

# Chapter 23

## Framework Proposition Strategy for Collection of Returned Products in Reverse Logistics Environment

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### **ABSTRACT**

*The importance of reverse logistics and product recovery is evident in various industries as well as in current UNESCO sustainable development goals. This includes plastics and recycling with the former “contributed” significantly towards environmental issues and the latter being one of the primary solutions. The motivations of its implementation are generally divided into legal, economic, and socio-environmental factors. One of the crucial components of plastics recycling and a reverse logistics system is product return channels. The success of other components especially the recovery operations depends on the effectiveness of the return channels. Although numerous investigations on product return channels have been carried out, research on some critical aspects remains wanting. This study presents a review that highlights this deficiency, depicts relevant research development on product return channels, decision-making issues, and direction for future research. At the end of the study, the authors propose a new closed-loop logistics network and future research framework propositions.*

### **INTRODUCTION**

Minimizing environmental pollution and industrial waste has become one of the main concerns in many countries. Developed countries such as Japan, United States and the European Union (EU) have already enacted legislation on these issues. It is also acknowledgeable that other related problems such as scarcity of natural resources in certain industries, limited landfill capacities, and the negative effect of discarded products has undesirably amplified over the years. For some companies, engagement in environmental preservation and management of industrial waste is no longer an option. According to

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Sasikumar, Kannan and Haq (2010), many companies are now engaged in product recovery business due to increasing government pressure, environmental deterioration, economic pressure, resource reduction and social responsibilities. Hence, various governments have started pressuring companies to take responsibility over their products beyond its lifecycle. Sohail and Sohal (2003) stated that legislation aimed at environment-benign production forces manufacturers to take back their products from end-users after they discard them. This is where reverse logistics and reverse supply chain management started.

Logistics network design that encompasses decisions such as determining the numbers, locations, quantity of the flow and capacities of the facilities is one of the most important strategic decisions in the reverse supply chain management (Pishvae, Kianfar and Karimi, 2010). This network design becomes even more important with the legal implementation of the extended producer responsibility (Alumur, Nickel, Saldanha-da-Gama and Verter, 2012). The extended producer responsibility states that manufacturers are responsible for free taking back and recovery of their end-of-life products and must bear all or a significant part of the collection and treatment costs (Mansour and Zarei, 2008). At the same time, the amount of collected returned products should at least satisfy the required minimum collection rate. It is also noted that collection of used products potentially accounts for a significant part of the total costs of any closed-loop supply chain (Dekker, Fleischmann, Inderfurth, and Van Wassenhove, 2004).

Government regulations concerning product take-back such as a specific minimum level of product returns (minimum percentage of products that firms need to take back) play a major role in the promotion of product recovery. This regulation has been widely practiced in many EU nations and other developed countries such as the United States and Japan. With the enforcement of environmental laws, firms are obliged to come up with suitable ways to manage their discarded products. Other than the requirement to comply with product take-back regulations, there is also the need for firms to devise effective and efficient ways to do so. And this is where the economic factor comes into play. An increasing number of firms are beginning to appreciate the fact that reverse logistics and product recovery management can lead the way towards the realization of business objectives such as profit maximization, cost minimization, resource utilization and production efficiency. Major firms such as Canon, Xerox, Hewlett-Packard, Agfa, Kodak, Daimler-Chrysler, BMW, and Visteon are practicing product recovery management to enhance their profitability and cost competitiveness (while complying with environmental regulations), factors that could lead to better competitive positioning in the market. This brings us to the third driver – consumer pressure. The consumers of today are increasingly environmentally conscious. Termed ‘the green consumers’ they can be expected to frown on products and firms that are not environmentally friendly. Their influence is gaining in strength, and with the current level of business competition, firms are understandably concerned about their image. Thus, it is not surprising that many firms have implemented environmental campaigns with product recovery themes such as shopping bag recycling (Tesco, Aldi, Carrefour, etc.) and free take back of used products such as personal computers, washing machines and mobile phones. Some firms even go a step further by offering refund payments in a bid to encourage more returns.

In the meantime, the emergence of reverse logistics as the most significant recovery approach in environmental management within the broad supply chain context has long been recognized. The role of reverse logistics in the environmentally-conscious society of today is clearly vital. Implementation of an effective reverse logistics system involving management of product return flows is seen as one of the primary ways of enhancing the competitiveness and profitability of firms (as explained in the previous paragraphs). In other words, the current application of this system in many industries is not only for the purpose of complying with environmental laws but also as a profitable and sustainable business strategy

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