The Dynamics of Returns Management
A White Paper
Sunland Logistics Solutions
Logistics and Supply Chain

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Executive Summary

Our project centers around rapid growth in Omni-channel and associated impact on the arena of returns management. We were also entrusted with identifying reputed, top-drawer technologies and solutions, as well as their unique characteristics that would allow for superior returns processing. The value proposition of our research findings, for clients of the third party logistics providers, is three fold. It consists of reduction in customer (retailer) costs that are tied up in returns, or are required for processing/handling returns, enhancement of their profitability and enabling the use of returns management as a source of differentiation and competitive advantage.

With the huge amounts of their money being tied up in customer-returned merchandise, companies were looking at preventing unavoidable returns by identifying related trends and mitigating underlying causes. Customers are increasingly judging seller/retailer’s performance based on the extent that the retailer is able to provide a holistic, consistently positive customer experience during both forward and reverse touch-points. Hassle-free return policies and adept handling of return touch-point are intrinsic to forming long-standing bonds and fostering customer loyalty.

Though a returned product can be initiated by customers, retailers, distributors, manufacturers and environment legislators, Omni-channel advancement mainly impacts customer-initiated returns, that could be generated due to perceived product defects or due to buyer’s remorse. We believe, that the knowledge and skills possessed by sortation personnel, enabling them to determine the most optimal, value generating disposition destination for a return, are key cogs in the wheel of reverse logistics. The steady Omni-channel expansion means a slew of ramifications for industry players such as warehouse management providers and third party logistics providers as well as their clients, i.e. retailers and manufacturers. The entire industry is still in flux, trying to come up with novel ways to address the same.

We zeroed in on leading technologies that can help the relevant stakeholders tackle their most relevant pain points, with regards to handling Omni-channel returns. Specialized warehouse management providers such JDA/ Red Prairie, Manhattan Associates, HighJump, IBM Sterling and SAP provide a number of advanced features targeted towards varied sized customers having differing integration needs and dealing with increasing volumes, higher rate and enhanced complexity of forward transactions, along with providing specialized support for returns management. Though, these are leading WMS providers in the industry, we believe that there’s still a sizable scope for improvement as far as the returns-related capabilities of these products are concerned.

Additionally, we also looked into the end-to-end return solutions that provide a complete solution for returns processing. These solutions make returns processing faster, easier and convenient at many levels by offering winning attributes such as visibility along the entire returns processing, configurability to enable creation and housing of business rules and policies as well as credit reconciliation, to name a few. Leading
providers in this area are GENCO's R-Log, SAP's Advanced Returns Management and IBM's Sterling Reverse Logistics solution.

Secondary markets have been identified as having a huge potential, in the value that they help to recoup from returned offerings that can no longer be sold at their original price, through the primary channels. There are a variety of secondary options, such as factory outlets, value retailers, online marketplaces, salvage brokers, dollar stores, international disposition, charities, flea markets, pawn shops, recycle, landfill, where a product can end up depending on various attributes such as product quality or condition, its initial price, product size, its position in product lifecycle as well as the manufacturer's go-to market strategy. At the top of the hierarchy are factory outlets, value retailers and online marketplaces, where merchandise can be resold for as high as 70% of its initial price point. At the bottom are flea markets and pawnshops, which fetch the least value for returns intended for reselling.

One of the key solutions that a 3PL provider in reverse logistics can offer is to provide a centralized return center for its customers as the benefits of a CRC are abundant and crucial for a fast and efficient returns processing. At the same time, avoidance of manual intervention in the returns processes by automating crucial decision making steps will go a long way in providing a seamless and error free returns processing. 3PL providers also can help customers choose some of the best Warehouse Management Solutions available in the industry best suited to the customer needs and future business direction of the customer.

The other aspect of choosing a software solution for returns management is the crucial decision to go with an end-to-end solution or a best-of-breed solution. This decision is crucial as it is a strategic decision and both solution have their set of pros and cons. Consideration should be given to the functional requirements and budget constraints of the customer along with the various trade-offs that come along with choosing one over another. Since warehouse management is such an essential component of the returns processing, 3PL providers need to deploy the best practices to come out as a winner. Few of the best practices include separation of duties, hiring skilled workers for crucial activities such as sortation, and automating processes.

Similarly, latest trends in transportation need to be adapted by the 3PL providers to optimize scheduling and transportation routes, to protect the shipments from further damage, and to efficiently use the scarce resources available to both forward and reverse logistics by integrating the two. Lastly, by hiring personnel skilled in the specialized area of sortation, refurbishment and disposition and providing training programs to share these skills with the customer, 3PL providers can provide tangible value to the returns processing area of firms.
I. Introduction

The Omni Channel Paradigm

In the age of Omni-channel retailing, customers expect a seamless shopping experience even when they use multiple channels (online, telephone, brick and mortar stores) and devices to purchase a good or service. The customer may use one channel for browsing, sampling the item, another for making payment and still another for picking up the item.

Omni-channel retailing presents the customer with various new purchasing options, such as:

- Order placed online, fulfilled directly to customer’s home.
- Order placed online, product sent to retail store for in-store pickup.
- Purchase made in-store, product found to be “out-of-stock”, so delivery made later to store or directly to buyers home.
- Order submitted online through a distributor channel like Amazon, and fulfilled directly to customer’s home either by retailer or via vendor’s logistics infrastructure.
- All above scenarios can be considered in reverse whenever a product return is required.

Omni-channel retailing differs from multi-channel and cross-channel retailing. In the case of multi-channel retailing, the retailer operates multiple independent distribution channels in a siloed manner and the customers perceive the sales channels as distinct access points of purchase. In cross-channel retailing, the retailer has a unified view of the customer, but it operates multiple functionally separate channels. Also, the customers are presented with a unified brand view across various touch points spanning multiple channels.

In Omni-channel retailing however, the firm has a unified view of the customer across all channels and all types of customer-facing systems. All the channels, supporting supply chain and associated inventory is truly integrated, helping the firm provide customers with a consistent, holistic brand experience at all touch points.
Impact of Omni-Channel on Returns Management

The term Returns management, though often used interchangeably with Reverse Logistics, is technically does not mean the same thing. Returns Management is an overarching concept or practice that consists of the actual offering being returned along with the management of the entire spectrum of reverse logistics processes and other associated activities carried out both within the firm and across the industry value chain.

