



CHALLENGES IN THE IMPLEMENTATION OF A REVERSE PACKAGING LOGISTICS SYSTEM: A CASE STUDY IN A RETAILER OF BUILDING MATERIALS

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ABSTRACT

The inquiries regarding reverse logistics have gained attention as a set of strategic, competitive, economic and ecological factors gain importance in the current context, as it presents solutions or alternatives that corroborate the expansion of the useful life of the packaging in the direction for recycling, and to collaborate with social actions aimed at promoting sustainability. The main goal of the article was to analyze the challenges faced in the implementation of a reverse packaging logistics program in a retail building materials company. Regarding the technical procedures, a field survey was conducted, considering a retail company located in João Pessoa, PB as an intentional non-probabilistic sample. Data were collected through participatory observation, unstructured interviews and closed questionnaires. The main variables analyzed were: Involvement of business leaders; acceptance of the reverse logistics program by the client companies; storage of materials; handling and transportation; sales, cost and value generation; and impacts on the routines of the implantation company. There were some difficulties, in which the lack of commitment of the builders and their employees in the segregation of the products stands out. However, there was evidence of improvements in interorganizational relationships due to the involvement of managers in the reverse logistics program.

Keywords: Reverse logistic; Construction; Sustainability.



1. INTRODUCTION

Global organizations are seeking endlessly more cost-effective strategies for their productive chains, which demand tactics to improve the relationship between the cost of logistics and sales (Sakai, 2010). In this configuration, it is noticed that organizations are inserted in a highly competitive, globalized environment and, in order to overcome many challenges, they need to look for solid actions aimed at reducing costs and at the same time offering quality in their products and services (Ende et al., 2015) in order to meet the needs of stakeholders.

It is noteworthy that, with the globalization of the economy, the importance of logistics has expanded dramatically, since the logistics costs related to transport represent a significant share of the total cost of goods traded in the domestic and foreign markets.

The statements regarding reverse logistics have gained space and attention as a tangle of strategic, competitive, economic and ecological factors gain relevance in the current context, since it exhibits resources or alternatives that contribute to increasing the useful life of packages directed towards recycling, and which cooperate with social actions that tend to the rise of sustainability.

In this perspective, it should be noted that the research on reverse logistics has become relevant as a result of the growth in the presence of reverse operations in recent times, due to financial or regulatory reasons. Companies and society have given special attention to this theme due to the growing socio-environmental awareness, given the competitive advantage that it provides (Fonseca et Souza, 2009). Based on the research carried out in the CAPES, SPELL and SCIELO journals, there are several studies on reverse logistics; however, there are no studies focused on small retailers of materials for civil construction, which was addressed in the research.

For Senthil et Sridharan (2014), reverse logistics is part of a broader supply chain management process called return management. A complete supply chain should include both direct and reverse logistics. Forward logistics operations subsequently increase reverse logistics activities and therefore play an important role in the success of organizations.

In the case of civil construction, Reverse Logistics is intended to deal with material flows, which start at the places where the products are consumed (construction site) and end at the places of origin (retail store, wholesaler or factory). The objective is to restore its value or reject in an appropriate way, to collaborate with the environment, society and economic and commercial factors that can be highlighted: the disposal of damaged products in the market; the

social attitude; and disposable, reusable or recyclable packaging (Luchezzi et Terence, 2013).

Retail has a strategic position in the value chain of the economy, since it is the intermediate sector between producers, clients and consumers. It is highlighted the prominent role of retail in the logistics intermediation of defective products, post-consumer goods and their packaging by making feasible the reuse, recycling or the return of these materials to their manufacturers.

The main objective of this article was to analyze the challenges faced in the implementation of a reverse logistics program for metallic and plastic packaging in a retail building materials company.

2. THEORETICAL REFERENCE

In this division is located the theoretical support that underlies the research. In this sense, the theoretical structure is the result of the exposition of the various authors in the study area, which allows understanding the similarities and discrepancies between them, providing the necessary grounds for the research.

Traditional Logistics and Reverse Logistics

Logistics is the process of planning, implementing and controlling the efficient and effective flow of goods, services and information relevant from the origin to the final consumer, in order to meet the demands and requirements of customers (CSCMP, 2007 *apud* Ballou, 2006). By means of this definition, it is understood the importance of the logistics in the present time, since it is approached as a strategic theme for the organizations that seek to minimize the time between purchase of inputs, production of goods and/or services and their delivery to the final destination, according to the desire of the customer, taking into account lower cost and higher quality.

For Bowersox et Closs (2001) *apud* Sakai (2005), the objective of logistics is to supply products or services at the place and time expected by customers, noting that the implementation of best logistics practices is one of the great challenges of organizations in global competition.

