

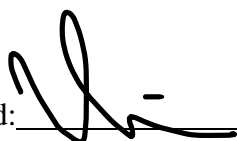
IMPLEMENTATION OF GREEN SUPPLY CHAIN MANAGEMENT



UNIVERSITY OF WISCONSIN, PLATTEVILLE

UNITED STATES OF AMERICA

The attached educational project, by Thanatporn Sato, entitled IMPLEMENTATION OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES, when completed, is to be submitted to the Graduate Faculty of the University of Wisconsin- Platteville in partial fulfillment of the requirements for the (MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT) degree.

Approved:  Date: 08/16/2022

Project Advisor: Alyssa M. Zasada

Professor: Yunshan Lian

Suggested content descriptor keywords:

GSCM, GREEN SUPPLY CHAIN MANAGEMENT, GREEN SUPPLY CHAIN MANAGEMENT PRACTICES, SCM VS GSCM, IMPLEMENTATION OF GSCM

IMPLEMENTATION OF GREEN SUPPLY CHAIN MANAGEMENT

A Seminar Paper

Submitted to

the Graduate Faculty of the

University of Wisconsin - Platteville

in Partial Fulfillment

for the Degree of

MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT

By

THANATPORN SATO

Year of Graduation:

SUMMER 2022

Abstract

Environmental issue has been the biggest issue in recent years; scarcity of natural resources has many organizations shifting their focus toward sustainability and green practices. The term sustainable or green supply chain management refers to integrating sustainable environmental processes into traditional supply chain management. Organizations' orientations toward green and SCM issues may lie as organizations gain insight into strategies and resources needed to implement 'green' practices and ensure sustained economic and environmental performance. There are many strategies and resources that organizations can consider depending on the goal and size when implementing GSCM practices by examining framework, models, and methods, including Just-in-time (JIT) and Total Quality Management (TQM). JIT, TQM, and GSCM are complementary as they impact environmental performance more than those implemented individually.

Table of Contents

	Page
Abstract.....	3
Section 1: Introduction	5
Section 2: Literature Review	6
Green Supply chain management (GSCM)	6
Green supply chain management (GSCM) and Circular Economy (CE)	7
Improving Organization performance through GSCM	8
Factors that influence GSCM practices	9
GSCM, Just-in-time (JIT), and Total quality management (TQM)	11
GSCM practices framework	12
Section 3: Methodology.....	13
Section 4: Discussion and Conclusions	14
References.....	15

Introduction

The recent rise of many environmental issues such as rapid depletion of resources, environmental pollution, global warming, and a decrease in biological diversity has caused deterioration in the ecological balance. Adding the 'green' component to supply chain management involves addressing the influence and relationship between supply chain management and the natural environment. Several organizations have responded to environmental issues by implementing green principles within their organization. Green supply chain management (GSCM) incorporates product design, material sourcing/selection, manufacturing, operation, and end-of-life management. Manufacturing companies generally implement green practices in green supply chain management (GSCM).

Supply Chain Management (SCM) requires the integration and coordination of business processes and strategy alignment throughout the supply chain to satisfy the customers of the supply chain. An increase in environmental issues has encouraged the consideration of various factors that influence the environment. Thus, green supply chain management (GSCM) practices can improve organizations' sustainability performance rather than supply chain management (SCM) which is based on profitability. However, applying these practices and selecting the most appropriate ones for implementation is becoming increasingly difficult due to many obstacles; each organization has its strategies, purposes, and capabilities to consider. The continued academic growth of the 'green' field and its development requires new insights and knowledge. Green supply chain management (GSCM) practices have been proposed to consider all information and knowledge developed during the manufacturing process and among all supplier partners. Lack of information availability leads organizations to make decisions under significant uncertainty causing unexpected results. Choosing and considering the proper 'green' practices

can improve organizational performance. The purpose of this paper is to assess the impact of the implementation of green supply chain management (GSCM).

Literature Review

As the complexity increases in the global supply chain, in every industry, organizations require robust and reliable supply chain management (SCM) tools, processes, and people coordination for critical efficiency and optimization. Some of the primary key goals for SCM are to achieve efficient fulfillment of demand, drive outstanding customer value, enhance organizational responsiveness, build a resilience network, and assist financial success. Supply chain management first appeared as an inventory management approach emphasizing the raw material in logistics literature in 1982. SCM is defined as integrated planning, coordination, and control of all business processes and activities in the supply chain to provide superior consumer value at less cost to the supply chain while satisfying the stakeholders' requirements in the supply chain. SCM consists of all parties involved as suppliers, manufacturers, distributors, wholesalers, retailers, and customers as directly or indirectly in producing and delivering products or services to final customers with both upstream and downstream sides through physical distribution and flow of information and finances. The primary focus of traditional SCM is on the economy and control of final products, which rarely considers the ecological effects. Traditional SCM operates on rules based on historical transactions. This traditional approach to a supply chain is the cycle approach, in which the processes in a supply chain are divided into a series of cycles. Each cycle is performed at the interface between two successive supply chain stages.

