

REVERSE LOGISTICS IN ECOLOGIZATION PROCESS OF ENTERPRISE ACTIVITY

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Abstract The concept of "reverse logistics" as a new approach of the flow processes managing in the enterprise is revealed. The role of reverse logistics providing in ecologization process at enterprise is researched. Applied aspects of reverse logistics in business activities are showed.

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1. INTRODUCTION

For a long time efforts of cleaner production and distribution has traditionally been viewed as costly projects that do not add to the profitability of the invested capital to owners, but rather reduce it, forcing mankind to seek regulatory stimulating measures of overnational (Kyoto Protocol), national and local character. In some way this confrontation of efficiency and environmental goals had led to sustainable development, and thus influenced consumer behavior in B2B and B2C markets, which are increasingly paying attention to the consistency of raw materials and products. Processes, technologies, etc. with the requirements of the environment and society, sometimes resorting to regulatory decisions. Obviously, the ideal situation would be the attainment of the same orientation efficiency purposes and environmental friendliness of production, including the supply chain.

A new approach in the management of critical material and adverse flows in different areas of the logistics of the company is to distinguish the scope of reverse flows caused by the growth of consumer culture and consumers' knowledge, increase of social responsibility, active state control of production processes, associated with environmental pollution and depletion of limited natural resources (Дзюбіна, 2011, pp. 46-49).

According to the analysis of business practices, almost all enterprises produce excess goods and have returning products, waste of resources and materials that are the by-products of their activities and determine the need for ecological solutions in the enterprise and require the introduction and improvement of reverse logistics at the company to minimize the negative impact on the environment.

More and more entrepreneurs are showing interest in implementation of reverse logistics of the company. This approach to the management of flow processes are economically and environmentally reasonable because it carries a set of preferences. In view of the increasing pressure of environmental factors and recognition of importance of ecologization of the business, objectives of reverse logistics play an increasingly prominent role in modern business practices (Гриненко А., 2010).

2. CONCEPT AND ROLE OF REVERSE LOGISTICS

Important role in the successful implementation of supply chain Processes such as management forecasts, strategies replenishment, warehousing, transportation and exchange of electronic data play important role in the successful implementation of supply chain. However, there is one more significant process, the importance of which is still not fully understood by many manufacturers. It's about reverse logistics that is a part of the supply chain and includes all activities associated with the movement of goods back to the warehouse of the manufacturer or seller (Heljula, 2012).

Table 1 Different definitions of “reverse logistics”

Authors	Reverse logistics –
Drozd I.P., Kolomiyets V.I.	modern system of traffic management waste products that occur in the production of goods and human life. According to the basic idea of logistics, all stages of production and marketing process are united in a single movement process and transformation of product, comprising the step of recycling and further processing of wastes in order to reuse
Zueva O.M.	the planning, implementation and monitoring process of logistics trade flows from the sphere of circulation and consumption resulting from the reverse of distribution of finished products, dangerous, bad, stale and used products and packaging, and related information in order to restore or correct the value of recycling.
Hatoryn G.	activities designed to prevent the return of products to reduce the amount of material in the system of direct move to a smaller flow of material going in the opposite direction for the reuse and recycling of materials.
Stock G. R., Lambert D.M.	A part of logistics in general. This area is like a waste management, as a set of processes in reversing logistics includes recycling, recycling of excess or obsolete materials, purchasing of products that require recycling or recovery, cargo processing of returned products that has disadvantages and so on.
Sagaidak- Nikityk R.V.	traffic management system of waste products, arising in the processes of production, packaging, distribution of ready medicines and related information about financial flows in order to improve the efficiency of environmental protection and optimization of costs related to waste management.
Hryhorak M.Yu., Bondurovska A.O.	part of the logistics activities of industrial enterprises, which is a combination of raw materials, inventories, uncompleted process, finished goods, assigned to the specified time interval and sent in the direction from the consumption source to the source of creation in order to restore values, re-use or recycling.
Johnson D., Wood D., Verdlow D., Merphy- youn. P.	broad concept, encompassing logistics management and activities to reduce and eliminate losses of dangerous and safe products and packaging. It means reverse distribution, that is the movement of goods and information to the opposite direction from normal logistic activities. Reverse distribution is defined as "the process by which a company collects its used, damaged or stale products and / or packaging from end-users."
Luysons K., Jyllinghem M.	phenomenon, that is opposite to direct logistics, it is the process of planning, implementation and control of production and cost effective flows of raw materials, WIP inventory, finished goods, related information, moving from the point to the source of its consumption_ to the point of origin in order to restore the values or proper disposal.

Reverse logistics is a chance of nonconflict achieving of economic and environmental goals if it would be created, developed and implemented in appropriate way. As the data regarding the volume of business returns shows, along with the increase in product sales is the growth of the number and volume of inverse material flow, requiring new approaches to the analysis and management. Logistics management approach of reverse material flows means integration into a single management system elements that are in constant motion to minimize the cost and reduce the negative environmental impact.

