School of Business, Stockholm University

Course Paper

Completing the Supply Chain Model

Authors of the Paper:
Paloma Rengel
Christoph Seydl

Teachers of the Course:
Richard Gatarski, PhD
Stig G. Johansson, PhD

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1 Introduction

Traditionally, supply chain models are based on unidirectional logistics in the value chain (Chaffey, 2002, p. 222−224). Some of these models might even consider the cross section functions in a secondary value chain (Figure 1 (a)). Most systems are set up for outward logistics, and dealing with a reverse product stream can become a difficult and costly process (Kewill, 2000). Given this problem, it is necessary to view also reverse streams as integral part of the supply chain (Figure 1 (b)), mainly where a physical transport of goods occurs.

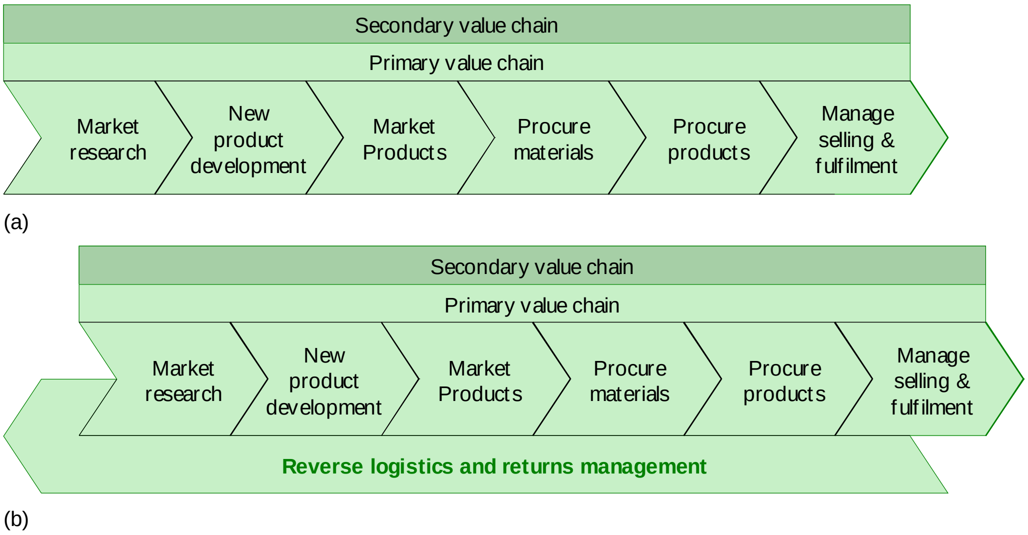

Figure 1: Two alternative models of the value chain: (a) a unidirectional value chain model (Chaffey, 2002, p. 223) (b) bidirectional value chain model with reverse logistics and returns management (own source)

Reverse logistics defined

As reality looks like, reverse logistics theories are a rather new topic for e−business. It seems that so far most of the literature on logistics overlooks the fact that there is also a stream backwards the supply chain.

The term of reverse logistics is used and defined differently by different authors. According to Kokkinaki et al. (2001), reverse logistics stand for all operations related to the reuse of products and materials. Bichler et al. (2002) state that the reverse logistics process »includes the management and the sale of surplus and returned equipment and machines from the hardware leasing business.«

The Reverse Logistics Executive Council (http://www.rlec.org) defines reverse logistics as »the process of moving goods from their typical final destination to another point, for the purpose of capturing value otherwise unavailable, or for the proper disposal of the products.« According to this definition, reverse logistics activities include:

- processing returned merchandise for reasons such as damage, seasonal, restock, salvage, recall or excess inventory
- recycling packaging materials and reusing containers

- reconditioning, remanufacturing and refurbishing products
- obsolete equipment disposition
- hazardous material programmes
- asset recovery

Normally, the problem of logistics are the events which bring the product towards the customer. In the case of reverse logistics, the resource goes at least one step back, e.g. from the customer to the distributor or to the manufacturer (*Figure 2*).

