressured, customers who engage in wardrobing behaviours might choose an affordable rental option instead. Some providers offer add-on technology for retailers to advertise a rental option next to their “buy” button. Rather than offering their clothes for renting via a separate platform, which requires customers to think of this option and search for it, the add-on technology offers an alternative solution to customers who would potentially buy an item they only need for a short time, and then either sell, donate or fraudulently return the item. Research is required to assess how effective such solutions are at reducing wardrobing, and whether there is a reduction in sales as retailers fear.

Another way to potentially reduce returns is through offering customers a variation of gamification – namely, through a price negotiating tool, as proposed by a retail technology innovator. This tool aims at the space between regular full-price sales, promotions, and price reductions at end-of-season sales where retailers attempt to reduce the unsold stock. Customers get a rating for making fair offers, and the better their score, the higher the chance that a retailer will accept a bid. Research is needed to explore how much of a discount retailers should accept for a positive outcome and the effectivity of such approaches, as there might also be a potential of creating more unwanted retail returns where

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

customers end up bidding on items because they get caught up in bargain hunting rather than the purchase being driven by any real need.

Finally, product returns allow retailers to engage with customers to solicit positive and negative feedback on products and returns strategies. For instance, sometimes a slight change in design, packaging or description might make a product significantly less likely to be returned. Many retailers overlook potentially valuable opportunities for responding to feedback due to a lack of internal interdepartmental communication, insufficient resources, or an excessively siloed organisational structure. Deeper and meaningful engagement with stakeholders is needed to identify potential improvements in this sensitive but ultimately wasteful domain of retail returns. For academics, this also demands continued committed industry and consumer engagement and, equally, open-mindedness.

**References**

Althouse, M. (2022). This Falls Church startup wants to rethink online returns, Technical.ly, 24 March 2022. Available at: <https://technical.ly/startups/greenlist-online-returns/> (Accessed 16 May 2023)

Atwal, G., & Heine, K. (2022). Luxury, entrepreneurship, and innovation. *Strategic Change*, 31(3), 273–274.

Baldi, B., Confente, I., Russo, I., & Gaudenzi, B. (2024). Consumer-centric supply chain management: a literature review, framework, and research agenda. *Journal of Business Logistics*, 45(4), e12399.

Bijmolt TH, Broekhuis M, De Leeuw S, Hirche C, Rooderkerk RP, Sousa R, Zhu SX (2021) Challenges at the marketing–operations interface in omni-channel retail environments. *Journal of Business Research*, 122:864-874.

Bogner, A., Littig, B., & Menz, W. (2009). Introduction: Expert interviews—An introduction to a new methodological debate. In *Interviewing experts* (pp. 1-13). London: Palgrave Macmillan UK.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Campus Engage (2023). Engaged research for impact; A policy briefing for higher education institutions. Available at: <https://www.iua.ie/wp-content/uploads/2023/12/Campus-Engage-Engaged-Research-Policy-Briefing-for-HEIs-Published-3.pdf> (Accessed 21 October 2024)



Cassell, C., Grandy, G., & Cunliffe, A. L. (2017). The SAGE handbook of qualitative business and management research methods.

Cole, D., Mahapatra, S. and Webster, S. (2017), A Comparison of Buyback and Trade-In Policies to Acquire Used Products for Remanufacturing. *Journal of Business Logistics*, 38: 217-232.

Confente, I., Russo, I., Peinkofer, S. and Frankel, R. (2021), "The challenge of remanufactured products: the role of returns policy and channel structure to reduce consumers' perceived risk", *International Journal of Physical Distribution & Logistics Management*, Vol. 51 No. 4, pp. 350-380. <https://doi.org/10.1108/IJPDLM-03-2020-0089>

Corbin, J., & Strauss, A. (1990). *Basics of qualitative research* (Vol. 15). Newbury Park, CA: sage.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. sage.

Davis, E. (2024). Many unhappy returns. *BBC Radio 4: The Bottom Line*, 25 January 2024. Available at: <https://www.bbc.co.uk/programmes/m001v1j4> (Accessed 1 March 2024)

de Borba, J. L. G., Magalhaes, M. R. D., Filgueiras, R. S., & Bouzon, M. (2020). Barriers in omnichannel retailing returns: a conceptual framework. *International Journal of Retail & Distribution Management*, 49(1), 121-143.

