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**The Relationships between Green Supply Chain Management (GSCM) Practices and  
Performance Outcomes in Malaysia**

**Limkokwing University of Creative Technology (LUCT)**

**Author's name, PHD Student: Du Qing**

**Student ID: 110050785**

**Email: [duqing0050@hotmail.com](mailto:duqing0050@hotmail.com)**

***ABSTRACT***

The main purpose of this research study to understand the relationships between Green Supply Chain Management (GSCM) practices and performance outcomes. However, there is a limited study conducted to investigate the relationship between GSCM and product quality improvement. In Malaysia, the level of participation in green initiatives is low and there is also less study conducted on GSCM. Therefore, this research aims to investigate the relationship between GSCM and product quality improvement. Quantitative approach was conducted in this research and questionnaire was the major instrument used for data collection. The population of this research was 425 of manufacturing firm with certification of ISO 14001 in Peninsular Malaysia. Simple random sampling was adopted in this study with the sample size of 208. All the three hypotheses was accepted in this study which proved that there was significant relationship between eco-design, green purchasing and reverse logistics with product quality improvement respectively. As overall, it is proved that there is moderate relationship between GSCM and product quality improvement with the accepted hypotheses and the moderate correlation coefficient value. Implementing GSCM practices does bring benefits in term of improving the product's quality. Eco-design, green purchasing and reverse logistics are the

commonly adopted GSCM practices in Peninsular Malaysia. These three practices work at best state if being incorporated as much as possible in the operation and production line.

**Key Words:** Green, Chain, Management, Supply, Practices, Implementation, Performance, and Improvement

## 1.1 Introduction

Nowadays, business organizations are concerned and aware about the global and environmental issues. Environmental issue, competition, regulatory and community pressures leading business organizations to take initiative to balance between environmental and economic performance. Business organizations are continuously seeking for new ways to address those environmental issues and at the same time to increase their competitiveness in the market. Hansmann and Claudia (2014) have mentioned that business organizations that have successfully addressed the environmental issues will gain new opportunities in competition and add new value to their core business. It is believed that Green Supply Chain Management (GSCM) has become the best practices in integrating environmental thinking in the ongoing operations (Srivastava, 2015).

Supply chain can be defined as a system that includes purchasing and inbound logistics, production, distribution and reverse logistics (Sarkis, 2015). Greening the supply chain is an action that adds “green” component to Supply Chain Management and influence the relationship of Supply Chain Management to the natural environment. GSCM not only increases eco-efficiency and synergy between business partners, but also helps to improve environmental performance, reduce wastage and lowers the production costs. Bowen et al. (2013) identified that organizations that implement GSCM practices will results in financial operational and ecological benefits

It is essential for business organizations to take strategies for reducing environmental impacts from their products and services (Lewis & Gretsakis, 2013). In addition, the business should substantially improve its quality and performance for better generation of profit. Beamon (2015) said that the strategies for supply chain nowadays is concentrate on developing environmental management in the manufacturing operations. This is due to the people are viewing manufacturing and production process as the culprits in harming the environment, in the form of

waste generation, ecosystem disruption and depletion of natural resources (Fiksel, 2012). Thus, manufacturing firms should start to think and act green due to the increasing awareness on the environmental issue.

The relationships between Green Supply Chain Management (GSCM) practices and performance outcomes. The previous studies are more concern on the performance outcomes which including environmental, economic and operational. The study of the outcomes of GSCM is expected to illustrate how effectively the green supply chain initiatives are implemented.

Greening the supply chain bring direct impact on the operational performance of a firm. Operations are the basic foundation in distribution and manufacturing which then lead to financial returns. Szwilski (2014) said that environmental management systems is an innovative tool for improving the operational performance of the organization, whereas Tooru (2013) demonstrated that operational performance of a firm can be improved by adopting Environmental Management Systems (EMS). Therefore, it is proven that implementing GSCM does bring positive impacts on the operational performance of a firm.

The most common operational outcomes are including the increase of goods delivered amount, reduce inventory level, decrease scrap rate, increase product's quality, increase product's line and improved capacity utilization (Zhu et al., 2005; Zhu, Sarkis & Lai, 2007; Zhu, Sarkis & Lai, 2008; Zhu et al., 2015). Product quality improvement acts as an important criterion in operational performance because the results showed that it has the highest mean value compared to the other outcomes (Zhu et al., 2005; Zhu et al., 2010; Lee, Kim & Choi, 2012). Furthermore, Zhu et al. (2005) said that GSCM practices were considered as key role on promoting a product's quality for operational performance. Hence, this supported that quality management has strong relationship with EMS (Zhu & Sarkis, 2014).

