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EXTENT OF ADOPTION OF REVERSE LOGISTICS WITH REFERENCE TO PRODUCT REUSE

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ABSTRACT

Reverse logistics is referred as a vital part of the logistics management skill and includes the activities that are related to return, reduce and discarding of end-of-life products. It mainly involves the flow of information for the consumption end to the producer end and is also known as a backward end logistics process. It includes all the functionaries related to Product Recovery Management and is regarded as the vital component of all the manufacturing companies.The conduction of reverse logistics activities like gathering, recycling, discarding and managing so that sustainable production and manufacturing process takes place in the community. The implementation of the reverse logistics process helps in preserving the environment by promoting re-utilization of the used products, recovery, recycling and effective use of the resources resulting in the reduction of waste

Keywords : Reverse logistics, Product Recovery Management,

1. Introduction

Conventional supply chain perspectives consider a set of processes that are driven by customer demand that convey goods from suppliers through manufacturers and distributors to the final customers. However, this is not where the story ends. Physical goods do not simply vanish once they have reached the customer. Nor does the value incorporated in them. Therefore, many goods move beyond the conventional supply chain process thereby generating additional business transactions like used products are sold on secondary markets; outdated products are upgraded to meet latest standards again; failed components are repaired to serve as spare parts; unsold stock is salvaged; reusable packaging is returned and refilled; used products are recycled into raw materials again. The set of processes that accommodate these goods flows, which can often be interpreted as running 'upstream' in a conventional supply chain scheme, is known as reverse logistics

2. Literature Review

Fernandez, (2003) examined that reverse logistics is the process in which goods are received from the consumers to the company after using the product so that the product could be reused or resold by making the repair, refurbishing, or remanufacturing the product. It also includes the process of cannibalization, recycling, incineration, and landfilling so that the products that are of no use in any of the supply chain processes are discarded. **Kroon andVrijens, (1995)** examined that reverse logistics is also associated with performing logistics management activity in which the activities that are related to reducing, administrating and discarding of non-useful waste are carried out through the process of products packaging. It ensures the implementation of wastage management practices so that more organizational efficiency is achieved at a low cost. **Carter and Ellram, (1998)** analyzed that reverse logistics is regarded as the process in which the functionaries related to forward managing of products are carried out in such a way that there are fewer cases of flow back of products and ensures reuse of materials by implementing recycling procedures. As a result, by

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pursuing the activities related to reverse logistics, the companies become more aware of the environment and prefer to perform activities that are in the favor of re-utilization of products.

According to **Tibben-Lembke & Rogers, (2002)**, there is a difference between the forward and reverse logistics while considering the forecasting of the goods. For example, in the logistics, there is straight forward forecasting of products but in reverse logistics, the forecasting of products is difficult. **Guide et al., (2000)** examined that there is a difference between the logistics because, in reverse logistics, the entire process of attainment of the product depends upon the participation of the consumers and their ability/efficiency to make accessibility of products for reuse or recycling purpose. While in the case of logistics, marketers use different analyzing/measuring strategies to evaluate the patterns of consumer behavior and make forecasts related to production and sales. Hence, there is a great difference between the forecasting of goods in the forward and reverse logistics processes. **Rink and Swan, (1979)** analyzed that reverse logistics is highly responsible for bringing changes in the product lifecycle by making changes in the marketing and logistics process.**Silver et al., (1998)** examined that there is a difference between the inventory process in the forward and reverse logistics process limitations in the adoption of reverse logistics in the traditional logistics process

According to **Larsen, Masi, Feibert & Jacobsen,(2018)**, reverse logistics process involves the conduction of activities that are related to the setting up plans, supervising and making cost-effective utilization of raw materials so that the in-process functioning of the inventory and finished goods are coordinated by using the point of sale information. It helps in assessing and recapturing the value of use goods and making proper arrangements for the disposal of goods that cannot be reused or remanufactured further. **Mukhopadhyay and Setoputro, (2004)** analyzed that the implementation of reverse logistics in the functioning of the firm helps in increasing the revenues of the firm by making profits from the resale of core components to the real supplier, independent recovery firm. **Brito (2003)** examined that the firms are mainly involved in the process of reverse logistics for two main purposes in which the first purpose is to increase the profit of the company and secondly the implementation of reverse logistics process ensures the safeguarding of environment which is mandatory for the companies to follow.According to **Fleischmann, (2001)** reverse logistics is the process that involves the acquiring of used products from the consumer's end and make reuse of them by repairing, recycling and remanufacturing so that the final capturing value of the product is gained before making the disposal

3. Research objectives

The aim of the study is to analyse the adoption of reverse logistics with reference to reuse of the product. The other objectives related to the study are mentioned below :

- To understand extent of adoption of reverse logistics with reference to reuse of product

4. Scope of work

The study useful in the future because it provides valuable facts related to supply chain management, logistics, forward logistics, and reverse logistics. The supply chain management is not only restricted to the movement of raw materials and finished products but it also includes the movement of unsold or returned products from the consumption end to producer end. Moreover, reverse logistics also helps in increased asset utilization, provision of increased customer satisfaction, better management of inventory and producing increased return on investment (ROI). It also promotes sustainable production and encourages the efficient use of resources that helps in preserving environment. Hence, it can be said that reverse logistics is highly beneficial for increasing the performance and productivity of the company by integrating the supply chain system with the resource management and organizational functionaries. The study covers all the facts related to the reverse logistics and provides in-depth learning about the recapturing values and asset recovery associated with the reverse logistics process.

