

Re-PRODUCTION WITHIN THE FRAMEWORK OF REVERSE SUPPLY CHAIN MANAGEMENT

Sipahi E.

Dr, Business Administration/MoNE, <https://orcid.org/0000-0002-6495-4378>, Ankara, TURKEY

Abstract- In reverse logistics, the products that are completed in the life cycle are re-processed by raw materials, energy sources and so on. It is a process that makes it possible to use for purposes. It is an important structure of logistics system that provides economic benefits for companies.

It also makes it possible to eliminate wastes that cannot be destroyed in ecological terms and to evaluate them. It creates the appreciation and satisfaction of the customer by drawing the image of firm environmental company ". Reverse logistics is also made compulsory by legal regulations in many countries. In the first part of the study, the concept of logistics is explained by explaining the concept of supply chain management and theoretical information about reverse logistics is given. Reverse logistics was examined in the context of literature and the studies carried out in Turkey and abroad were investigated. In the second chapter, literature researches about the concept of reproduction, its scope and reproduction process, expectations and problems from reproduction are given.

In the third part of the study, the differences between forward and reverse logistics and the needs of the system are presented.

Index Terms- Supply Chain, Reverse Logistics, Recycling, Reproduction

I. INTRODUCTION

The ultimate goal of today's businesses is to increase customer profitability while providing customer satisfaction. Therefore, businesses are turning to different business models or restructuring their business activities in order to adapt to the competitive environment. Environmental awareness, which is a continuation of this process, is now one of the elements that companies should implement as a top model. Especially with the introduction of "green production" into changing business structures, the importance given to environmental protection activities increases.

Supply Chain Management (SCM) is an integrated management of material, information and money flow that enables the customer to reach the right product at the right time, at the right place. In this process, especially in the post-production period, reproduction, which does not contain any harmful elements such as waste and poison, provides enterprises with advantages such as cost savings, resource savings and efficient use of energy. In recent years, environmental concerns have increased the interest in reuse and make it compulsory. In this study; Due to the depletion of resources and their effects on ecology, it has been explained recently how the recycling of the returned products is provided to the producer with the effect of laws and economic factors.

In order to determine the environmental benefits and the problems experienced, suggestions were made on the operational performance of the reproduction applications in the light of the literature review.

1.1. Problem

Increasing competition and conscious consumers force businesses to change more and more. The most important fact of modern business management is that businesses should be in a supply chain.

With the reverse logistics system, which is one of the supply chain processes, redesigned applications to manage the product flow in order to efficiently reuse, recover, destroy and reuse resources are being adopted by enterprises more and more. In order to be able to implement reverse logistics activities, companies need to reorganize their systems, processes and decision-making processes.

1.2. Purpose and Importance of the Study

In this study; the aim of this course is to discuss how the recovery of the products returned to the manufacturer for any reason, the environmental benefits, and to make recommendations by examining the problems experienced in performing these functions within the framework of the literature. In today's world where the importance of information sharing in the supply chain is discussed, the concepts of production, distribution, planning and logistics should not be neglected.

Increasing importance of recycling and reuse issues in recent years is important because it is seen that studies on the protection of the environment, decreasing the resources used and legal regulations and studies on the concepts of back logistics and re-distribution are increasing.

II. LITERATURE

2.1. Supply Chain

Supply chain; suppliers, logistic service providers, manufacturers, distributors and retailers and includes materials, products and information flow is provided as a set of elements [1].

In other words, the supply chain is a network of producers and distributors that supplies raw materials, converts them into intermediate goods and final products, distributes final products to customers [2].

2.2. Supply Chain Management

Supply chain management; customers high-quality goods, fast and reliable way to deliver the lowest cost and provide competitive advantage to the business management [3].

The definition of supply chain management emerged when it became necessary to discuss the need for a new perspective and approach to managing integrated marketing channels. [3] Bartels (1976) argues that marketing and distribution are not different. Forrester (1958) confirmed that business activities within marketing channels are linked. Information, materials, money, labor, capital instruments can be shown as an example of the interaction between the currents [4]

Supply chain management is a hierarchical and strategic target for supply planning and demand, raw material resources and content, product production and parts, implementation of innovations and directives, customer and user [5].

2.3. Logistics

According to The Council of Logistics Management (CLM); covers the planning, implementation and control of the effective movement, storage and movement of materials, services and information flow in the supply chain from the starting point of the raw material to the end point where the product is consumed in order to meet the needs of customers " (<http://www.logisticsclub.com>, date of access 05.06.2019).

(The Council of Logistics Management) defined reverse logistics as follows: It is the process from the point where the semifinished products, stocks in production, finished products and related information are consumed to the planning, implementation and destruction of the return movements from the point to the first point "

(<http://www.kobifinans.com.tr>, date of access 06.04.2019).

2.4. Importance of Supply Chain Management

In the formation of competitive advantage within the scope of supply chain management, the integration of all these activities related to the development of supply chain relations becomes compulsory.

Success is no longer measured by a process. Competition is defined as a network of competition that collaborates with other enterprises throughout the supply chain [7].