As a consequence, GSCM practices have become prevalent in this sector to manage environmental issues for the effectiveness of their productions (Wooi and Zailani, 2010). The Malaysian Economic Transformation Programmed (ETP) has also highlighted the green technology development in the effort towards achieving developed-nation status (Yacob, (Aziz, Makmor and Zin, 2013).

## **1.2 problem statement**

As mentioned earlier, the previous studies showed that product quality improvement acts as important criteria in operational performance where it has the highest mean value compared to others. Nevertheless, product quality has not received sufficient attention from the research community. Previous researchers have neglected to consider the relationship between Green Supply Chain Management (GSCM) and product quality improvement. Moreover, the study conducted by Eltayeb, Zailani and Ramayah (2011) have investigated the relationship between green supply chain initiatives with cost reduction, one of the outcomes of operational performance and they recommended to investigate the effect of green supply chain initiatives on other kinds of outcomes of operational outcomes such as quality, flexibility and delivery in the future studies.

Besides that, the concept of GSCM is still relatively new in Malaysia. There are only a few studies conducted on GSCM adoption and implementation in Malaysia. Seman et al. (2012) stated that a lot of companies in Malaysia are still lacking behind and have little intention to adopt green supply chain concept in their business operation. The level of readiness for business organizations to go green is still unsure. From the study conducted by Wooi & Zailani (2010), they found out that Malaysia has low involvement and low participation in green initiatives. This situation is because green concept is still a new concept and lack of information resources and expertise to deal with the environmental issue in Malaysia. The firm size and expenses incurred in adopting green supply chain practices also preventing implementation of GSCM in Malaysia.

Consequently, this research aims to identify the relationship between GSCM with product quality improvement in Malaysia. This study is able to provide an insight about the outcomes of implementation of GSCM and how it influenced the performance of the organizations especially towards product's quality.

### **1.3 Research objectives**

In line with the research questions, there were two main research objectives in this study which were listed below.

1. To examine the level of implementation of Green Supply Chain Management (GSCM) in Malaysia?
2. To identify the relationship between Green Supply Chain Management (GSCM) and product quality improvement?
3. What are the Dimensions of (GSCM) Practices?

### **1.3 Literature Review**

This literature review offer an insight regards on the topic and better understanding on the research objective. It started with the definition of “green” and “supply chain management”, followed by various definition of “green supply chain management” from different people and definition of “quality”. Next, it reviews on the previous studies done in green supply chain management and lastly explained about the conceptual framework that used in this research.

#### **1.3.1 Definition**

According to the Oxford Advanced Learner’s Dictionary (2041) defined green as concerned with the protection of the environment or green politics in adopting a greener lifestyle. Vachon and Klassen (2006) pointed out that “green becomes a common practice to illustrate the environmental friendly image of products, processes, systems and technologies and business organizations .Greening concept can also refer to the reaction of different perspective of practitioners towards environmental issues (Rao, 2012). Therefore, we can say that going green is a concept that related with the environment context and apply it in our daily life, system, production or business organizations.

#### **1.3.2 Supply Chain Management**

A supply chain consists of direct and indirect ways to fulfill the customer’s needs (Chopra & Meindl, 2013). A typical supply chain may involve a variety of stages, including the customers,

retailers, wholesalers or distributors, manufacturers and suppliers as shown in the Figure 1.

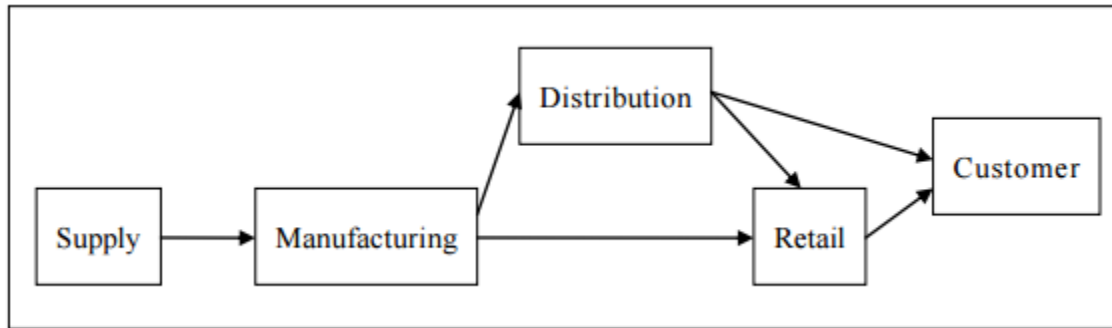


Figure 1: The structure of a supply chain (Beamon, 1999).

