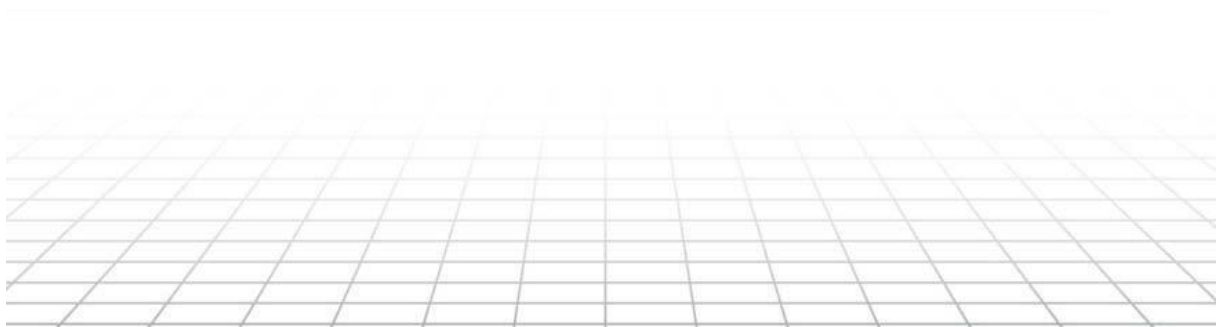


Optimising E-commerce Returns with Automated Storage Systems

White Paper

Quickly organise returned items by dispensation category to minimise inventory costs, labour requirements and space demands through deployment of flexible automated storage and retrieval systems.



Introduction: E-commerce Returns Statistics

Shopping online has been embraced in a big way. Actually, “big” might be considered an understatement.

In 2014, U.S. e-commerce retail sales to consumers exceeded \$300 billion for the first time.¹ By the end of 2015, e-commerce sales are projected to hit \$334 billion—or, nearly 10% of all domestic sales—with physical goods sitting at the top of the growth category.² Analysts don’t expect this trend to wane anytime soon; rather, the forecast is for a 10% compound annual growth rate (CAGR) from 2014 until 2019, equating to \$480 billion in online sales.³

Yet with all those parcels arriving in the mailbox or on the doorstep of consumers, there are bound to be some returns. After all, unless a shopper is buying an item already seen in person elsewhere, e-commerce purchases are highly dependent on images and text that describes a product—whether generated by the online merchant or reviewers who have experienced it.

Just how many returns do e-commerce operations experience, and why? Here’s a few statistics:

- Approximately 33% of all products purchased through e-commerce channels are returned.⁴
- Up to 30% of soft goods purchased online, such as apparel and footwear, are returned.⁵
The biggest cause is size.⁶
- Less than 10% of hard goods purchased online—like toys, gifts and housewares—are returned.⁷
- 23% of e-commerce returns are caused by a mispick (the wrong item or quantity of item(s) is picked instead of the correct one⁸).⁹
- 22% of e-commerce returns are due to the product not matching its online description.¹⁰
- 20% of e-commerce returns are because the product received is damaged.¹¹
- Return volume peaks during the holidays, with parcel carrier UPS expecting returns of items purchased online to grow by 15% during this season.¹²

With the e-commerce returns data just as staggering as the explosion of online shopping’s popularity, many online retailers are discovering that their returns management process isn’t operationally efficient

¹ Enright, Allison. “U.S. annual e-retail sales surpass \$300 billion for the first time.” *Internet Retailer*. February 17, 2015. Accessed November 16, 2015. <https://www.internetretailer.com/2015/02/17/us-annual-e-retail-sales-surpass-300-billion-first-ti>

² Mulpuru, Sucharita et al. “Forrester Research eCommerce Forecast, 2014 to 2019 (US).” Forrester Research. April 27, 2015. Accessed November 17, 2015. <https://www.forrester.com/Forrester+Research+eCommerce+Forecast+2014+To+2019+US/fulltext/-/E-res116713>

³ Ibid.

⁴ Banjo, Shelly. “Rampant Returns Plague E-Retailers.” *The Wall Street Journal*. December 22, 2013. Accessed November 18, 2015. <http://www.wsj.com/articles/SB10001424052702304773104579270260683155216>

⁵ Brohan, Mark. “Reducing the rate of returns.” *Internet Retailer*. May 29, 2013. Accessed November 20, 2015. <https://www.internetretailer.com/2013/05/29/reducing-rate-returns>

⁶ Banjo, Shelly. “Rampant Returns Plague E-Retailers.” Ibid.

