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Raul Rza

Azerbaijan State University of Economics
Master's student
<https://orcid.org/0009-0000-6198-9658>
raulrza03@gmail.com

Reverse Logistics Processes Management Mechanisms

Abstract

The management of reverse logistics processes is of strategic importance in the modern business environment from both economic, environmental and social points of view. This process involves the return, processing, reuse or proper disposal of products and materials by the user. The main goal of reverse logistics is to ensure efficient management of resources, reduce costs, prevent time losses and at the same time minimize the negative impact on the environment. Management mechanisms combine various strategies to optimize the process. These include the creation of product collection and return systems, proper inventory and warehouse management, coordination of transport and logistics, as well as the application of information technologies. Effective management mechanisms allow companies to obtain additional value from returned products. For example, the repair, recycling or use of returned products in the production of new products reduces costs and creates an additional source of income. In addition, reverse logistics also serves to increase social and environmental responsibility.

Keywords: *management, logistics, administration, optimization, social*

Raul Rza

Azərbaycan Dövlət İqtisad Universiteti
magistrant
<https://orcid.org/0009-0000-6198-9658>
raulrza03@gmail.com

Tərs logistika proseslərinin idarəetmə mexanizmləri

Xülasə

Tərs logistika proseslərinin idarə olunması müasir biznes mühitində həm iqtisadi, həm ekoloji, həm də sosial baxımdan strateji əhəmiyyət kəsb edir. Bu proses məhsul və materialların istifadəçi tərəfindən geri qaytarılmasını, emal edilməsini, yenidən istifadəyə verilməsini və ya düzgün şəkildə məhv edilməsini əhatə edir. Tərs logistikanın əsas məqsədi resursların səmərəli idarə olunmasını təmin etmək, xərcləri azaltmaq, vaxt itkilərinin qarşısını almaq və eyni zamanda ətraf mühitə mənfi təsiri minimuma endirməkdir. İdarəetmə mexanizmləri prosesi optimallaşdırmaq üçün müxtəlif strategiyaları birləşdirir. Bunlara məhsul toplama və geri qəbul sistemlərinin yaradılması, inventar və anbar idarəetməsinin düzgün aparılması, nəqliyyat və logistika koordinasiyası, eləcə də informasiya texnologiyalarının tətbiqi daxildir. Effektiv idarəetmə mexanizmləri şirkətlərin geri qaytarılan məhsullardan əlavə dəyər əldə etməsinə imkan verir. Məsələn, qayıdan məhsulların təmiri, təkrar emalı və ya yeni məhsulların istehsalında istifadə olunması xərcləri azaldır və əlavə gəlir mənbəyi yaradır. Bundan əlavə, tərs logistika sosial və ekoloji məsuliyyətin artırılmasına da xidmət edir. Tullantıların azaldılması, resursların səmərəli istifadəsi və karbon izinin azaldılması şirkətlərin dayanıqlı inkişaf strategiyasına töhfə verir. Bu proseslər şirkətlərin bazarda rəqabət üstünlüyünü gücləndirir, müştəri məmnniyyətini artırır və brend imicini möhkəmləndirir.