Green Supply Chain Management (GSCM)

Sustainable development began to draw attention with the publication of the Brundtland report in 1987 (Yildiz Cankaya & Sezen, 2019). Adding 'green' into SCM, change the concept

of traditional SCM to integrate environmental-related performance. The integration of environmental concerns within supply chain management has itself evolved into a separate and growing field (Serkis, J., 2012). GSCM refers to a way in which innovations in supply chain management and industrial purchasing put the context of the environment into consideration. GSCM activities include reuse, recycling, remanufacturing, and reverse logistics. GSCM is an essential organizational philosophy that represents a significant role in promoting efficiency and synergy between partners. It facilitates environmental performance, minimizes waste, and save cost in order to achieve corporate profit and set market share objective (Sanket et al., 2018). Green practices are operations that seek to reduce or eliminate negative impacts on the environment. Business activity can pose a significant environmental threat regarding carbon monoxide emission, discarded packaging materials, scraped toxic materials, traffic congestion, and other forms of industrial pollution (Sanket et al., 2018). GSCM has the same concern as the traditional SCM regarding product design, use, reuse, disassembly, final disposal, warehousing, transportation, and supplier development. Supply chains and organizations can gain competitive advantage by being the first to adopt environmental sustainability and implement GSCM practices (Green et al., 2012).

Green Supply Chain Management (GSCM) and Circular Economy (CE)

A circular economy (CE) is an economic system of closed loops that reduce material use and redesign materials to be less resource concentrated. It recaptures waste as a resource to manufacture new materials and products. GSCM and CE practices aim to improve environmental performance, while economic performance can also be associated with the concept (Liu et al., 2018).

CE concept was introduced globally; the initiative occurred in Europe, the USA, Japan, Korea, China, and Vietnam. Three levels are required for effective implementation in CE: micro, meso, and macro. Each class is an indicator for measuring CE. The micro level measures a single firm and product. The meso level measures industrial symbiosis and eco-industrial park—the macro level measures global, national, regional, and city. The micro level focuses on greener production, such as product recycling or reuse, while the meso level primarily focuses on creating the local ecosystem in the particular eco-industrial park. The eco-industrial park is a community of manufacturing and businesses that aims to enhance environmental and economic performance by efficiently utilizing resources. The macro level focus on the exchange of materials between the economy and the environment. It focuses on the material accretion in the national economies rather than the flows within the economy.

Green supply chains are the significant unit of action toward CE. There are some similarities between GSCM and CE, yet their practices have been considered equal on some level. These various levels that relate to or parallel the GSCM dimension to CE are enterprise, industrial park, regional/national, and global levels. At the enterprise level, CE practices advance the design of reverse supply chains, recycling, reusing, or manufacturing end-of-life products (Liu et al., 2018). Eco-industrial parks can be considered a practical implementation of GSCM; firms within an industrial park seek to realize some GSCM practices (Zeng et al., 2017). The relative core objectives of the two concepts vary from one another. GSCM emphasizes environmental performance, while CE emphasis more on economic performance.

Improving Organizational performance through Green Supply Chain Management

The idea of GSCM creation includes environmental thinking in supply chain management; it is also viewed as a single functional dimension of green purchasing or reverse

logistics. A growing number of organizations realize that to achieve their environmental goals and competitiveness simultaneously, they need to manage their supply chain with green initiatives looking beyond their own facilities (Lee & Choi, 2021). The “Green” process demands a different approach to managing its organization and supply chain compared to the traditional method. Customer and competitor knowledge requirements require management processes capable of sensing and adapting to the sensitive market needs change. Understanding more about the resources and capabilities needed to implement green practices and ensure sustained economic and environmental performance may lie in firms’ orientations toward green and SCM issues (Kirchoff et al., 2016). Few studies have considered the organization operation process, which is derived from dynamic capabilities, to address how the capability of a firm plays a critical role in implementing GSCM (song et al., 2018). Some resources under the environment may offer an efficient routine process, however, does not offer a sustainable competitive advantage. Considering the dynamic of the market constantly changing, a good understanding of the market changes and efficient processes adoption changes adoption in an organization require.