⁷ Ibid.

⁸ Rammelmeier, Tobias et al. “Active Prevention of Picking Errors by Employing Pick-by-Vision.” Accessed November 20, 2015, <http://www.fml.mw.tum.de/fml/images/Publikationen/2011-06%20Active%20prevention%20of%20picking%20errors%20by%20employing%20Pick-by-Vision.pdf>

⁹ Forrester Research. “Crafting a Returns Policy that Creates a Competitive Advantage Online: A commissioned study conducted by Forrester Consulting on behalf of UPS.” April 2008. Accessed November 20, 2015. https://www.ups.com/media/en/returns_forrester.pdf

¹⁰ Ibid.

¹¹ Ibid.

¹² Banjo, Shelly. “Rampant Returns Plague E-Retailers.” Ibid.

or effective. In fact, “reverse logistics is one of the most often overlooked elements of the complete operations cycle.”¹³

And yet, it shouldn't be. That's because an unmanaged, uncontrolled returns process can put tremendous strain on a facility's available space and labor. Further, and perhaps most compelling, are the costs associated with returned inventory.

*Returned products turn back into inventory. Depending on how long it has been, since the initial sale, that inventory may even be less valuable as a sale than it once was... With unmanaged or poorly managed returns process, the more returns you receive, the more it effectively bogs down your system. Eventually, many of those returns will have to be sold at a discount, just to get them out of the system... These returns are eating into your profit.*¹⁴

Reverse logistics isn't just a cost of doing business. It's a significant cost that can have an enormous impact on the bottom line. According to research by Aberdeen Group, “the top challenge facing manufacturers and retailers in regard to returns management is cost containment.”¹⁵

Why? Here are some more statistics:

- The typical manufacturer spends 9% to 15% of total revenue on returns.¹⁶
- In 2014, the total amount of merchandise returned to retailers was \$284 million; in 2013 it was \$267.3 million.¹⁷
- Home-shopping network QVC reported a rise in returns to 19.4% of gross product revenue in 2012 from 18.9% in 2010.¹⁸
- Now out of business, online jewelry and accessory retailer Modnique.com reported that returned and canceled items represented as much as 15% of revenue.¹⁹
- A global research study of 300 companies' multi-channel order fulfillment and returns processes in 2014 by Gartner found that “companies only resold at full price 48% of the products that consumers returned.”²⁰
- Companies that implement an improved reverse logistics operation that enhances the speed and efficiency of returns save roughly \$300,000 in costs annually.²¹
- Companies with best-practice reverse logistics operations are 47% more likely to process returns daily.²²

¹³Greve, Curtis and Davis, Jerry. “Recovering Lost Profits by Improving Reverse Logistics.” June 2014. Accessed November 23, 2015. https://www.ups.com/media/en/Reverse_Logistics_wp.pdf

¹⁴Lunka, Ryan. “Item Returns: How increasing your sales can reduce your profitability.” *nChannel*. November 20, 2014. Accessed November 17, 2015. <https://www.nchannel.com/blog/item-returns-how-increasing-sales-reduce-profitability/>

¹⁵Pinder, Aly. “Returns Management Matter: The Biggest Hidden Secret in the Supply Chain.” *Aberdeen Group*. November 12, 2015. Accessed November 17, 2015. <http://www.aberdeengroup.com/research/11115/11115-RR-returns-management-manufacturers.aspx/content.aspx>

¹⁶“Reverse Logistics: Driving Improved Returns Directly to the Bottom Line.” *Aberdeen Group*. February 2010. Accessed November 23, 2015. https://www.ups.com/media/en/Reverse_Logistics_wp.pdf

¹⁷“2014 Consumer Returns in the Retail Industry.” *The Retail Equation*. December 2014. Accessed November 24, 2015. <http://www.theretailequation.com/retailers/IndustryReports>

¹⁸Banjo, Shelly. “Rampant Returns Plague E-Retailers.” *Ibid*.

¹⁹*Ibid*.

²⁰Lunka, Ryan. “Item Returns: How increasing your sales can reduce your profitability.” *Ibid*.

²¹Pinder, Aly. “Returns Management Matter: The Biggest Hidden Secret in the Supply Chain.” *Ibid*.

²²*Ibid*.