5. Research Methodology

The descriptive research is meant to investigate one or more variables to correctly and systematically

describe a population and incident. Therefore, because the study is objective and intent to describe the impact Reverse Logistics processes on the firm's performance considering retail sector, descriptive research design finds its place appropriately.

The current research wants the accumulation of relevant data via questionnaires, backed up by the idea to analyse the effect over firm performance through Reverse Logistics from the perspective of the Indian retail sector. The study was performed by doing data collection by questionnaire method for primary data and this was done with variety of participants affecting the decision making in the Indian retail organizations

The sampling technique adopted for this study is the non-probability sampling technique. The particular sampling technique elected within the scope of non-probability methods is Convenience sampling. The researcher found convenience sampling as the most relevant sampling technique related to this study as the researcher is keen to determine how organized retail sector can leverage the process of reverse logistics in order to enhance business performance

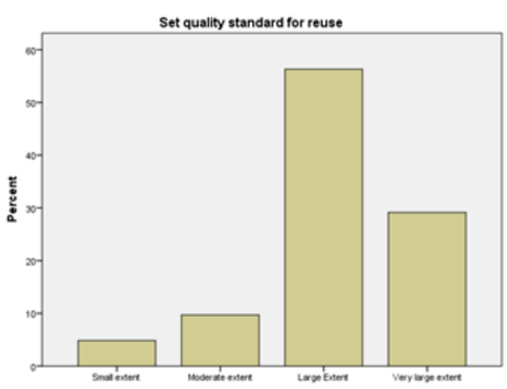
This survey based study was conducted in various retail organizations in Mumbai and Thane region. A 5 point Likert- scale questionnaire was developed which measures level of understanding of various reverse logistics practices adopted by various retail organizations. It was assumed that these employees of these organizations would have general awareness of about various reverse logistic practices. This was supplemented by authors two years' experience in field of retail industry in supply chain management department. Questionnaire was circulated to 200 respondents of various organized retailers in Mumbai and Thane region. The typical respondents to the survey had roles ranging from VP, General Managers, Department Heads, Store managers, Category Managers, Warehouse Managers and SCM Executives. After codification, data was keyed in IBM SPSS Statistics 20 software to produce quantitative comparisons and further analysis. After removing missing value etc. the data was organized and in all, 103 usable responses were collected from various retail companies and used for further analysis

6. Data Analysis

1. Set quality standard for reuse

Set quality standard for reuse

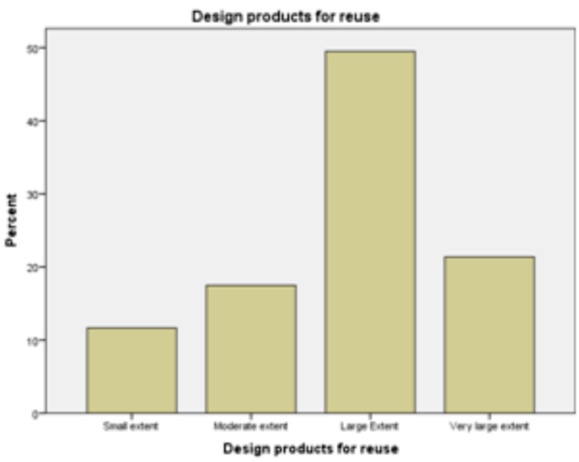
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	5	4.9	4.9	4.9
	Moderate extent	10	9.7	9.7	14.6
	Large Extent	58	56.3	56.3	70.9
	Very large extent	30	29.1	29.1	100.0
	Total	103	100.0	100.0	



2. Design product for reuse

Design products for reuse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	12	11.7	11.7	11.7
	Moderate extent	18	17.5	17.5	29.1
	Large Extent	51	49.5	49.5	78.6
	Very large extent	22	21.4	21.4	100.0
	Total	103	100.0	100.0	



3. Firm reuses packaging materials wherever possible

Firm reuses packaging materials wherever possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	9	8.7	8.7	8.7
	Small extent	14	13.6	13.6	22.3
	Moderate extent	26	25.2	25.2	47.6
	Large Extent	44	42.7	42.7	90.3
	Very large extent	10	9.7	9.7	100.0
	Total	103	100.0	100.0	