Frei, R., Jack, L., & Krzyzaniak, S. A. (2020). Sustainable reverse supply chains and circular economy in multichannel retail returns. *Business Strategy and the Environment*, 29(5), 1925-1940.

Frei, R., Jack, L. and Krzyzaniak, S. A. (2022). Mapping product returns processes in multichannel retailing: challenges and opportunities. *Sustainability*, 14(3), 1382.

Frei, R., Zhang, D., Bayer, S., Gerding, E., Wills, G. and Speights, D. (2023). What factors drive product returns in omnichannel retail? *SSRN Papers*, available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4410055](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4410055) (Accessed 16 May 2023)

Gallino, S. & Moreno, A. (2014) Integration of online and offline channels in retail: The impact of sharing reliable inventory availability information. *Management Science*, 60(6):1434-1451.

Gallino, S. & Roederkerk, R. (2020) New product development in an omnichannel world. *California Management Review*, 63(1):81-98.

- Garrido-Hidalgo, C., Olivares, T., Ramirez, F. J., & Roda-Sanchez, L. (2019). An end-to-end internet of things solution for reverse supply chain management in industry 4.0. *Computers in Industry*, 112, 103127.
- Griffis, S. E., Rao, S., Goldsby, T. J., & Niranjan, T. T. (2012). The customer consequences of returns in online retailing: An empirical analysis. *Journal of Operations Management*, 30(4), 282-294.
- Hagberg, J., & Hulthén, K. (2022). Consolidation through resourcing in last-mile logistics. *Research in Transportation Business & Management*, 45, 100834.
- Higginbottom, G. M. A. (2004). Sampling issues in qualitative research. *Nurse Researcher* (through 2013), 12(1), 7.
- Hjort, K., Hellström, D., Karlsson, S., & Oghazi, P. (2019). Typology of practices for managing consumer returns in internet retailing. *International Journal of Physical Distribution & Logistics Management*, 49(7), 767-790. <https://doi.org/10.1108/IJPDLM-12-2017-0368>
- Hübner A, Wollenburg J, Holzapfel A (2016) Retail logistics in the transition from multi-channel to omni-channel. *International Journal of Physical Distribution & Logistics Management*, 46(6/7):562-583.
- Jaller, M., & Pahwa, A. (2020). Evaluating the environmental impacts of online shopping: A behavioral and transportation approach. *Transportation Research Part D: Transport and Environment*, 80, 102223.
- Koul, S., & Eydgahi, A. (2017). A systematic review of technology adoption frameworks and their applications. *Journal of technology management & innovation*, 12(4), 106-113.
- Li, Y., Martínez-López, F. J., Feng, C., & Chen, Y. (2022). Green Communication for More Package-Free Ecommerce Returns. *Journal of Theoretical and Applied Electronic Commerce Research*, 17(4), 1450-1472.
- Loomba APS & Nakashima K (2012) Enhancing value in reverse supply chains by sorting before product recovery. *Production Planning & Control*, 23(2-3):205-215.
- Mandal, P., Basu, P., & Saha, K. (2021). Forays into omnichannel: An online retailer's strategies for managing product returns. *European Journal of Operational Research*, 292(2), 633-651. <https://doi.org/10.1016/j.ejor.2020.10.042>

- Merlano, E.F., Frei, R., Zhang, D., Murzacheva, E. and Wood, S. (2024), "Consumer perspectives on interventions to combat fraudulent product returns in omnichannel fashion retail", *International Journal of Physical Distribution & Logistics Management*, Vol. 54 No. 10, pp. 969-1001. <https://doi.org/10.1108/IJPDLM-02-2024-0082>
- Muir, W.A., Griffis, S.E. and Whipple, J.M. (2019), A Simulation Model Of Multi-Echelon Retail Inventory With Cross-Channel Product Returns. *Journal of Business Logistics*, 40: 322-338.
- 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.
- Nuss, C., Sahamie, R., & Stindt, D. (2015). The reverse supply chain planning matrix: A classification scheme for planning problems in reverse logistics. *International Journal of Management Reviews*, 17(4), 413-436.
- Office for National Statistics (2024). Internet sales as a percentage of total retail sales (ratio) (%). Available at: <https://www.ons.gov.uk/businessindustryandtrade/retailindustry/timeseries/j4mc/drsi> (Accessed 1 March 2024)
- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative social work*, 1(3), 261-283.
- Phau, I., Akintimehin, O. O., Shen, B., & Cheah, I. (2022). "Buy, wear, return, repeat": Investigating Chinese consumers' attitude and intentions to engage in wardrobing. *Strategic Change*, 31(3), 345–356.
- Ren, X., Windle, R. J., & Evers, P. T. (2023). Channel transparency and omnichannel retailing: The impact of sharing retail store product availability information. *Journal of Operations Management*, 69(2), 217-245.
- Rooderkerk RP, Kök AG (2019) Operations in an omnichannel world. Gallino S, Moreno A, eds. Omnichannel assortment planning (Springer Cham), 51-86.
- Saghiri, S., & Mirzabeiki, V. (2021). Omni-channel integration: the matter of information and digital technology. *International Journal of Operations & Production Management*, 41(11), 1660-1710.
- Sandberg, E., Oghazi, P., Chirumalla, K., & Patel, P. C. (2022). Interactive research framework in logistics and supply chain management: Bridging the academic research and practitioner gap. *Technological Forecasting and Social Change*, 178, 121563.

