THE INTERNATIONAL JOURNAL OF HUMANITIES & SOCIAL STUDIES

Product Disposition and Environmental Sustainability in Food and Beverages Companies: Success Determinants for Reverse Logistics System

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Abstract
Reverse logistics goes beyond a customer returning a product at a returns collection centre to involving a more complex and challenging activity like product disposition which can affect the environment if not well taken care of. Therefore, the study examined whether the company's decision-making process towards ensuring environmental sustainability influences the selection of disposition strategy (ies). With food and beverages companies in Lagos State, Nigeria being the focus of the study, data were gathered from both primary and secondary sources while the paired samples t-test was employed for the purpose of data analysis.
Findings thus revealed that to a large extent the need to protect the environment influences the kind of disposition option(s) selected by companies although other factors such as savings attached to such disposition options, regulatory factors as well as the non-financial considerations like protecting the company brand name could also influence their choices.

Keywords: *Reverse logistics, decision making, sustainability, customer loyalty*

1. Introduction

Sustainability, climate change, and control of waste disposal are common topics today in the media, in the state and federal regulatory agencies, in corporate boardrooms, and even among consumers. These discussions are beginning to create a sea change in the world of reverse logistics. As companies begin to respond to new "green" directives, hire staff that have "sustainability" experience, and begin to build a strategic plan for reducing their impact on the environment and becoming more socially responsible, they are looking to all functional areas to respond. Hence, the reverse logistics function that has often been neglected even in leading-edge companies has now become highly visible as the main product return and disposal function.

The need for ecologically-sound, "green" handling of end-of-life parts and product is not a new concept. Being aware that products and parts may contain hazardous materials and, therefore, should not be deposited into landfills is also not new. Reducing touch points, handling, and cost is also partof common thinking when dealing with material that needs repair or has lost its value and appeal to the consumer. What is new is that all of these activities must now meet the needs of the very wide corporate umbrella of "reducing a company's carbon footprint," as well as being "green," "sustainable," and "socially responsible." As companies launch new environmental initiatives to mitigate their impact on the world's climate, they are finding that mishandling reverse logistics may leave them open to fines from regulatory agencies, and to a potentially negative reaction from customers that could affect future business (Rodriguez, 2008).
With a dearth of research on product disposition and the need for environmental sustainability through the reverse logistics process in Nigeria, this study was therefore proposed to examine how decision-making influences a company's choice of reverse logistics strategy and the need to sustain the environment.

1.1. Proposition

That the food and beverages company's decision towards ensuring environmental sustainability has no significant effect on the disposition strategy (ies) adopted by the companies was proposed for the study.

2. Literature Review

2.1. Reverse Logistics and Environmental Sustainability

For years the producers' responsibilities were finished when the product was on the shelves in the shop or when the guarantee period was over. Supply chain (SC) management was perceived as the planning and control of the flow of goods from the sourcing base to the final consumers, accompanied with the necessary information and money for the independent entities along that chain. Nowadays manufacturers need to take into consideration the post-consumption

phase of their products, the so-called end-of-life phase (EOL): the environmental burdens incurred during different stages of the product transfer from manufacturer to final user and then to the disposal site.

The interest in environmentally friendly supply chain management has risen considerably in recent years. This can be seen by the number of initiatives taken by companies. Brand-owners are very often perceived to be responsible for environmental problems in the entire supply chain from the sourcing base to end-of-life recovery issues. It is expected that the manufacturers should reduce sources of waste and pollution throughout their entire SCs, across multiple entities, upstream (suppliers) and downstream (distributors and consumers). An environmentally friendly supply chain connects with partners who should make managerial decisions with regard to environmental consequences. Although, companies are forced to adopt ecologically responsive practices to meet legislative requirements but they can also benefit from "green" behaviour (Paulina & Campos, 2012).

Furthermore, there are a number of problems covered within the framework of environmentally friendly supply chain management but in our opinion; one of the main issues that need to be addressed by managerial decision-making is closing the materials flow loops: including issues related to the collection of used products, their recovery and reuse.

Sustainability has been seen to be the need to meet the needs of the present without compromising the needs of the future generations. As stated by (Rodriguez, 2008), the need for ecologically-sound, "green" handling of end-of-life parts and product is not a new concept. Being aware that products and parts may contain hazardous materials and, therefore, should not be deposited into landfills is also not new. Reducing touch points, handling, and cost is also part of common thinking when dealing with material that needs repair or has lost its value and appeal to the consumer. What is new is that all of these activities must now meet the needs of the very wide corporate umbrella of "reducing a company's carbon footprint," as well as being "green," "sustainable," and "socially responsible".

As companies launch new environmental initiatives to mitigate their impact on the world's climate, they are finding that mishandling reverse logistics may leave them open to fines from regulatory agencies, and to a potentially negative reaction from customers that could affect future business. Working with the wrong partner can also be costly if that partner is not diligent in his or her own environmental practices.