It acts like a network with a constant flow of information, product and funds between different stages. It started with manufacturing a product that can satisfy a customer's need. The materials and equipment will be supplied by the suppliers. Then, the finished product can be stored in the warehouse before it distribute and delivery to the retailers. The customers either can get the product from the wholesalers or retailers. However, Sarkis (2013) defined supply chain in a more complex way, where it said that supply chain is a system that comprises the activities like purchasing and inbound logistics, production, distribution and reverse logistics.

### 1.3.3 Green Supply Chain Management

Green supply chain management (GSCM) is an action by adding “green components” into supply chain management. We know that traditional supply chain is the manufacturing process of raw materials into the final products where it then delivered to the customers by the distributor or retailer. Green, Morton and New (2014) defined green supply chain is an innovation of SCM and industrial purchasing activities are aligning with environmental requirements. They mentioned that purchasing activity act as a support service within the corporations and drive better environmental management throughout the supply chain.

GSCM is to involve and implement environmental thinking into all stages starting from resource extraction of raw materials to product design, manufacturing processes, delivery of final products to customers and end-of-life products management (Srivastava, 2013). On the other hand, Beamon (2014) also defined green supply chain as “the extension of the traditional supply chain to include activities that aims at minimizing environmental impacts of a product throughout its entire life cycle. The activities may include green design, resource saving, harmful

material reduction and product recycle or reuse. This means that green supply chain is by adding green concept into the supply chain's boundaries starting from the suppliers to the customers.

### **1.3.4 Operational Performance**

Green Supply Chain Management (GSCM) performance includes four main aspects such as environmental, positive and negative economic performance and operational performance (Zhu & Sarkis, 2004; Zhu, Sarkis & Geng, 2005; Vachon & Klassen, 2006). It may be accepted that Toward adopting Also actualizing GSCM, it will prompt moved forward natural Also monetary execution et cetera improve the operational benefits of the business execution. Operations would that essential establishment over appropriation what's more manufacturing which prompts budgetary returns. Operational conclusions could make ordered under expense reductions, result nature improvements, upgrades over conveyance and adaptability (Rao, 2002; Vachon & Klassen, 2006).

### **1.3.5 Green management**

Green management practices (GMP) provide a firm with supplementary sources of information that can enhance their business and environmental objectives. Adoption of green management practices help with improved firm image, increased efficiency, environmental compliance improvement, cost savings, achievement of societal commitment and reduction of carbon emissions etc.

### **1.3.6 Green distribution and warehousing**

Green distribution and warehousing can reduce the waste and play an important role in energy reduction and value addition of green products in warehousing significantly improve overall performance of organization with better corporate image. Green distribution helps enterprises to obtain superior financial and environmental performance.

### **1.3.7 Green manufacturing**

Green manufacturing practices are to implement socially and environmentally accountable practices to mitigate harmful effects of manufacturing and increased profitability of firms. Green practices in production improve efficiency of processes. This practice involves the application of

the green resources, which may lead towards competitive advantage through reduction in products' cost and improvement in products' quality. Lean and green manufacturing industry both are working for eliminating waste and improving the efficiency of manufacturing processes. Baines et al. highlighted the benefits of green manufacturing: green practices in production processes mitigate the bad effects of manufacturing processes on environmental sustainability, while green manufacturing improve operational, environmental and financial performance of firms.

### **1.3.8 Supply Chain Management Goals**

the main goals of supply chain management include the emphasis on making the customers' demands come true effectively, the profitability of the supply chain, and also the secondary objectives of supply chain management that include creating the ability to develop new products, minimizing the amount of time that a product passes through the supply chain and arrives the final customer and moreover maximizing the supply chain flexibility at responding the changes in customers' needs (Mir and Seyed, 2003).

