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Importance of Reverse Logistics for Retail Acts

Gabriela Cecilia Stănciulescu
The Bucharest Academy of Economic Studies
Romania

1. Introduction

After 1970 – the energy crisis – the literature began to speak of encompassing logistics materials management and logistics supply production to ensure the efficiency of the procurement of raw materials and production programs were effectively correlated with the market objectives. The participants in the Environment for Europe Ministerial Conference in 1995 adopted a program through which the developed countries agreed to encourage sustainable consumption that translates to the optimum use of resources.

Reverse logistics activities include, collecting useful waste to be returned to the manufacture, purchasing reusable packaging, re-selling components with low wear, the re-sale of consumer goods following refurbishment. In other words, when speaking about reverse logistics we are referring to:

1. a channel conversely, meaning a situation in which a channel or a part of it is designed for the flow of goods or materials moving forward in the opposite direction to the consumer;
2. the many activities being the inverse of transportation, handling, storage that unfolds in reverse channels required for the full use of the products, materials and components throughout the lifecycle;
3. the regulators that are needed to protect the natural environment; they are being increasingly accepted even though this is more than the idea that it would increase the costs of private firms to prevent pollution and to carry out greening actions, thus causing higher prices and decreased competitiveness (Porter & van der Linde, 2008).

As shown by Porter, properly designed environmental standards can stimulate innovations leading to increased resource productivity, thus helping companies become more competitive. The way companies react to environmental problems can be an indicator of their competitiveness, but these rules do not automatically lead to innovations or superior productivity. Companies will realize that successful innovations will benefit (Porter & van der Linde, 2008).

2. Reverse logistics

Logistics is defined by The Council of Logistics Management as the process of planning, implementing and controlling the efficient, cost-effective flow of raw materials, in-process

inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements.

Reverse logistics includes all of the activities that are mentioned in the definition above. The difference is that reverse logistics encompasses all of these activities because they operate in reverse. Therefore, reverse logistics is the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or for proper disposal.

More precisely, reverse logistics is the process of moving goods from their typical final destination for the purpose of capturing value or proper disposal (Rogers & Tibben-Lembke, 1998). The re-manufacturing and refurbishing activities may also be included in this definition of reverse logistics. Reverse logistics is more than re-using containers and recycling packaging materials. Redesigning packaging to use less material or reducing the energy and pollution from transportation are important activities, but they might be better placed in the realm of "green" logistics. If no goods or materials are being sent "backwards," the activity is probably not a reverse logistics activity. Reverse logistics also includes the processing of returned merchandise caused by damage, seasonal inventory, restock, salvage, recalls and excess inventory. It also includes recycling programs, hazardous material programs, obsolete equipment disposition and asset recovery.

An extended study undertaken in 1998 (Rogers & Tibben-Lembke, 1998) aimed at defining the state of the art in reverse logistics and to determine the trends and best reverse logistics practices. Part of the research charter was to determine the extent of the reverse logistics activity in the U.S.A. Most of the literature examined in preparation for this research emphasized the "green" or environmental aspects of reverse logistics. In this project, green issues were discussed, but the primary focus is on the economic and supply chain issues relating to reverse logistics. The objective was to determine current practices, examine those practices and to develop information surrounding the trends in reverse logistics practices.

To accomplish this task, the research team interviewed over 150 managers that had a responsibility for reverse logistics. Visits were made to firms to examine, firsthand, the reverse logistics processes. Also, a questionnaire was developed and mailed to 1,200 reverse logistics managers. There were 147 undeliverable questionnaires. From among the 1,053 that reached their destinations, 311 usable questionnaires were returned for a 29.53% response rate.

3. Motivators of design for environment-friendly reverse logistics

According to Bras (1997) and Rose (2000), mainly four motivators, involving customers (stakeholders), competition, ISO 14001 system and the most important, legislations, make organizations and corporations more concerned about environment-friendly products and technologies on their own initiatives. The integrated relationship of each factor can be represented in Figure 1. This section provides a brief description of each factor and their impact on a corporation's reverse logistics strategy.

The increasing awareness among customers of the importance of saving the environment will certainly stimulate the corporations to improve their performance in both the green manufacturing procedure and the products design and recycling to satisfy the customer

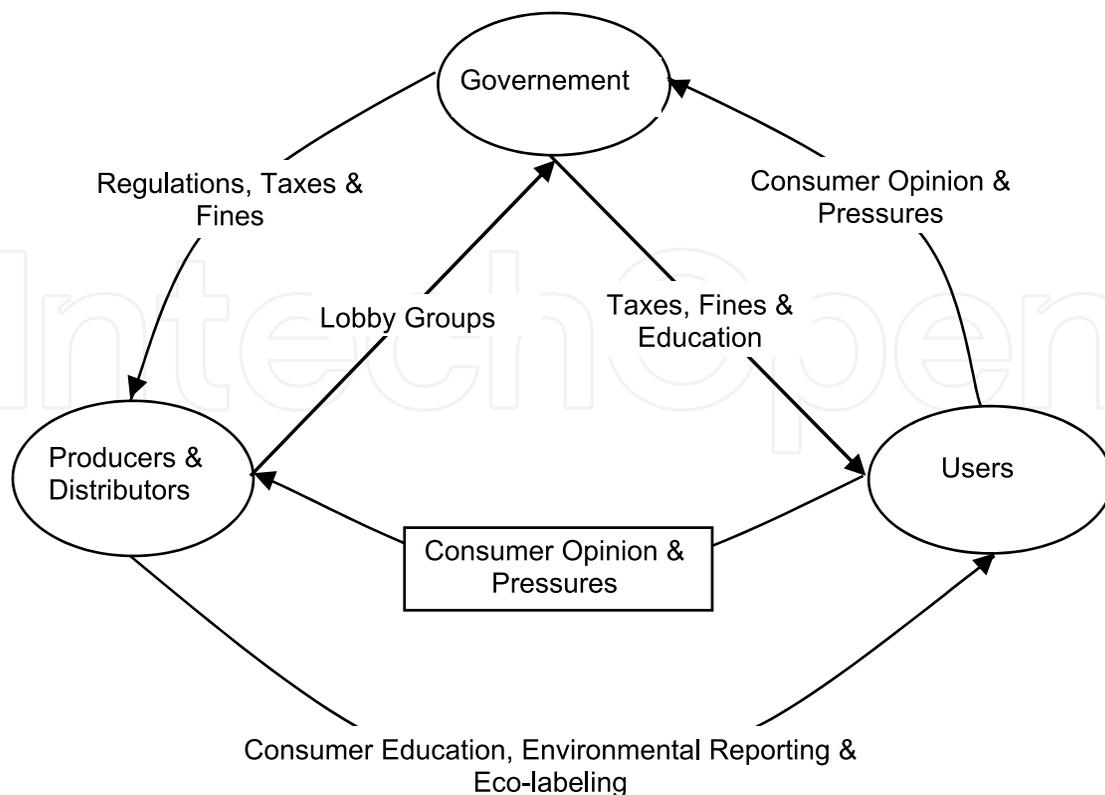


Fig. 1. The Motivators of Design for Reverse Logistics and Their Relationships (Wang, 2008)

