

The Reverse Logistics and its Position in Practice in the Czech Republic

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Abstract The paper deals with the importance of reverse logistics, its current position not only in the field of logistics, and its subsequent application in company practice in the Czech Republic. Originally, reverse logistics only focused on, and was therefore also connected with, product recycling. Nowadays the dominant value, sense of reverse logistics lies in the collection, sorting, dismantling and processing of used products, components, side-products, surplus supplies and wrapping material, where the main aim is to secure the new utilization or material improvement thereof in a way that is environmentally friendly and economically interesting.

Keywords reverse logistics, green logistics, supply chain management, push and pull strategy, consumer behavior of customers, environmental legislation.

I. INTRODUCTION

The term reverse logistics started to be used in the early 1990's but logistics we know for a long time.

Nonetheless, we still come across companies whose strategic - top management (i.e. the company management strategic level) has never heard of or does not take into consideration integrated logistics, or more precisely the supply chain management, i.e. reverse logistics which in the modern sense of logistics is viewed as a part of the supply chain management.

II. Supply chain management (SCM)

Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies [2].

The term "supply chain management" is slightly misleading and inaccurate as in reality we do not encounter only one supplier-customer chain but a large number of chains existing among suppliers and their subcontractors and final customers, consumers. These chains form the net, or, strictly speaking, they are grouped into the nets. From this perspective, it might be probably better to use the term "supply net management", which could be, however, rather confusing today – in the overtechnicalized era of computers and internet.

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Among the main features of supply chain management, the following might be classified:

- effective inventory management within the whole chain;
- effective cost management within the whole suppliers chain;
- sharing the visions and missions;
- sharing the risks and quittances;
- focusing on long-term time horizon;
- co-ordination at particular levels of chains;
- focusing on cultivation of relation development with crucial suppliers.

It is obvious that short-term targets of supply chain management are formulated in terms of increasing, improving productivity; decreasing inventory and continuously decreasing particular production periods. Long-term targets of supply chain management are the following: increasing consumer satisfaction, increasing the market share and earnings (trading income after tax) of all members of a particular chain.

During the realization of successful supply chain management, the following characteristics are vital:

- sharing information at all levels of suppliers chain;
- integration of all processes in suppliers chain;
- active cooperation in whole suppliers chain;
- definition of clear goals and expectations of all partners in suppliers chain;
- integrated behavior among consumers and suppliers.

III. Reverse logistics and analysis of the processes of reverse logistics

Companies in the Czech republic usually link logistics as such only with warehouses and transport; logistics departments are at the most entrusted with loading or dispatch activities. Which means that they do not view logistics as strategic distribution of resources – capacities (including production capacities), staff, goods and information, respectively logistics as a strategist of fully integrated chains, supply chains. And nothing indicates that companies deal with material back-flows from customers (flows of devalued, morally or physically outdated products, wrappings and sales returns), i.e. reverse logistics.

The term reverse logistics is interchanged with the term green logistics not only in company practice, but also in theory. This is because both logistics deal with some issues but it is essentially incorrect to view these terms as synonyms, because reverse logistics focuses on the movement of used goods with the aim to further enhance such goods and green

logistics focuses on minimizing the impact of logistics on the environment.

Rather extensive legislation, which on the one hand tries to protect the environment and on the other hand takes into consideration restricted economic sources, then especially leads companies to concentrate on reverse logistics. We can divide the methods that induce companies to behave in a more environmentally-friendly way and to engage in sustainable development into two basic strategies, namely the push strategy and the pull strategy [7].

The push strategy includes:

- environmental protection legal regularization;
- activities by non-profitable organizations aimed at environmental protection;
- employee environmental awareness;
- rival ecological behavior;
- association guidelines that take into consideration environmental protection;
- guidelines for the grant of loans taking into consideration environmental protection.

The pull strategy includes:

- environmental awareness of our customers;
- national, EU subsidy programmes for ecological activities;
- customer wishes and requirements;
- ecological prizes.

The main stimulus for the growing influence of reverse logistics not only in the logistics field is European standards the objective of which is to reduce at least a little the extensive wastefulness that goes hand in hand with modern consumption and which is left untouched by the market. The problem, in fact, is that back-flow is very costly, several times so in comparison with goods flow towards the customer (references state nine or ten times more). Another problem lies in the economical and ecological impossibility to recycle everything unnecessary that logistics chains and consumption spheres release (For example in the case of wrappings, costs of transport and energy consumption are limited.). In the end, costs are of course reflected in retail prices and may affect the competitiveness of products and suppliers [3].