One of the most crucial returns management activities is that of avoidance, which stands for finding ways to reduce return volume by preventing returns, an activity that is especially important in the Omni-channel context. Avoidance needs companies to track their returns, on the basis of return reasons, so as to identify any major patterns, analyze the related root cause and resolving the same so as to reduce the overall return volume.

Returns management deals with multiple kinds of returns – marketing returns of slow moving, surplus inventory, product recalls by manufacturer, competitor buyouts, returns mandated by environmental regulations, returns of damaged items initiated by retailer, asset returns etc. but the biggest category of returns, which is also the most impacted by the advent of Omni-channel is that of consumer returns, i.e. products returned by end customers due to defects or buyers’ remorse. These items have been opened and used by the customers and are usually treated as either salvage or surplus items.

Omni-channel retailing has brought about a surge in the volume of customer returns. In 2004, overall returns constituted 6%\(^1\) of retail revenue and returns related logistics accounted for as high as 4%\(^2\) of said firms’ total logistics costs. This was a clear signal that the area of return management could no longer be relegated to the back burner. Companies, especially retailers are looking to streamline returns processing so as to recoup as much value as they can from the same and enhance their profitability. Effective returns management is essential for the survival of retailers in high return categories, such as electronics and toys. Other firms are looking to leverage returns management as a strategic capability.

In addition to the primary expectation of seamless product delivery, the ease of returning the product has also become a really crucial requirement for the Omni-channel consumer. In the era of ever-increasing purchase channels and ubiquitous information sharing, power has shifted into the hands of the consumers. The customers expect the same level of service and consistent positive experience, in the returns arena, as they do at touch points across multiple forward channels. Hence, a sub-par customer experience at any forward or reverse touch-point cause a firm to lose related business and directly impact the firm’s bottom line. So, firms should look at
implementing effective returns management and providing hassle-free returns service, as a way to enhance customer satisfaction and build loyalty, ultimately providing them with a source of differentiation and competitive advantage.

Reverse Logistics – What does it entail?

Reverse Logistics, consists of processes for moving the product backwards from a forward point in the supply chain, towards its point of origin, with an aim of capturing value or disposing off the product. Interestingly, the term reverse logistics was coined because it was believed that returns followed the same rules as forward logistics, just in the opposite direction. When the details and complications of returns are examined, it becomes clear that the two directions are very different and require dedicated management and core competencies that many businesses have yet to develop.

Key steps that come under the purview of reverse logistics are as follows:

1. Gatekeeping: This is the first stage in Reverse Logistics wherein, the decision whether or not to have product enter into the reverse logistics system is made. Items can be introduced into the reverse stream by distribution centers, retail stores, or end consumers.

2. Collection: This stage consists of consolidating returned products and getting them from the point of origin to the location where the next stage, Sortation, will occur.

3. Sortation: This is the most critical stage, wherein each item needs to be examined and a decision needs to be made as to the final destination that will either return the most value to the firm or be the most cost effective way to dispose off zero value items. The extent of value captured in the step is dependent on the knowledge and skill of the party performing this process. This step is the heart of reverse logistics, wherein sortation specialists encode their knowledge into business rules that are used to identify any constraints, special needs etc. for the item under consideration, before the best possible final disposition decision is made.

4. Disposition: This final stage is the process of transporting items to their final destination. At this point items have been collected and sorted into somewhat uniform pallets that make loading and transporting from the collection center easier and more efficient than when it arrived.
Benefits of Centralized Reverse Logistics

Decisions related to disposition of returned products can be made in a centralized or decentralized manner, but the former is preferred over the latter, because has the following disadvantages of decentralizing the disposition process:

- Higher overall transportation costs.
- Reduced profits due to smaller volumes sold at each location, precluding higher prices on secondary markets
- Sub-optimal disposal and re-processing decisions due to lack comprehensive expertise at all locations.

Centralized Return Centers (CRCs) have become an increasingly popular solution for providing centralized sorting and return disposition services, especially for clients grappling with large volumes of Omni-channel returns. In a reverse logistics network having a CRC at its core, all returns are brought to a common, specialized facility where they are sorted, processed and sent to their following destinations. The benefits offered by the CRC are manifold as illustrated below:

- Consolidation of large return volumes leading to higher reselling revenues
- Speedier reconciliation and RMA verification leading to prompt and improved customer service
- Compacted disposition time due to efficient and organized handling of returned products
- Presence of sortation specialists and with ability to determine best channel to dispose the product and extract maximum value out of it
- Allow for consistent standardized disposition decisions with reduction of errors
- Reduced reverse-logistics related transportation costs due to consolidation and utilization of milk runs. Empty distribution trucks can be used to transport returns.
- Helps retailers to dedicate maximum retail store space to selling merchandise, than tying it up in storing non-selling returns
- Easier to identify trends in return-related issues leading to timely implementation of measures for improving product quality and reducing return volumes.

High Level Flow in a Reverse Logistics Process

Given below is a high-level diagram of the reverse logistics process, with a centralized return center at its core. It depicts the various types of returns, who initiate them and the various disposition locations that they can possibly be forwarded to, or they can end at.
II. Implications for Industry Players

Returns management has different complications and ramifications for all parts of the supply chain: from retailers, to warehouses, manufacturers, and 3PLs. Many companies have ignored these issues, considering returns to be “junk” not worth dedicating resources to, and have suffered major financial and competitive losses as a result. The spread of Omni-channel will further complicate the returns process due to increased rates of returns in the magnitude of 2x -3x. This increase in returns will make the value tied up in substantial, and put further strain on return processing resources that are already lacking. Returns Management will soon become an impossible area to ignore, and one that will require skills and competencies that are not core to most businesses. The major issues that need to be addressed in each part of the reverse logistics chain are as follows:
Retailers

1) Returns to store – Buyer’s Remorse, Defects, Non-defective defects, Misinformed purchases
   a. Affects single items that are difficult to sort, consolidate, pack, and ship; these processes take valuable space and employee resources away from stores’ selling focus
   b. Item conditions range from “used” to “poor” and packaging, including barcodes, can be compromised or missing, increasing the chance of damage during transport
   c. Customer satisfaction takes precedence over gatekeeping
   d. Actual condition of items hard to tell without accurate customer input
   e. Personnel lack expertise and knowledge about returns process and business rules

2) Further Complications from Omni-Channel:
   a. Customer purchase information needs to be available at all possible return locations
   b. Return locations need to be able to process SKUs not carried in that channel
   c. Customer experience must be consistent and uniform across channels
   d. Need to limit the rate of items being converted from “new” to “used”
   e. Need to find ways to reduce the amount of returns

