

Reverse logistics

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2.12

A critical area of the supply chain is reverse logistics. Traditionally defined as the process of moving product from its point of consumption through channel members to the point of origin to recapture value or ensure proper disposal, this chapter uses a more holistic definition. Reverse logistics includes activities to avoid returns, to reduce materials in the forward system so that fewer materials flow back, and to ensure the possible reuse and recycling of materials.

Returns can affect every channel member from consumers, retailers and wholesalers to manufacturers. Returns are caused for different reasons depending on who initiates them – end consumer, wholesaler or retailer and manufacturer – and on the nature of the materials involved – packaging or products. Reusable packaging is becoming more and more common, especially in Europe where manufacturers are required to take back packaging materials. This chapter will focus mainly on reverse supply chain for products.

The size of reverse logistics is considerable. According to Stock et al (2001), reverse logistics costs are as high as 4 per cent of total logistics costs, which amounts to an estimated \$35 billion in 2001 for the US alone. Consumers cause most product returns. According to a survey of 311 logistics managers in the US in 1998, average consumer returns across retailers are 6 per cent. Table 2.12.1 shows the return percentages for different industries.

Reverse logistics moves product from the point of consumption to the point of origin to recapture value or ensure proper disposal.

Characteristics of reverse logistics

The reasons for returning products can be distinguished by where the returns initiated. Listed below are the main return reasons for each supply chain partner.

Table 2.12.1
Percentage of returns by industry

Industry	Percentage
Book publishing	10–30%
Magazine publishing – special interest	50%
Computer manufacturers	10–20%
Direct to consumer computer manufacturers	2–5%
Apparel	35%
Mass merchandisers	4–15%
Auto industry (parts)	4–6%
Internet retailers	20–80%

Source: Adapted from Dawe, 1995

Consumers may take advantage of a money-back guarantee, have problems with product installation or return a product because it is faulty.

Customer not satisfied

Most manufacturers and retailers allow customers to return products if they do not meet their demands within a predefined period. Money-back guarantees are standard practice for most direct sales channels. Consumers and retailers will sometimes abuse the return policies of manufacturers. Consumers wanting to try a new product will sometimes abuse the ‘not satisfied, money-back’ guarantee and simply return the product within allotted return period and receive their money back.

Installation or usage problems

Some customers experience problems with installation or usage of their recently acquired products. They perceive the product to be defective, while the reason for dissatisfaction is actually caused by difficult set-up or installation procedures or unclear instructions. This is a common problem in the computer industry where in some categories such as CD-ROM drives, return rates of 25 to 40 per cent are not uncommon. Complicated installation procedures and a lack of clear and simple instructions exacerbate the issue.

Warranty claims

Defective products or parts can be sent back to retailers or the manufacturer for repair. Products might either be dead on arrival, not working according to specifications or cosmetically damaged. This could happen either to the retailer or the end consumer. Alternatively, products might break down during the course of their life cycle. If the product is still within the warranty period extended by the manufacturer customers might return their product to the manufacturer or if that period has expired, customers could take up other options such as taking the product to a specialist repair center.

Faulty order processing

Both end consumers and retailers can experience shipping problems. Products need to be delivered in full and on time or customers can make claims against manufacturers and return (part of) their shipment. Examples of delivery problems are incomplete shipments or missing parts, wrong quantities, wrong products, duplicate shipments and untimely delivery, which can cause the customer to miss out on the intended use of the product.

Shipping problems, unsold stock, the end of a life cycle or serious product flaws can prompt the return of a product.

Retail overstock

Manufacturers can provide resellers with the luxury of returning unsold stock. This is a common practice in the book industry, for example. Retailers that need to make their accounting figures look good for the end of quarter or month will sometimes send significant amounts of unsold stock back for credits, only to reorder it again after the end of a financial period.

End of product life cycle or product replacement

Once a product has reached the end of its lifecycle, many manufacturers want to get it out of the retailers' shelves as soon as possible to prevent sales cannibalization of the new version. This means that the old products have to be disposed of. Manufacturers either have to take the stock back, based upon the conditions agreed with the retailers, or the latter need to dump the old version quickly.