demand. The increasingly positive attitudes of consumers on green products, therefore, accelerate the innovation of products and techniques on environmental safety and further stimulate organizations to make designs for a product life-cycle strategy. Another important factor that will influence the consumer's purchasing willingness is the corporations' image, more specifically, the role of the corporation and its contributions for saving the environment. Wal-Mart provided a good example of being publicly boycotted for its unrecyclable products with an environment-friendly label.

Competitors that get ahead in product end-of-life processing will stimulate corporations to make more efforts to recapture the market shares by designing more environment-friendly and recyclable products and processes, and take more responsibilities for the end-of-life products (Rose, 2000). Reverse logistics is a complex and comprehensive system that requires designers to take into account the reusability, disassemble-ability, re-manufacturability, serviceability and recyclability of the returned products. Meanwhile, the marketing, finance, safety, health, functionality and manufacturability aspects should also be considered carefully to obtain a trade-off design for all these factors. Nowadays, many countries have made efforts to improve the reverse logistics using different systems. The EU has made specific regulations for monitoring and inspecting the performances of companies for the treatment and recycling of waste electrical and electronic equipment (WEEE) that has been proved an effective way for implementation. However, the WEEE recycling and disposal in China is facing a dilemma because customers, unwilling to end the life of the products, and the companies doubt the worthiness of an investment in the WEEE recycling system. Through the investigation of two leading Chinese companies in the household appliances industry, Wang (2008) finds that:

1. The financial profit is still the fundamental driving force for companies to integrate reverse logistics into product design process. The management of the companies is reluctant to invest in the programs in which consumers are not interested.
2. The consciousness of the WEEE among the Chinese consumers is still low, which can be proved from their definition of “green” products – low in harm to the healthy people and low energy consumption – which are only a small aspect of environmental protection and are much less than sufficient.
3. The difficulty of a “take-back” is another barrier for a company’s initiative to establish a comprehensive reverse logistic system, because they may feel it is not worthwhile investing much on an idle facility.
4. The WEEE reverse logistics design is far too laggard for the innovation in the new EEE in China. Also, Chinese companies are more willing to invest in the improvement of inventory management and customer relationship management rather than obsolete domestic appliances.
5. The Government should play a more active role in encouraging corporations to take more responsibility for the recycling and treatment WEEE, closing down the illegal small warehouses for reselling WEEE after a simple clean and maintenance, and finally, ‘propagandizing’ the importance of the WEEE recycling and treatment and the harm to the environment caused by illegal recycling.
6. The Haier Co provided a quite new concept – employing sub-contractors to do its take-back, recycling and treatment jobs. This allows it to have sufficient time to estimate the benefits from the reverse logistics and to develop a reverse logistics suitable for its development before investing.
7. There are also some companies that have not even established a WEEE disposal department. This will eventually impact on their export business, because more and more countries have published stricter regulations for companies to take more responsibility for the environment.
8. Integrating reverse logistics into product design, in the long-term view, can shorten the recycling and treatment time and further cut costs.

Supply chain management is the coordination and management of a complex network of activities involved in delivering a finished product to the end-user or customer. All stages of a product’s life-cycle will influence a supply chain’s environment burden, from resource extraction, to manufacturing, use and reuse, final recycling, or disposal (Zhu et al., 2007). Environmental issues under legislation and directives from customers, especially in the U.S.A., the European Union (EU) and Japan, become an important concern for the manufacturers. As a more systematic and integrated strategy, the Green supply chain management (GSCM) has emerged as an important new innovation that helps organizations develop “win-win” strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency.

A research (Zhu, Sarkis, & Lai, 2007) aimed at surveying the current green activities in the computer parts’ manufacturers in Thailand and evaluating the green supply chain management. The 11 manufacturers were selected for case studies that provided in-depth interviews about green procurement, green manufacturing, green distribution and/or reverse logistics. Their products or services are related to computer parts that are IC, hard disk drives, power supplies, print circuit boards and monitors. Also, several stakeholders in

the EOL electronic parts, used computer stores (second-hand markets), waste collectors (called SaLeng), disassembly/recycle plants and final treatment/landfill companies, are involved. Most of them comply with the WEEE and the Restriction of Hazardous Substances (RoHS) Directive (RoHS) directives to minimize the hazardous or toxic elements in electronic partsⁱ. To obtain efficiency and effectiveness in the GSCM, collaboration among the important stakeholders in the electronics industry must be strongly concerned.

4. Reverse logistics activities

Typical reverse logistics activities would be the processes a company uses to collect used, damaged, unwanted (stock balancing returns) or outdated products, in addition to the packaging and shipping materials from the end-user or the reseller. Once a product has been returned to a company, the firm has many disposal options from which to choose. If the product can be returned to the supplier for a full refund, the firm may choose this option first. If the product has not been used, it may be resold to a different customer or it may be sold through an outlet store. If it is not of sufficient quality to be sold through either of these options, it may be sold to a salvage company that will export the product to a foreign market.

If the product cannot be sold "as is" or if the firm can significantly increase the selling price by reconditioning, refurbishing or remanufacturing the product, the firm may perform these activities before selling the product. If the firm does not perform these activities in-house, a third party firm may be contracted or the product can be sold outright to a reconditioning/remanufacturing/refurbishing firm. After performing these activities, the product may be sold as a reconditioned or remanufactured product, but not as new. If the product cannot be reconditioned in any way, because of its poor condition, legal implications or environmental restrictions, the firm will try to dispose of the product for the least cost. Any valuable materials that can be reclaimed will be reclaimed and any other recyclable materials will be removed before the remainder is finally sent to a landfill.