Before characterizing the particular processes of reverse logistics, it is very important to realise which elements belong to reverse logistics, i.e. passive elements of reverse logistics:

- used (or unused) products from consumers.
- goods (incl. covers) returned from wholesales and retailers;
- waste and material losses during production.

The content and processes of reverse logistics of particular corporations are given by the character of the production of a particular corporation, so it means that the content of activities of reverse logistics of the particular corporations can be different.

Individual processes of reverse logistics can be generalized, i.e. it is possible to classify them theoretically into four basic

types (entering inspection; collection; sorting operation – separation, disposal – re-processing) [7]:

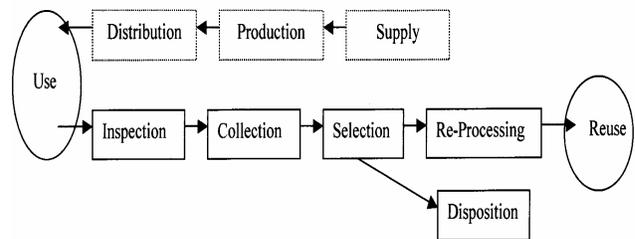
A) entering inspection: primary and very important process which determines whether a passive logistic element (product, material) will or will not be entered into the system of reverse logistics;

B) collection: gathering and collection of materials and products for subsequent processing;

C) sorting operation – separation: materials and products are authoritatively sorted according to the ways of their further use and processing;

D) disposal – re-processing: materials and products are disposed according to their character and the entering reason to the reverse logistics – i.e. reparation, removal of applicable functional parts, recycling, storage to the trash yard or burning up.

Graph 1 - Processes of reverse logistics [7]



The aforementioned, generalized four processes (entering inspection; collection; sorting operation – separation, disposal – re-processing) represent the main basis of the reverse logistics. It is clearly noticeable that also the activities strictly typical of "common" logistics are used for these four basic processes of reverse logistics - e.g. storage, transport, reloading etc.

For example, the purpose of storage in the reverse logistics is creating big volumes of secondary raw materials, waste and goods so that their transport could be economically profitable.

A) Entering inspection

Entering inspection means the verification of the returned goods, products and waste before entering to the subsequent activities of reverse logistics.

It is possible to declare clearly that a superior verification on entry is the first critical and crucial factor for efficient management of backward flow, thus logically influencing the profitability of the company. One of the possible and easy ways how to reduce the quantity of the returned goods and products is a strict, autocratic claim policy, which on the other hand can negatively influence the relations between companies and their customers. It is very difficult to answer this question and to take the decisions. Generally, it is possible to say that if the customers expect some considerable complications with claims and product returns they will also have bigger doubts when purchasing and they may not purchase the goods and products. The company after making

its reclaim conditions stricter may experience the drop in sales.

An improvement of the process of entering inspection can be the solution. Primarily, it is possible to improve this process of entering inspection by cultivation of the human potential (i.e. educating the responsible employees) and secondarily, by means of economic and non-economic stimuli which can support the entry of goods to the reverse logistics.

Among the economic stimuli, the following might be classified:

- backward repurchases;
- scraping - reduction in price of a new product in lieu of delivery of an old one;
- using deposit charges on returnable covers or even products, if we hire them in consideration of something;
- money reward for delivering the products intended for recycling or for reprocessing to the pre-determined delivery place;
- backward offtake free of charge or cheaper.

Among non-economic stimuli, the following might be classified:

- legislative steps;
- interchanging new products for old products;
- simplifying the possibilities of returning the goods;
- improving consumer awareness with regard to possibilities to return goods;
- leasing the products in lieu of sales of products.

B) Collection

The next stage is the process of collecting the goods, surplus products, fallout, and material, and their transport to the place where further examination and processing is being carried out. The activities which belong to this process of collection are: searching the desired entries, their purchase, free offtake, translocation to the place, where they will be stored. The above mentioned processes are to a certain extent required by the legislation, depending on the type of production. It might be said that there are 3 basic ways of the collection of used products from customers:

1. The products are withdrawn by the trader who sells them to the producer

2. Customers send the goods directly to the producers - customers can be motivated to act in this way by various instruments (free of charge postage, discount for a new product if you send the old one, etc.).

3. The third independent subject collects the products and then sells them to the producers or processors (e.g. picking-up points in cities and communities where the citizens bring the old products).

C) Sorting

In the next phase of reverse logistics, it is necessary to decide, how to deal with the passive element of reverse logistics, i.e. whether the passive element contains any economic value and how much of it and what the next place of its further processing will be. At this stage the flow of

passive elements is being branched. There is a general rule that the decision made at an early stage of processing is preferable with regard to costs.