Açar sözlər: *idarəetmə, logistika, idarə, optimallaşdırmaq, sosial*

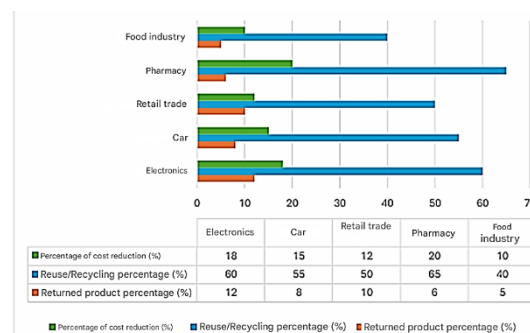
Introduction

The complexity of the business environment in the modern manufacturing and service sector and the increase in competition force companies to optimize their operational processes and implement sustainable management systems. In this context, reverse logistics plays an important role, as it ensures the efficient management of products and materials not only at the production and sales stages, but also at the return, recycling and disposal stages. Reverse logistics not only allows for cost reduction and efficient use of resources from an economic perspective, but also brings to the fore aspects of environmental and social responsibility. The mechanisms for managing reverse logistics processes aim to achieve optimal resource allocation at each stage of the product cycle, reduce time and costs, and at the same time maintain environmental sustainability. Among these mechanisms, product collection and return systems, inventory and warehouse management, transport coordination, the application of information technologies and performance monitoring play an important role. Effective management mechanisms allow companies to create added value from returned products, reduce waste and increase environmental sustainability (Alarcón, Estrada, de la Torre, 2021; Salas-Navarro, Castro-García, Assan-Barrios, Vergara-Bujato, 2024; Martins, Nunes, Melo, Brandão, Braga Júnior, Nagata, 2022; Rodrigues, et al., 2025; Kolomiyets, Rodchenko, Melentsova, Korol, Moskalenko, 2024; Lobacheva, Yadova, 2020). The relevance of the topic is manifested both at the global and local levels. Increasing consumption, rapid technological changes, and environmental problems are forcing businesses to focus not only on product production, but on all stages of its life cycle.

Research

Statistics in the field of reverse logistics process management show that the implementation of effective mechanisms significantly increases the operational efficiency of enterprises. According to studies conducted around the world, proper management of returned products reduces costs by an average of 10-20%, while at the same time increasing resource efficiency in the production chain by 15-25%.

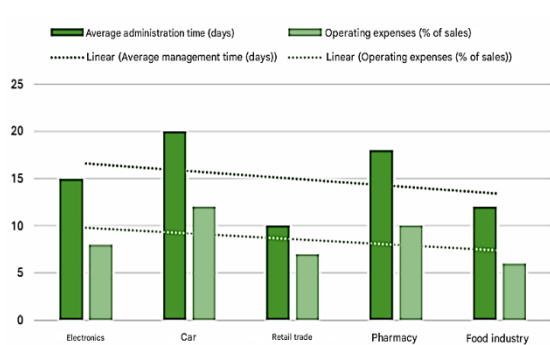
Graphic 1. Statistical indicators of reverse logistics processes in various industries.



Source: Compiled by the author.

Graphic 1 show that the management of returned products in the electronics and automotive sectors provides both economic and environmental benefits for companies. For example, in the electronics sector, 60% of returned products are recycled or reused, which leads to a reduction in waste and the creation of an additional source of income. In addition, various studies show that the application of information technologies in the management of reverse logistics processes can reduce operational errors by 25-30%.

Graphic 2. Return management time and costs by industry.



Source: Compiled by the author

As can be seen in Graphic 2, the time taken to handle returned products and the operating costs vary across industries. While the automotive and pharmaceutical industries have relatively long product handling times, this is due to the technical complexity of the products and the detailed verification of the return processes (Uriarte-Miranda, Caballero-Morales, Martinez-Flores, Cano-Olivos, Akulova, 2018; Alkahtani, 2021; Dabees, 2023; Dabo, Hosseinian-Far, 2023; Soares, et al., 2025; Suman Kalyan, 2024). In the retail and food industries, product returns are processed more quickly, resulting in lower costs. In the electronics sector, the average handling time is 15 days, with costs at 8% of sales.

Conclusion

Reverse logistics process management is of strategic importance in the modern business environment in terms of ensuring economic efficiency, environmental sustainability and social responsibility. Analysis and statistical indicators show that proper management of returned products allows for cost reduction, efficient use of resources and waste minimization. Management mechanisms applied in various industries – for example, product picking systems, inventory and warehouse management, transport coordination and the application of information technologies – significantly increase the efficiency of processes. Statistical analysis shows that IT systems reduce operational errors, transport coordination shortens delivery times, and warehouse and inventory management optimize both errors and delivery times. The combined application of these mechanisms allows enterprises to create added value from returned products, reduce operating costs and ensure environmental responsibility.

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