### **1.3.9 Green Supply Chain Management (GSCM) in Malaysia 1**

The studies of Green Supply Chain Management (GSCM) in Malaysia are still limited and the findings are not consistent. The level of implementation of GSCM in Malaysia is still remaining low and a lot of companies are yet to adopt GSCM in their business operation (Woof & Zailani, 2010). Malaysia also has low involvement and low participation in green initiatives. Woof and Zailani (2010) have investigated the main barriers that preventing Malaysia's companies to go green which is because the amount of cost of adopting green supply chain practice is high and it depend on the size of the companies. Moreover, the research study done by Eltayeb and Zailani (2013) that studied the adoption level of green initiatives in Malaysia, have showed that Malaysia still in low adoption level of green supply chain initiatives. The level of readiness to go green and adopt green technology among Malaysian manufacturing companies is still remained unclear.

### **1.3.10 Green Supply Chain Management Practices**

Today, environmental issues are increasing due to high demand of eco-friendly products from worldwide consumers. Organizations are forced to introduce Green management practices



in their operations to obtain an economic growth. Due to rapid changes in the global manufacturing industry, environmental issues become more prominent to continue the business

### **1.3.11 Supply Chain Management as a Set of Management Processes**

Supply chain management is progressively being perceived as the joining of key business forms over the store network. Execution is brought through by three essential components: the inventory network organize structure, the store network forms, and the administration segments. Regarding inventory network arrange structure, it is imperative to coordinate choices identified with acquiring, producing, stocks, warehousing, and conveyance, and in addition characterize objectives and techniques how to accomplish it. Then again, it is essential to plan an arrangement of standard procedures which will guarantee reasonable conduct of the people or organizations that are a piece of the inventory network. Last yet not alt slightest, it is important to characterize control instruments to have the capacity to review execution of store network as per the arrangement, by planning exercises and procedures keeping in mind the end goal to fabricate connects between inventory network individuals and settling on the correct choices.

### **1.3.12 Supply Chain Management versus Supply Chain Orientation**

As indicated by Mentzer, the possibility of coordination of production network from a general point of view (characterized before as an administration theory) is all the more precisely called inventory network introduction. The genuine execution of this introduction, crosswise over different organizations in a store network is all the more properly called production network administration.

Taking everything into account, production network introduction is characterized as (Mentzer, 2002) Acknowledgment by an association of the systemic, vital ramifications of the strategic exercises required in dealing with the different streams in a store network. The usage of inventory network introduction requires a few organizations in the production network to use store network procedures to understand the arrangement of administration exercises characterized

The point when characterizing supply chain management, it may be as a relatable point to relate it on logistics should finer see all the approach, since the idea about supply chain management began in the logistics writing (Min, 2002). Halldorsson Furthermore Larson (2000, p. 220) indicate that supply chain oversight economy relative on logistics could make seen for four different approaches (see figure below). They recommend that particular case purpose behind these different perspectives will be that supply chain administration need not been constructed transparent by person widespread meaning.

Figure2: Perspectives of SCM versus Logistic

Traditionalist	Re-labelling	Unionist	Intersectionist
Logistic	Logistic	SCM	
SCM	SCM	Logistic	LogisticSCM

According to the Traditionalists view, the logistic function hires “supply According to the At the point when characterizing supply chain management, it is regular to relate it to coordination’s to better comprehend the approach, since the idea of inventory network administration began in the coordination writing (Min, 2002).

Halldorsson and Larson (2000, p. 220) demonstrate that inventory network administration with respect to coordination can be seen in four diverse ways (see Figure 2). They recommend that one explanation behind these different points of view is that store network administration has not been made straightforward by one all inclusive definition

## 1.4 Theoretical framework

Figure 1.1: The Theoretical framework.

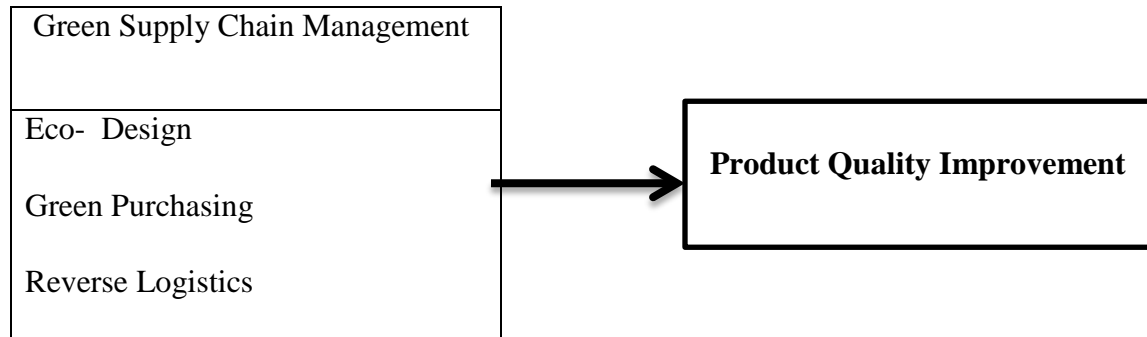


Figure 1.1 showed the conceptual framework developed based on previous research findings. Deming's theory and systems theory is used to assume the relationship between GSCM and product quality improvement, since there is less study conducted. The dimensions of GSCM are eco-design, green purchasing and reverse logistics. These dimensions were used to identify the level of implementation of GSCM in the manufacturing firms and investigate whether implementing GSCM have positive or negative relationship with product quality improvement.