- Sandberg, J. (2005). How do we justify knowledge produced within interpretive approaches? *Organizational Research Methods*, 8(1), 41-68.
- Shankar, V., Kalyanam, K., Setia, P., Golmohammadi, A., Tirunillai, S., Douglass, T., Hennessey, J., Bull, J.S. and Waddoups, R. (2021). How technology is changing retail. *Journal of Retailing*, 97(1), 13-27.
- Stark, A., Ferm, K., Hanson, R., Johansson, M., Khajavi, S., Medbo, L., ... & Holmström, J. (2023). Hybrid digital manufacturing: Capturing the value of digitalization. *Journal of Operations Management*, 69(6), 890-910. <https://doi.org/10.1002/joom.1231>
- Sternberg, H., Mathiassen, L., Carnovale, S., Richey, R.G., Jr. and Davis-Sramek, B. (2024), Conducting engaged logistics and supply chain research: From real-world problems to journal publication. *Journal of Business Logistics*, 45: e12380. <https://doi.org/10.1111/jbl.12380>
- Stock, J.R. and Mulki, J.P. (2009), Product returns processing: an examination of practices of manufacturers, wholesalers / distributors, and retailers. *Journal of Business Logistics*, 30: 33-62.
- Talen, E., & Park, J. (2022). Understanding urban retail vacancy. *Urban Affairs Review*, 58(5), 1411-1437.
- Tait, A. (2023) Buy. Return. Repeat ... What really happens when we send back unwanted clothes? *The Guardian*. Retrieved from <https://www.theguardian.com/global-development/2023/mar/31/what-happens-when-we-send-back-unwanted-clothes> (Accessed 20 May 2023)
- Tang, H. (2019). Peer-to-peer lenders versus banks: substitutes or complements? *The Review of Financial Studies*, 32(5), 1900-1938.
- The Industry Fashion (2023). Fashion's New Omni-Consumer: How fashion brands and retailers can adapt to the new channel-hopping, post-pandemic fashion consumer. Available at: <https://www.theindustry.fashion/fashions-new-omni-consumer-how-fashion-brands-and-retailers-can-adapt-to-the-new-channel-hopping-post-pandemic-fashion-consumer-2/> (Accessed 15 April 2025)
- Tushar, W., Saha, T. K., Yuen, C., Smith, D., & Poor, H. V. (2020). Peer-to-peer trading in electricity networks: An overview. *IEEE Transactions on Smart Grid*, 11(4), 3185-3200.
- Vakulenko, Y., Hellström, D., & Hjort, K. (2018). What's in the parcel locker? Exploring customer value in e-commerce last mile delivery. *Journal of Business Research*, 88, 421-427.

Van de Ven, A. H., & Johnson, P. E. (2006). Knowledge for theory and practice. *Academy of management review*, 31(4), 802-821.

Vollstedt, M., & Rezat, S. (2019). An introduction to grounded theory with a special focus on axial coding and the coding paradigm. *Compendium for Early Career Researchers in Mathematics Education*, 13(1), 81-100.

Wallenburg, C. M., Einmahl, L., Lee, K.-B. and Rao, S. (2021), On packaging and product returns in online retail—Mailing boxes or sending signals? *Journal of Business Logistics*, 42: 291-308.