3) Returns from store – Defects, Surplus, Buyouts, Recalls
   a. Affects case lots of items that are easier to pack and ship
   b. Product usually in “new” condition with intact packaging

Warehouses (CRC or DC belonging to retailer, warehouse manager, or 3PL)

1) Returns originating from consumers directly to warehouses (direct to consumer returns)
   a. Conditions with individual manufacturers need to be check for business rules on disposition
   b. Affects single items that take time to consolidate, and are difficult to sort, pack, and ship
   c. Unless previously specified, condition of items needs to be determined on a case by case basis thru inspection requiring skilled labor
   d. Gatekeeping decisions need to be made so items are returned to forward stream, sent to a landfill, or sent to a recycling center instead of traveling farther up the reverse stream
e. Lack of expertise and knowledge about business rules and secondary markets can have a big impact on the value that is recovered from merchandise
f. Level of returns hard to forecast for efficient resource planning and utilization

2) Returns originating from stores to warehouses
   a. Pallets of customer returns contain a mishmash of items in varying conditions that need to be inspected, sorted, and stored
   b. Can be special case circumstances in which product comes from all stores at one time leading to a large surge in the demand on resources
   c. Some product needs to be transferred into forward stream to go to a different store

Manufacturers

1) Returns originating from Consumers – Direct sales returns
   a. Affects single items arriving via mail that are difficult to open and sort
   b. Unless previously specified, condition of items need to be determined on a case by case basis thru inspection requiring skilled labor
   c. Repackaging, repair, or refurbishing may be required involving specialized resources
   d. Items need to be returned to forward stream or disposed of in a way that supports brand
   e. Consolidation and repacking may be required

2) Returns originating from warehouse – wholesale returns
   a. Similar issues as to direct sales returns, but items arrive in bulk instead of single packages

Transportation Providers

1) From store to warehouse (warehouse can be a DC or CRC) –
   a. FIFO loading precludes pickup during forward milk runs
   b. Uneven and difficult to forecast flow calling for complex and dynamic route planning and scheduling that differs from forward routing
   c. Might have to load totes instead of pallets, increasing loading difficulty and time
   d. Partial and un-stackable pallets make cube utilization of trucks inefficient
   e. Compromised packaging and non-uniform product sizes on pallets increases the possibility of damage during transport
   f. Milk runs could include several retailers that might each employ different processes and procedures that need to be accounted for
I. From warehouse to warehouse
   a. Better packaging and larger amounts simplifies the transportation process to be similar to that of the forward stream

II. Best-in-Class Software Solutions

Returns management has always been an area, which has its own set of challenges and pain points because of its very nature. With the advent and rise of Omni-channel retailing, it has become even more challenging and difficult to manage as companies are trying more and more to provide a superior customer shopping experience without hurting the bottom line. So, to be able to better manage returns and extract the maximum value out of the entire reverse logistics flow, it is indispensable to have the right software solutions in place.

There are many software solution vendors, which offer specialized solutions for the different entities that constitute reverse logistics flow such as warehouse management, transportation management, and order management etc. These solutions are then integrated to provide an end-to-end visibility of the returns flow. Then again, there are vendors, which offer end-to-end returns management solutions to take care of the entire returns flow. Selecting one solution over another requires one to understand their business needs better and how the solution can play a role in generating considerable value to their business.

For the purposes of this paper, we are focusing on identifying the best-in-class warehouse management solutions (WMS) and end-to-end returns management solutions and the common attributes that make them so.

Warehouse Management Software

In the era of Omni channel retailing and liberal return policies, large volumes of returned products inundate the distribution networks of firms, in an unpredictable manner, adding to their warehousing costs and complicating the reverse logistics process. Manually run warehouses, are especially prone to returns processing and order fulfillment errors. A suitably organized warehouse process, sustained by leading edge software and hardware technologies can greatly help to reducing human errors related to the handling and storage of the immense variety of differently valued returns.
As we know, the onset of Omni channel requires firms to have a unified and real-time view of stored inventory, across all channels, and proper storage and traceability of returns is an integral part of the same. Moreover, minimizing the time that returns are unavailable for purchase, is a prerequisite to extracting maximum value from returns processing, thus requiring retailers to have a clear picture of both inventory availability as well as related demand. Hence, an increasingly large number of organizations are going for software that can aid them in seamlessly melding the returns processing and order management so as to leverage the benefits gained from having a holistic view of the entire gamut of customer purchase data and product inventory, whilst trying to make return related decisions.

The top drawer warehouse management systems for returns management have special features for stocking, sorting, tracking returns and ensuring timely disposition and account reconciliation and of returned products, but also promote multi-location monitoring, intelligent inventory tracking and easy integration with existing systems. Judicious use of such technologies, can lead to reduced warehousing costs, increased reliability in inventory operations, agile order fulfillment as well as deriving of enhanced value from returns handling and disposition.

Some of the finest warehouse management software (WMS) systems that have been used and recommended by reputed names in the industry and some details regarding the same are as follows:

<table>
<thead>
<tr>
<th></th>
<th>JDA/Red Prairie</th>
<th>Manhattan Associates (WMoS)</th>
<th>SAP</th>
<th>HighJump</th>
<th>IBM Sterling</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year Founded</strong></td>
<td>1975</td>
<td>1990</td>
<td>1972</td>
<td>1983</td>
<td>1975</td>
</tr>
<tr>
<td><strong>Employees</strong></td>
<td>~1100</td>
<td>~2000</td>
<td>~53000</td>
<td>~300</td>
<td>~2700</td>
</tr>
<tr>
<td><strong>Industry Focus</strong></td>
<td>Automotive, Building products, Consumer goods, Food/beverage, Government, High tech, Electronics, Industrial, Automotive, Pharmaceuticals, Retail</td>
<td>Automotive, Consumer goods, Food/beverage, Government, High tech, Electronics, Industrial, Automotive, Pharmaceuticals, Retail</td>
<td>Aerospace, Automotive, Chemicals, Consumer goods, Food/beverage, Healthcare, Building products, High tech, Retail, Manufacturing, Third party</td>
<td>Aerospace, Automotive, Consumer goods, Food/beverage, Healthcare, Building products, High tech, Retail, Manufacturing, Third party</td>
<td>Automotive, Chemicals, Consumer goods, Food/beverage, Building products, High tech, Industrial, Pharmaceuticals, Retail</td>
</tr>
</tbody>
</table>
Key Enabling Attributes of Warehouse Management Systems