Thus, a company's decision towards ensuring environmental sustainability goes a long way in influencing the kind of disposition strategy (ies) that may eventually be selected by the company since choosing an appropriate disposition option helps to minimize the environmental impact of returns.

2.2. Hierarchy of Disposition of Products Framework

The hierarchy of product disposition developed by {Carter & Ellram, 1998)as shown in fig.1 indicated that the resource reduction should be the goal in the reverse logistics process. Resource reduction refers to the minimization of materials used in a product and the minimization of the waste and energy achieved through the design of more environmentally efficient products. Consequently, both the forward and reverse flows of materials will be minimized.

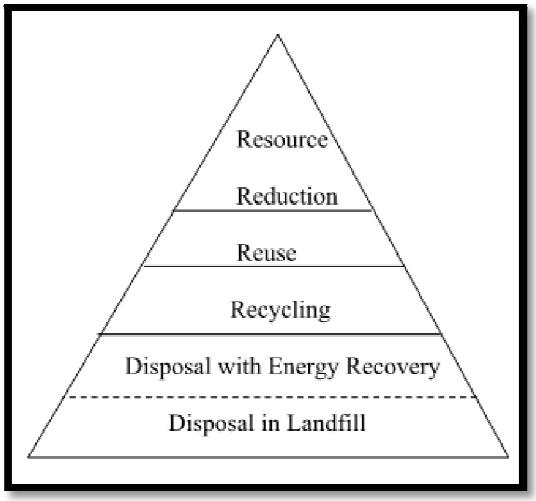

Figure 1: The Hierarchy of Product Disposition
Source: Carter and Ellram (1998)

Once the resource reduction option has been exhausted, the company should try to maximize the reuse and then consider recycling. Disposal should be the last option (Kopicki et al, 1993) also provide support for the hierarchy by noting that a reused item can reduce purchasing, transportation, and disposal costs while a recycled item will often reduce only disposal costs. It should also be noted that the categories within the hierarchy are not mutually exclusive.

2.3. Decision Making and Selection of Disposition Strategies

Regardless of how carefully products are designed, manufactured, and distributed with the goal of reducing a company's "carbon footprint," if reverse logistics activities and the selection of disposition strategies to be adopted by the company are not carefully managed, a company's image could be detrimentally affected.

Customers may see a company as negligent or thoughtless based solely on its handling of returnsand its disposal of products. Choosing inappropriate disposition options can also be costly if the management is not diligent in their decision making as more stringent regulations are being enforced.

3. Methodology

The study was carried out in Lagos State, with a focus on the food and beverages companies in the state. Lagos state is the most industrialized state in the country and the choice of the food and beverages companies however is based on the ubiquitous nature of these companies in the study area, with their products being consumed on a daily basis. A total of thirty food and beverages companies purposively selected formed the sample size of the study. Data were collected from both primary and secondary sources. Based on 80% response rate from the respondents, data was analyzed using the paired samples t-test.

4. Result and Discussion

	Mean	Std. Deviation	t	df	Sig(2-tailed)
Pair 1 Disposition strategies -Decision influence	8.511	11.048	2.017	28	.000

Table 1: Paired Samples T-Test of the Influence of Company's Decision in Ensuring Environmental Sustainability on Disposition Strategy (Ies) Adopted
Source: Author's Computation (2019)

Effect size for the paired-samples t-test using Eta squared is given as:

$$\frac{t^2}{t^2 + N - 1} = \frac{2.017^2}{2.017^2 + 30 - 1} = \frac{4.068}{4.068 + 30 - 1} = \frac{4.068}{33.068} = .12$$

Decision rule: To interpret the eta squared values the following guidelines from Cohen (1988) was used whereby 0.01=small effect, 0.06=moderate effect,0.14=large effect.

A paired-samples t-test was conducted to evaluate the impact of the company's decision in ensuring environmental sustainability on the disposition strategy (ies) adopted by the companies. The result from Table 1 showed a significant effect at t = 2.017, p<.05. This implies that the drive to protect the environment influences the kind of disposition strategy (ies) selected by these companies. The eta squared statistic (.12) however indicated a moderate size effect of the company's decision influencing the disposal methods used. This goes to say that other factors such as savings attached to such disposition options could also influence their choices, regulatory factors as well as the non-financial considerations like protecting the company brand name.

5. Conclusion and Recommendation

The study set out to examine whether a company's decision-making process towards ensuring environmental sustainability influences the selection of disposition strategy (ies). However, based on the findings of the study it was concluded that to a moderate extent, the drive to sustain the environment influences the disposition option(s) that may be selected by the company while other factors could also influence their choices.

Reverse logistics though is quite challenging to manage; nevertheless, the opportunities outweigh the challenges. Companies are therefore encouraged to be more responsible by giving priority to the environment either at the production phase by using raw materials that are environmentally friendly or at the disposition phase by choosing the most appropriate disposition option for their products as this will empower value creation through customer satisfaction since customers nowadays are becoming more conscious not only of their health but also sustaining the environment around them, as these will further yield financial results and customer brand loyalty for the company.

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