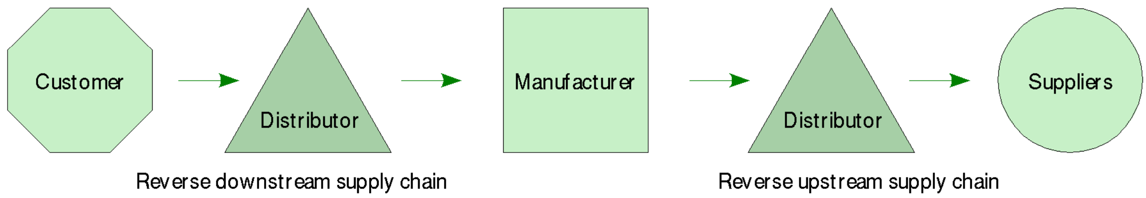

Figure 2: An example of a simplified reverse supply chain (own source)

Reverse logistics play an important role in the field of end-of-life (EOL) respectively end-of-use (EOU). Lourenço (2001) states that reverse logistics are related to the process of recycling, reusing and reducing the material, i.e. goods or materials that are sent backwards in the supply chain. This is in line with Kokkinaki et al. (1999) who argue that reverse logistics »include collection, disassembly and processing of used products, product parts, and/or materials, in order to ensure a new use or an environmentally friendly recovery.«

Returns management defined

Sometimes returns management (return processing) is even considered as a part of reverse logistics (*Figure 3 (a)*). Many returns management concepts often go a step further than just dealing with logistical problems (*Figure 3 (b)*). A modern returns management can cover following different tasks (Advisor Media, 2001):

- Minimising or even eliminating returns
- Handling return procedures
- Redistribution of goods

A returns management system must be able to handle at least one of these three tasks.

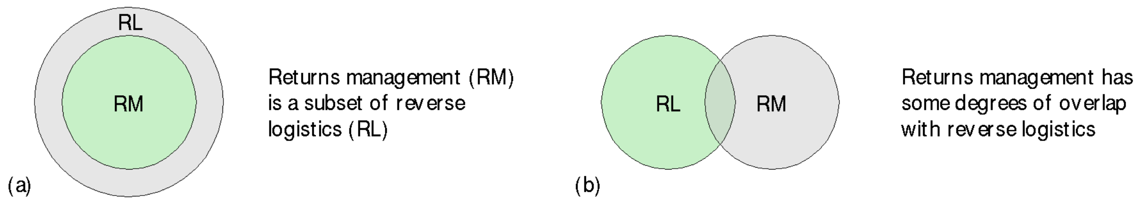

Figure 3: Two alternative definitions of the relationship between returns management and reverse logistics (own source)

When one considers the fact that minimising respectively eliminating returns can be a part of returns management, it does not seem appropriate to treat returns management as only a subset of reverse logistics. Therefore, the paper will deal with the topic of returns management and and reverse logistics in two separated sections each.

Returns management will become increasingly more important for many companies, especially for the B2C mail−order business, because the volume of returns increases continuously. It is estimated that the number of online returns by consumers in the United States will reach 90 millions in 2005 (Kemp, 2001; Advisor Media, 2001).
The reasons for return differ. While impulse decisions reflect B2C to a large extent, technical problems (e.g. broken goods, wrong order) are more typical for B2B. However, it can be said that the main purpose of return management is to create efficiency in terms of returns of goods.

The effect on e−business

Some have already recognised the importance of handling the reverse product stream. On the one hand side there is also a need to track this reverse stream. However, it is not always possible to track this stream. Therefore, it can be necessary to find systems that allow this electronically. One reason for an integrated electronic tracking lies in the fact that might enable the company to have a much more efficient flow of goods. For instance, it would not be easy for a company to redirect a good, if you do not know where it is. Another reason could be that a company might need information about the reverse stream and its costs.

2 Reverse logistics

As already explained in chapter 1.2, there is a certain overlap between reverse logistics and returns management. Therefore, this chapter will mainly focus on the redistribution, logistical frames and recycling issues.

During the last years the importance of reverse logistics has increased. The companies are becoming aware of their benefits. The rate of reverse logistic streams can be dangerously high for some companies but having a good management of these streams can lead to a significant increase in the bottom line. Reverse logistics are environmental friendly because of the reuse, refurbish and recycle, leaving the landfill as the last option. Some articles point out the customers loyalty and the strategic use as benefits of reverse logistics as well.

Reverse distribution

Reverse logistics involves the physical transportation of used (or not sold) products from the end user (or retailer) back to a manufacturer (Fleischmann et al., 1997). Manufacturers need to have a plan to get value out of reverse logistics streams. There are some legal restrictions and groups of pressure that force manufacturers to follow a specific plan of product disposition. But when manufacturers can design their own plan they have to be sure to choose the most profitable one. Transportation costs are one of the highest costs. Manufacturers can save money and time if they transport the goods of the reverse logistic stream directly to their final destination. When a goods comes »back« in the supply chain to the manufacturer there are several ways to redistribute it:

- *Sell via outlet:* This option is usually chosen by brand sensitive companies. Manufacturers take back returns and sell them in their own outlet stores. These outlet stores are often highly profitable. The margins for the manufacturer are even higher than if the product was sold to a retailer (Rogers and Tibben Lembke, 1999, p. 83).
- *Sell to secondary market:* The type of products sold to secondary markets are usually closeouts, surplus and salvage items. Firms that buy these products at low prices operate this market. Then they sell them through their own stores or to other mark−down retailers (p. 84).
- *Remanufacture or refurbish:* Specially used for electronic equipment, domestic appliances and industrial machines. The manufacturer diagnoses the problem and repairs the item, sometimes with a loss of quality but conserving the product identity (Fleischmann et al., 1997).
- *Donate to charity:* When the product is usable but need some reparations or it is out of season to give it to a charitable organisation is an alternative. This option can lead to tax advantages (Rogers and Tibben Lembke, 1999, p. 84).
- *Recycling:* An ecological motivation is behind recycling. Some legislation and groups of pressure have pushed manufacturers to adopt environmental friendly plans. To reduce the amount of materials used in doing a product, to reuse and recycling the product is the goal. And this order is important, first material reduction to maximum, then maximise the reuse and finally recycling. The items for recycling are usually sent to specialised companies (Carter and Ellram, 1998).
- *Auction returned goods on the internet:* This application might increase. Even if the manufacturer has to pay for this service to internet auctioneers, the cost of the transaction is lower than absorbing the costs of shipping the products back and disposing them (Richardson, 2001).
- *Landfill:* Landfill and incineration capacities are almost saturated in the industrial countries. Disposal should be the last option. The manufacturer will dispose the product at the lowest cost (Fleischmann et al., 1997).

Reverse distribution can take place through the outward network, through a new reverse network or through combinations of both networks. Is it more efficient if both outward and reverse networks are integrated? To integrate these networks is a difficult task because of the differences between the products delivered first and the returns. The manufacturer controls the qualities of the delivered products but he has little control in the quality of the returns. The quantity and timing of the returned goods are also different. Altogether bring uncertainty to the manufacturer. To establish suitable integrated networks is complicated and it could not be the better choice. The goods of the reverse stream usually require different handling because of the different collection and delivery this makes the outward network little suitable for these goods. There are several types of reverse logistic streams so it could be possible to use the outward network for some of them but it is difficult to have the networks integrated for all the reverse streams (Fleischmann et al., 1997).

Optimising reverse logistics

Electronic systems can help to solve common problems in reverse logistics as inventory visibility and speed in the reverse logistic stream. If the returned product is not processed quickly it can be obsolete when the manufacturer decides what to do with it. Processing returns electronically minimises time constraints (Richardson, 2001).

Global players have already recognised the importance of electronic reverse logistics systems. For instance, Global Assets Recovery Services (GARS) helps IBM to centralise all secondary channels of sales into the Interactive Offer System. GARS is developing a database that links components across IBM divisions, which allow IBM technicians to order parts through a web site and received them the next day. Dell is also updating its asset recovery services division through an online programme that allows order and process new systems and to take away the old ones (Ferguson, 2000).

However, e−business solutions which can handle reverse logistic streams are not only used by global players. Examples of companies that are optimising reverse logistics flows with electronic information systems follow, based on the frame presented before:

- *Sell via outlet:* The virtual factory outlet Haburi.com was an internet start−up company needed of a scalable web hosting solution to run its business. IBM helped to create an e−business hosting platform designed to grow according Haburi.com. The web site was prepared taking care of the storefronts, and payments in a secure way. An information technology infrastructure was designed to host the web site (IBM, (n.d.)).
- *Sell to secondary market:* Estee Lauder has built its own software specifically oriented to handle returns. Its reverse logistics system includes scanners, business intelligence tools and an Oracle data warehouse. The boxes of returned products are scanned when they come to their warehouse. The scanned data provides information about expiration dates and the system select which products can be sold in other markets, or given away to charities. Inventory levels are monitored in order to ship the products out when the amount of them made the operation profitable (Caldwell, 1999).
- *Remanufacture or refurbish:* »Great Plains Software uses serial numbers to track returned parts of products throughout the repair process and interfaces with other modules to update inventories, issue credits, generate purchase orders and handle other functions associated with customer service« (Caldwell, 1999). This allows the company to handle efficiently the whole refurbish process without wasting time and monitoring where the items are.
- *Donate to charity:* Genco has developed a system that follow the 3M's business rules for determining what products are going to be destroyed, sent back to 3M for refurbishing or donated (Caldwell, 1999).
- *Recycling:* The Institution Recycling Network has a web site where the members can place an order for recycling material pick up. E−mail confirms the received order. 80% of the members use the web site. The web site is monitored and updating. This system is faster than the telephone (Ward, 2002).
- *Auctions:* Honeywell International Inc. has a manufacturing site that allows returns of used brake cores. The customers are in the truck brake aftermarket. They can buy the cores from another customers negotiating on the web site. The prices of the product can be fixed more efficiently through this system (Richardson, 2001).
- *Landfill:* Estee Lauder is reducing the amount of its products in landfills. Its reverse logistics system gives several dispositions of the products before to send them to landfills. Actually, this software has reduced the volume of destroyed products in half (Caldwell, 1999).