For easier decision making, it is important to have information why a particular product entered into reverse system of logistics, i.e. cooperation with consumers, who return the products. A fundamental principle is the quality of the returned product as the basis of making the decision whether to reuse the product or remake it, recycle it or liquidate it. Especially in case of consumer goods, its physical inspection is really necessary.

D) Disposal – re-process

There is a large number of possibilities how to deal with the returned goods. Carrying them out is, however, influenced by the specific features of the product (e.g. construction of the product and the degree of its damage) and the economic criteria, i.e. whether it pays off or not to re-process the product.

The possibilities of processing are following:

- repairing - repairing has recently become more expensive in comparison with purchasing a new product, typically in case of consumer electronics. However, the role of repair services is still irreplaceable in the market and, moreover, its importance has increased in the last decade as the repair services have become a vital source of information for the departments of development and marketing; they can (and should) inform about some frequently occurring defects and problems of the returned products and they can (and should) serve as independent reviewers of legitimacy of the claims, etc.

- upgrade – upgrade is similar to repairing, the difference however is that for upgrade it is necessary to exert more work and the final product has higher quality and value than the repaired product.

- direct reuse – using without any repairs (usually only after cleaning and wrapping up), e.g. returnable bottles and other products where deposit charge is used.

- recycling – disassembling the products into their individual parts, which are subsequently reused after their processing; i.e. material which would otherwise end up as waste is used again as raw material for making a new product.

- reprocessing – reprocessing requires a considerable amount of work and therefore, we have to decide very carefully if this operation is economically profitable or not. It is very often necessary to disassemble the product to its separate components and then to check these components. Defective and worn-out parts of the products have to be replaced by new ones. The final product is then combined from both old and new parts and it is qualitatively comparable with a new product. That is why it is possible to sell it on equal terms as the new production.

- cannibalization - several defective products are used for assembling another product, which will be without defects.

It is very difficult to decide which procedure to use for a given passive element of the reverse logistics. This

fundamental, crucial step is given by the condition (shabbiness, functionality) of the product.

However, as in any other economic activity, it is very important to keep in mind economic and environmental costs and revenues. Generally, it is possible to say that the suitable products for recycling are those ones where it is possible to separate individual raw materials. On the other hand, reprocessing is suitable for the products of higher quality which are easily dismountable to individual modules.

Other factors, which fundamentally influence life-cycle of products, are:

- legislation - requirements on manipulation with dangerous materials or requirements on minimal percentage of recycling;
- existence of the demand for the modified products (parts and materials);
- supplies (existence of sufficient quantity) of suitable used products and parts;
- the existence of the developed technologies (i.e. accessibility) for particular possibilities of processing, manipulation etc.

In companies using both new and second-hand parts during the production, four basic processes can be distinguished:

1. Disassembly and testing – the input is formed by used and unnecessary products from customers, from distributors and producers. First, these are disassembled to parts and individually tested with regard to the quality. Accordingly, two flows are divided – the parts suitable for reprocessing and the other ones intended for upgrading, recycling, cannibalization or liquidation.

2. Process of testing and remanufacturing - functional parts intended for reprocessing are repaired, functionless and effete parts are replaced.

3. Process of manufacturing – the input is formed by new and gained second-hand parts. The new product (called serviceables) is made up from these parts.

4. Process of liquidation – the input is formed by useless parts (other kinds of their usage are not cost-effective).

Practically, the processes are much more complicated as the companies try to identify the particular flows which would be as complex as possible in the proces of increasing the value. Operating sequences differ considerably in the quantity of added value. Specific knowledge belong to these operations, which means that especially reprocessing is carried out within the company but recycling is provided by a specialized company. Out of the above mentioned possibilities of processing the material, recycling is most widespread one in practice. Theoretically, it would be possible to obtain higher economic value by using other procedures, the incurred costs (especially logistic costs) would be, nevertheless, so huge that it would not pay off, and therefore, recycling is the most widespread method of processing.

Another reason is also legislation as the companies in the Czech Republic are forced by means of legislation to material recycling, which means that currently, the market of the

subjects focusing on recycling is wider than in case of reprocessing, disassembling or upgrading.

IV. Conclusion

Generally reverse logistics is a very specific field. It has three passive elements - used (or unused) products from consumers; goods (incl. covers) returned from wholesales and retails and waste. The activities of reverse logistics is possible to classify theoretically into four basic types (entering inspection; collection; sorting operation – separation, disposal – re-processing).

The aim of this paper was to underline that the companies have to be initiative and have to themselves deal with back-flows from wholesales, retails and customers. Unfortunately the crucial stimulus for the development of reverse logistics is legislation which to a greater or lesser extent successfully attempts to induce companies to be environmentally friendly.

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