Factors that influence GSCM practices

GSCM assists the organization in depicting itself and its products as environmentally conscious from a consumer perspective. Some theoretical and empirical research in GSCM is dedicated to examining the forces for adopting and applying GSCM practices. Agi & Nishant (2017) suggest that there are three types of drives that push toward the adoption of the GSCM approach. The first type of driver is associated with voluntary, proactive strategies to gain a competitive advantage, attract environmentally sensitive customers, develop new markets, and enhance the organization’s image. The second type of driver for adopting GSCM is related to the

influence of non-market pressure. These pressures are legal demands and governmental regulations by the growing concern about organizations' environmental protection and social responsibility. It is critical to comprehend the fundamental reasons for different levels of success in implementing GSCM. Other factors and these three types of drivers influence the intention of adopting GSCM practices. These factors are supplier, cost, market/financial, environmental, governmental, and customer.

- Supplier- supplier is a guiding force representing the supply chain's demand for GSCM, thus playing a crucial role in improving GSC efficiency. If Suppliers and distributors consider adopting GSCM would help reduce the risk and complexity of target enterprises' green orientation, creating a growing passion for GSCM.
- Cost- The benefits of green supply chain practices result in an organization's cost cut and probability. This beneficial interpretation to an advantage for long-term strategies. It is a great advantage to address the environmental issues while minimizing costs when combining green practices with SCM.
- Market/financial- This is a main GSCM component since the primary goal of implementing GSCM is to combine economic and environmental supply chain success to achieve the organization's financial success. This demonstrates a direct link between green production and green logistics.
- Environmental- environmental certifications such as ISO 14001, EMAS, and ECO-Label are vital as they are the first step toward a green initiative. The activities or actions in GSCM practices would minimize the environmental effects of industrial operations while maintaining quality, competitiveness, and operating costs.

- Governmental- central governmental and regional environmental regulations are the two most important drivers for GSCM implementation in an organization. The existence of government is among the most visible stakeholders influencing organizations' adoption of environmental practices.
- Customer- Customers have the most market power in adopting green practices, encouraging organizations to embrace green policies by putting pressure on the organization. They are the external focus driver of green supply chain policy adoption. Customers are the most significant variable in environmental management policies.

Green supply chain Management (GSCM), Just-in-time (JIT), and Total quality management (TQM)

The objective and relationship of GSCM, JIT, and TQM with the environment created a more significant impact than an individual in implementing GSCM practices. Just-in-time (JIT) is a collection of concepts and techniques that aim for efficiency throughout the supply chain. JIT is a process that focuses on increasing value-added and eliminates waste by providing perfect and simplified operations. Total quality management (TQM) is a continual process that focuses on detecting, reducing, and eliminating manufacturing errors, streamlining supply chain management, and improving customer experiences. Green et al. (2019) 's literature review provided a theoretical model incorporating seven hypotheses to assess the impact of JIT and TQM practices on environmental sustainability by implementing GSCM practices. Figure 1 illustrates the seven hypotheses to evaluate the effect of JIT and TQM practices on ecological sustainability.

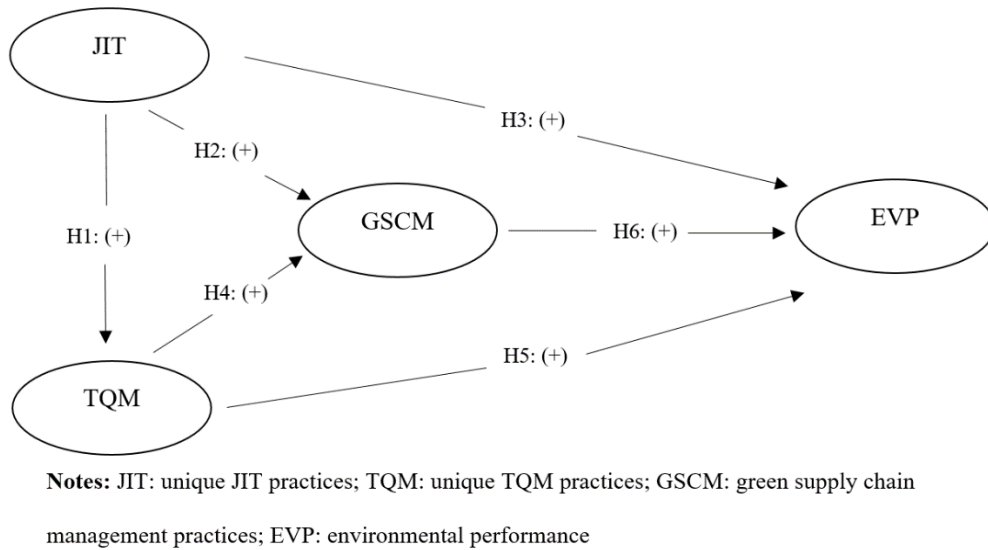


Figure 1. Structural model with hypotheses

The combination of JIT, TQM, and GSCM practices as a set of methods in which they are mutually supportive may yield a more significant competitive advantage when combined in manufacturing organizations. This combination of practices leads to a higher level of environmental sustainability that can be achieved than individually implemented. JIT and TQM are complementary since the primary goal of JIT are to reduce and eliminate waste, while TQM's primary goal is to make things right the first time with zero defects, continuous improvement, and customer satisfaction. It is logical to assert that environmental sustainability initiatives are more likely to thrive in an organizational environment that already incorporates JIT and TQM within its production processes (Green et al., 2019).