Wiklund, J., Wright, M., & Zahra, S. A. (2019). Conquering relevance: Entrepreneurship research's grand challenge. *Entrepreneurship Theory and Practice*, 43(3), 419-436.

Zhang, D., Dawson, I., Frei, R. and Merlano, F. (2024). Navigating the green path: exploring the dynamics and impact of peer-to-peer retail returns. Presented at: EurOMA 2024 TRANSFORMING PEOPLE AND PROCESSES FOR A BETTER WORLD, Barcelona, Spain, 29 June - 3 July 2024. Retrieved from: <https://orca.cardiff.ac.uk/id/eprint/170419> (Accessed 20 Jan 2025)

Zhang, D., Frei, R., Bayer, S., Senyo, P. K., Gerding, E., Wills, G. and Beck, A. (2022). Understanding fraudulent returns and mitigation strategies in multichannel retailing. *Journal of Retailing and Consumer Services*, Vol. 70, 103145.

Zhang, D., Frei, R., Wills, G., Gerding, E. and Senyo, P. K. (2023). Strategies and practices to reduce the ecological impact of product returns: an environmental sustainability framework for multichannel retail. *Business Strategy and the Environment*, 32(7), 4636–4661.

Table A: Retail technology characterisation

Attribute	Type
Stakeholder	Customer-Facing/Shopper-Facing vs. Employee-Facing vs. Supplier-Facing
IT-relatedness	IT based vs. non-IT based
Domain span or source of origin	Single vs. multiple domain; Internal vs. External; Outside-in versus spanning versus inside-out

Newness	<i>Incremental versus radical</i>
Nature of change	<i>Facilitating vs. Disruptive</i>
Outcome	<i>Commoditising vs. Value-adding</i>

Table B: Characterisation of “the try whilst the courier waits” proposition (Shankar et al., 2021)

Attribute	Type
Stakeholder	<i>Enhance consumers’ shopping experience, with implications for employees and potentially third-party couriers who provides the delivery and take-back service</i>
IT-relatedness	<i>Non-IT based</i>
Domain span or source of origin	<i>Multiple domains involved, including operations and logistics; Mostly internal changes, with possible involvement of a courier service; Inside-out innovation</i>
Newness	<i>Radical change to the eCommerce service provision</i>
Nature of change	<i>Facilitating the existing concept of remote selling</i>
Outcome	<i>Value-adding</i>
Obstacles to overcome	Organisational change; perception from retailers that consumers may be reluctant to pay fees for this service.
Adoption implications	The additional staff time will require significant investment from retailers, but it may bring a competitive advantage. Customers who are willing to pay the fees will find the solution very convenient, as it removes the effort of having to manage, package and ship returns.
Likely outcomes	Retailers will benefit from immediate availability of the unwanted items. It will also lighten the burden of assessing and processing returns. This approach provides added value to consumers and retailers alike, and if implemented properly as a positive experience, will increase consumer satisfaction and loyalty. It is most likely to be successful in the luxury sector or where customers appreciate and are willing to pay for a high service level. Our research has shown that especially young customers with a busy life and some available income fall into the latter category.
Effectiveness (1)	Trying whilst the courier waits very effectively increases the probability that an item will be resold via the original channel and at full price, as its return to sellable inventory is immediate.

Sustainability	The additional courier journeys create emissions, but this is negligible in comparison with the avoided processing of conventionally returned items and the manufacture and distribution of replacement items.
----------------	--

Footnote: (1) A measure of effectiveness assesses how well an entity or process achieves its intended impact or purpose.

Table C: Characterisation of P2P returns shipping

Attribute	Type
Stakeholder	<i>Customer-facing</i>
IT-relatedness	<i>Requires new IT capabilities, but mainly a conceptual innovation</i>
Domain span or source of origin	<i>Multiple domain; Internal; Inside-out</i>
Newness	<i>Radically new approach</i>
Nature of change	<i>Facilitating more efficient resale of returns</i>
Outcome	<i>Value-conserving</i>
Obstacles to overcome	Re-organisation of returns processes; need for reliable product verification methods; potential abuse / fraud and how to mitigate against it; retailers' perception of customer acceptance.
Adoption implications	An increasing number of returns service providers are experimenting with this solution, reducing the barriers for adoption. It requires a digital returns system able to support P2P matching, verification, shipping and payment processes.
Likely outcomes	P2P returns will require retailers to give discounts to customers, but P2P shipping will lead to a decrease in manual processing at warehouses and hence reduce costs there. Consumers who choose this option will likely feel satisfied with the discount as well as their contribution to reducing packaging, transportation, and waste.
Effectiveness	The P2P returns approach effectively increases the probability that an item will be resold via the original channel but at a slightly discounted price. Items virtually return to sellable inventory at an accelerated rate and without physical processing at the warehouse.