Generally, packaging materials returned to a firm will be reused. Clearly, reusable totes and pallets will be used many times before disposal. Often, damaged totes and pallets can be refurbished and returned to use. This work may be done in-house or by using companies

ⁱ While electronic devices have become a way of life for much of the world, their presence have caused adverse effects on the health of many and the environment. We rely on electronics for nearly every aspect of life. They allow us to obtain information easily and they are even used to save lives in hospitals worldwide. However, once these electronic devices become obsolete, their disposal poses extreme health risks due to the hazardous materials commonly found in electronic parts and components. In an effort to fix this problem, the Restriction of Hazardous Substances (RoHS) Directive was created by the European Union and went into effect July 1, 2006.

This directive is intended to regulate toxic materials in electronic devices and electrical systems. In an effort to reduce toxic e-waste and lessen the negative environmental footprint electronic devices have on our planet, the European Union has restricted the use of six materials in electronic parts that are deemed hazardous.

As such, RoHS restricts the use of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ether. These restrictions are intended to apply to the production of consumer electronic equipment, appliances, tools, toys and medical devices (<http://EzineArticles.com/3940448>)

whose sole mission is to fix broken pallets and refurbish packaging. Once repairs can no longer be made, the reusable transport packaging must be disposed of. However, before it is sent to a landfill, all salvageable materials will be reclaimed. European firms are required by law to take back transport packaging used for their products. To reduce costs, firms attempt to reuse as much of these materials as possible and reclaim the materials when they can no longer be reused.

4.1 Interest in reverse logistics

Awareness of the art and science of logistics continues to increase. Additionally, great interest in reverse logistics has peaked. Many companies that previously did not devote much time or energy to the management and understanding of reverse logistics have begun to pay attention. These firms are benchmarking return operations with the best-in-the-class operators. Some firms are even becoming ISO certified for their return processes. Third parties specializing in returns have seen a great increase in the demand for their services. Leading-edge companies are recognizing the strategic value of having a reverse logistics management system in place to keep goods on the retail shelf and in the warehouse fresh and in demand (Raicu et.al, 2009). In the case of Romania, the recovery management is limited to the only three products' industries, which are:

1. collecting and recovery of old cars (usual older then 10 years) and parts of them, following some stages of reverse logistics process;
2. collecting and recovery of electronics and electric products;
3. packaging waste recovering.

For the first products category, the Public Authority supports the fixed cost of car recovery from the public budget and the financial program is well-known as "crock" program. There are some recovery centres, and all stages of the reverse management are accomplished by private operators. The second products category is periodically collected, in front of the final user's house. The obligation for providing location of the recovery centres is on the Public Administrative Authority at local level. According to the Romanian Government Resolution no.448/ 2005, every county has to provide at least one recovery centre for electronics and electrical equipment; as well as each of the city having more than 100,000 inhabitants. In Bucharest, the minimum number of such centre is at least six, one for each of the administrative sector. The producers and distributors support all the involved costs for all reverse management activities.

Besides these product types for the recovery there are no other initiative for materials which still have usage value. Moreover, there is no planning measure to reserve some space for the purpose of the recovery centre settlements into the outskirts of the new urban areas.

4.2 Return percentages

The reverse logistics process can be broken down into two general areas, depending on whether the reverse flow consists primarily of products or primarily of packaging. For product returns, a high percentage is represented by customer returns. Overall customer returns are estimated to be approximately 6% across all retailers. Return percentages for selected industries are shown in the following table. In each case, return percentages were established by several different firms.

<i>Industry</i>	<i>Percent</i>
Magazine Publishing	50%
Book Publishers	20-30%
Book Distributors	10-20%
Greeting Cards	20-30%
Catalog Retailers	18-35%
Electronic Distributors	10-12%
Computer Manufacturers	10-20%
CD-ROMs	18-25%
Printers	4-8%
Mail Order Computer Manufacturers	2-5%
Mass Merchandisers	4-15%
Auto Industry (Parts)	4-6%
Consumer Electronics	4-5%
Household Chemicals	2-3%

Table 1. Sample Return Percentages (Rogers & Tibben-Lembke, 1998)

Clearly, return rates vary significantly by industry. For many industries, learning to manage the reverse flow is of prime importance.

5. Reverse logistics – component of environmental sustainability

There are three main principles in sustainable development:

- environmental sustainability, ensuring a tolerable development for all essential ecological processes, especially the diversity of biological resources
- social and cultural sustainability, which guarantees a favourable economic development, members of society, culture and values compatible with the existing culture and civilization, to preserve community identities
- economic sustainability, having a role in ensuring efficient economic development, resources are handled so that it also will exist in the future.

Reverse Logistics is the process of disposing of used products or a new initial point of the supply chain, such as the customer returns, overstock, expired food, also redistributing them using specific rules to collect their management. Reverse logistics refers to recoverable material components after consumption, waste and packaging, which go on backward, from the consumer production that is incorporated into a new economic cycle. Reverse logistics supposes some extra handling operations, which involve certain circuits', and also specific charges for the reception from consumers, sorting, loading and unloading. In attempting to design a total system of distribution, logistics specialists have traditionally approached the distribution process, starting with the manufacturer and the product flow from the producer to the consumer. It is well known that, during accelerated economic growth periods, as emergent economies have known, the urban settlements go to the fringe, creating huge residential areas. These are acquiring in time (in a nonregular environment) new spatial functions such as commercial, educational and social ones. Some of them are set up simultaneously with the residential development stage. This kind of real estate evolution is presented in the recent development of Bucharest suburbs.

The following two types of residential areas rising up in suburbs are distinguished:

- low density zones, with lodgings like villas, having large space and high income inhabitants;
- high density zones, with lodgings on many levels, usually four or eight levels, having large flat surface and inhabitants with high income, at least greater than the average income of the city's inhabitants (Raicu et.al, 2009).

Making a reverse logistics process for a company or a product is very difficult, especially because, in many cases, there is no systematic plan of distribution. In addition, many products reach the retailer and consumer brand identity without any product or provider. Locating these products and sending them back to the producer is a very costly process. Products may be withdrawn by a company for a variety of reasons, poor packaging, improper labeling or delivery methods resulting in improper alteration and contamination. The level of urgency of the withdrawal depends on several factors, most importantly, the gravity product risk.

Three different levels can be identified, depending on the level of penetration of the product in the system. At the first level, the product is still under the manufacturer's control, the deposits under its control or primary distributor warehouses. At this level, the location and recovery of a product is a logistics specialist for the simple matter of rebuilding the stock. At the second level, the product should be located and removed from the intermediaries involved in the product distribution – the wholesalers and retailers. Withdrawal, in this case, becomes a little more difficult. At the third level, the product is in the hands of the consumer. Here, we reach the highest level of difficulty.