Manufacture recall programs

Serious flaws in a product can lead to a recall, instigated either by the manufacturer or a government agency. Common recalls appear in the automotive, pharmaceutical, and the toy industry. Aside from the safety issues in such situations, getting the discredited product out of circulation and into designated storage centers as soon as possible is a crucial part of damage limitation strategies. It is a grim deadline that any company would prefer not to have to meet, but many do. The US Consumer Product Safety Commission in 1999 reported 304 corrective actions involving over 75 million consumer product units of various types that either violated mandatory safety standards or presented a substantial risk of injury to the public.

Other complications

The green factor

New environmental laws are being enacted worldwide and more stringent compliance to these laws is required. The laws are often accompanied with serious financial implications. The few managers who implemented reverse logistics in the past usually did so because it was environmentally responsible. Today, the green factor has evolved to a bottom-line issue. In the past once a product left the

Environmental and economic considerations have led to manufacturers taking their products back at the end of their lifetime.

manufacturer's factory doors the responsibility to dispose of the product also disappeared. However, legislation in Europe and in the US is changing, sometimes even making manufacturers responsible for disposal of the product at the end of its life cycle, such as in Germany.

Previously manufacturers could easily dispose of products in a landfill; today there are strict environmental regulations as to how much and what can be dumped. Certain hazardous materials such as chemicals and heavy metals are banned from disposal in landfills, while other products are banned because they can be recycled and therefore should not take up valuable landfill space. Landfill costs have also increased steadily. These environmental reasons along with economic considerations cause a growing number of manufacturers to take their products back at the end of their lifetime.

Electronic commerce

The emergence of selling via the Internet has led to many companies focusing on their reverse logistics capability; with the rise of electronic business channels, there has been a significant increase in consumer returns. Some electronic retailers estimate that up to 50 per cent of their goods sold on the Internet are returned. e-commerce has propelled the amount of returned products to levels demanding every executive's attention.

For electronics and high-technology products, electronic retailers report return percentages in certain product categories of up to 80 per cent. Any manufacturer not paying attention to reverse logistics is basically siphoning profits from the bottom line. With online transactions growing fast, independent analysts, Gartner and Jupiter Media Metrix, expect overall returns to increase drastically over the next few years. The emergence of e-business does not only pose a threat but also an opportunity to improve the total cost of returns. New business models also allow companies to redesign their entire reverse logistics capability in their own and their customer's favor. How this can be done will be discussed later in this chapter.

Shorter product life cycles

Product life cycles of many products, especially in the electronics and high technology industry have reduced drastically. This has led to advanced supply chains to move product out to customers with minimal stock, because obsolescence rates are high and the value of finished goods inventory of computer equipment loses up to 12 per cent per month. Equally important, therefore, are the speed and cycle time with which returned products can be turned around. This will have a tremendous impact on the company's bottom line. Very few companies, however, appear to be giving the manufacturer inventory visibility on returned items. Manufacturers often only learn when the products hit the unloading docks at their warehouses.

Complex and underdeveloped area

The traditional view, however, is that reverse logistics adds no value to the supply chain and places retailers and manufacturers under additional financial pressure. The state of awareness and development of reverse logistics is analogous to that of inbound logistics 10 to 20 years ago. Where firms once only concentrated on physical distribution and gave little attention to inbound materials management, so, too, do many organizations give little attention to reverse logistics. This is demonstrated by the fact that there are few dedicated resources in charge of managing the entire returns process.

Many departments own a piece of the process, customer service, logistics, operations, accounting and sales. Behind every returned-goods transaction are complex inventory control, information management, cost accounting and disposal processes. It especially becomes complex in the pharmaceutical industry where returns management is placed under strict regulations of drug enforcement bodies. Organizations handling returns must be licensed and are subject to audits. When there are discrepancies between what a pharmacist claims has been returned and what the manufacturer received investigative procedures take place and parties can be fined.