The enabling characteristics, that make the above indicated solutions leaders in the arena of integrated warehouse management of both forward and reverse aspects of the supply chain, are given below, followed by a Harvey ball chart listing how the various contenders compare on the same:

a) **Yard Management** - The yard management aspect of the WMS helps to oversee the movement of trucks and trailers in the yard of a manufacturing facility, warehouse or distribution system. This is important to get a clearer picture of the static inventory that is not inside the warehouse proper.

b) **Labor Management & Performance Management** - The labor management functionality enables the WMS in planning labor/workforce requirements and in reporting statistics related to labor productivity. It also aids in performance management, by allowing comparison of the productivity and performance of groups and individuals with a pre-defined standard.

c) **Returns Management** - The WMS also helps to implement the management of the entire spectrum of reverse logistics processes and other associated activities carried out both within the firm and across the industry value chain.
d) **Lot Tracking** - This feature helps the system to track information regarding a lot or batch of a product. You can monitor multiple stock units of a batch, set and view lot status and expiry dates and determine what can be sold or purchased on the basis of the above parameters.

e) **Quality Control** - The quality control piece of the software helps to check the merchandise during the receiving, during warehouse process, after exiting from production and at the time of shipping process. The software also displays instructions on required to effectively spot quality concerns. Once an item fails the quality check, it is placed into a quarantine zone for subsequent handling.

f) **Shipment Documentation** - The shipment related information from ERP and WMS is consolidated to form bill of ladings, packing slips, labels, etc. Premier systems provide the option for document signing and scanning, thus avoiding human scanning and preventing printing related expenses.

g) **RFID Compliance** - An RFID enabled WMS compliant offers automation functionalities that assist in the efficient overseeing and management of all the aspects of warehousing.

h) **Kitting and Assembly** - The WMS should allow for the efficient and accurate kitting, i.e. bundling together and supplying separate but related items together. Once the configuration of the kit has been decided it can be assembled and then shipped to the appropriate destination.

i) **Voice-enabled Capabilities** - State of the art WMS are equipped with voice-enabled capabilities that facilitate real-time communication between the distribution center workers and the WMS, thus helping to provide up to the second information about inventory levels, along with enhancements in accuracy of order fulfillment as well worker productivity.
End-to-end Returns Management Solutions

End-to-end solutions provide a complete solution for the returns processing from when the customer returns a product at the store or ships a product to the retailer to the stage when the product is finally disposed. With manual processes, there is a high chance of losing important return-related data such as reason for the return in transition as the product moves through different stages of the reverse logistics chain. The sharing of this data with all parts of the organization is crucial so that appropriate measures can be taken to reduce the number of returns. The end-to-end solution provides visibility to the entire returns process including in-transit inventory. This helps in reducing inventory and aids in improving planning. The elimination of manual labor greatly increases the speed of processing returns thereby enabling the organizations to capture the maximum value from the returned goods. Especially in the predominant era of Omni-channel retailing, managing the returns process efficiently and swiftly can provide any organization a significant competitive edge over its competitors.

There are many providers that offer end-to-end solutions, some of which cater to only e-commerce businesses. We restricted ourselves to the solutions that are enabling organizations to handle Omni-channel retailing which is the main theme of this paper.
Following are the best-in-class end-to-end returns management solutions to handle the most complicated returns processes of global organizations.

**Top 3 End-to-End Return Software Solutions**

a) GENCO’s R-Log  
b) SAP’s Advanced Returns Management  
c) IBM’s Sterling Reverse Logistics

**Key capabilities of End-to-End Return Software Solutions**

a) **Real Time Visibility** – Ability to track and control a single item end-to-end including in-transit returns. This feature will also enable businesses to provide customers a seamless returns experience as more and more customers are reported to check for the status update of the returned goods.  
b) **Configurability** – Ability to create, hold and maintain return policies and business rules that define the appropriate product disposition methods depending on various product attributes.  
c) **Directed Workflow Processes** – Ability to direct product disposition based on the rules that are set and incorporated in the system by the customer. For example, repair or destroy, return to stock, return to vendor etc.  
d) **Credit Reconciliation** – Ability to manage and streamline credit reconciliation between customers, manufacturers and various service providers.  
e) **Integration** – Ability to integrate with suppliers’, vendors’ and customer call centers so as to present a unified view of the returned goods to all the stakeholders involved in the returns process.  
f) **Dashboard and Reporting** – Ability to create customized reports and dashboard views acting as decision support tools to improve management of returns and reduce returns related costs. Further, the solution should have the ability to export information into various file formats such as Microsoft Excel.

**IV. Value Reclamation and Secondary Markets**

For those items that cannot be resold or returned to the vendor, a decision has to be made as what to do with it in order to get the most value back. At this point, it is
impossible to reclaim the original cost of the item and the goal is to offset the loss as much as possible. Reclaimed value can vary widely depending on the product and its condition, but 5-20% of the original sale price seems to be common based on conversations with different companies engaged in returns reclamation. Product is generally combined into lots of similar items and conditions and then sent to a secondary market for sale to end consumers detailed below. The product characteristics and condition determine which market will take the items and how much value can be obtained. There are no set values for these products and sales are conducted via auctions or fierce negotiations, as both sides have to deal with very low margins. For some items, no value can be reclaimed and the focus is on reducing the costs involved in disposing of them.

Factory Outlet

Factory outlets are owned by manufacturers and serve as direct sell channel to customers. Manufacturers use these outlets to sell excess inventory, inventory that have
been hard to push through in their primary stores, or sub-optimal quality products, and returned products, at a lower price point that primary stores. Manufacturers aim to recover more than 70 per cent of the original retail price in a factory outlet store. In fact, the factory outlets can be sometimes more profitable than the original retail stores because manufacturers can sell them at prices higher than the wholesale prices earned from retailers and because this is a direct channel between the manufacturer and the customer. For example, Saks Fifth Avenue, a popular high-end clothing and apparel specialty store, has more outlet stores (Saks Off-Fifth) than regular stores.

**Barter Companies**

Barter companies can be alternate channels for retailers looking to dispose of products. A consumer firm can give their unwanted inventory to the barter firm in exchange for a decided number of units of a particular type of product from the barter company’s large inventories of different categories of products. Some examples of bartering websites are Bookins, Swap.com and Craigslist.