For the purpose of effective management of the enterprise in the languages of the market economy, the development and increase of social responsibility, problem solving of pollution and ecologization of activities, the company needs to consider management processes of reverse flow not as isolated fragments, but as an integrated system and implement tactical and strategic planning of their optimization, reduction and prevention.

Scientists have different interpretations of "reverse logistics", but they are close on the content and do not contradict each other, but rather reflect different views of the authors on the same issue. Table 1 shows the most common definition of "reverse logistics" (Григорак, 2013).

Table 2 Differences between forward and reverse logistics

Forward logistics	Reverse logistics
Product quality uniform	Product quality not uniform
Disposition option clear	Disposition not clear
Routing of product unambiguous	Routing of product ambiguous
Forwards distribution costs more easily understandable	Reverse costs less understandable
Pricing of Product uniform	Pricing of Product not uniform
Inventory management consistent	Inventory management not consistent
Product lifecycle manageable	Product lifecycle less manageable
Financial management issues clearer	Financial management issues unclear
Negotiations between parties more straightforward	Negotiations less straightforward
Type of customer easy to identify and market to	Type of customer difficult to identify and market to
Visibility of process more transparent	Visibility of process less transparent

Following the idea of basic logistics, all stages of the manufacturing process, transportation and distribution of products are combined into a single process of circulation and transformation of the product. An important difference is that in the direct logistics the main sources of effect is the scale, but in reverse logistics - individual decisions. This is where we have different features and tools of a reverse

logistics and simply logistics. The main differences between these concepts are given in Table 2 (Partridge, 2011).

Operation of the supply chain is not possible without reverse material flows, but the very existence of these flows without the proper administrative process is not reverse logistics. And under the influence of the theory and practice of management backflow a the concept of logistics was expanded.

The most important step is to truly understand the product's impact, from the start of the manufacturing process until the end of its useful life. Although reverse logistics concerns only the reverse half of the supply chain, the implications for its success begin with the forward supply chain (Rogers, 2013).

As reverse logistics concerns direct and reverse material flows in the interconnection of components of one logistics system of any businesses, then it can be shown schematically as it is shown in Fig. 1.

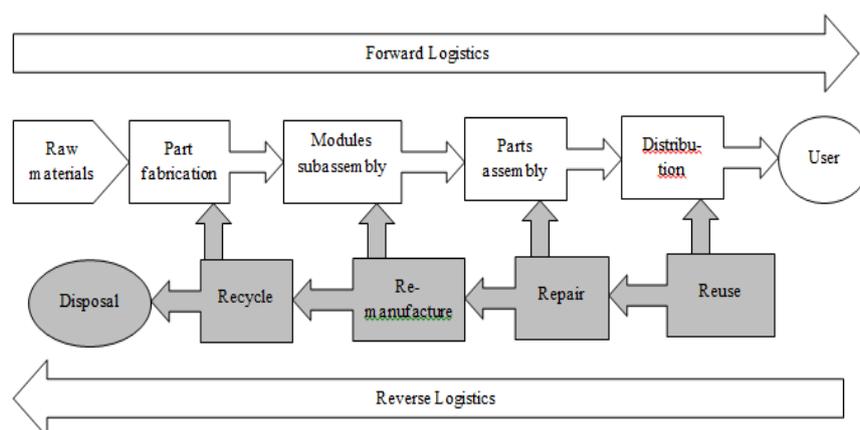


Fig. 1 Schematic illustration of logistics and reverse logistics

The reverse flow is different in a number of ways. First, product arrives whenever customers decide to return an unwanted item, or a retailer decides to pull slow-moving product, or a manufacturer institutes a packaging change, or any number of other possible causes. Second, the product is not all in new condition. Third, much of the packaging is damaged or shelf-worn. The end result: the company must look at each individual item and make a decision as to its disposition. In addition, there are methods that are unsuitable for solving common logistics problems - optimal batch production, the optimal route, inventory levels, supplier selection, etc. - all that complicates the management of reverse logistics compared to direct logistics.

Reverse logistics is connected with obtaining of significant competitive advantages, but to isolate and count them it is rather difficult, because unlike direct logistics flows, there is no generally accepted methods for identifying and calculating costs and losses while providing returns of products, packaging containers and more.

Hypothetically, there are two ways, first: getting cheaper raw materials, parts and components of the product etc. through processes of recycling and reuse (the so-called environmental impact proposals), and secondly, getting more loyal attitude of consumers, which may lead to increase of demand and therefore reducing component of fixed costs in the cost of so-called economic impact of demand) or their complex implementation.

In other words, there is a problem in implementing this system of a reverse logistics to achieve a state of «vested» (win-win) between production and environmental activities of the enterprise (Fertsch, 2010).

3. PRACTICAL ASPECTS OF REVERSE LOGISTICS AS ECOLOGIZATION PROCESS AT ENTERPRISE

Further, while companies struggle at times to find ways to make their supply chains more environmentally friendly, one subset of the supply chain is a part of ecologization process at enterprise: reverse logistics. Because reverse logistics by definition includes processes such as remanufacturing, refurbishment, recycling, reuse, and asset recovery, engaging in reverse logistics activities guarantees companies a certain level of green. All elements of reverse logistics have green implications. Reverse logistics addresses questions including: At a product's end of life, can some components be salvaged and reused? Can the materials be ground up, recycled, and made into additional parts? Recovering products, refurbishing goods, and pulling out parts such as precious metals that can be recycled or reused are green processes, and they bring a huge benefit to the environment (Rogers, 2013).