Another key issue is that most supply chains are specifically designed to go forward. When logistics managers suddenly have to throw their supply chain into reverse they face all kinds of problems that have not been accounted for in the logistics system. This is especially the case with recall programs. When a company does not have the right solution or does not have a plan at all, it could lead to serious problems, particularly if the consumer's safety is involved.

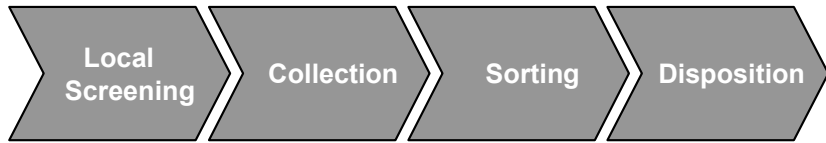
Dr R. Dawe (1995) has described a number of symptoms that indicate whether a company could have a problem with its reverse supply chain. They are: returns arriving faster than processing or disposal; large amount of returns inventory held in the warehouse; unidentified or unauthorized returns; lengthy processing times; unknown total cost of the returns process; and customers losing confidence in the repair process. Supply chain executives recognizing any of these symptoms should find some ways to alleviate their organization's problems in the next section.

Attacking the returns challenge

The volume and the method of processing returns drive the total cost of returns. Companies can reduce the costs associated with returns considerably through a number of different ways and even use their capabilities as a competitive weapon. The most important levers an organization can use to make their returns work best are outlined below. Companies can change the way they are organized to manage returns, alter the way they process returns, use advanced technology

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Companies can use their returns process capabilities as a competitive weapon.

**Figure 2.12.1**

Four key steps in the returns process

to process more efficiently and to prevent returns or ultimately outsource their entire returns supply chain.

Improving the process

The four key steps involved in a returns process are local screening, collection, sorting and disposition, as shown in Figure 2.12.1.

Local screening

Screening products at the point of collection helps to ensure correct decisions are made and excessive costs are avoided.

Local screening is done at the point of collection of the returned products. Often products enter the supply chain that should not enter in the first place and cause unnecessary transportation, administration and handling costs. In an ideal reverse supply chain, products are screened at the point of collection according to specifications of the manufacturer. Disposition, however, changes based on the product (or its version), the vendor and the retailer. Therefore, complex decision mechanisms need to be maintained to allow disposition of product based on customer agreement on a product-by-product basis. With the ubiquitous presence of the Internet plenty of opportunities exist to do this in a cost efficient and effective way. This will be discussed in more detail in the Technology section.

A good example of effective local screening is the process implemented by Nintendo, the video game manufacturer. Nintendo rewarded retailers financially for registering the product and name of the purchaser at the time of sale. This allowed the retailer and Nintendo to determine when the warranty of a product had expired and also whether the product was returned within the allotted time window. To facilitate this process, Nintendo designed special packaging with a see-through opening for retailers to scan the product serial number when the product was sold.

Another example of innovative local screening is a global copier manufacturer in Europe. It provided its field service technicians throughout Europe with a scanner connected to a handheld device, which determined if technicians had to return their defective spare parts to a central location in Europe for repair or refurbishment or whether they could dispose of the parts locally. On top of the system they worked with colored stickers that indicated the destination of the part to facilitate processing. They were able to reduce half the amount of parts returned through the system, which resulted in significant transport savings.

Collection

There are many different ways to collect the products that are destined to enter the reverse supply chain. Retailers often have to send their return products back to their suppliers' different warehouses throughout the country. Different processes need to be set up to facilitate timely processing of these returns. This can often be very complicated and confusing for both retailers and manufacturers as they are dealing with multiple parties, many of whom are concentrating on getting products out to the customer, rather than back to the source.

Many companies have trouble running a logistics system in forward, let alone running one in reverse in parallel at the same time. Some companies have set up central collection centers for collecting and sorting returns, which have proven to be very effective. Ford in the US, for example, is now using one single carrier to handle all its returned spare parts. Simultaneously, it has provided the dealers with one single 800 number for all their issues with returned parts. Subaru of America has gone one step further: it has outsourced the entire returns collection to Roadway Express' reverse logistics subsidiary, Rexsis. The dealers call one toll-free number regardless of the issue and Roadway Express handles all inquiries.