4. Firm uses packaging materials that can be reused for other purposes

Firm uses packaging materials that can be reused for other purposes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	4	3.9	3.9	3.9
	Moderate extent	13	12.6	12.6	16.5
	Large Extent	72	69.9	69.9	86.4
	Very large extent	14	13.6	13.6	100.0
	Total	103	100.0	100.0	

5. Firm trains employees on reuse and recycling as waste management strategies

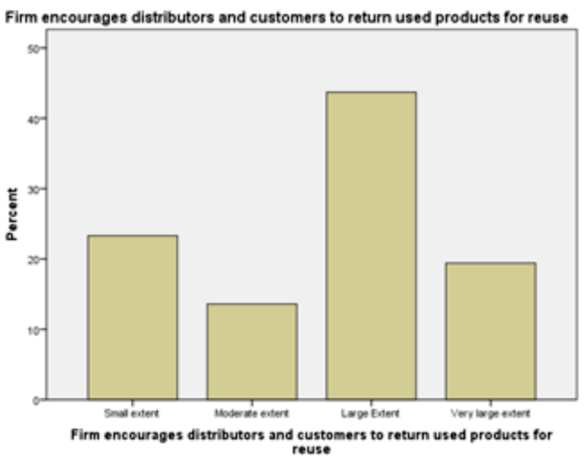
Firm trains employees on reuse and recycling as waste management strategies

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	16	15.5	15.5	15.5
	Moderate extent	20	19.4	19.4	35.0
	Large Extent	40	38.8	38.8	73.8
	Very large extent	27	26.2	26.2	100.0
	Total	103	100.0	100.0	

6. Firm encourages distributors and customers to return used products for reuse

Firm encourages distributors and customers to return used products for reuse

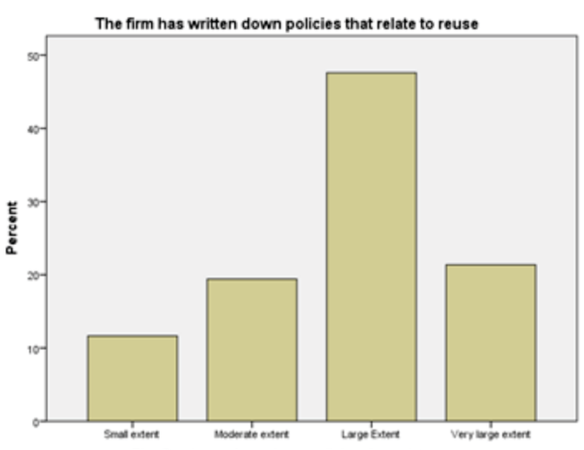
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	24	23.3	23.3	23.3
	Moderate extent	14	13.6	13.6	36.9
	Large Extent	45	43.7	43.7	80.6
	Very large extent	20	19.4	19.4	100.0
	Total	103	100.0	100.0	



7. The firm has written down policies that relate to reuse

The firm has written down policies that relate to reuse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	12	11.7	11.7	11.7
	Moderate extent	20	19.4	19.4	31.1
	Large Extent	49	47.6	47.6	78.6
	Very large extent	22	21.4	21.4	100.0
	Total	103	100.0	100.0	



8. Firm instruct customers to reuse packaging materials and products where possible

Firm instruct customers to reuse packaging materials and products where possible

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small extent	10	9.7	9.7	9.7
	Moderate extent	20	19.4	19.4	29.1
	Large Extent	41	39.8	39.8	68.9
	Very large extent	32	31.1	31.1	100.0
	Total	103	100.0	100.0	

7. Conclusion

The extensive research was carried out to understand extent of adoption of reverse logistics with reference to product reuse. The study critically established linkages of reverse logistics with product reuse. Further the study also reveals that adoption of reverse logistics has to a great extent altered the reuse of product. Based on study following conclusions can be drawn

1) 56.6 % & 29.1 % respondents said that their firms have set the quality standard for product reuse in large and very large extent respectively.
2) 49.5% & 21.4% respondents said that their firms have designed products for reuse in large and very large extent respectively.
3) 42.7 % & 9.7% respondents said that their firms reuse packaging material in large and very large extent respectively.
4) 69.9 % & 13.6% respondents said that their firms reuse packaging material that can be reused for other purposes in large and very large extent respectively
5) 39.8 % &26.2% respondents said that their firms reuse packaging material that can be reused for other purposes in large and very large extent respectively
6) 38.8 % & 26.2% respondents said that their firms train employees on reuse and recycle as waste management strategies in large and very large extent respectively
7) 43.7 % & 19.4% respondents said that their firms encourage distributor and customers to return used products for reuse in large and very large extent respectively
8) 47.6 % & 21.4% respondents said that their firms has written down policies for that related to reuse in large and very large extent respectively

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