According to Santos et al. (2010) that quote Lacerda (2002), reverse logistics can be perceived as a complementary process to traditional logistics, because while traditional logistics has the function of taking products from suppliers to intermediate or final clients, reverse logistics must complete the cycle, bringing back the products already used from different points of consumption to their origin.



On the other hand, for Parral et Rubio (2014), reverse logistics is defined as a research area that deals with the management of the valorization of products, since they are no longer desired or end-of-life products by consumers, in order to obtain an economic value of the recovered product. Reverse Logistics has become a matter of great importance for organizations when it is perceived that the products that return to the companies are elements that are becoming decisive aspects in the process of managerial decision making, relating them to the design and development of their supply chains.

For authors such as Olorunniwo et Xi (2011), a firm's reverse logistics practices can have strategic implications, since its market positioning can close the business cycle, providing customers and partners with the ability to retrieve products, credits and several bonds that are traded. In sum, it should be noted that the reverse logistics actions have the fundamental objective of reducing environmental pollution and waste of material, as well as the reuse and recycling of products.

Reverse logistics is one of the means used to apply shared responsibility for the product life cycle. The National Solid Waste Policy (PNRS) defines the reverse logistics as an instrument of economic and social development qualified by a tangle of actions, processes and means to enable the collection and return of solid waste to the business sector for reuse, in its cycle or in other productive cycles, or other environmentally appropriate final destination. "(Ministry of Environment, 2017)

Reverse logistics has historically been linked to product recycling activities and environmental aspects, so it became important in companies due to the pressure of stakeholders related to environmental issues and could not be ignored. In general terms, reverse logistics has the fundamental aim of reducing environmental pollution and raw material waste, as well as products reuse and recycling (Santos et al., 2010).

Reverse Logistics planning covers virtually the same elements of a traditional logistic plan: service level, storage, transportation, inventory level, material flow and information system.

According to Lacerda (2002) apud Santos et al. (2010), there are six critical factors that influence the efficiency of the reverse logistics process: (1) Good input controls; (2) Processes mapped and formalized; (3) Reduced cycle time; (4) Information systems; (5) Planned logistics network; and (6) Collaborative relationships between customers and suppliers. The more combined these factors, the better the performance of the logistics system.

Reverse Logistics in Construction: reasons and causes

Civil Construction has risen in recent decades and, because of the fierce competition, organizations are looking for effective technical and economic actions. Civil Construction needs more agility with information processing to make decisions and, therefore, increase the importance of logistics. Due to this difficulty and the logistic variables in the works, it is possible to understand the problems and to name a series of techniques more suitable to be used, aiming at the need to improve the processes of direct and reverse flow, as well as the reduction of costs. With the increase of competitiveness in this sector, companies have the need to adopt production techniques with lower cost, maintaining their quality (Luchezzi et Terence, 2013).

According to Daher et al. (2006), the main reasons that lead organizations to act more strongly in Reverse Logistics are: (1) Environmental Legislation, which forces companies to turn back their products and take care of the necessary treatment; (2) Economic improvements in the use of products that return to the production process, rather than the high costs of correct disposal of waste; (3) The growing environmental awareness of consumers.

For Rogers and Tibben-Lembke (1999) apud Daher et al. (2006), there are other strategic reasons, such as: (1) Differentiation by service; (2) Distribution channel hygiene; (3) Profit Margin Savings; and (4) Recapture of value and assets recovery.

Whatever the causes that induce an organization to take care of the return of its products and/or materials and to try to manage this flow in a scientific way, this is the practice of Reverse Logistics. The logistic process is perceived as a system that unites the company to the consumer and its suppliers, because the logistics process is presented in terms of two interrelated efforts: (1) Value Added Inventory Flow and (2) Needs Flow of Information (Daher et al., 2006).

Brief Contextualization of the Trash

As people began to live in society, cities were formed and, consequently, an increase in population and waste produced with them. With this, the increase of garbage has been expanding and bringing serious and severe environmental problems in the present time. In this way, disposal sites for all this waste are rapidly depleting, requiring urgent action to reduce waste sent to landfills. It turns out that today's environmental problems have become an issue that transcends the capacity of the government and, in that sense, it needs to have the active participation of society in general (Oliveira, 2012).



The implementation of selective waste collection programs and reverse logistics programs corroborates to reduce the pollution caused by garbage. For the economy, it represents a reduction in the use of natural resources, in addition to obtaining financial resources from the commercialization of these materials.

Characterization of the Packaging Sector

According to Muraro et al. (2006) apud Oliveira (2012), the returnable packaging sector is one of the segments of reverse logistics that exhibits business earnings opportunity even in a civilization that further privileges disposable packaging.