All in all, there are companies which can create benefits by making use of electronic reverse logistic systems.

3 Returns management

As partly discussed before, handling returns can be problematical and expensive for a firm. This chapter will deal with problems of returns concerning damage and retails. Answers to these problems will be discussed too.

The challenge

In the late 1980s returns started spinning out of control. This was the time, when many retailers began using returns as a competitive weapon in the battle to win market share. Consumers quickly took advantage of liberal no−hassle return policies. Often, retailers were taking back items, even when they knew that the items were older than their return policy allowed. In some cases, retailers took back products that they did not even sell all in order to keep the customers happy (Bayles, 2001, p. 238).

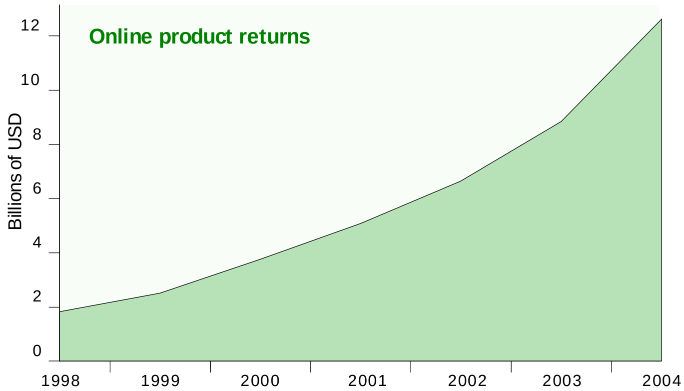

Figure 4: Online product returns are skyrocketing (Source: Bayles, 2001, p. 263)

While returns are a big problem for many brick−and−mortar companies, this problem with returns are often even worse for many internet retailers. Pure internet retailers have preoccupied themselves with building attractive web sites, launching huge off−line marketing campaigns and trying to create the coolest place to shop. Anyway, they have often neglected the very physical processes of product returns (p. 262). *Figure 4* shows how fast returns of online products are growing.

According to Rogers and Tibben−Lembke (1999, p. 8), direct retailers have higher return rates than most other retail channels. It is not unusual for such a company to have return rates above 35 percent. The mean level is approximately 25 percent. Kewill (2000) states that most systems are set up for outward logistics, and therefore dealing with returns is a difficult and costly process. The challenge of returns management systems is to overcome this.

Despite from this need, very few firms have successfully automated the information surrounding the return process. Some years ago, reverse logisticians seemed to feel that nearly zero good reverse logistics management information systems are commercially available (Rogers and Tibben−Lembke, 1999, p. 43). Nowadays, there are emerging some products which fill this vacuum.

Reducing returns

Some firms have begun to take a more aggressive stance with customers in order to reduce the number of returns. It is not easy to make a pre−emptive step, if other companies operating in the same industry have liberal return policies. If one player in the industry has a liberal return policy, it is difficult for other companies in that industry to tighten their return policies. Anyway, some retailers are beginning to rethink liberal return policies and balance value of such a policy as a marketing tool against the costs (p. 21). Reducing return rates even a single percentage point can result in a substantial improvement of the overall profitability (Swift Rivers, 2002). If a firm can reduce the costs by having a less liberal return policy, it will also be much easier to compete with price.

Return policies play an important role for internet retailers. On the one hand side, 94% of customers are influenced by an online merchant’s return policies (Bayles, 2001, p. 264). On the other hand side, internet retailers have higher return rates than their brick−and−mortar counterparts. estimated returns for products sold through US internet retailers are on average 30% of all purchases (Kokkinaki, 2001). Hence, it seems necessary to find the right balance between costs and competitive advantage of it.