2.5. Reverse Logistics Concept and Scope

Reverse logistics is a process that covers all logistical activities from the user-required product to the reusable product in the market [8]

When it is considered within the scope of reproduction activities, it is the process of collecting used products and parts from consumers and bringing them back to the centers where reproduction is realized [9].

Companies that have product return policies realized that treating returns on individual basis and separate from their main operations was not very efficient. By setting up dedicated reverse supply chains companies could not only make the return process, quick, efficient, and cost effective but also improve the customer satisfaction.

The TIC Reverse Logistics™ Process Innovative and Efficient



Figure 1. Reverse logistics processes

<http://www.inboundlogistics.com/cms/article/closing-the-supply-chain-loop-reverse-logistics-and-the-scor-model/>
(date of access 20.05.2019)

Figure 1 shows a comparison of reverse logistics with some of the priority features of advanced logistics:

Product Acquisition: involves collecting the product from the customers. The timing, quality and quantity of the returns need to be managed effectively to make the process profitable. Companies may work with retailers and other distributors to coordinate the collection.

Inspection and Sorting: Once the product has been collected from the customer it has to be inspected, sorted. Effective inspection and sorting will help in the disposition of the returned goods, and help reduce storage costs of returned goods.

Reconditioning: Based on the condition of the returned goods the company makes a choice of disposition, the item may be repaired, refurbished, remanufactured, disassembled for parts, or recycled. Companies may choose to send the returned goods to third parties for recycling. Repairs and

refurbishments may be made in house and products added back into the inventory.
http://www.forbes.com/2005/11/02/returns-reverse-logistics-market-cx_rm_1103returns.html (date of access 11.04.2019)

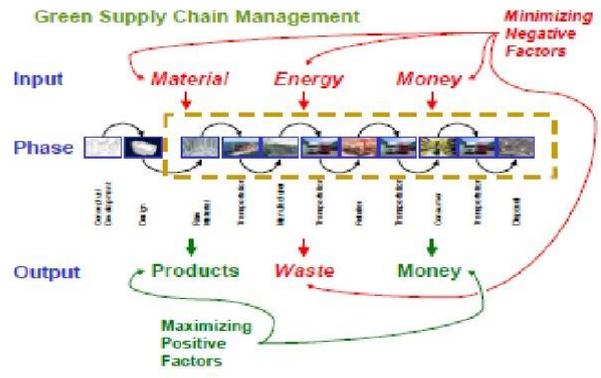


Figure 2. Reverse Logistics and Green Logistics

Reverse logistics refers to the processes for the transportation of products from their locations for recovery. Green logistics is to understand and minimize environmental and ecological impacts of logistics.

<http://www.inboundlogistics.com/cms/article/closing-the-supply-chain-loop-reverse-logistics-and-the-scor-model/>

(date of access 20.05.2019)

Some green logistics activities are considered reverse logistics. For example: the use of reusable transport containers and reproduction: both reverse logistics and green logistics activities.

Many green logistics activities are not related to reverse logistics. For example: Designing products in a way that reduces energy consumption and designing environmentally friendly packages are not reverse logistics activities. In Reverse Logistics, some products flow through the supply chain from the customer to the previous stages of production to the customer.

III. METHOD

Where appropriate, review articles represent powerful sources of information for practitioners seeking state-of-the-art evidence to guide decision-making and work practices [10]. Similar studies on

the subject of the research have been examined, and the most appropriate sources have been obtained which will guide the research throughout the study and will be presented later in the publication of the research.

Table 1. Reverse Logistic Studies from Past to Present

YEAR	AUTHOR	SUBJECT	TITLE	CONTENT
2001	Teunter RH [11].	Decomposition	A reverse logistics for inventory control	Valuation method A method has been proposed to value new, recoverable and recovered assemblies (products, parts, parts, etc.) in production systems.
2005	Dowlatshahi S. [12].	Decomposition	Reverse logistics production Strategic framework for the design and implementation of operations Reverse logistics (RL) is defined as a systematic process that manages the flow of goods / parts from the point of consumption to the point of possible recycling	Using the embedded theory approach, insights into their RL applications are concluded.
2007	Wang Ziping; Yao Dong-Qing; Huang Peiqing [13].	China B2C	A new position-stock with reverse logistics implemented in e-markets policy	On China's electronic markets, a single supplier and supply chain have been proposed
2008	Min Hokey; Ko Hyun-Jeung [14].	Network design	Party logistics service dynamic design of a reverse logistics network for providers	Regarding the location and allocation of repair facilities for reverse logistics

				(3PLs) a mixed integer programming model and a genetic algorithm that can be solved.
2011	Xu ; Hong [15].	Decomposition	By choosing the logistics mode iters the unused household appliances Working on.	Conversely, resources saved by the impact of logistics on household appliances prevent wasted equipment from becoming a major problem in front of us..
2011	Mukherjee Krishnendu; Sarkar Bijan; Bhattacharya Ardhendu [16].	Outsourcing	Reverse logistics environment supply planning model for reproduction system	A mixed integer programming model for reproduction is established. The goal is to maximize the total cost of savings to make.
2012	Kenne Jean-Pierre; Dejax Pierre; Gharbi Ali [17].	A loop in a closed loop supply chain production planning of production and reproduction system	The conditions were developed using optimal control theory based on stochastic dynamic programming.	The numerical algorithm based on numerical methods was used to solve the optimal control problem.
2012	Lieckens K; Vandaele N [18].	Network design	Multiple inverse logistics network design under uncertainty/Differential development algorithm	The heuristic method has been proposed for optimal solution of the processing method.