Generally speaking a barter company would give better deal for easily selling products than for products that will be tougher to sell. Some can even use universally popular products such as discount coupons, airplane tickets, etc. as a kind of informal currency of exchange. Barter companies can seem like an attractive options for firms, stuck items whose actual value is much lesser than the value recorded in the firm’s books. Such firms would prefer to exchange said products in lieu of some desirable good, instead of writing them down. Barter companies may also seem like a good option for products that have reached their end of life, or permanently unsalable from their original channel.

**Value Retailer and Dollar Stores**

Value retailing is an up and coming segment of the secondary market, consisting of renowned players like Marshall's, Ross, Big Lots, etc. Primary products sold here are prior season merchandise that remained unsold at a specialty retailer or department store. Other types are excess product returned by retailer to manufacturer or sold to salvage broker.

Dollar stores, on the other hand, sell their items, at a fixed, albeit extremely low price point, which is close to a dollar. These stores carry both new product as well as excess inventory mostly in non-electronic categories such as food, toys, health and beauty products, cleaning wares etc. Salvage dealers form the primary source of supply, with manufacturers and retailers coming in a distant second and third. Asset recovery process serves as a major source for goods for Dollar stores. The segment has
seen a huge spurt in growth during the years, as is evident from observing the financials of the three largest dollar store chains - Dollar General, Dollar Tree and Family Dollar.

**International Disposition**

Manufacturers can choose to sell the returned goods in the international markets, which serve as secondary markets. Products can be directly sold to international outlets or can be sold to salvage dealers who would further sell them to international outlets. The returned product has to change hands multiple times throughout its journey to the final disposition destination, i.e. the international market. Hence, there’s a high probability of leakage during the reverse flow and, in the absence of proper scrutiny, the products intended for international markets may end up in the primary market. Product disposition in the international market is a good option for manufacturers who want to reclaim the maximum possible value without tarnishing the brand image of the organization nationally. The companies also will have to weigh in the transportation and handling related costs, benefits and risks of disposing in the international market as opposed to other disposition methods available to the manufacturer in the primary market such as refurbishment, recycling or landfills.

**Flea Markets and Pawn Shops**

Flea markets and pawnshops generally serve as marketplaces for secondhand goods sold by individuals, but can also serve as channels for manufacturers and salvage dealers to liquidate merchandise.

Flea Markets consist of many sellers selling their wares in stalls, situated alongside each other. These markets could be arranged indoors or increasingly, outdoors. Flea market entrepreneurs source their goods from multiple suppliers, but mostly from auctions and salvage dealers. At times, retailers can rent stalls, for prompt liquidation of outdated or excess inventory.

Pawnshops are one of the lesser-used disposition mechanisms wherein used goods are exchanged for a price that is much lower than its market rate. People who come to sell their goods here are generally in desperate need for cash. United States has stringent rules governing the pawnshop operation that vary from state to state. Some rules are aimed at protecting prospective pawnshop customer and others are designed to make it easier to trace stolen items back to their sellers. While most of a pawnshop’s inventory is purchased from end consumers, some will supplement their inventories by purchasing clearance and returned goods from salvage dealers and retailers. This is especially true in the case of chain pawnshops that can purchase and disperse lots out amongst the stores.
Online Marketplaces

Marketplaces on the web have sprung up that act like their physical value store and pawn shop counterparts. Online marketplaces provide a venue to connect buyers and sellers for a fee, but all product storage, transport and sales related labor requirements are still handled by the seller. Items can be put up for sale at set prices in places like Amazon Marketplace, half.com, and Craigslist. eBay is one of the biggest online market places offering both set price sales and auction type sales. There are many “EBay stores” that operate by purchasing liquidation lots and then reselling the items individually.

Many major retailers with online presences now have a section of their web stores that acts as an internally supplied online marketplace. This allows the store to reach out to their same customer base and sell used, refurbished, and remanufactured items at a slight markdown. Home Depot, Newegg, and Best Buy all have online sales venues for returned merchandise. This allows consumers to get a discount while still receiving the return and customer satisfaction policies of these major retailers. By selling direct to market, retailers are able to reclaim more value from their returns than using any other secondary market.

Charities

Charities also serve as one of the last stops for returned products. Retailers donate their good to charities when they are unable to liquidate them through other channels. A positive side effect is the ensuing tax benefits, which, at times, makes donating goods to charities more profitable than selling them.

Some charities aim to provide goods at inexpensive prices to people in the very low-income segment. Charities obtain their products either from donations given by individuals, businesses, etc. or they purchase the same from retailers and salvage brokers. Examples of charities include The Salvation Army, ReStore, and Goodwill. The retailer Target has a standing relationship where it sells their returns and clearance product to local Goodwill stores.

Salvage

There will be merchandise in the reverse flow that cannot be sold. This can be due to damage, health hazards, manufacturer’s decree, or even cost of sale being higher than value. While a lot of this will incur costs to landfill or recycle, some value may be reclaimed thru salvage. Parts or materials of the product could still have enough value to justify removing them and placing them for sale.
A lot of electric items have precious metals inside them such as copper, gold, and platinum. These metals make excellent electrical conductors and can be found in wires, cathodes, and circuits. While damaged or obsolete devices have no value or can’t be sold, these metals can be removed and sold to reclaim some value before the rest of the item heads to landfill or recycling.

Again, one of the largest salvage markets is for automobiles. Salvage yards abound where cars are stripped of any parts that can be sold, before the rest is turned into slag for recycling. A car with collision damage will typically have a good engine still, and a car that has a blown engine can have body parts that are in great shape. These parts can be bought and installed by shops, or by handy end consumers as well. Many parts can be salvaged as well, especially those that are bulky with small moving parts. Alternators, batteries, and blocks are some of the most common parts that can have cores salvaged in order to go thru refurbishment to create a repaired item that can be used to replace a broken one. There are some parts on older cars where the core has been reused several times over and is still good.

Some manufacturers will salvage excess and obsolete inventory to create products to be sold as new. Many electronic manufacturers will have a quality brand and a budget brand. If a quality item does not sell well, the guts of the item can be recased and re-branded to allow its sale as a new, different product in the budget line. This facilitates value reclamation, protects the brand and reduces the cannibalization of marked down prior versions on sales of the newest version of an item.