According to the *Associação Brasileira de Embalagem* (ABRE - Brazilian Association of Packaging), packaging is a container that stores products transiently, individually or grouping units, having as main job to protect it and extend its life, making distribution, identification and consumption feasible.

Still according to ABRE, the packaging also allows the expansion of new products and ways of preparation with the use of home appliances. And faced with the competitive market environment, packaging has become strategic for business competitiveness with regards to packaging, distribution and sales efficiency. And through the population growth of the planet, packaging has become essential for optimization and the use of food and inputs demanded by society and to reduce global waste.

3. METHODOLOGY

The field research carried out is of an applied nature, since it generates knowledge destined to the solution of specific problems. The work was a descriptive investigation, given the objective of observing and analyzing the challenges faced in the implementation of a reverse logistics program in a retailer of materials for civil construction.

As for the technical procedures used, the article is considered, for Barbosa (2012), as a field survey, since data and facts were collected, as occurred in the process of implementation of the reverse logistics program.

The work can be considered a case study, observing that, for Gil (2009, p.5), a case study "can be considered a design in which several methods or techniques of data collection are used, as for example, observation, interviewing and analysis of documents". In addition to this, a bibliographic research was carried out from books and articles available in periodicals, annals, websites and libraries. The method is

inductive, aiming to answer the problem from the construction of generalizations, observing a specific concrete reality.

An intentional non-probabilistic sample was considered to be a retailer of materials for civil construction located in João Pessoa, PB. The data collection was done by:

- I. Participatory observation of the company's Reverse Logistics Program, from May 01 to 20, 2017, taking into account that the researchers are employees of the company and participated in all stages of the process, from: idealization of the program, creation of the project implementation and execution of the system;
- II. Unstructured interviews were carried out with the other employees of the retail company analyzed and with three managers of partner companies that participate in the Reverse Logistics Program of the company, with the purpose of discovering the level of involvement of the contractors with the company and the impact (perceived by them) that the Reverse Logistics Program of the retail company causes in society and its partners;
- III. Direct application of a closed questionnaire to evaluate the engagement of the employees (bricklayers, buyers, engineers) of the builders who were directly involved in the Reverse Logistics Program;

For data treatment a qualitative-quantitative approach was used, since the main objective of the article was to analyze the challenges faced in the implementation of a reverse logistics program. The main variables listed for observation and non-structured interviews were:

- a) Involvement of business leaders;
- b) The acceptance of the Reverse Logistics Program by the employees of the client companies;
- c) storage of materials;
- d) handling and transportation;
- e) Sale, costs and generation of value (monetary, socio-environmental and marketing);
- f) Impacts on the routines of the implantation company.

The data analysis was divided in two steps: (1) analysis of the quantitative data, where the information was tabulated in a Microsoft Excel worksheet, where the data were analyzed in order to obtain a qualitative and quantitative data collection, where simple calculations of basic descripti-



ve statistics were made and their respective percentages were extracted. And to analyze the obtained data, the theoretical reference of the research was used; (2) analysis of the qualitative data, which was done through content analysis, where the open answers provided by those involved in the research were transcribed in Microsoft word, and, a posteriori, categorized phrases and words, with the purpose of understanding the respondents' perspective.

4. RESULTS PRESENTATION

This chapter initially presents a brief contextualization of the researched company and then presents the data and analyzes of field research.

Company Characterization

For obtaining the results of the research, a multi-brand technical resale of the retail trade of materials for civil construction, located in the city of João Pessoa, was analyzed. The company was founded by 4 partners in October 2013, who do not actively participate in the routine of the company; they have participation exclusively in strategic decision making. The decisions of tactical/managerial level of the company are in the exclusive responsibility of the Administrative Manager of the company.

Currently, the company has a workforce of 6 employees: 1 Administrative Manager, 1 Administrative Analyst, 2 Sellers, 1 General Service Assistant and 1 Driver. The company's marketing sector is outsourced.

Currently, 95% of the company's main clients are construction companies and only 5% of its clients are individuals. Sales are carried out by the company, which aims to present the best solutions for its customers, aiming at the best cost-benefit ratio in each specific case. All sales focus on the provision of technical assistance and follow-up of its customers, from the application of the products to the delivery of the work.

Field research

The company's traditional logistics process is the company's own, and follows the internal policy of delivery, exchange and return of products, which was established according to the laws: Municipal No. 12,170, dated September 15, 2011 and State No. 12,170, of June 27, 2014. Such policy aims to better serve its customers. The company offers the delivery of the goods free of charge to its customers, as long as they comply with some internal rules of the company, as mentioned below:

1. Make minimum purchase in the amount of R\$ 300,00 for delivery in João Pessoa;
2. The delivery date of the goods purchased by the Client is up to 48 hours for the city of João Pessoa for goods available in storage;
3. In the case of purchases whose delivery distance is greater than the usual route, the following procedures will be adopted:
 - Metropolitan Region of João Pessoa (Bayeux, Santa Rita, Conde, Cabedelo) -The merchandise will be scheduled for delivery to be made within 72 hours after the date of purchase.
 - Region of Campina Grande and adjacent regions - Delivery of the goods is fixed for the days of Tuesday and Friday, or according to logistics schedule, where the minimum purchase value for delivery is R\$ 600.00.