Sustainability	Packaging can be reused conveniently. The additional transportation creates emissions, but this is negligible in comparison with the avoided processing of conventionally returned items at the warehouse and the manufacture and distribution of replacement items.
----------------	--

Table D: Characterisation of returns ecosystems

Attribute	Type
Stakeholder	<i>Customer-facing, employee-facing and downstream supplier-facing</i>
IT-relatedness	<i>IT based with non-IT consequences</i>
Domain span or source of origin	<i>Single domain (returns processing and resales)</i> <i>Internal and external;</i> <i>Spanning the whole returns ecosystem</i>
Newness	<i>Radical</i>
Nature of change	<i>Facilitating</i>
Outcome	<i>Value-conserving</i>
Obstacles to overcome	Resistance to change; it would be difficult for an individual retailer to create a returns ecosystem as required for this approach, as it requires partnering with a community of retailers and third-party providers.
Adoption implications	For consumers, it could mean that different items in an order would take different paths onwards.
Likely outcomes	If implemented successfully, retailers would retain more value from returned products and reduce waste, which could improve their bottom line and increase shareholder value. Warehouse employees would deal with less returns.
Effectiveness	The returns ecosystems approach effectively increases the probability that an item will be resold via a variety of primary or secondary channels, at full or reduced prices. Adopting a differentiated approach to dealing with the diverse nature of returned products increases the retained product value and the speed of resale.
Sustainability	More items are resold, reducing their shipping and processing, as well as the need to manufacture and distribute replacement products.

Table E: Characterisation of retailers taking control of secondary markets

Attribute	Type
-----------	------



Stakeholder	<i>Involves consumers, employees and downstream supply chain partners</i>
IT-relatedness	<i>Can involve IT based tools and platforms</i>
Domain span or source of origin	<i>Multiple domain; Internal and external; Can be outside-in or inside-out</i>
Newness	<i>Incremental</i>
Nature of change	<i>Facilitating</i>
Outcome	<i>Retaining value</i>
Obstacles to overcome	Fear of cannibalisation of primary sales by secondary sales; fear of devalorisation of the brand; investment into secondary market channels.
Adoption implications	An increasing number of retailers are choosing to partner with reputable resellers or to build their own outlet channels. Both are alternatives to using the conventional solution of using so-called jobbers who purchase unwanted and unspecified items in bulk at extreme discount rates. Building their own outlet channels requires an investment in time and effort for retailers and their employees, whereas partnering with resellers requires trust.
Likely outcomes	Both solutions provide discounted products for consumers to buy, likely increasing satisfaction and loyalty, especially with their financial means are constrained. Retailers retain more value from returned products and hence increase their profits whilst also reducing waste.
Effectiveness	Retailers taking control of secondary markets very effectively increases the probability that an item will be resold without going through the hands of multiple traders, reducing the risk of items being damaged, discarded or destroyed.
Sustainability	A higher resell rate through the original retailers will reduce the need to manufacture and distribute replacement items.

Table F: Characterisation of wardrobing sensor tags

Attribute	Type
-----------	------

Stakeholder	<i>Customer-facing, as it holds them accountable for their behaviour, and provides employees assessing the condition of returned items with additional information</i>
IT-relatedness	<i>Non-IT based</i>
Domain span or source of origin	<i>Single domain (returns processing); Internal implementation; Outside-in, as technology developed externally</i>
Newness	<i>Radical, as nothing similar existed before</i>
Nature of change	<i>Facilitating better returns management</i>
Outcome	<i>Value-conserving, as it reduces losses from write-offs</i>
Obstacles to overcome	Investment needed; currently unproven technology, with unknown reliability; retailers' fear of backlash from consumers.
Adoption implications	If implemented at a large scale, the tags are estimated to come at a very minor added cost of 1-2 pence per item, and can be combined with the usual RFID swing tags or replace them. Honest customers should not have any issues with them.
Likely outcomes	Wardrobing behaviour would be strongly discouraged as the tags would provide proof of the return policy abuse. Retailers need to take action if this is detected, by declining a refund or warning the customer that such behaviour would lead to a ban if repeated. Eliminating wardrobing would have a strongly positive effect on the retailer's bottom line.
Effectiveness	A reliable implementation has the potential to drastically reduce one of the most frequent returns frauds.
Sustainability	Wardrobing can lead to products being wasted and replaced due to damage and/or delayed returning. A lower wardrobing rate will reduce the need to manufacture and distribute replacement items.

