

# Exploring Drivers of Closed Loop Supply Chain in Malaysian Automotive Industry

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## INTRODUCTION

With the emergence of industry, people have become voracious pursuit of profit, in which they affect the environment and social wellness. Issues related to environmental and social destruction such as pollution, carbon footprint, ozone depletion, deforestation and waste management problem had threatened the environment and human being on this day. These environmental issues have caused resurgence and challenges in finding a solution to this problem, namely sustainability.

The concept of sustainability has been introduced by the World Commission on Environment and Development (1987), has given a change to the business world today. The issue of sustainability has brought changes to the terms of a business venture of the company's goals, operations, manufacturing, supply chain, administration and marketing. The concept of sustainability has rejuvenated the world of supply chain where green practices in supply chain can reduce environmental impacts. The green supply chain management is defined as the integrated supply chain management where it revolves around the green purchasing ranging from suppliers, manufacturers, users, and so the process will revert to reverse logistics, which will close the loop process of the supply chain (Q Zhu et al., 2005).

## BACKGROUND

This study takes the approach of a closed supply chain in the automotive industry in Malaysia. automotive industrial sector in Malaysia has been developing since Malaysia has its own national car industry and is seen as encouraging growth in the national economy to this day. Starting in 2015, the Malaysian government has imposed regulations to the automotive industry to perform activities 3Rs reduce, reuse and recycle. This has made the automotive supply chain to the supply chain is closed. Therefore, this study examined the main factors that make the automotive industry players to engage in the closed loop supply chain.

## CLOSED LOOP SUPPLY CHAIN

Closed-loop supply chain is defined by Guide & Van Wassenhove (2009), as a supply chain management which can maximize the creation of value through the entire life cycle of a product and also the dynamics of the recovery of the species and the number of returns in a short period of time. The maximizing value creation process and also the dynamics of the recovery is obtained through the design, control and operation of the system.

The closed loop supply chain combines both forward and reverse supply chain where these green

practices able to minimize the industrial waste and also reduce the environmental impact. The practice of zero-waste which includes recycling, reuse, reduce, remanufacturing, refurbish and repair in closed loop supply chain has generate a process of cradle-to-cradle where it can generate values not only in terms of profitable values to the shareholder and also to its stakeholders. Shaharudin, Govindan, Zailani, & Tan (2015) stated that when the organization could identify the benefits of all types of product returns, then the combination of design for forward and reverse supply channels and an environmentally friendly way to dispose the product; it will then give the organization the ability to achieve sustainability in business.

### **Forward Supply Chain, Reverse Supply Chain and Reverse Logistics**

Traditionally, supply chain management is revolving on the forward supply chain. For the forward supply chain, it starts from the raw materials purchases from the supplier to the manufacturer, manufacturing and assembling operations, distribution centre, then to the distributors and retailers, and ultimately to consumers (Souza, 2013). However, the traditional supply chain ignored the elements of environmental conservation and end of life of the product is considered as waste. As for the closed loop supply, it will change or renew the end-of-life phase of a product where the old product will be refurbished or remanufactured. Closed-loop supply chain will help in reducing the amount of industrial waste disposal of non-biodegradable and hazardous material and also reducing the shortage of landfill capacity for industrial materials disposal. Recently, the automotive industry starts to adopt this green practice in order to minimize the environmental impact. Among the product returns received in closed loop supply chain is the commercial returns, repair or warranty returns, leasing, end-of-use returns and end-of-life returns.

The reverse supply chain is established to manage the return of products from the consumer to the manufacturer and also from the manufacturer to the supplier (Schenkel, Krikke, Caniëls, & der Laan, 2015). According to Günther, Kannegiesser, & Autenrieb (2014), the process of closing the loop in the supply chain or reverse supply chain, it is including the important context of sustainable supply chain management; the reuse, refurbishment or recycling of goods. By closing the loop, it involves the final stages of life-cycle of a product where the product will go through processes of recycling, remanufacturing, reclamation and also reverse logistics (Sarkis, 2012).

In the closed loop supply chain system, the reverse supply chain will collect the product return from customers and returned to the original manufacturer in order for improvement and also enhances by refurbishment, remanufacturing, repair or recycle; either certain parts or whole parts of the product. This provided benefits for reverse supply chain and has been an emphasis on the manufacturing industry to shift towards convergence of the strategy to increase the product life cycle, in which they not only provide good value for but as well as integrated supply chain management strategies (Genovese, Acquaye, Figueroa, & Koh, 2015).

Closed loop supply chain could focus on product return and repair or improvement of products either by component or the entire product. Reverse logistics plays a key role in the implementation of closed-loop supply chain. The process of reverse logistics includes planning, implementing, controlling efficiency, cost effective flow of raw materials, the process of purchasing or inventory, finished goods as well as information related to the value or disposal of waste properly (Aravendan & Panneerselvam, 2014). The reverse logistics that have been effectively implemented could ensure the success of the implementation of closed-loop supply chain, in which they could reduce dumping in the inventory and distribution costs could be salvaged. The closed loop supply chain can

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