6. Opportunities for sustainable management of reverse logistics

Many companies realize that there are large amounts of money that can be recovered by returning the goods. A large number of companies have developed this “recall” business. Logistics service providers have found that up to 7% of company sales are embedded in the cost of the return. This figure is hard to imagine because, as part of the answer, they provide reverse logistics applications worth between US\$50,000 and US\$500,000 dollars for a single license for a location.

Logistics companies made between 12 and 15% profit from this industry. One of these companies is represented by Unyson, whose CEO, Mr Donald Matlby, explains how companies can do more business if they apply the reverse logistics process. Unyson manages products returned, destroyed (in whole or in part) and the registration of each product defects in a specially-designed transport network on the Internet. This allows an in-transit visibility absolute return, while the returns are forwarded to the center or distribution center to be discarded or repaired. A company that has a logistics service provider can create his own internal platform returns, but its cost may exceed US\$1 million. Another way to get your ‘money-back-returns’ policy is enforced by the company Bed, Bath & Beyond, which pays much attention to their clients so that they remained loyal to the company's products. BB & B accept products returned by customers who consider them inadequate without further explanation being required. Products will be replaced or a credit will be given to customers buying in other company stores. The return process begins when a customer, vendor, dealer or manufacturer finds something inappropriate in a product (expired, damaged, broken or wet). This finding needs to initiate a response, through

automated processes already established, to determine fault, return the transport, also the eventually physical process of redistribution or recycling and the final payment to the client. The idea of reverse logistics and return can be difficult, expensive and time-consuming for everyone involved, manufacturers, retailers and consumers. As an example, the Romanian Ministry of Finance announced on a press release that the European Commission, on 4 May 2011, has approved the introduction of reverse charge mechanism for domestic supply of the following products: corn; wheat; rye; sunflower; barley; sugar beet; soya and two-row barley.

The measure has to be further approved by the Council of the European Union, and will enter into force 10 days after such approval. The vendors' and suppliers' aim is to reduce the total cost, while increasing the supply chain visibility, through a management program using the Internet. A company monitoring their returns may reduce between 15 to 30% of losses granted by the correction process. And those savings can be even more significant. Shipping and handling costs may be partially or entirely eliminated by consolidating and also optimizing the delivery, in particular, the elimination of non-returnable products or materials that would be discarded before being loaded into the truck for the long journey home.

7. Threats for reverse logistics due to global instability

The network of facilities, processes and people involved in procurement of raw materials, production, distribution and related information flow are integrated in one complex chain. However, the consumer is not always the end of the chain and, a return flow of products should be added to forward flow into a closed loop supply chain.

Products that have failed, recalled products or obsolete ones, spare parts that still have some value, waste that must be disposed of and even unsold products become subject of take back system, as the responsibility for them shifts back to the producer. Suppliers and producers are facing new and complex challenges determined by several factors:

- Increasing competition in a global environment. Companies adopt more flexible sales policies and agree to take back unsold products from retailers.
- Consumer awareness on companies and their products environmental footprint.
- Legal constraints. Original manufacturer is now responsible for final disposal of the product.
- Shortening product life cycles. Products become obsolete more quickly and returns increase.

There are important characteristics that need to be managed in order to ensure an economically viable reverse supply chain, listed by Blumberg: uncertain flow of materials, diversity of returned products depending on the specific customer, time, value improvement, flexibility of the supply chain, coordination between multiple parties involved into the returning process.

When both forward and backward system are controlled by one company the result is a closed loop supply chain with positive effects on reducing costs of returns, transportation, warehouse expenses and time.

Beyond their choice between compliance with minimum legal requirements and adopt a pro-active green behavior, companies are facing their utmost challenge: survive the global financial crisis.

Aberdeen Group researches propose a holistic approach, integrating supply chain management and financial management of the company through sales and operation planning, in an attempt to resolve complex challenges and changes of global environment. They identify strategies for managing complexity within Global Supply Chains, and define best companies in terms of successful and operations planning and their core capabilities. The capabilities of best-in-class companies are: employees understanding the business strategy, products and processes, high level reporting designed for executive management, ability to consider previous results with regard to forecast accuracy and inventory, capability to express sales and operations planning in terms of revenues and margins. Research group considers key performance criteria to distinguish the best-in-class companies with regard to a successful sales and operations planning :forecast accuracy, complete and on-time orders delivered to customers, decreased cash- to- cash cycle, gross profit margins.

The most companies in best class category are focusing on holistic consideration of supply, demand and finance.

Capgemini Consulting conducted in 2009 a survey on 300 companies reflecting the impact of economic crisis on the activities and projects that supply chain managers will execute in the coming period. On top of the list are inventory optimization projects, followed by supply chain strategy and improve planning and supply chain visibility projects.

The focus of strategic actions has shifted in 2010 versus 2009 from inventory decrease to management of volatile demand and integrating the financial planning and budgeting process with the sales and operations planning.

Global market and recent effect of economic crisis impose changing the traditional supply chain network required to become more flexible and organized to deliver smaller and more frequent orders. More flexible supply chain could imply adapting manufacturing and packaging process for point of sale customization , outsourcing , regionalization of distribution network and horizontal integration.

Global market in which consumers seek on-demand goods and services can determine breakdowns in complex supply chain management. Consequently, companies should pay closer attention to business environment and assess risks associated with both suppliers and customers. Moreover, global instability and pressure to cut cost can lead to increased risk of supply chain disruptions.

8. Reverse logistics as a strategic weapon

When companies think about strategic variables, they are contemplating business elements that have a long-term bottom line impact. Strategic variables must be managed for the viability of the firm. They are more than just tactical or operational responses to a problem or a situation. Not long ago, the only strategic variables a firm was likely to emphasize were business functions, such as finance or marketing. During the late 1970s and 1980s, some forward thinking companies began to view their logistics capabilities as strategic. Although more and more firms have begun to view their ability to take back material through the supply chain as an important capability, the majority of these firms have not yet decided to emphasize reverse logistics as a strategic variable.