The delivery flow follows the following order: (1) customer purchases the goods; (2) the business sector of the company creates the delivery routes; (3) purchase: invoice is issued and the form of payment is agreed; (4) delivery of the merchandise is carried out at the place indicated by the customer.

The deliveries of the company are carried out following routes of proximity and purchase order: customers who have made purchases for the longest time receive before, always paying attention to the established deadline of delivery.

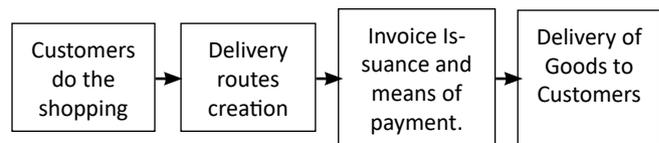


Figure 1. Traditional Logistics Flow of the Company

The Reverse Logistics Program of the company was designed by the Administrative Manager of the retailer studied, together with the company's management, in order to improve the company's image and partnership with consumers, since the partner clients that adopt the Program Reverse Logistics of the company earn a discount percentage on future purchases. Values vary according to the quantity and types of packages returned. As the metallic packaging has higher market value, it also represents a higher percentage of discount to customers (table 1).



Table 1. Percent discount per unit of package returned

Table% of discount per unit	
Balde Plástico	0,5%
Metallic Drum	2%

Source: Elaborated from research data, 2017.

The company's Reverse Logistics Program also aims to strengthen relations with its consumers, promote an improvement in the environmental conditions of the planet, bring to the employees of the companies involved an environmental awareness and, consequently, bring a financial return to be donated to NGOs located in the city of João Pessoa.

The company's Reverse Logistics Program works as follows: (1) customer informs the company the time, location and quantity of packaging (plastic buckets or metal drums) available for collection; (2) The company schedules one day of the week exclusively for collecting the packaging; (3) The company estimates the number of packages that will be collected and contacts the partner companies that purchase the packaging in order to avoid cost with packaging storage; (4) The collection of the packages is carried out and they are directly taken to the company that will buy the material; (5) The profit obtained from the sale of the goods is reversed in the purchase of goods such as: food, diapers, toiletries, which are delivered to NGOs.

Analysis of variables

- a) Involvement of business leaders: In the research, it was verified that the leaders of the companies involved (three construction companies and the retailer) see the Reverse Logistics Program positively, for the following reasons, cited by them: other builders due to associated image, financial return (for gaining discounts on their purchases).
- b) Acceptance of the Reverse Logistics Program by the employees of the client companies: There was difficulty of acceptance by the employees of the partner companies, since it was found that they used the packaging for personal purposes (sale of metal packaging or use of buckets).
- c) Storage of materials: The Company does not carry out storage of the collected materials, since the deliveries are carried out in a programmed way and soon after they are delivered to the company recycling partner.
- d) Handling and transportation: Handling of empty containers is carried out manually by logistics offi-

cial. The transportation from the customers to the recycling center, receiver of the materials, is carried out in the company's own vans.

- e) Sales, costs and value generation (monetary, socio-environmental and marketing): It was not possible to calculate monetary values, due to the time of project implementation, however it was perceptible the value added to the images of the companies participating in the project through virtual media that linked the socio-environmental commitment made to the brands.
- f) Impacts on the routines of the implantation company: The project, in its initial phase, required special attention of analyst, manager and marketing team to define the flows and approach. It was estimated that, with the growth of the project, it would be necessary to allocate a trainee to take care of it, but that this could be borne without burden to the company, through the packages sold.

5. CONCLUSIONS

Although reverse logistics bring financial and marketing benefits to companies and environmental benefits to the planet, it is not a policy seen with priority by micro and small businesses. With the study carried out, it was noticed that the commitment of the leaders was undoubtedly the most important of the presented variables so that the implementation of the project was successful. The dissemination of socio-environmental awareness was carried out through lectures in conjunction with them, which resulted in the successful collection of packaging.

The study also highlighted opportunities to expand the program through the involvement of cooperatives to create handicrafts, which could be a source of income for low-income families.

There was a limitation on the number of participating companies due to the time available to carry out the project as a whole. It is suggested to re-evaluate the program in a longer period of time to obtain more data regarding financial gains and to discover possible failures in the course of the progress and, thus, to propose improvements.

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