Table G: Returns pathways with their enablers, risks and barriers, advantages and disadvantages

Pathway	Enablers	Risks and barriers	Advantages	Disadvantages
<b>P2P shipping</b>	Item in pristine condition, modern returns portal,	Wrong or damaged item may be shipped,	Minimum transportation, quick resale,	Retailer does not see the returned item

	requires second customer registering their wish to purchase the returned item	the returning customer sees the address of the second customer	reduced price for second customer, no processing needed, avoiding international returns journeys	
<b>Local third-party reseller</b>	Returns service provider with capable online portal must be used, distributed network of resellers required, training for resellers required to authenticate and inspect returned items	Customer loyalty may be lost to local retailers	Less transportation	Unclear what happens to the margin of the initial retailer
<b>Physical store</b>	Customer travels to local store	May be used for frequent free returns if online returns incur a fee	Less transportation, less packaging, customer remains loyal to initial retailer, quick resale at full or reduced price, works also for lower priced items	Potentially imbalanced inventory, retailer may need to sell items that are outside of their regular offering
<b>Distribution centre</b>	Items purchased in store usually need to be returned to store and from there are	Lost value due to insufficient training and conflicting Performance	Any onwards pathways are available from here	Increased transportation, packaging, and processing

	shipped to the warehouse	goals of third-party warehouse operators		
<b>Third-party repairer</b>	Skilled labour required	Items may become damaged in the process, potentially costly	Damaged items do not go to waste	Specialist manufacturer knowledge may not be available
<b>Third-party reseller</b>	May require agreements with brands to be able to use their labels, which increases the reselling value	Items may not always be genuine	Lower prices for customers	Manufacturers and retailers may perceive these as competition or threats

Source: Current study

Table H: Solutions for items to reach customers and returning to retailers

Solution	Comment
1) Buy online, return to store	This is a tried-and-tested approach, favoured by many omnichannel retailers (Jack et al., 2019), as it has the potential to reduce the logistics and processing in comparison to the online returns process. However, it does require the customer to travel to a store.
2) Try whilst the courier waits	Expensive due to the courier's idle waiting time, but effective; returns items to the retailer immediately and reduces opportunities for returns fraud.
3) P2P returns	Efficient solution for returned items to reach the next customer quickly but limits the retailer's ability to verify that the right item is being sent and its condition; potential for the returning and receiving customers to blame each other. Possible issue with data privacy.
4) Online system offering various options to	eCommerce platforms can provide various options for purchasing and returning items, in combination with sustainability information, for customers to make informed choices. Besides offering various shipping options, selected eCommerce platforms already offer rental solutions, which may reduce

buy/rent and return	wardrobing. Additionally, they could offer customers the option of buying discounted items via outlet channels or used items via sharing platforms, assisting the customer by providing product availability information (Ren et al., 2023). The system may suggest the most sustainable option based on characteristics of the customer, product, and retailer.
5) Local hubs	Showrooms for delivery, returns and trying on (fitting rooms); reduce packaging and local traffic. Just as some retailers propose that customers pre-purchase cheap return shipping labels if they expect to return something, retailers can propose solutions such as shipping products to a local fitting hub or showroom. If conventional returns are required, the online registration system can identify the most effective way to return, providing information on sustainability. Customers could be encouraged to shop in store if one is close-by, or choose delivery to a trial hub otherwise, and to use of sizing tools (e.g., scanning feet) to reduce unnecessary orders and frustration.