**Brokers/Salvage Dealers**

Currently the secondary markets are very fragmented and varied. A lot of the sales that occur are facilitated by a broker or passed thru a salvage dealer to get from the manufacturer or retailer to the end consumer. Entities in this area form relationships with individuals in every secondary market in order to supply merchandise to them. They will buy full truckloads, cases, or lots of combined products and then parcel out the goods to the best market based on demand and highest sale price. Salvage dealers purchase, store, and sell the goods, while a broker simply acts as a middleman between the buyer and seller and never takes ownership of the goods. Retailers and manufacturers like to work with these entities because they can sell large and varied lots to them quickly and easily. Often lot sales are made via a black box auction where brokers and dealers make bids without knowing the exact contents and condition of the lots. Through their varied channels and partnerships they can sell just about anything and can send product to any of the secondary markets listed above.

**Remanufacture/Repair/Refurbishment**
Returns due to damage and defects often can be repaired to increase the overall value reclaimed from them. These items cannot be resold as new, but once returned to working condition can be sold through the various secondary markets mentioned above. There is a fair amount of specialized labor and other costs involved in repair, so this option should only be considered for items of high value such as electronic and mechanical devices. Since the damage or defect to an item is usually uniform across the entire product, focus can be placed on making repairs that are common, cheap, and easy, in order to get the maximum in reclaimed value versus cost expenditure. Remanufactured items are those that are repaired by the original manufacturer or authorized third part, are certified to be as good as new products, and usually are covered under manufacturer warranties. Repairs and refurbishments do not involve the original manufacturer and come with no certification or warranty unless granted by the performer of the work. Returns from stores can consist of items with damaged packaging. These items can be repackaged and sold as new in the original or a secondary market.

When smart phones were first released, the most common reason for warranty returns was broken or cracked screens. While this makes the phone inoperable, the screen is a very low value item compared to the phone as a whole. Many third party companies sprang up to fill this gap, replacing screens for phones under warranty as well as directly for consumers that did not have warranties.

A major company that produced vacuum cleaners realized that most of their defects affected 3 minor parts. Any vacuum that was found to be defective would automatically have all 3 of those parts replaced. If it then worked, it could be sold as reconditioned. If not, it would be thrown away without any further inspection. This reclaimed a lot of value for the company at very little cost and effort.

Automobiles have the biggest repair market associated with them due to the low cost to repair versus total cost. There are certified repair centers, local mechanics, specialists, and even do it yourself stores such as Checker and Napa Autoparts. Even many of the parts that are damaged or failed can be refurbished and repaired such as radiators, engines, and shocks.

V. Future Areas of Focus for Reverse Logistics Providers

1. Choosing Between Centralized and Decentralized Return Centers

A key decision in reverse logistics is whether to have a single centralized or multiple decentralized returns center(s). Reverse logistics providers should perform a thorough
and integrated network analysis and evaluate all the factors given below, before
advising customers on the prudent course to take:

- Customer firm’s corporate policy, business model, industry structure and future plans
- Customer service standards, volume and complexity of product
- Changes in consumer behavior, marketing strategies, product offerings
- Regulatory requirements

The industry is in consensus that in a majority of scenarios, centralization is the way to go, because of numerous advantages, some of which are discussed in the section Benefits of Centralized Reverse Logistics. Customers, especially retailers dealing with omni-channel returns, are willing to pay a premium for the higher reselling revenues, improved identification of trends and optimal disposition decisions supported by the holistic view provided by centralized return centers. Hence, we believe that reverse logistics providers would do well to capitalize on this sizeable opportunity and equip themselves with centralized return handling capabilities. There will surely be scenarios, where decentralized return centers would make more sense, but this decision should ultimately tie in with the customer’s business strategy as well as their value proposition to its customers.

2. **Effective Software Selection and Automation**

As touched upon earlier, automation of key supply chain activities greatly helps in reducing human errors related to the handling and storage of the immense variety and huge volumes of returns, coming from differing sources and in an unpredictable manner.

Customers are looking to reduce the returns-related logistics and inventory costs further by putting their warehouse assets and resources to the most optimal use, and latest software technologies can assist them in this endeavor. These systems help organizations to easily implement embedded best practices and value-added services, such as those listed in Leading WMS within their warehouse operations. Helping customers select a warehouse management solution (WMS) that is best in sync with their needs, is an important value adding activity that third party logistics providers and logistics consultants can provide their customers.

**Comparing Between Warehouse Management Software:** We applied the Magic Quadrant methodology of evaluating software solutions, to the leading WMS identified in the section named Leading WMS and came up with the following assessment:
Leaders: These are software like JDA Red Prairie and Manhattan Associates WMoS that not only execute well against their current mission, but are also poised well for tomorrow.

Visionaries: Software like SAP, HighJump and IBM Sterling that have a sound vision for what the market trends are, but their execution capabilities are still not as mature as the leaders’.

Challengers: This category includes software solutions like Manhattan Associates SCALE that execute well or have a healthy market presence as of now, but do not have a clear direction for the future.

Niche Players: These are software such as Infor (not shown here), that focus and perform well in a specific segment, or they might even be obscure in their focus, and lack the capabilities to either perform better than the others, or innovate faster than other players.
Support for SaaS: From the above WMS players, JDA Red Prairie, HighJump and IBM Sterling display both SaaS, i.e. software as a service and on-premise deployment capabilities. Both the Manhattan Associates offerings as well as SAP come without the SaaS option.

We believe that using a service-oriented architecture, via SaaS is a key best practice in the supply chain industry, which can be a highly cost-effective way for firms, especially small and medium business firms, to avail of the latest, advanced features available in the market, at an affordable monthly fees.

Choosing between End-to-End and Best-of-Breed Software Solutions: The decision to choose the right enterprise solution is always a tough one for companies. Both best of suite and best of breed have their set of pros and cons and the decision to implement one is a long-term strategic business decision. Additionally, it is not just a decision of selecting a software solution to fulfill business needs but it is also a decision to enter into a long-term partnership with a particular vendor. Below are some of the essential factors that should be considered before taking a decision of pursuing one over another.

- **Integration:** The key benefit of implementing an end-to-end solution is that there is no need for integration and there is just one vendor to deal with. Also, the fact that all the business processes and the databases are integrated makes implementation and subsequent operations much easier as users do not have to be trained on different systems. Whereas in the best-of-breed solution, integration is the key issue. The processes are split between different modules, each of which requires duplication of data entry and development of interfaces to keep the multiple databases in sync.

- **Functionality:** Best-of-breed solutions provide the best features and functions for a specific component within a business process as these solutions are specifically designed for a particular business requirement. Usually, one may also expect to receive better service from the best-of-breed vendors as compared to end-to-end solutions, as the vendors have expertise in a particular business function.