2012	Abdallah Tarek; Diabat Ali; Simchi-Levi David [19].	Decomposition	Sustainable supply chain design, closed loop formation and sensitivity analysis	Dependent place-inventory in unrestricted closed loop inventory models in forward and reverse supply chains decisions are introduced.
------	---	---------------	---	---

Note: Table 1 was created by the researcher.

IV. RESULT AND SUGGESTIONS

- The increase in the world population, the change in consumption habits, the inability to destroy the wastes cause both economic and ecological damages. Therefore, advanced logistics and reverse logistics systems should be maintained together in the production sector.
- Reverse logistics systems should be able to provide raw material requirements for many reproducible products and energy savings for companies.
- Establish new business areas in the market.
- As we have seen in the literature research, a lot of research and suggestions on the basis of general and sector have been presented in terms of separation and recycling. However, there is not enough research on network design.

REFERENCES

[1]– Kopczak, L.R. (1997), Logistics Partnership and Supply chain Restructuring Survey Results from the US Computer Industry, *Production and Operations Management*, Vol: 6, No: 3, s. 226-247.

[2]– <http://www.logisticsclub.com>, (date of access 05.06.2019).

[3] <http://www.inboundlogistics.com/cms/article/closing-the-supply-chain-loop-reverse-logistics-and-the-scor-model/>[3] (date of access 20.05.2019)

[4]– Svensson, G. (2002), The Theoretical Foundation of Supply Chain Management a Functionalist Theory of Marketing, *International*

Journal of Physical Distribution & Logistics Management, Vol: 32, No: 9, s. 734-754.

[5]– Chow JT, 2008. Bilateral laparoscopic adrenalectomy for corticotrophin-dependent Cushing's syndrome: a review of the Mayo Clinic experience. *Clin Endocrinol (Oxf)*.

[6]– Speakman, R.E., Kamauff, J.W. ve Myhr, N. (1998), An Empirical Investigation into Supply Chain Management: A Perspective on Partnerships, *Supply Chain Management*, Vol: 3, No: 2, s. 53-67.

[8]– Fleischmann, M., Jacqueline, M., Van Der Laan, E., Van Nunen, JOA.E.E. & Van Wassenhove, L.N. (1997), Quantitative Models For Reverse Logistics: A Review, *European Journal of Operational Research*, Vol: 103, No: 2, s. 1-17.

[9]– Ferrer, G. ve Whybark, D.C. (2000), From Garbage to Goods: Successful Remanufacturing and System Skills, *Business Horizons*, Vol: 43, No: 6, s. 55-64.

[10]– Paré G., Trudel M.-C., Jaana M., Kitsiou S. Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management*. 2015;52(2):183–199.

[11]– Teunter, R. H. 2001. Economic ordering quantities for recoverable item inventory systems. *Naval Research Logistics* 48 (6):484–495.

[12]– Dowlatshahi S. 2000. Developing a Theory of Reverse Logistics Interfaces, vol. 30 No. 3, *Sustainable Business (May - Jun.)*, pp. 143-155.

[13]– Ziping W. , Dong-Qing Y., and Peiqing H. A new location-inventory. *International Journal of Production Economics*, 2007, vol. 107, Issue 2, 350-363.

[14]– Min, H. & Hyun-Jeung K. (2008). The Dynamic Design Of A Reverse Logistics Network From The Perspective Of Third-Party Logistics Service Providers, *International Journal of Production Economics*, Volume 113, Issue 1, May 2008, p.p. 176-192.

[15]– Xu, J., L. Hong and Y. Li (2011). Designing of collection and delivery point for E-commerce logistics. *Information Technology, Computer*.

[16]– Mukherjee K., Sarkar B., Bhattacharya A. Comments on the erratum to "Supply planning model for remanufacturing system in reverse logistics environment" *Computers and Industrial Engineering*, 51, (2006, 279-287.

[17]– Kenne J.P., Dejax P. & Gharbi A. Production planning of a hybrid manufacturing–remanufacturing system under uncertainty within a closed-loop supply chain. *Int. J. Production Economics* 135, 2012; 81-93.

18 Lieckens, K. and Vandaele, N. 2012. Multi-Level reverse logistics network design under uncertainty. *International Journal of Production Research* 50 (1):23–40.

[19]– Tarek A., Diabat A & Simchi-Levi D. 2011. Sustainable supply chain design: a closed-loop formulation and sensitivity analysis, *Journal Production Planning & Control The Management of Operations*, vol. 23, p.p. 120-133 2012 -Issue 2-3: Sustainable Manufacturing.
<https://doi.org/10.1080/09537287.2011.591622>.

<http://www.inboundlogistics.com/cms/article/closing-the-supply-chain-loop-reverse-logistics-and-the-scor-model/>