Different systems are needed to process returns, particularly because of the complexity of the process and the multiple parties involved.

Sorting

Some large retailers have been using centralized return centers (CRCs) for many years. They have selected centralized return centers dedicated to handle their entire reverse logistics operations. The advantages of using centralized return centers are numerous. When a company dedicates an entire facility, organization and system to optimize the handling of returns, benefits arise from a whole range of areas. Some of the key benefits are: efficiency can increase as employees occupy positions full-time and can focus on handling returns only, experience in the sorting process will help employees make better and quicker disposition decisions, and cycle times will improve, resulting in better asset recovery and higher customer satisfaction. GM in the US, for example, has in cooperation with UPS centralized its parts return center. Dealers once returned parts to some 200 locations, which was very confusing. Today all returned parts – 30 000 a month – go to the Orion facility.

In any case, whether it happens in a centralized way or not, sorting is a crucial step in the reverse logistics process because employees make decisions on what ultimately happens to the returned product. Complex business rules underlying these decisions need to be updated continuously and designed so that employees can implement the rules easily. Use of bar code scanners connected to a database that contains those business rules speeds up the process and avoids judgmental errors. Information technology is a key in this process and will be discussed in more detail later. In the near future use of radio

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frequency (RF) tags can automate this process even further. RF tags are already used on expensive products, however their current price does not yet allow them to be applied to mass consumer goods.

Disposition

Three ways to dispose of product can be distinguished: sell as-is, repair or reuse (part of it) and ultimately dispose of the product. Some key activities within each of these categories are:

- Sell as-is:
 - resale (as new)
 - sell via outlet or discount store
 - e-auction, and
 - sell to secondary market
- Repair or reuse:
 - repair
 - refurbish or remanufacture
 - modify and
 - recycle
- Dispose:
 - scrap
 - donate (to charity), and
 - dispose in secure manner (for example, certain drugs).

Disposition should be done to maximize the value of reclaimed goods or dispose of the goods in the most cost-effective way. Below are some innovative ways leading practice companies have adopted to improve the disposition of their returned items.

Create profit centers

Some companies have gone as far as to create profit centers around their returns process. This focuses the organization on maximizing the prices they will get for the goods by exploring innovative ways to sell their returned goods. Manufacturers refurbish the product and auction it through the Internet or redeploy it to, say, outlet stores. A key problem in selling returned goods is price setting. Experts in sales and marketing techniques usually set prices for new products. Returned goods prices are frequently determined through negotiation.

However, one thing organizations need to watch out for when reselling their returned items in general, and in particular when setting up profit centers around returns, is cannibalization; the returned goods channels can potentially steal clients away from the primary products and channels. A clearly defined channel and pricing strategy needs to take this into account. More brand-sensitive companies for example will take back returns to keep them from being sold through alternate channels, and then sell them in their own highly profitable outlet stores. In the publishing industry, some publishers have

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Organizations need to be wary of cannibalization when reselling their returned items or setting up profit centers around returns.

contracts with certain authors that prohibit their titles going to alternate channels to protect their 'brand' name.

e-auction

To obtain the highest prices for returned items, some service providers have set up capabilities to coordinate returns and help manufacturers recoup some of their costs by reselling returned goods on Internet auction sites. One example is ReturnBuy.com, a Virginia-based company in the US that serves the high technology and computer industries. The company uses an Internet-based yield optimization technology to resell goods online. It claims it enables its customers to obtain a much higher price for the goods than through the average liquidator. Another example is the industrial automotive industry, where some manufacturers have set up B2B web sites where customers can buy second hand equipment or certain spares from each other, negotiating on the web site. The selling customer then simply ships the equipment or part directly to the web site buyer.

Change to leading practice organizational structure

One way of dealing with reverse logistics is to segment the supply chain into separate forward and reverse organizations. If a logistics organization deals with both forward and reverse product flows, the focus will predominantly be on forward product logistics. Often physical constraints, such as the number of docks and processing space in distribution centers, can limit an organization's capability to effectively handle both logistics flows. When executives have to make decisions around shipping new product out versus processing returned goods, the decision is usually made in favor of the first.