- **Return on Investment:** Best-of-breed solutions are reported to offer greater bang for their buck. On the contrary, with end-to-end solutions the return on investment is not as prominent as compared to best-of-breed solutions because organizations have to compromise on the functionality of the processes to make them fit into the one-size solution.

- **Flexibility:** End-to-end solutions also tie the organization to a single vendor hence reducing flexibility. In case of a problem with the vendor, the entire solution may need to be switched causing a serious damage to the business operations and a huge dent in the balance sheet.
Implementation time: Best-of-breed solutions complicate and delay the implementation process, as the organization has to work with multiple vendors. Upgradation to new software versions and hence new functionalities is comparatively easier in end-to-end solutions as organizations do not have to deal with software compatibility issues that arise with multiple software interfaces.

There are compromises to be made whichever option is chosen by an organization. The important thing is to identify those compromises. For example, what are some of the functions and features that need to be given up if an end-to-end solution is chosen? What are some of the must-have and nice-to-have features? Are some of the nice-to-have features going to be must-have features in the future? If a best-of-breed solution is chosen, can it be easily integrated with the existing software solutions or other best-of-breed solutions that may be implemented in the future? Once all these questions are answered and the estimates of return on investment and costs are done, a decision can be made that best meets the business needs and the budget constraints.

Automated Workflow: To build a cost effective, fast and easy returns management process, it is quintessential to have as many as decisions and processes to be automated throughout the entire returns management value chain. Automating the Return Material Authorization (RMA) generation process is a crucial step towards achieving a better and efficient returns process. It will not only help reduce significant cost in processing RMAs but also will be able to shorten the time between a sale, a return and a replacement (if any). Additionally, this will ensure clear visibility into the entire RMA process chain and status of any RMA request will be available real-time for the customer to see.


Warehouses acting as returns collection centers bear the brunt of the complexity and work required in the returns management process. It is here that the gatekeeping and sortation steps occur. Items must be assessed, valuated, sorted, staged, combined, packed, sold, and shipped. Each of these duties listed is labor intensive and is best performed by someone that has training and skill. To maximize revenue, it is best to keep costs low through separation of duties and automation, combine items into lots, and keep the turnover rate high.

Separation of Duties

With the amount of labor and skills required, it is best to employ specialists rather than generalists. Receiving, packing, and shipping are labor and time intensive, but not skill intensive. Unskilled workers should perform said tasks so as to lower the
utilization rate of skilled workers. Assessing and sorting are tasks that require some skill, but this can be easily trained. Determining the value an item can fetch on the secondary market based on its condition is a highly skilled and knowledge based task that should be performed by someone with industry experience. Sales is another area that requires in depth knowledge of the secondary market and its major players, as well as exceptional skill in negotiations and nonstandard sales types like auctions and brokered deals. These two positions are best filled via a talent acquisition program to seek out subject matter experts within the field.

**Automation**

To free up staff time and increase the pass-through rate, as many processes as possible should be automated. A paperless system should be implemented using barcodes and handheld scanners to enter data into the system. This increases accuracy and frees up time. An effective warehouse management software can be programmed with business rules so that manufacturer regulations and guidelines of what to do with new in box can be seen and processed without the need for human decision making. Conveyor belts are good to use to move items from section to section and maintain FIFO processing.

**Combining**

To keep transaction and shipping costs low, most brokers and dealers in the secondary markets prefer to buy in bulk. By collecting and storing items by type in the warehouse, lots can be formed that will fetch a higher per item price than if the items were not combined into a lot. Many manufacturers also have rules as to the minimum amount of items that can be in a returns shipment to them, forcing the warehouse to collect and store items until the threshold is reached. Combining items also makes it easier to pack and ship them.

**High Turnover Rates**

While kitting can increase the price obtained per item, it is a double-edged sword. Trends and technology change rapidly, causing the value of merchandise to decline over time. Space is also a warehouses number one resource and having a ton of returns sitting around waiting for kitting can lead to an opportunity cost of lost profit. For these reasons, it is important to prioritize the turnaround rates of returns over storage and kitting. Many times it is possible to sell incoming truckloads so that the merchandise is cross-docked and never even enters the warehouse.
4. Enhancing Transportation Efficacy

The reverse flow of returned merchandise is tactically different from the forward flow of merchandise due to uneven demand, compromised packaging, and partial pallets. The main points to consider are truck routing, cube use and protection of goods, and efficient use of resources.

Routing – Since most deliveries to retail locations are made using milk runs using FIFO loading, returns cannot be picked up at the same time as a delivery. This means that returns pickups have to be scheduled and managed separately. Since product coming back from stores will be less than product going to stores, milk runs are the most efficient form of transport to use.

There are two different ways to schedule these milk runs. The first is to have set pickup times where a truck visits a designated route of store on a set interval and picks up whatever returns those stores have accumulated since the last pickup. This method is often used by retailers because it is simple and easy to plan, but it can be inefficient as some of the stops can have little to no returns wasting time and money, or the route can have too many returns for the truck to carry.

The other method is to pick up from stores on an as needed basis. In this method, when a store has filled a designated number of pallets of returns, they signal the carrier that a pickup is needed. This standardizes pickup amounts, but causes pickup frequencies to fluctuate based on the return rates at each individual retail location. Milk runs can then be routed more efficiently to ensure that trucks are able to pick up everything and fill the cube space of the truck as best as possible. This method employs a complex and ever changing scheduling and routing system that requires a dynamic management system with a high level of visibility and control.

A 3PL focused on reverse logistics would be able to manage transportation in this manner leading to value creation that can be claimed by selling reverse logistics support to retailers. A 3PL can contract with a multitude of retailers, enabling milk runs to be further optimized by including nearby locations of different stores to decrease travel between pick up locations.

Shipment Protection – The standard practice for shipping returns is to pile the merchandise as it is received onto a pallet and then shrink-wrap it to keep everything on the pallet. Since pallets then consist of items of different dimensions and varying levels of packaging, the amount that can be placed on a pallet is limited creating short pallets that cannot be stacked. These types of pallets are inefficient at filling the
cube space of trucks and merchandise can be damaged if merchandise hangs off of
the pallet or it is not shrink-wrapped securely. The solution to this is to provide the stores
with specialized return pallets designed to increase capacity and protection.