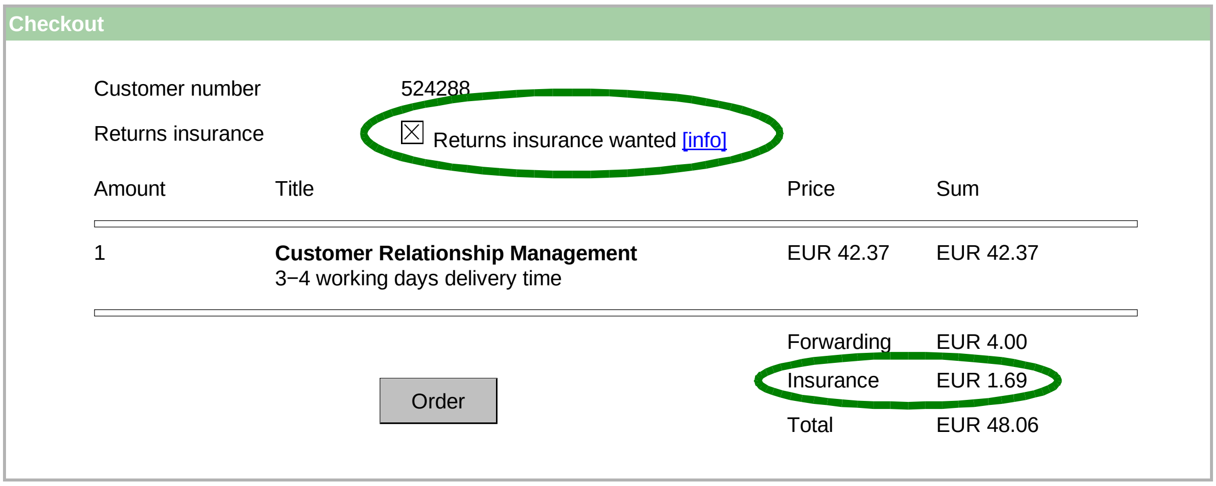

Figure 5: An example for an online order form which allows the customer to chose between hard and soft return policy (own source)

Another possibility could be to let the customer decide, if he or she wants to pay the higher price for the liberal return or not. In other words, the customer gets rewarded, if he or she is willing to contribute to a lower risk of returns. *Figure 5* shows a possible solution for an e−commerce site. There is a check−box in the online order form which allows the customer to chose between a return insurance or none. Since this system might be unknown by the customer, there is the possibility to click the »info«−link, so that a new browser window pops up and the advantage and disadvantage of the returns insurance is described. If the user choses the option with the insurance, a price for it will be calculated. The price for the insurance could be either a fixed average value, or it could be calculated by a set of different variables, such as product category of each good (e.g. return risk for consumer electronics is rather low (Rogers and Tibben−Lembke, 1999, p. 8)), demographic characteristics (e.g. data mining results can show a different return risk between genders) or by the customer 's return history.

Products which can provide respectively are based on a data mining function for returns already exist. For example, Swift Rivers has created a tool called Compass (Swift Rivers, 2002). This is a decision support application which makes use of the collected data on returns. The software examines periodic batch data feeds and presents analytic results through a web−based interface, as *Figure 6* shows. The reports produced by the software should give the management the possibility to react and make better decisions, e.g. it should become easier to investigate root causes for problem returns (http://www.swiftrivers.com/solutions.htm). Compass seems to focus on the company's macro perspective, and ignores more or less the individual return.

Figure 6: Swift Rivers' Compass as an example for a decision support system for returns management (Source: http://www.swiftrivers.com/solutions.htm)

This macro perspective on returns can increase the visibility of quality problems. Rogers and Tibben−Lembke (1999, p. 56) argue that having an overview on the total figures of total returns make it easier to see quality problems. If the company is doing a good job of gatekeeping and has a system in place that allows to match returned merchandise with the vendor file, the company can more quickly see problem products and suppliers. They can then improve for instance product quality so that returns will be reduced.

A company can build a data warehouse that contains return reasons, by tracking hundreds of return authorisations. If there is a quality problem with a product, consolidation of returns will highlight those quality difficulties more quickly. Hence, it is possible to prevent greater expense for all of the members of the supply chain, when the firm can react earlier (pp. 56−57).

An important prerequisite for building a data warehouse for returns is gatekeeping.

Gatekeeping is defined as the screening of defective and unwarranted returned merchandise at the entry point into the reverse logistics process (Rogers and Tibben−Lembke, p. 38; Bayles, 2001, p. 272). A web−based gatekeeping system seems to be a promising solution, where an internet or internet web page guides the employee through the returns process for each product. When a customer returns a product, the employee scans the bar code on the particular good. Then the computer system asks the manufacturer's system for the appropriate returns procedure, and a web page appears which steps the returns process for the particular product (Rogers and Tibben−Lembke, 1999, p. 193). Hence, gatekeeping can contribute to insure that products will be returned, when the returns policy allows this.