- Implementing a managed reverse logistics process can increase a company's revenue by up to 5% of total sales.²³

What can an e-commerce operation do to get a better grasp on returns? Consider establishing an automated returns practice. A top executive at one of the largest third-party logistics (3PL) providers, GENCO, says automation can cut reverse logistics costs associated with excess inventory, returns processing and asset liquidation by 10% to 15%.²⁴

That statement is supported by research from the Aberdeen Group, which evaluated 167 service and manufacturing operations about their reverse logistics practices. The top 20% of aggregate performance scorers (what Aberdeen calls the "Best-in-Class" companies) in the study were 74% more likely to have automated their returns process. By putting "a system in place to predictably and repeatedly execute on the return and disposal of a part or product,"²⁵ these companies are better able to both manage the complexity of a reverse logistics operation, and resolve customer issues as quickly as possible.

Further, the report states:

As a result of automating the returns operation, service organizations have been able to achieve improved results in better first-time fix of issues [64%], greater service level agreement (SLA) compliance [58%], increased value reclaimed from returned parts [24%], and a higher level of customer satisfaction [77%] as compared to those organizations that have not leveraged the efficiency gains of an automated returns process.

This white paper examines how the deployment of affordable, flexible automated storage and retrieval systems can simplify reverse logistics processing. Through the implementation of such a system, returns can be handled as another form of inbound shipping through efficient routing and restocking items to minimize inventory costs, labor requirements and space demands.

Automated Storage and Retrieval Systems Simplify Returns

The first handling step of receiving and processing returns is decidedly manual. Operators trained in quality control must open received parcels, assign them a tracking number printed on an associated barcode label, then carefully inspect and test the item(s) inside. Based on a variety of factors—including the condition of the item, its age, visible defects or damage, seasonal category and others—returned items are then assigned a disposition destination. Classifications might include:

- **Restock** and return to inventory for immediate sale (95% of items are returned not because there is something wrong with them, but because of customer dissatisfaction²⁶).

²³Greve, Curtis and Davis, Jerry. "Recovering Lost Profits by Improving Reverse Logistics." Ibid.

²⁴Vehec, Dave. "About Face—Reversal of Fortune." *Supply & Demand Chain Executive*. January 21, 2015. Accessed November 23, 2015. <http://www.sdexec.com/article/12037309/statistics-reveal-8-to-9-percent-of-goods-purchased-at-stores-get-retained-and-25-to-30-percent-of-e-retail-orders-are-sent-back>

²⁵Pinder, Aly. "Key Trends in Returns Management." *Aberdeen Group*. April 8, 2013. Accessed November 23, 2015. <http://www.aberdeen.com/research/8443/ra-returns-operation-management/content.aspx>

²⁶"Streamlining the Five R's of Reverse Logistics to Maximize Revenue Streams." *Ryder Exchange Blog*. March 6, 2014. Accessed November 23, 2015. <http://blog.ryder.com/2014/03/five-rs-of-reverse-logistics/>

- **Repackage** for re-sale in a secondary channel, such as a discount retailer’s online or brick-and-mortar stores.
- **Repair**, refurbish or remanufacture—particularly for electronics such as mobile phones and tablet computers.
- **Return** to supplier, vendor or manufacturer—most frequently seasonal items purchased with a sales agreement stipulating that the source will accept unsold inventory.²⁷
- **Recycle**, reclamation or disposal. High-tech devices utilize rare earth metals, such as gold, palladium, silver, copper, titanium and more. The Environmental Protection Agency estimates that reclaimed metals from one million cell phones is worth more than \$2.8 million²⁸.



Once returned items have been inspected and labeled with a disposition destination, however, things tend to fall apart for many returns operations. Inundated with a potentially overwhelming number of discrete items, managing their sortation and routing can be a real challenge for fulfillment centers. Boxes and totes of returned items can quickly overwhelm both the space allotted for their temporary storage, and the labor assigned to their management. Especially for facilities with hundreds of thousands of square feet of conventional inventory storage racking, sending an operator to physically return one item to its stock location can be a time-consuming and ergonomically fatiguing task.

²⁷Greve, Curtis and Davis, Jerry. “Recovering Lost Profits by Improving Reverse Logistics.” Ibid.

²⁸Ibid.

To move returned items through the disposition process quickly, utilizing an automated storage and retrieval system (AS/RS) can speed up the processing time to maximize asset value recovery in a compressed footprint while reducing cycle times and labor-associated handling costs.

While there are a variety of AS/RS technologies offered in the market—including capital-intensive, multi-million-dollar robotic installations—the most affordable and flexible solutions are horizontal carousels, vertical carousels and vertical lift modules. These self-contained systems offer higher density storage in a more compact footprint than manual storage equipment can provide.