As mentioned, the creation of profit centers around the returns process is a way of maximizing the value from returned products. Estée Lauder has, after a very successful reverse logistics project, created a \$250 million product line from its return goods flow, now representing the third most profitable product line within the company. Centralized return centers have also proven to be a successful way for companies to handle returns more quickly and efficiently. Cost savings most often are realized in labor, due to scale and dedication, and transport, due to consolidation of freight.

Outsourcing is another way of effectively organizing the returns process. Several leading manufacturers and retailers, such as Compaq, Thomson, Target and 3M, have very successfully outsourced their returns processes to competent, dedicated solution providers. Ultimately, companies such as Dell have taken structural steps to avoid the majority of returned products by developing a build-to-order or configure-to-order operating model, which addresses the underlying issues of why returns occur in the first place. These business models are, however, not applicable to every industry or product.

Segmenting the supply chain into separate forward and reverse organizations can improve efficiency.

Collecting the right information to allocate and accurately calculate debits and credits is crucial for manufacturers and distributors.

Implement state-of-the-art information technology

Not many leading software manufacturers offer specialized capabilities to handle reverse logistics. The maintenance, repair and overhaul functions in enterprise resource planning (ERP) suites from vendors such as Baan, Great Plains and Oracle provide some support for reverse logistics processes. A number of specialized companies have developed packages to deal with returns. While integration with back office functions remains an issue, the widespread use of Internet technology has substantially improved the way different supply chain partners can communicate with each other. Online return capabilities and electronic processing of returns drastically increase the speed with which returns can be handled, increase customer satisfaction and can reduce costs by more than 400 per cent. According to the Gartner Group, electronic handling of returns costs \$4.05 versus \$25 if the return is handled by a call center. Information technology should be used in every step of the reverse logistics process, from local screening right through to disposition.

In the local screening process, customers and retailers can simply go to the manufacturer's website, search by stock keeping unit (SKU) or order number to identify the product to be returned, and check its return parameters to see if it can be returned and how to do it. For example, the customer can enter the details of the return on the web site and drop the product in a specified location such as the local post office. If the software can also capture the reason for return, it can determine disposition up front, cutting transportation costs and processing time.

Collection is also simplified as manufacturers have a much better understanding in advance of how many products are to be returned and where they are located so that freight can be combined. An example of a sophisticated solution is Return Valet by catalog retailer Spiegel Inc. In cooperation with Newgistics and local post centers, Spiegel has developed a capability where customers can return their mail-ordered product to a local post office. The clerk validates and checks the return procedure online, prints a receipt with credit amount and sends the product back to Spiegel's distribution center, which issues the credit when the product arrives. Collecting the right information from customers and retailers in order to be able to allocate and accurately calculate debits and credits is crucial for manufacturers and distributors.

If product return information is entered into a system at point of return and matched with the product's bar code or product number, it will considerably ease matching and issuing of credits before sorting the goods. Managing returns online can contribute significantly to this process by, for example, using screens that force customers to enter required data, so receiving companies can keep track of required information to process returns quickly and accurately. In the disposal process, as described earlier, Internet

technology can also contribute by providing online auction services to maximize revenues from returned goods. Alternatively it can be used to connect to third party logistics providers to arrange for a quick and proper pick-up of returned products and transport to their next destination.

In the central sorting process, information technology helps employees in the complex decision making process of final destination of the returned product. The computer maintenance company DecisionOne, for example, uses Kirus software, which includes its customers' (Compaq, Dell, Sun) own decision rules for deciding whether to repair, disassemble for parts, redeploy or scrap returned products.

Finally new information technologies can be used to analyse return reasons and provide valuable information to prevent future returns. The next section will deal with this topic in more detail. Many companies are, however, still developing proprietary software to manage their reverse logistics process. Price of available systems and cost of integrating existing packaged systems is often mentioned as a reason for their internally developed systems.