Source: Current study

#### Appendix A: Semi-structured interviews

ID	Sector	Representatives	Country	Company size
1	Groceries, Apparel, Electricals	<b>LP1 A:</b> Loss Prevention Manager in charge of online and wholesale operations. <b>LP1 B:</b> Loss Prevention Manager in charge of store operations.	UK	Large
2	Fashion and Apparel, Footwear, and Accessories	<b>LP2:</b> Profit Erosion and Data Mining Manager.	UK	Large
3	Electricals, Fashion and Apparel	<b>LP3 A:</b> Head of Digital Risk. <b>LP3 B:</b> Risk and Loss Prevention Investigator.	UK	Large

4	Electricals	<b>LP4 A:</b> manager of Loss Prevention and Inventory Control (online). <b>LP4 B:</b> Returns Manager, involved with returns and returns prevention.	Canada	Large
5	Groceries, Apparel, Electricals	<b>LP5:</b> Multi-Channel Returns Manager.	UK	Large
6	Fashion and Apparel, Footwear, and Accessories	<b>LP6 A:</b> Fraud Analytics Manager. <b>LP6 B:</b> Head of Online Loss Prevention.	UK	Large
7	Electricals	<b>LP7:</b> Fraud Prevention and Investigations Manager.	UK	Large
8	Fashion and Apparel	<b>LP8:</b> Director of Loss Prevention.	US	Large
9	Retail expert	<b>E1:</b> An analyst with extensive retail experience.	UK	N/A
10	Retail expert	<b>E2:</b> Works closely with retailers on identifying problems of loss and returns.	UK	N/A
11	Retail expert	<b>E3:</b> 30 years of research experience in understanding retail loss problems.	UK	N/A
12	Returns technology service provider	<b>S1:</b> Senior Manager (Public Relations) who works closely with retailers. <b>S2:</b> President of retail technology company.	US	N/A
13	Returns technology service provider	<b>S3:</b> CEO & Co-founder	Global	N/A
14	Returns technology service provider	<b>S4:</b> Chief Technical Solutions in product returns	Global	N/A
15	Service provider	<b>S5:</b> Founder and CEO	UK	SME
16	Service provider	<b>S6:</b> Founding member	US	Start-up
17	Service provider	<b>S7:</b> Founder and CEO	UK	Start-up
18	Third-party reseller	<b>S8:</b> Founder and CEO	UK	SME

19	Academic	<b>R1, R2:</b> Researchers and educators (2x)	UK	N/A
20	Returns technology provider	<b>S9:</b> Founder and CEO	UK	Start-up
21	Service provider	<b>S10, S11:</b> Founding members (2x)	UK	Start-up
22	eCommerce Retailer	<b>LP9:</b> Returns manager	UK	Large
23	Industrial research organisation	<b>R3:</b> Head of section <b>R4:</b> Researcher	US	SME
24	Fashion manufacturer and retailer	<b>LP10:</b> Head of Garment Technology	UK	SME
25	Service provider	<b>S12:</b> Manager	UK	SME
26	Third-party reseller	<b>S13:</b> Director	UK	SME
27	Third-party reseller	<b>S14:</b> Director	UK	SME
28	Fashion manufacturer and retailer	<b>LP11:</b> Returns manager	US	Large
29	Omnichannel retailer	<b>LP12:</b> Returns manager	Europe	Large
30	Fashion manufacturer and retailer	<b>LP13:</b> Technology manager	UK	SME
31	Service provider	<b>S15:</b> Founder and CEO	US	Start-up
32	Online marketplace	<b>LP14:</b> Fraud manager	Global	Large

NB. Following the OECD, a large company is considered to have over 250 employees.

#### Appendix B - Figure 1: Thematic analysis coding

(see separate file)

#### Appendix C: Examples of quotes pertaining to codes

Code	Sources	Example quote
Try whilst the courier waits - combines the delivery and returns journey	LP8, E2	"What we do is, we offer a service against a fee, whereby the customer gets to try on items whilst our courier waits. It takes a little bit of time for the courier, yeah, but it removes a whole lot of hassle for the