There is no question that the handling of reverse logistics challenges is an essential, strategic capability. In a celebrated case a few years ago, the McNeil Laboratories division of Johnson & Johnson experienced a very serious threat when someone poisoned several people by

placing cyanide inside unopened bottles of Tylenol, a Johnson & Johnson flagship product. This horrible act happened twice in the space of a few years. The second time, Johnson & Johnson was prepared with a fine-tuned reverse logistics system and immediately cleansed the channel of any possibly tainted product. Because Johnson & Johnson acted so quickly and competently, a mere three days after the crisis, McNeil Laboratories experienced an all-time record sales day. Undoubtedly, the public would not have responded so positively had Johnson & Johnson not been able to quickly and efficiently handle its recalled product in reverse through its existing system. Clearly, the Tylenol incident is an extreme example, but it illustrates how reverse logistics capabilities can be strategic and how they can dramatically impact the firm.

Another example of how reverse logistics can be used by retailers as a strategic variable is by keeping the consumer product fresh and interesting. According to a quotation from Dan Eisenhuth, executive vice president for asset recovery at the GENCO Distribution System, "Retailers used to liquidate to compensate for 'screw-ups'. Today they do it to stay fresh". The most important asset a retail store has is its retail space. To maximize the profit per square foot of selling space, stores have to keep the fresh goods visible. Grocery stores, with razor-thin profits of one to two per cent, realized long ago that it is critical to keep on the shelf only those products that will sell. Supermarkets have to turn over their inventories frequently to prevent spoilage loss and to maximize the return on their space. Now, non-grocery retailers have begun to adapt supermarket ideas to their own businesses.

Grocery retailers started building reclamation centers in the 1970s. These reclamation centers were places where old and non-selling products would be sent. In many instances, reclamation centers would be attached to a store. Later on, supermarket chains began shipping obsolete or bad product to one central reclamation center for processing. Reverse logistics is strategically used to allow forward channel participants – such as retailers and wholesalers – to reduce the risk of buying products that may not be "hot selling" items. For example, a record company developed a program to adjust return rates for various products depending on variables such as name recognition of the individual recording artist. This program produces a win-win environment for both the producer and the retailer, not to mention the consumer, who gets a broader selection. The program gives the company the ability to develop new artist franchises. Had the record company not implemented this program, its retailers would likely be willing to only carry "sure-thing" products.

Another example of the strategic use of returns is the electronic distributor that, during a period of volatile memory chip prices, created a program to help reseller's better control their inventory and balance stocks. By allowing resellers to return anything within a reasonable time frame, customers were encouraged to keep inventory low and make purchases just-in-time. Strategic uses of reverse logistics capabilities increase the switching costs of changing suppliers. A goal of almost every business is to lock customers in so that they will not move to another supplier. There are many ways to develop linkages that make it difficult and unprofitable for customers to switch to another supplier. An important service a supplier can offer to its customers is the ability to take back unsold or defective merchandise quickly and credit the customers in a timely manner.

If retailers today do not have a strategic vision of reverse logistics, it is likely that they will be in trouble tomorrow. Retailers in high-return categories – such as catalogs, toys and electronics – can easily go out of business if they do not have a strong reverse logistics

program. Given the competitive pressure on the North American retailers, the bottom line contributions provided by good reverse logistics programs are important for the firms' overall profitability.

<i>Role</i>	<i>Percentage</i>
Competitive Reasons	65.2%
Clean Channel	33.4%
Legal Disposal Issues	28.9%
Recapture Value	27.5%
Recover Assets	26.5%
Protect Margin	18.4%

Table 2. Strategic Role of Returns (Rogers & Tibben-Lembke, 1998)

For more than one mass merchandiser included in the research, the bottom line impact of good reverse logistics was large. Another large retailer found that 25% of the profit of the entire firm was derived from its reverse logistics improvements during its initial phase. In this research project, the research team examined several ways that reverse logistics could be used in a strategic manner. These strategic uses of reverse logistics are presented in Table 2.

8.1 Competitive reasons

Research respondents stated they initiated reverse logistics as a strategic variable for competitive reasons. Most retailers and manufacturers have liberalized their return policies over the last few years owing to competitive pressures. While the trend towards the liberalization of the return policies has begun to shift a little, firms still believe that a satisfied customer is their most important asset. A part of satisfying customers involves taking back their unwanted products or products that the customers believe do not meet their needs. Generally, customers who believe that an item does not meet their needs will return it, regardless of whether it functions properly or not. In an interesting example of this behavior, one retailer recently reported the return of two Ouija boards. Ouija boards are children's toys that, supposedly, allow contact with the spirit world. On one Ouija board, there was a note describing that it did not work because "... no matter how hard we tried, we could not get any good answers from the 'other side'..." The other Ouija board returner said that the reason for return was, "too many spirits responded to the Ouija board session and things became too scary". In both cases, the consumers were allowed to return these "defective" products. These competitive pressures appear to be, in large part, cultural. North American consumers and businesses are much quicker to return goods than those in most other countries. In fact, in many other countries, returns are never allowed. Some of the international managers and academics interviewed in the course of this research believed that if liberal returns were ever allowed in their country, both businesses and consumers would abuse them. However, it is clear that, in some countries, business return models are moving closer to the North American models. Over the next few years, it is likely that international firms will feel a strong pressure to liberalize their return policies and improve their reverse logistics capabilities.

8.2 Good corporate citizenship

Another set of competitive reasons is those that distinguish a firm doing well for other people. Some firms will use their reverse logistics capabilities for altruistic reasons, such as philanthropy. For example, Hanna Andersson, a US\$50 million direct retailer of infants and toddlers clothes, developed a program called Hannadowns. In the Hannadowns program, customers are asked to mail back their children's gently worn Hanna Andersson clothes. The company then will give those customers 20% off the purchase price of new Hanna Andersson clothes. For Hanna Andersson, this program has been very successful. In 1996, 133,000 garments and accessories were returned. These returns were then distributed to schools, homeless shelters and other charities.

In a second example, a shoe manufacturer and retailer, Kenneth Cole Productions, encourages consumers to return old shoes to Kenneth Cole stores during the month of February. In return for bringing in an old pair of shoes, the customer receives a 20% discount on a new pair of Kenneth Cole shoes.

In Figure 2, an advertisement for the Kenneth Cole shoe donation program is depicted. This program has been very successful in providing shoes to those in need. Nike also encourages consumers to bring their used shoes back to the store where they were purchased. These shoes are shipped back to Nike, where they are shredded and made into basketball courts and running tracks. Instead of giving consumer discounts, like Andersson or Kenneth Cole, Nike donates the material to make basketball courts and donates funds to help build and maintain those courts. Managing these unnecessary reverse flows is costly. However, these activities enhance the value of the brand and are a marketing incentive to purchase their products.