A pallet fitted with a simple sturdy cardboard box ensures that product does not
exceed the edges of the pallet, gives support to stack items higher, eliminates the
need for shrink-wrapping, and provides an extra layer of protection for the
merchandise. These boxes can be dropped off folded to stores at the time of pickup
and reused several times before being recycled at their end of life. Sturdier boxes with
wood or metal can be used if further protection is needed, or if the ability to stack
pallets is needed. While these would cost more, they would also have a longer
lifecycle than their cardboard counterparts.

**Resource Use** – Since the logistics part of returns management utilizes the same
resources as forward logistics, the most efficient system would be one that integrates
the two. In separate systems, forward trucks leave the DC full and return empty while
reverse trucks leave empty and return full. A combined system could allow forward
trucks to pick up returns on the way back to the DC increasing the utilization of trucks
to reduce the amount of trucks needed and reducing empty miles driven. This system
would operate best when DCs handle returns or CRCs are located close to DCs.

When this is not the case, returns can be sent from DCs to the CRCs using cross-
docking which would help decrease the number of partial truckloads travelling long
distances to the CRCs causing a reduction in transportation costs. This system requires
the control of both forward and reverse logistics and further complicates the routing
and scheduling issues involved in both and is therefore best handled by a diverse and
dynamic 3PL.

5. **Building Skills and Knowledge**

Returns management requires the use of specialized skills and knowledge to be
efficient and achieve the most value reclamation. The areas that require special focus
are sortation, refurbishment, and disposition.

Errors in these areas can lead to increase costs and lost revenues in a system that
already has very tight margins. Hiring talented personnel and implementing training
programs to instill these skills and knowledge into the management of returns increases
the value of the system. Since there are added costs to hiring and training, this is an
area where 3PLs can excel over retailers and can offer a value added service to them.
Sortation – This process requires that decisions be made on the disposition of each item. While part of this can be automated using business rules supplied by manufacturers or based on price points of merchandise, much of it has to be made by personnel in order to obtain the maximum value from each item.

Everything that is not sent to a manufacturer or disposed of right away needs to be inspected for condition and quality which are big determinants as to what secondary market it can be sent to and how much value it has. Damaged and defective goods need to be assessed to decide whether their net value can be increased through refurbishment or they should be dispositioned as is. Errors in these tasks can lead to increased costs and lost revenues in an area that already has very tight margins.

Refurbishment – The refurbishment process is different for each type of item and requires specialized skills and even equipment (i.e. sewing clothing vs. soldering electronics). In order to be able to have a net value gain, enough products have to flow through the refurbishment center to justify the purchase of talent and tools. Most refurbishment centers focus on one product type, and are further bolstered by having a contract with a large customer. In 2010, GENCO acquired ATC Technology Corporation to gain their electronics refurbishment capabilities and also to gain their contract with U.S. Cellular for logistics and refurbishment.

Sales – The sale of returned merchandise requires good negotiation skills, a good understanding of secondary markets, and good contacts and people skills. Since goods can be sold via live auctions, online auctions, online marketplaces, or direct sales, staff must be on hand who knows each of these formats well enough to execute them. Opened/used merchandise is hard to place a value on. It is worth more than 0 and less than retail, but the exact value has to be decided between the buyer and seller.

The final value agreed upon will be based on the negotiation skills of the two sides. In order to maximize value reclamation, the seller should acquire talented negotiators who will be able to get top dollar on sales. An item can fetch different sale prices depending on which secondary market it is sold. It is essential that the people making the decisions know the various markets well enough to be able to send it to the market that will result in the highest revenue.

Even within the same market, different firms have varied requirements and expectations. Brokers facilitate a majority of the secondary market transactions. They act on behalf of several firms, to obtain merchandise that said firms would be interested in. To be profitable, companies involved in the sale of returns should seek to acquire and maintain contacts with various countries in order to cut out the middleman and increase revenues.
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Appendix – Industry Examples – Omni Channel Returns

Below are a few product categories that we researched, to identify some of the prominent processing and decision-making steps that the related returns go through, prior to reaching their final disposition location.

Mobile Phones and Tablets

Key:

- **Source of Customer Return**
- **Decision-making Step**
- **Intermediate Processing Step**
- **Return Destination**
The above flow diagram illustrates a high level flow of some of the routes that a returned mobile phone or tablet can take, through the reverse logistics network. The diagram portrays the flow of Omni-channel returns initiated by the customer either due to the device being deemed defective or as a result of buyer’s remorse. The returned item could either be returned to the retailer store in person, retailer’s returns center via mail, to the manufacturer mostly by mail, or more rarely, to the manufacturer’s premises, in-person, generally in situations where the manufacturer is also the retailer.

After that, the mobile phone/ tablet follows the circuitous path outlined above, passing through multiple decision-making steps (in purple) as well as multiple re-processing steps, (in turquoise blue), before finally ending at one of the multiple destinations (in green) above. Disposition decision is made on the basis of the cost for processing return vs. residual value of the processed return, as well as requirements of the manufacturer’s policy.

Two main points to be kept in mind are as follows:

- Process returned item in a timely manner, because these items have a very short product cycle, resulting in swift deterioration in residual value.
- Prevent hazardous e-waste from going into landfills by using options such as recycling and reusing, repairing/ refurbishing, reselling via secondary channels, donating to charity.
The apparel industry has a very high return rate. Some of the major return reasons are wrong size, properties of fabric, color matching, buyer’s remorse etc. A returned clothing item at the retailer prompts a series of decisions based on the condition of the clothing. If the item is in brand-new condition, the item is put back into the shelf. If the item is returned because of a minor defect such as missing button or loose threads, it is fixed and resold.

If the item is determined to be worn, damaged, soiled, or smelly, the item may be sold “As-is”, or sent to the manufacturer based on agreements between retailer and manufacturer, or may be disposed through one of the many disposal channels, with the ultimate goal of reclaiming as much value as possible. Some of the secondary markets for the clothing industry are Retailers’ outlets, International Markets, Thrift Stores, Discount Web sites, Discount/Off-price retailers.
Automobiles are a high cost consumer item that has a lot of low cost parts that can fail. A large repair, refurbishment, and secondary market system has formed to supply cheap parts to keep cars running as long as possible. While new parts can be returned due to overstock and buyers' remorse, the majority of returns are of used parts, many of which have failed due to defects or from use. The goal in this industry is to maintain a closed looped system where parts, or their cores, are refurbished and reused many times over.

Repair and remanufacturing centers abound to turn around parts and make them available for resale. These parts are generally sold to repair shops who install the parts, rather to end consumers, creating a unique secondary market system. Those parts that cannot be repaired and resold must be recycled or sent to the landfill.