Environmentally-friendly manufacturing and distribution operations are growing in many parts of the world. There are three driving forces for this trend:

1. environmental laws and regulations are increasingly widespread,
2. consumers are becoming receptive to products made from recycled as well as virgin materials,
3. some companies are finding recycling, remanufacturing, and processing of used products, materials, and packaging to be good business that represents additional sources of revenue.

Companies need to understand what resources are used in their manufacturing process; whether any of those products are hazardous; which components can and cannot be recovered and reused. Then they need to examine the various waste streams and outputs associated with the process. This approach means thinking of reverse logistics at the beginning of a product's lifecycle, and designing with

its end-of-life disposition in mind. Designing a product in a way that reduces the amount of hazardous materials that are used and maximizes the use of those materials so they can have an extended life, will reduce the product's overall long-term environmental impact.

This "designing with the environment in mind" aspect of reverse logistics is key for global telecom supplier Ericsson:

- the company tweaked its designs to reduce operating energy consumption; reduce product weight and volume,
- remove banned or restricted substances,
- keep product disposal in mind throughout its product development process.

The philosophy has helped Ericsson decrease the raw material footprint of its mobile switching center products by 70 times over the past 10 years (Rogers, 2013). American Coors Brewing Company follows various ecologization activities to achieve both environmental and productivity benefits. The main of them (Kulwiec, 2006):

- a Coors partner purchases 79,000 tons of used glass, or cullet per year and 30 percent of the bottles recycled: 100 tons of cullet will yield 100 tons of bottles. The strategy of reducing weights of certain-sized bottles has yielded an annual savings of 72 million pounds of glass,
- a redesign of bottle boxes has cut the amount of corrugated uses by 8 million pounds annually. 90 percent of Coors' paper packaging is recyclable,
- the aluminum cans Coors places in the market contain approximately 40 percent recycled content. Recycling aluminum saves 95 percent of the energy needed to produce new metal from raw materials.

The electronic products industry also needs ecologization with regard to how its products and processes may affect the environment. One of the leading players in this industry, computer maker Dell offers consumers and businesses around the globe a number of ways to "retire" used computers in an environmentally-responsible manner. Dell proposes business and public institution customers with either value recovery or recycling: Value recovery includes refurbishment and resale of used computers or parts, with most of the proceeds being returned to the customer and performs environmentally responsible recycling of outdated or non-functional products and parts (Kulwiec, 2006).

Other good practices of reverse logistics ecologization implementing presented in Table 3 (Heljula, 2012).

Through effective reverse logistics operations, companies can also cut out inefficient returns processes that result in unnecessary transportation moves, helping to reduce carbon emissions and improve air quality.

Table 3 Good practice of reverse logistics implementation

Type of manufacture	Description
Engine manufacturer „Motormaster”	Disassembly of engines and use of spare parts from returned goods have been introduced, because life cycle of machinery lasts years and even decades, so the company should have a stock of spare parts for the technical support of products that have been sold much earlier. Thus, after bulkheading of the engines, the ones that could be updated _were being run in resale, and unsuitable or outdated ones were dismantled for parts.. On the one hand it saves resources, materials and energy for the production of new engines and spare parts, and on the other - to ensure a high level of after-sale service without any cost.
Manufacturer of household appliances „Henderson BT”	Introduction of high-performance information system on the enterprise, which enabled each return of household appliance (due to damage and malfunction) logically link with a specific client, the original purchase order, place and date of manufacture. These data is used to evaluate manufacturing defects, improving the process and development of new packaging that will prevent goods damage. As a result, it was possible to minimize manufacturing defects, reduce the need in spare parts due to faulty of the existing ones and eliminate the damage during the transportation and so on.

While much of ecologization aspects of reverse logistics focus on returned goods and how best to reuse or dispose of them in a cost-effective and environmentally friendly way, the reverse logistics process also has a variety of transportation and carbon footprint implications. Greening returned goods processes but ignoring reverse transportation concerns makes for an incomplete ecologization reverse logistics strategy (Rogers, 2013).

3. CONCLUSION

These arguments and examples to demonstrate fully the positive contribution, that brings increases of the efficiency of reversing logistics in the management process of the final product cost and minimizing of the negative impact on the environment. Indeed, quite recently, returned goods were subjected to disposal and write-off, and now repair and re-sale of them brings the company additional income and lower levels of negative environmental impact.

Although nowadays very few companies deal with reverse logistics issues. More and more manufacturers recognize the importance of this process and start to implement it. The successful implementation of a reverse logistics system is a strategic approach to this issue. It is very important to integrate all aspects of the enterprise functioning, which means ensuring closer links between the marketing department and logistics to obtain the even level of returns with the obvious

benefits for customers. Reverse logistics involves several departments and can not be treated separately from the rest of the business processes.

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BIOGRAPHICAL NOTES

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