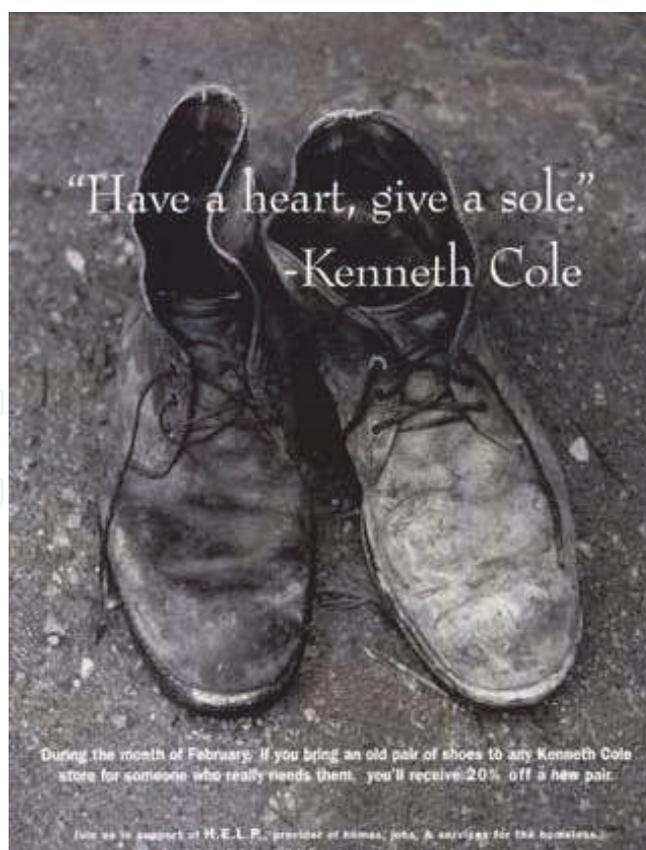


Fig. 2. Shoe Return Advertisement (Rogers & Tibben-Lembke, 1998)

Firms are using reverse logistics strategically. They are acting as good corporate citizens by contributing to the good of the community and assisting people who are probably less fortunate than their typical customers. While these policies may not be the reason all customers purchase their products, they are considered a marketing incentive. It is using reverse logistics to not just be environmentally friendly, but to promote customers at a real cost to their businesses.

8.3 Clean channel

Reverse logistics competencies are also used to clean out customer inventories, so that those same customers can purchase more new goods. Auto companies have fairly liberal return policies in place and a large reverse logistics network that allows them to bring back parts and components from their dealers. These parts are often remanufactured, so that value is reclaimed. If new parts held by the dealer are not selling well, the auto companies will give the dealers a generous return allowance, so that they can buy new parts that they really need, and therefore, better service the ultimate consumer. Most auto dealers, and many dealers in other industries, are family-based businesses with limited supplies of capital to invest in inventories. They often have less than state-of-the-art inventory management capabilities. It is in the best interest of the parts suppliers to clean out these inventories, reduce credit-line constraints and improve customer satisfaction.

8.4 Protect margin

Nearly 20% of the firms included in the research use their reverse logistics capabilities to protect their margins. This strategic usage of reverse logistics is closely related to “cleaning out the channel”. Firms cleanse their inventories and the inventories of their customers and their customers’ customers by using reverse logistics processes. Some firms are proactive in their management of the downstream inventory, as opposed to merely being reactive. These firms have programs in place that maximize inventory freshness. Fresher inventories can demand better prices, which in turn, protect the margin. While many companies have yet to recognize the strategic potential of efficient reverse logistics, it is clear that the tide is beginning to turn. There is more interest in reverse logistics now than ever before. Firms are beginning to make serious investments in their reverse logistics systems and organizations. One clear indication of the strategic importance of a business element is the amount of money spent on managing that element. Given the volume of returned products experienced in some industries, it is not surprising that the firms in those industries consider returns a strategic and core competency. It appears likely that companies in industries that generally do not place much value on good reverse logistics practices, will, over the next few years, find that making investments in their return systems will enhance their profitability. It is clear that for many firms, excellent reverse logistics practices add considerably to their bottom line.

One of the difficulties in managing returns is the difference in the objectives of the manufacturers and retailers. The distance between them on many issues can make the difference seem like a chasm. Whenever a retailer wants to return an item, the retailer and the manufacturer may disagree on any one of the following:

- condition of the item
- value of the item
- timeliness of the response.

Often, from the retailer's perspective, every product was sent back in pristine condition and any damages must have occurred in transit or must be manufacturing defects. The manufacturer may suspect the retailer of abusing the return privileges because of poor planning or of returning a product damaged by the retailer.

Once the condition of the item is agreed upon, the value that the retailer should receive must be determined. The retailer may claim full credit and the manufacturer may have a dozen reasons why it should not receive full credit. These issues can be difficult to sort out. After they have all been decided, the refund never comes quickly enough to suit the retailer. Retailer returns to the supplier are a method of reducing inventories near the end of a quarter. Retailers may suddenly move material back to the supplier, or at least notify the supplier that they are going to do so, and negotiate the details later. For similar reasons, manufacturers can be slow to recognize returns as a subtraction from sales. They may want to delay returns until a later accounting period or they may not want to credit the returned items at the full price. Sometimes, the retailer simply deducts the cost of the items from an invoice. Often, that invoice is not the same one for the goods being returned.

In the end, both parties need to realize that they have to develop a working partnership to derive mutual benefits. Obviously, neither one can live without the other; they need to work together to reduce the number of returns coming back and speed up the processing of those that do come back. Inefficiencies that lengthen the time for processing returns cause harm to both firms.

8.5 Zero returns

A number of firms are experimenting with zero returns programs. In a zero returns program, the manufacturer never again takes possession of a product once it has been sold. The retailer takes the responsibility for the exhibited product in accordance with the manufacturer's stipulations. In return, the retailer receives a payment that is intended to reimburse him for the cost of the returned items and for exhibiting the product. By removing the need to handle the returns, the manufacturer expects to save enough costs to more than offset the increased payments to the retailer.