Today, the use of internet has become much more common than it was some years before (Chaffey, 2002, pp. 12−13) so that is possible to establish a web−based customer self−service for the returns process. According to Gartner Research, companies can cut returns costs up to 73% by automating the returns process, which includes online ordering, self−service product inquiry and automated return data (Advisor Media, 2001). Firms can reduce the cost of call centre calls, order look−ups, data entry, return authorisation, and second− and third−stage shipping by integrating business rules into an automated rules−based engine for returns processing, when with a web−based front end for handling returns is used. Such an electronic self−service can also cut returns by integrating frequently asked questions and troubleshooting data into reason codes that give customers information for corrective action and therefore avoid a return altogether (Advisor Media, 2001). This system seems to be most appropriate for e−retail, where the customer is used to order via a web−based form. The performance of such an electronic self−service will be probably measured by its ability how it can handle exceptional cases.

Rogers and Tibben−Lembke (1999, p. 191) mention that the automation of those processes is difficult because reverse logistics processes have so many exceptions. The reason lies in the fact that not all of these processes are not within the company, and developing systems which have to work across boundaries add additional complexity to the problem. Hence, flexibility of such a system is required.

Bayles (2001, pp. 265−267) suggests following features, which can be built into a web site, in order to reduce returns in internet retail:

- Making the presentation of products accurate
- Implementing measures which can reduce the negative side−effects of impulse buy
- Information about delivery delay
- Providing the option for configuration

An accurate product presentation on the web involves e.g. good quality of pictures, specifications, colours or scale. The more information about the product that is provided the better off the shopper is (p. 265).

Unfortunately, an impulse buy can mean an impulse return. One−click purchase technology makes it easy to buy an item on impulse, but the buyer's remorse can set in immediately after clicking the buy button. A facility can be built in so that when an order is created online, a cancel option is created and remains online for an hour. Some retailers have found out that the cancel button is hit on average in 3% of the cases (p. 265).

When the time between the purchase and the receipt of the product is prolonged, the chances of a return increase. Therefore, it is recommended to keep customers proactively advised via e−mail if a product s shipment status is taking longer than it should (p. 266). Probably, it would be even better to increase the fulfilment rate of the company’s promises. Either the firm can improve their forward logistic processes in order to shorten the delivery time, or the company quotes the delivery time longer than expected.

Another technology, which might reduce the risk of returns are online tracking systems. Many of the large parcels carriers use track and trace systems, which enable to follow the flow of their customers’ goods throughout the supply chain from point of collection to point of delivery. Such a trace system works as follows: The vehicle drivers can scan the barcode on the parcel with a handheld device every time an activity takes place to the parcel (e.g. when it is loaded onto the vehicle or when it is delivered). Additionally, the driver can also input text via the keypad to record additional about the status of the parcel (e.g. the name of the person who has received it). All this information is transmitted back to the depot either from a base unit in the vehicle cab or by linking the device to the depot via a modem and mobile phone (Browne et al., 2001, p. 58). Based on such a tracking technology, some web sites allow the customer to check the status of their order. For instance, the direct retailer Norm Thompson provides such a feature. On a web−based form at the site, the customer must enter the order number as well as a code, which should verify the order number, in order to get the status report (*Figure 7*).

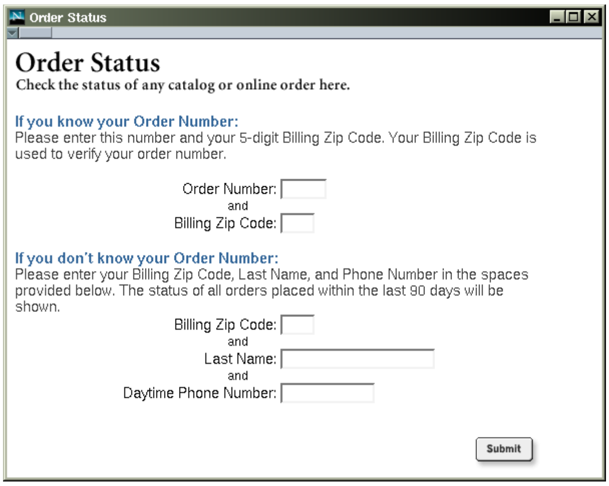

Figure 7: Request form for order status report at Norm Thompson (http://hera.nortom.com)