Analyse to prevent returns

Root-cause analysis should be at the heart of every reverse logistics system. A return goods management system provides a window into manufacturers' faults. Companies need to look beyond the processing of returns to reduce their reverse supply chain cost. The real benefit comes from sharing information with design, production, packaging and other departments on such things as what products are coming back and why they are coming back. This way reverse logistics systems can nip return problems 'in the bud'. Companies that concentrate solely on improving returns processes will miss significant cost saving opportunities. A good reverse logistics system includes proper data collection and effective reporting. To understand a consumer's reason for returning a good, companies must collect structured and consistent data concerning the reason for the return and the product and its condition. With this information, trends should be analysed in individual products and consumer segments to determine root causes.

Mitigating the front-end process by providing front-end customer service and technical support can also help companies reduce returns. Some manufacturers, for example, ask customers for a serial number of their printer when they order cartridges to ensure they receive the correct types. Another good example is Sharp consumer electronics. At one time at least half of the products returned were in perfect working order. To counter this they added simple but effective elements to their reverse logistics program. Through analysing return reasons Sharp could significantly reduce its VCR returns by making products easier to set up. Now, for example, the clock on the VCR is

Analysing data on why customers return goods can provide insight into faults and help to reduce reverse supply chain costs.

set automatically, the owner's manual has been simplified and customers are encouraged to call a prominently displayed toll-free number when they have installation problems.

Outsource suppliers are reverse-flow specialists. They can achieve economies of scale and also provide value-added services.

Outsource the returns process

Outsourcing of the returns process is also occurring on a more frequent basis and seems to be an alternative to avoid high investments in reverse logistics e-capabilities. Manufacturers such as Compaq, Dell, Cisco and 3M and retailers such as Sears have outsourced the handling of the reverse flow of goods. These companies decided the handling of returned goods was not a core competency and saw significant benefits in taking the flow of returned goods out of their distribution centers and placing it into the operations of outsourcers. These outsource suppliers have become specialists in managing the reverse flow of goods and can achieve economies of scale. They are often in a much better position to handle the returned goods and can provide value-added services such as refurbishment.

Successful reverse logistics projects

Throughout this chapter many companies have been named that have engaged in one way or another successful reverse logistics projects. A good example of a complete reverse logistics program is a project by cosmetics manufacturer Estée Lauder. The firm used to dump \$60 million of its products into landfills each year, destroying more than a third of the name brand cosmetics returned by retailers. Estée Lauder made a small investment of \$1.3 million to build its proprietary reverse logistics system of scanners, business intelligence tools linked to an Oracle database. The company has apparently recovered its investment in the first year through reducing labor and other costs.

Estée Lauder has reduced its production and inventory levels through its increased ability to put returned goods back on the market and the availability of better data on the reasons for returns. In the first year Estée Lauder was able to evaluate 24 per cent more returned products, redistribute 150 per cent more of its returns, reduce the destroyed products from 37 per cent to 27 per cent and save about \$0.5 million in labor costs. After implementation, Estée Lauder even considered making the system commercially available through a consulting firm that could serve as a reseller of the software.

When companies decide to embark on a reverse logistics project they can leverage knowledge, tools and processes from other successful projects such as Estée Lauder's, to prevent them from reinventing the wheel. Together with specialist service providers in the reverse logistics arena, significant improvements can be made to reduce costs, improve customer service and increase revenues.

Conclusion

The economic demand for reverse logistics capabilities is driven by two different factors; first, companies are starting to realize the economic value of sound returns management, and second, legal environmental developments are requiring manufacturers to be fully responsible for products over their entire life cycle. Online retailing and shortening product life cycles, mainly in the electronics and high technology sector, have increased the pressure to build strong capabilities in this area, or to outsource the handling of reverse logistics flow. Organizations currently have many opportunities for improving the way they manage their returns, from improving the process and using more sophisticated software to changing the organization or outsourcing the entire process. Smart executives will be looking to capture the value that is locked within the reverse supply chain.

Organizations have many opportunities for improving the way they manage their product returns.

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