Under some zero returns programs, the store always receives a credit for a certain percentage of sales, no matter how high the return rate. If the credit is 6%, and the actual returns are only 2%, the retailer is happy, because it still receives a 6% credit. When the opposite happens, the credit is set at 2%, and returns are 6%, the retailer loses. The idea behind the program is that the credit will be set high enough to exceed the average returns experienced by the retailer. However, given the power held by the large retailer chains, it can be difficult for the manufacturer to prevail against the retailer in this situation. Unfortunately, given the lax controls that many firms keep over their returns, the controls over zero returns programs are lacking. Some manufacturers accuse retailers of "double-dipping", taking payment from the manufacturer for destroying the product and then quietly selling the product out the back door to a secondary market firm.

8.6 Reverse logistics strategies

Depending on the life cycle of a manufacturer's products and the value of the products, firms will discover that different combinations of the above strategies will be needed to effectively and efficiently handle their returns. For high-value products with short life-cycles, such as computers, video games and camcorders, a POS system may be a very

efficient way for retailers and manufacturers to reduce the costs of fraudulent returns. However, the cost of the POS registration may make it difficult for many items to be managed in this manner. For example, the cost to track an individual low cost item, such as a pair of jeans, would probably prohibit using the POS registration.

Appropriate regulations, innovation-friendly and well designed should meet the following principles:

- Focus on results, not on technology
- Implementation of strict, not lax rules
- Regulations should be applied close to the end user, encouraging upstream solutions
- The staged use of commercial incentives
- Harmonization of regulations or convergence-associated domains
- Development of regulations with other countries at the same time or slightly before them
- The regulator should be more stable and predictable
- Soliciting at the outset of the companies involved in setting standards
- Developing technical expertise in the regulatory bodies
- Reduce time and resources consumed in the regulatory process (Porter & van der Linde, 2008).

Field	Countries with laws REP
Packagings	More than 30 countries (Brazil, Peru, Uruguay, China, South Korea, Taiwan, Japan, Czech Republic, Germany, Netherlands, Sweden, Hungary, Poland and so on)
Electrical and electronic	More than twelve countries (Belgium, Netherlands, Denmark, Sweden, Norway, Portugal, Italy, Switzerland, Germany - voluntary, China, South Korea, Taiwan, Japan, Brazil)
Vehicles	Netherlands, Denmark, Sweden, Germany, France, Japan, Taiwan, Brazil
Ready-made clothes	Sweden, Finland, Brazil, South Korea, Taiwan, Uruguay - Optional
Batteries	More than 15 countries (Austria, Germany, Netherlands, Norway, Brazil, Japan, Taiwan, Uruguay - voluntary measures, and so on)

Table 3. Countries where there are laws on "extended producer responsibility" for some areas (State of the World 2004, Worldwatch Institute)

9. The best-known product recycling programs in Romania

Depending on length, there are several types of distribution channels. Figure 3 shows a complex distribution channel in which there are more than two intermediary links between the producer and the consumer.



Fig. 3. A distribution channel

Reverse supply can be carried out on the same channel or a different one with one, several or no intermediaries between the customers and the producer. An effective method for collecting waste proved to be the granting of reductions by stores to customers who were bringing in various items (TV sets, refrigerators, phones, glass, PET bottles, and so on), also, the government was involved in such an action, through the program "Rabla" ⁱⁱ. One of the challenges that companies collecting recyclable products have encountered, together with the attention to environmental protection and the realization of projects without too high costs, was how to stimulate and encourage customers to bring in the goods that they no longer use. Thus, in Romania, the foundations for ideas on collecting various goods have been set.

At a press conference held in March 2011 at the Auchan hypermarket in Pitesti, the launching of a major ecologic campaign to recover PET bottles, entitled "Recycle and win", was announced. Adriana Gândilă (2011) said that this action, intended to be useful to all customers, was launched by Auchan Romania in collaboration with Greentech and Ropeco Bucharest. Thus, all the inhabitants from Pitesti were invited to bring to the Auchan store all the PETs that they did not need. They would then receive a voucher that could be used for shopping in the hypermarket. At the shop entrance, the device collecting the PETs was located near customer service, together with its instructions for use. Customers needed only to introduce the plastic bottle into a special orifice where it would scan the barcode on the bottle label to identify it. For each container, they would receive a shopping voucher worth 0.60 lei. The PET bottles collected by the machine would be recycled by the Greentech Company from Buzău.

Orange is another big player in Romania introducing a recycling program. This company allows customers with the Buy-Back service, even if they do not belong to the mobile network, to bring in the old telephone when buying a new one, a laptop or any other product available for purchase in the store. In exchange for the old telephone, the customer would receive a coupon with a value between 10 and 190 euros, depending on the terminal. The amount would be granted after analyzing the functionality of the device and could be used in Orange shops. Also, this company brings an online assessment service for the owned mobile telephone. Thus, from home, the client will know the value of his telephone. But if the telephone does not work or if the coupon value is too low, the customer could always bring it in top Orange stores for recycling. The conditions imposed in the regulation were:

- the client could bring in up to five telephones in one calendar year
- Orange has the right to exclude certain telephone models from the list
- the coupon is valid 15 days from the issuance date
- for a single transaction up to three coupons can be used, at least two of which must be issued in the name of the participant.

The Buy-Back Service was launched in Romania (Adriana Dahtide, 2010) in accordance with the initiative of the Orange-France Telecom to offer protection for telephones through the Orange Care program. In Bucharest, on 19 November 2010, the Environ Association, together with the District 1 City Hall and Romprest, started the campaign "Drive away the ghosts of old electronics". Approximately 2325 kg of WEEE were obtained in only three months through this program (Environ, 2007).

ⁱⁱEnglish translation of the program is „The crock”, and encourage the population to get rid of the old car, against value coupons to be used for purchase of a new car.

Environ Association guarantees, through its contractual partners, to achieve the highest standards of treatment and environmentally-sound disposal of waste electrical and electronic equipment (WEEE). The processes quality management system, the technical facilities with the most modern recycling installation, are essential attributes of recycling facilities in operation by Remat Holding, Stena DTM and GREEN WEEE.

Since 19 March, another recycling program called "Waste place is not in the house" was started. This currently operates only in Bucharest and the surrounding areas. Any customer may change the old TV for a new one and enjoy a discount up to 15% from large distributors in the market. The NGOs responsible for the collection of waste have launched programs to recycle old appliances. No matter the brand or whether or not they are working, the discount is obtained on the spot. The Romanian Recycling Association has also developed a program through which Romanians can send all electrical and electronic appliances to the recycling centers. Based on a receipt issued, they may receive a discount of up to 25% when buying a TV, refrigerator, washing machine or other appliance.