## 1.5 Recommendations

In this section, there are few recommendations that are suggested for the manufacturers in Malaysia and the future researchers based on the topic of relationship between GSCM and product quality improvement

### 1.5.1 Recommendations to Manufacturer in Malaysia

From this research, it is able to provide insight on how adoption of GSCM brings effect toward product quality improvement among manufacturing firm. Since that, it is proved that there is significant relationship between GSCM and product quality improvement, this outcomes can act as a motivator for the other category of manufacturing firm to adopt GSCM practices in their operation and production line. The manufacturing firm that produced paper products and rubber and plastics products has better involvement in greening their supply chain compared to other firms. The other firms should start considering apply eco-design, green purchasing and reverse logistics procedures. All these three procedures should be taken into account in order

to realize the full benefits of it. Even though that eco-design showed a lower correlation coefficient compared to others, it should not be left out from the implementation of GSCM. All the three dimensions work best when it incorporates as many as possible.

Furthermore, it can be a driver for the non-certified manufacturing firms to start greening their operation and production line. The findings were able to prove that the certified manufacturing firms have better competitive advantages in terms of their improved product's quality and have better demand from their consumers. Hence, the non-certified manufacturing firm should start have the initiatives to adopt green concept in their firm as a way to increase their economic, environmental and operational performance.

### **1.5.2 Recommendations to Future Researcher**

As recommendations to future researcher, to come examine ought to include entire Malaysia Likewise the respondent scope. This Look into might have been concentrated during peninsular Malaysia best and the information gathered unabated to speak to concerning illustration entire Malaysia. It ought to incorporate Sarawak Furthermore Sabah despite the fact that there will be main little sum from claiming manufacturing firm with Confirmation about ISO 14001. What's to come specialists ought also attempt their Verwoerd best for getting that's only the tip of the iceberg respondents On their Examine to expand the legitimacy Also unwavering quality of the information gathered.

### **1.6 Research scope**

This study will be conducted in Peninsular Malaysia and focus among ISO 14001 certified manufacturing firms in Malaysia. The manufacturing firms were selected because it is considered as an important contributor to Malaysian's economy in recent years (Seman et al, 2014). It is focused on ISO 14001 certified manufacturing firms because they are more likely to be involved in the adoption of GSCM practices (Handfield, Sroufe & Walton, 2005; Arimura, Darnall & Katayama, 2015). ISO 14001 principle provide framework which guiding manufacturing firms to implement and follow Environmental Management Systems (EMS) as to improve environment performance within the operation.

## 1.7 Conclusion

As a conclusion, this research study able to identify that there is relationship between GSCM and product quality improvement among manufacturing firm with certification of ISO 14001 in Malaysia. It able to achieve the objective stated and answered the research objectives. This research study is able to contribute to the study conducted by Eltayeb, Zailani and Ramayah (2014) that investigated one of the operational outcomes, cost reductions. Consequently, the findings of this research study able to prove that product's quality improvement have relationship with GSCM practices and confirmed that GSCM practices does bring about operational benefits to the organization. Applying GSCM practices does bring effect in term of improving the product's quality.

This research also able to justify that the eco-design, green purchasing and reverse logistics are the common practices that adopted in Malaysia. Eco-design and green purchasing have received more attention compared to reverse logistics. Mostly of the manufacturing firm that have been certified by ISO 14001 have adopted these three practices in their operation and production line. These three practices are correlated and it should be incorporated as many as possible to enhance the implementation of GSCM in the organization. Incorporation of all those three GSCM practices are able to work at best state in improving Those nature of the items as stated by Ecological necessities.

There may be likewise An necessity from claiming leading a greater amount exploration study with make directed Previously, future so as should help the association the middle of GSCM What's more result caliber change clinched alongside Malaysia. There is lesquerella huge contemplate that demonstrates the association between GSCM with item nature change Previously, Malaysia.

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