Sites that offer the possibility to configure the product online are noticing a dramatic drop in product returns. By giving customers the ability to configure products, the final product order is less prone to error because customers can choose specifications at their leisure and even take a break from the task and finish it later. For instance, Dell Computers recognised that their rate of product returns was actually lower from customers who had configured their own PCs online. This was explained by the flexibility when configuring a PC online (Caldwell, 1999; Bayles 2001, p. 266). It looks like that »configure your...« technology is mainly used on the computer market, as most search results on the internet about this feature are related to PCs and servers. However, there are also other fields of application for this technology, as the car manufacturer Fiat proves. At their British web site, Fiat (http://www.financefiat.co.uk) allows customers to select different car models and configure them individually. The system calculates the price according to the chosen car model and features (e.g. remote control door locking, metallic paint etc.). There is even the option to link the cars to one's financial background. It does not seem likely that people buy cars on impulse. However, there are doubts that consumers search really rationally, when they want to buy a car (Solomon et al., 1999, p. 215). but such a system could contribute to reduce forced returns, caused because customers cannot afford to pay the monthly rates for their car.

Handling returns more efficient

In a truly integrated supply chain, everyone in the supply chain should be able to track the product as it moves forward through the channel (Rogers and Tibben−Lembke, 1999, p. 45). Bayles (2001, p. 265) suggests that internet retailers should try to design their systems with forward and reverse logistics as a top priority. Design should start from the warehouse backwards. The aim of this is to create a good ability to handle returns.

An appropriate design of the web site allows changes, cancellations and to generate returns notifications faster. To capture the returns' information electronically allows the manufacturer to process the returns quickly at a lower cost. Gartner Group's Spieler has calculated the average cost of processing a return electronically at USD 4.75 while processing the return through a call centre is five times more expensive, around USD 25 (Richardson, 2001).

RMAs (return merchandise authorisations) can be used to track returns much easier. An RMA can be defined as a numbered authorisation provided by a mail−order merchant to permit the return of a product. The costumer has to write this code onto the parcel of the returned good so that it will be accepted by the company. For instance, DPS Telecom (http://www.dpstele.com) − a company for network alarm management − provides an online form for RMA requests, while other company's still require to send a fax for RMA requests. The customer fills in the contact information (address, phone number etc.), billing information (warranty, maintenance agreement) and the product information (part number, serial number etc.) as well as the reason for the return.

The use of an electronic RMA system has the advantage that the data are automatically collected as soon as the customer enters them. According to Rogers and Tibben−Lembke (1999, p. 47), part of a good returns transaction processing is understanding how the returned goods should be dispositioned. An electronic RMA system could enable such a function. A possible solution could be a system with systematic queries. Based on these queries, the system could recognise what kind of return it is, such as a return for recycling, a potential repair case or recall. Depending on the type of return, a different RMA code can be produced so that the product can be delivered to the right department instead of redirecting it. This could save logistic costs.

Some parcel carriers have even similar products which should help to streamline the returns process. For example, United States Postal Service offers companies to sign up for Returns@ease, an electronic merchandise return application programme interface, where customers can print RMAs themselves (http://www.usps.com/shipping/returns.htm).

On B2B level EDI (electronic data exchange) can be used to achieve cost savings to reduce the costs caused by returns. The Institute of Logistics and Transport (http://www.iolt.org.uk) defines EDI as »the computer to computer exchange of structured data for automatic processing«. The main benefits of EDI are as follows (Chaffey, 2001, p. 103):

- More rapid fulfilment of orders because reduced lead times are achieved through reduced times in and placing and receiving order, reduced time of information in transit and trough integration with other processes
- Fewer errors in data entry as well as less time spent by the buyer and supplier on exception handling
- Reduced costs resulting from reduced staff time, material savings (e.g. paper and forms) and improved inventory control

These advantages could be captured by reverse logistics such as returns logistics too. Although EDI (electronic data interchange) standards to facilitate this boundary spanning have been developed to handle returns, only few companies have implemented it. A main reason are the high expenses of EDI systems (Rogers and Tibben−Lembke, 1999, p. 46). Internet EDI, the use of EDI standards delivered across non−proprietary IP networks, could solve this problem. Internet EDI enables EDI to be implemented at lower costs by using virtual private networks instead of proprietary value added networks (Chaffey, 2001, p. 102).

4 Conclusion

Nowadays, the utilisation of the web is limited. The companies are not using all the web's potential, and neither are the customers. There are even companies and customers without internet access, which is a barrier in the diffusion of electronic reverse logistics, but some authors predict that this situation can change, so Rogers and Tibben Lembke forecast the web as an important system for reverse logistics in the future.