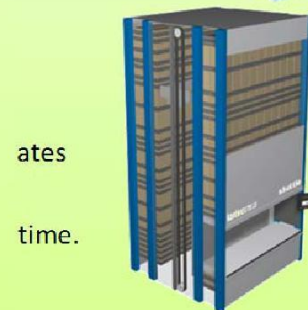
Horizontal Carousels – Consist of bins mounted on an oval track that rotate horizontally to deliver storage locations to an operator. These automated storage and retrieval systems eliminate unproductive travel and search time by delivering the product to an operator.



Vertical Carousels – Comprised of a series of shelves that rotate around a track—similar to a Ferris wheel—these automated storage and retrieval systems deliver stored items safely and quickly to an ergonomically positioned counter at the operator’s command, eliminating walk and item search



Vertical Lift Modules (VLMs) – An enclosed automated storage and retrieval system that consists of two columns of trays with an inserter/extractor in the center. The inserter/extractor automatically and retrieves stored trays from both columns and presents them to the operator at a waist-high pick window, eliminating travel and SKU search



The selection of the most appropriate AS/RS for a given reverse logistics operation is dependent on a variety of factors, including number of inbound returns received per day, the size variability of the returned items, and the desired rate of throughput for returns. When paired with fixed mounted or radio-frequency (RF) scanners for barcode reading, light-directed picking workstations and/or put walls, items routed to the automated returns processing area post-inspection can be quickly identified and operators guided to the appropriate receptacle presented by the AS/RS. Because the automated systems deliver the destined receptacle directly to the worker and highlight its position, both walk and search time are eliminated, enabling fewer personnel to sort and route more returns.

In certain applications, the storage bins in the AS/RS can even be utilized as forward pick areas. This functionality is enabled by integrated inventory management software that not only keeps track of the contents held within the machine, but also interfaces with a facility’s warehouse management system (WMS) and enterprise resource planning (ERP) systems. This function allows picks to be sourced from the most convenient location (in this case, the returns processing area) for even faster restocking and resale of returned inventory.

Likewise, when the AS/RS' software recognizes that a pre-determined quantity of returned inventory has been reached, it can work with the WMS to assign and interleave a task for those items. This might include routing to outbound shipping for return to a vendor or transfer to a secondary market reseller; transport by conveyor or cart to a stock position within the warehouse; or shipment to a reclamation or disposal service provider.

Sorting Returns with Horizontal Carousels: A Real Life System Example

A major omni-channel retailer who sells a broad variety of items through the Internet, mobile applications and broadcast television uses a combination of software, put walls and six horizontal carousels to sort returns by disposition destination.

As illustrated below, after passing through a manual inspection process to assign a disposition category, returned items are routed in totes via conveyor to the automated sortation area. Upon arrival, their barcodes are scanned with a fixed mounted scanner. This triggers the operation's warehouse control system (WCS) to pass the item information onto the horizontal carousels' inventory management system, which determines the carousel put away location. This determination triggers the illumination of a light beneath a cubbyhole position on one of two put walls.

The operator places the item into the cubbyhole and moves to the next scan. Meanwhile, the carousels' inventory management system tracks all product SKUs, dispositions and quantities as they are placed in each put wall location; the system also sends confirmation of the put to the operation's labor management system (LMS) via the WCS.

While the WCS suggests locations within the carousels for item put away, the carousels' inventory management system makes the ultimate decision based on a variety of factors, including what other inventory is already in each carousel and the items' sizes. The illumination lights on the carousel-side of the put wall indicates time for placement of items into the carousel. This alerts an operator positioned between the put wall and the horizontal carousels (three per put wall) that items are ready to be picked from the put wall and placed into the automated storage system.

The carousel spins until the appropriate column of storage bins is presented. Lights on the carousel illuminate to indicate into which storage bin the item should be placed. Bins can be sub-divided internally to hold multiple stock keeping units (SKUs), or multiple units of the same SKU. The bins can also be different colors to indicate a different disposition destination (yellow for internal restocking, blue for return to vendor, red for recycling, etc.)

The carousels' inventory management software is in continuous, real-time communication with the WCS, which passes pick information to both LMS and WMS. Pick tasks can be assigned to retrieve inventory from the carousel, either as carousel-only picks or mixed picks that marry items picked elsewhere with items stored in the carousel. This prevents items from having to be returned to stock elsewhere in the warehouse, saving both time and travel while minimizing cost of inventory. Likewise, when a pre-determined number of items is reached within a dispensation category—a minimum number of items required for a return to vendor, for example—the carousels' software sends a transaction to the WCS.