		consumer, and you know, busy people, they appreciate that.” LP8
P2P makes shipping and returns more efficient through its decentralised approach	S6, E1	“So, on the sustainability side, we assume that the returner is reusing their packaging because that's, in general, what consumers do when they ship a return back.” S6
Returning customers must be trusted	S4, LP5, LP9	“I think there's definitely something to be said about the levers that you have, the controls that you have as a brand when you're working with consumers who are returning because you have control of their refund, and so you can levy the expectation that they need to ‘play nice’ as they make their return.” S4
Returns ecosystem solutions work with local partners to reduce shipping and speed up the resale	S3, S4, E3, R2	So, in terms of the user experience, it's very transparent [...] we can send you to an offline store, as opposed to just having someone come and collect your item. So, we will actually say, “Here is a store near you, here is a partner near you, go to this partner.” S3  “[...] 45% of whatever they brought back [to the warehouse] went straight to the jobbers. No matter what it was, they would get less than £1 per item from the jobbers. So, it cost, say, £20 to get the item back [from abroad], they still only got £1 for that item. Which is absolutely insane. We could have got rid of it locally, which would have saved them the £20.” S4
Retailers fear cannibalisation by secondary markets and alternatives to buying	S10	“Sometimes we get the question of, ‘Won't rental cannibalise our sales?’ And our response to that is, ‘I mean, it will be worse for you if another brand cannibalises yourselves because customers are moving towards a rental model and you haven't moved quickly enough.’” S10
Taking control of secondary markets allows retailers to increase resales	E2	“It's one of the mid to high-end brands that are trying to take that preloved market back into their own hands because they'll come in, they'll assess the garment, with their in-house people, refurb where needed, and then it goes out at a fraction of the price, but it's been authenticated and checked so you know it's authentic. It's quite an interesting concept.” E2
Wardrobing is suspected to be very common, but retailers	LP6 B, S9, LP14	“Wardrobing is very high on our priority list. It's a tricky one. We don't include it in the more obvious fraud case statistics because



are still unable to prove wardrobing due to lack of evidence		<p>it's very very hard to prove. It's really hard to differentiate what people buy and sort of wear and then send back. Or they buy, they try on, and they like 'oh, it doesn't fit me'. I'm going to send that back. Because some people will try on their goods very quickly and send them back asap, but some people might not be able to get out and to return it is quickly. So, they might wait a bit. [...]So, we're trying to understand what that behaviour is and see if there is anything that we can map and pull together to actually identify these trends." LP6 B</p> <p>"It is very difficult to prove wardrobing except when we happen to find evidence. For instance, we have found suits that had flight tickets in the pocket, that had been obviously worn, used on a flight and then returned." S9</p>
Sensor tags could prove wardrobing, but investment is difficult to secure due to the current lack of evidence	LP1 A, LP14, LP3 B	"It's hard to put a number on our losses or lost sales due to wardrobing, and if we don't know how much it costs, we can't really make a solid business case to the upper management." LP1 A
P2P returns travel directly from customer to customer	S6, E1, E2	"[...] we have been operating under the assumption that our shipments go directly from Point A to Point B, the returner to the purchaser. And then the alternative is the same two customers would be involved, but it would make a stop at the brand's warehouse in between. And so, we calculate the emissions savings, basically, using this carbon calculator." S6
Returns portals can calculate the best destination and most efficient route for each item	S3, S12, R4	"We're an AI-powered engine behind any return portal, behind any bespoke platform, behind any e-commerce platform. And we are making real-time, dynamic decisions at every point of the return journey." S3
If retailers knew which returns to expect before they arrive, they could optimise inventory management	S7, S12, E3, LP2	"So, [the online returns portal], it doesn't de facto send the item back to the warehouse, it will also basically say, 'Listen, we've got a label here for you, a QR code, let's say, and with this QR code, basically, the item will be sent not to the warehouse, but to a store nearby, or an outlet, or a recycler or refurbisher.'" S7
Legacy returns systems do not allow strategic gathering	E1, LP1 B, LP8	"You'd be amazed at the lack of visibility that some companies have over what is going in and out of their warehouse. It's incredible. [...] And often the cause of it is all of these

and analysis of returns data		legacy IT systems. And instead of just scrapping it and starting again, they build on top of it, and they put system after system after system. " E1
More companies do simple repairs and refurbishing	LP12, E3, R3, LP10	"Sometimes, if something is returned to the shop, we will reattach a button that has come off a garment." LP12  "In some warehouses dealing with returns, they have, for instance, a bike mechanic who will inspect a returned bike and check if anything needs to be fixed." R3
Getting returns back faster improves cash flow and increases the probability of a resale	S14, S2, R1	"[...] we have a way of processing returns faster and cheaper, because it doesn't matter who it is, the brand, the retailer, the 3PL, if they had a way of receiving an item and restocking it quickly and cheaply, [...] they assess the disposition and sell it as non-new, I think that would be the more efficient way to deal with the returns." S14

Appendix D - Figure 2: Pathways onwards from a customer returning a product  
(see separate file)

First order codes

Strategy & Leadership  
Second order codes

Aggregated codes

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60