As there are real benefits of reverse logistics and returns management for the companies, and these benefits might grow with the development of an appropriate integrated internet, extranet or intranet solution, companies might realise the importance to develop an e business strategy which includes reverse logistics and returns management.

Despite the benefits of fully integrated reverse logistics and returns management systems, a company must weigh up the expected gains against the costs of such a system and the priority of other e business projects. Maybe, the costs for such systems decrease, when standard solutions for all these problems of reverse logistic streams will be developed. As Internet EDI proves, the spread and use of a technology is widely correlated to the costs of the technology.

REFERENCES

Advisor Media (2001, June 1), »Cost Savings in Returns Management«, *Advisor Zones*. Retrieved May 16, 2002, from the World Wide Web: http://www.advisor.com/ Articles.nsf/aid/SMITT238

Bayles, D. L. (2001), *E−Commerce Logistics and Fulfillment: Delivering the Goods* [Electronic version], Pearsons Education Limited, Harlow.

Bichler, M., Kalagnanam, J., Katircioglu, K., King, A. J., Lawrence, R. D., Lee, H. S., Lin, G. Y. and Lu, Y. (2002), »Applications of flexible pricing in business−to−business electronic commerce« [Electronic version], *IBM Systems Journal*, Vol. 41, pp. 287−302.

Browne, M., Allen, J., Anderson, S. and Jackson, S. (2001) *Home Delivery in the UK*. Retrieved May 16, 2002, from University of Westminster, Transport Studies Group Web site: http://www.wmin.ac.uk/transport/download/dti_final_report.pdf

Caldwell, B. (1999), »Reverse Logistics«, *Information Week*, Issue 729, p. 48.

Carter, C. R. and Ellram, L. M. (1998) »Reverse logistics: A review of the literature and framework for future investigation«, *Journal of Business Logistics*, Vol. 19, Issue 1, p. 85.

Chaffey, D. (2002), *E−Business and E−Commerce Management*, Pearsons Education Limited, Harlow.

Ferguson, R.B. (2000), »IBM, Dell move to reverse logistics«, *eWeek*, Vol.17, p. 20.

Fleischmann, M., Bloemhof−Ruwaard, J. M., Dekker, R., van der Laan, E., van Nunen, J.A.E.E. and van Wassenhove, L. N. (1997), »Quantitative models for reverse logistics: A review«, *European Journal of Operational Research*, Vol. 103, pp. 1−17.

Kemp, T. (2001, May 21), »Next E−Retail Step: Returns Analysis«, *InternetWeek*, p. 11.

Kewill Systems Plc (2000, October 19), *E−Fulfillment Execution − Business Briefing* [Electronic version], Kewill Systems Plc, Surrey.

Kokkinaki, A. I., Dekker, R., Lee, R. and Pappis, C. (1999), »An Exploratory Study on Electronic Commerce for Reverse Logistics« [Electronic version], *Econometric Institute Report Series*, EI−9951/A, Erasmus University Rotterdam, p. 1−16.

Kokkinaki, A. I., Dekker, R., van Nunen, J. and Pappis, C. (2001), »Integrating a Web−based System with Business Processes in Closed Loop Supply Chains« [Electronic version], *Econometric Institute Report Series*, EI2001−31, Erasmus University Rotterdam, pp. 1−30.

Lourenço, H. R. (2001), *Supply Chain Management: An opportunity for Metaheuristics*. Retrieved May 16, 2002, Universitat Pompeu Fabra, Department of Economics and Business Web site: http://www.econ.upf.es/deehome/what/wpapers/postscripts/538.pdf

Richardson, H. L. (2001), »«, *Industry Week*, Vol. 250, p. 37.

Rogers, D. S. and Tibben−Lembke, R. S. (1999), *Going Backwards: Reverse Logistics Trends and Practices* [Electronic version], Reverse Logistics Executive Council, Reno.

Solomon, M., Bamossy, G. and Askegaard, S. (1999), *Consumer Behaviour: A European Perspective*, Pearson Education Limited, Harlow.

Swift Rivers (2002, April 1), »Norm Thompson Selects Swift Rivers' Returns Management Solution«, *Yahoo! Finance*. Retrieved May 16, 2002, from http://biz.yahoo.com/bw/ 020401/12229_1.html

Ward, E. (2002), »Recycling Network Uses e Business Applications to Improve Communication & Efficiency«. Retreived May 22, 2002, from http://www.ir − network.com/Art_NHBR_0105.htm