Recyclable materials	Largest companies
Plastic/glass/paper	Greentech
Electronic and household appliances/batteries	GreenWEEE
Metals	Groups Remat/ Rematholding
Light bulbs	Recolamp
Packaging	Eco-Rom Ambalaje

Table 4. The largest companies who recycle in Romania (Source: author)

Greentech SA is one of the largest plastic recycling companies in the Southeast of Europe and the pioneer of plastic waste recycling in Romania. It is present in every city in this country. It is a private company and was founded in September 2002. Through specific production procedures, Greentech SA is converting the plastic waste in raw materials for different applications. Processing consists of different stages, sorting, crushing, washing with hot water and special cleaning solutions, drying, pelletizing and packing into big-bags (Greentech, 2007).

Eco-Rom Ambalaje was founded in 2003. The founding members are, Argus, Ball Packaging Europe, Chipita Romania, Coca-Cola HBC Romania, Heineken, Mars Romania, Munplast, Pepsi Americas, Romaqua Group Borsec, Tetrapak, Unilever and Titan. Eco-Rom is the market leader of takeovers from economic agents of the obligation for recycling and selling packaging waste. The model is inspired by the European Union, where, on the basic products packaging, is printed a green dot – a symbol of the company dealing with recycling. In Romania, Eco-Rom makes certain that the companies they represent meet their collection and recycling obligations (Ecorom Ambalaje, 2003). Monthly, it receives from each company the amount of money for the quantity of waste that is put on the market. The proceeds are further invested in the collection system, transport and the recycling of packaging waste.

The mission of REMATHOLDING is to take over and efficiently process the scrap to protect the environment. For its collaborators, this company transports a wide range of scrap

(ferrous, non-ferrous, board and paper, hazardous waste, and so on), with a modern fleet (Rematholding, 2003). The EMS (Environmental Management System) is an approach, a tool, a set of procedures, a planned and organized way of doing things to manage an organization's interaction with the environment (Ionescu, Andreea, the SEPIC project). An EMS is like any other planning and implementing management system for continuous improvement. The same basic steps apply to enterprise management, production line management, commuting to work management or even economic development management. The EMS goes through the steps of a classical model of planning and implementation built in a spiral of continuous improvement. Using this model, an enterprise systematically examines its own activities, sets environmental objectives and targets a better environmental performance and implements environmental management programs or projects to achieve its goals. The EMS is integrated into the overall enterprise management system.

There are five key steps to ISO 14001 EMS implementation (ISO 14001, 2009):

1. Environmental Policy
2. Planning
3. Implementation and Operation
4. Checking and Corrective Action
5. Management Review.

After discussing the research results with experts and manufacturers, some important suggestions were concluded, among the most important were:

- Promote Ecodesign: Ecodesign is an activity that integrates the environmental aspects into product designs and developments. The integrated activities lead to continual improvements in the environmental performance of the entire product through technological innovations. Developing environmentally-friendly products causes a change in the product design, using two principles, (1) a design to extend the lifetime of product; it can be improved, repaired and re-used in products such as modular design and, (2) a design for recycling/design for disassembly after the end-of-life products, so that more can be recovered.
- Control hazardous substances, complying with RoHS and other regulations
- Set rules for disposing of electronics waste and consider more investments in recycling plants
- Propagate GSCM knowledge and encourage the use of environmentally-friendly goods
- Set a directly-responsible unit to take charge of only the electronics waste, which will increase the reverse logistics efficiency
- Promote the refurbishing and recycling through campaigns/activities to raise the reuse/recycle awareness in electronics consumption
- Expand product lifespan by designing for disassembly or upgrading computer specifications instead of buying new ones or using computer rental services
- Set a database unit to collect and record information about the production, import/export data and waste management (do traceability)
- Encourage team building and train skilled laborers for reverse logistics management
- Raise the applications in Extended Producer Responsibility (EPR). EPR is an environmental protection strategy based on the "polluter pays" principle, by making the manufacturer of the product responsible for the entire life-cycle of the product and the packaging they produce

- Promote Product Service System (PSS): services and product-service combinations are recognized as a potentially powerful concept for sustainable developments. A product-service system (PSS) is a new trend that has the potential to minimize the environmental impacts of both the production and consumption. Thus, more traditional material-intensive ways of product usage are replaced by the possibility for fulfilling the consumers' needs through the provision of more de-materialized services.

9.1 The limitation of chapter's research

The number of sample companies is too small and the data collected are too little. However, it reflects the predicament of the current Romanian household appliances industries, because the manufacturers are criticized for the lack of a special recycling department and also face the risks of wasted financial resources. Also, companies can cooperate with each other to set up one common recycling center for pooling all of their end-of-life products and sharing the experiences on reverse logistic product design. Future research should be focusing on how to stimulate and encourage consumers to take back their end-of-life products rather than leave them in the corner.

9.2 Further study

Further study needs to concentrate on the practical possibility for implementing a legislation method, for example, WEEE Directives and RoHS Directives in Romania, and what will be the reflections.

10. Conclusion

While much of the world does not yet care about the reverse flow of products, many firms have begun to realize that reverse logistics is an important and often strategic part of their business mission. There is much money being made and saved by bright managers who are focused on improving the reverse logistics processes in their company. It is clear that, while sometimes it derisively referred to as junk, much value can be reclaimed cost-effectively. While the efficient handling and disposition of returned products is unlikely to be the primary reason upon which a firm competes, it can make a competitive difference.

In Romania, such programs are beginning to expand. It also important to note that Romanian consumers realize the importance of having such programs and of cooperating with the authorities and companies that collect recyclable materials. However, besides its own interest in protecting the environment, the consumer wants to have an immediate benefit (preferably a financial one). Auchan and Orange were the first stores in Romania to have launched such projects, but the Government was the promoter of this idea, through the "jalopy" for cars.

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Over the past few decades the rapid spread of information and knowledge, the increasing expectations of customers and stakeholders, intensified competition, and searching for superior performance and low costs at the same time have made supply chain a critical management area. Since supply chain is the network of organizations that are involved in moving materials, documents and information through on their journey from initial suppliers to final customers, it encompasses a number of key flows: physical flow of materials, flows of information, and tangible and intangible resources which enable supply chain members to operate effectively. This book gives an up-to-date view of supply chain, emphasizing current trends and developments in the area of supply chain management.

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University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
www.intechopen.com

InTech China

Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

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