GSCM practices framework

Based on the literature review from Younis et al. (2016) depict and proposes a research of sixteen hypotheses of the impact of GSCM practices implementation on corporate performance. The sixteen hypotheses showed a positive relationship between GSCM practices and corporate

performance with external control variables, whether implementing eco-design, green purchasing, environmental cooperation, or reverse logistics.

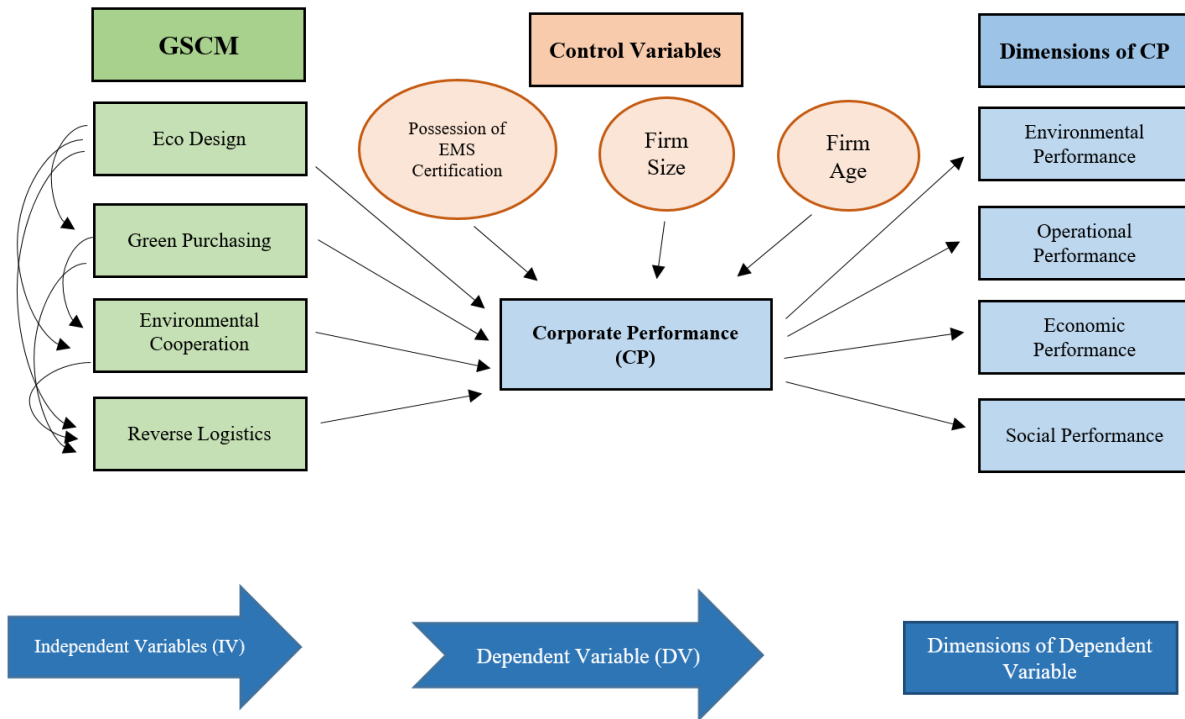


Figure 2. Theoretical model

Methodology

To understand the influence and the implantation of GSCM. The illustration of the framework of the GSCM practice from Younis et al. (2016) and the theoretical model from Green et al. (2019) literature review offer external and internal factors that are complementary to implementing GSCM practices. In association with the GSCM framework, a survey was also used to conduct the impact of implementing GSCM in organizations. Three sections of this survey aim to collect information on the organization's characteristics, the involvement of GSCM initiatives adoption, and the impact of GSCM initiatives on corporate environmental, economic, operational, and social performance. From the survey, 14. There was a 14.7 percent response rate

from 143 responses received; only 117 answers were found complete. These findings showed how significant external and internal factors impact implementing GSCM in organizations.

Discussion and Conclusions

Through this research on the implementation of GSCM, There is limited research presenting the effectiveness of implementing GSCM practices. By analyzing the framework and theoretical hypothesis, internal and external factors can play a critical role in implementing GSCM. Organizations that perform JIT and TQM effectively will benefit more from implementing GSCM. This result from the structural model with hypotheses proposes that the association of JIT and TQM has a direct and positive impact on GSCM implementation. Larger organizations will have the advantage of implementing due to financial resources. Smaller organizations have a limitation in implementing GSCM due to the high cost of materials for small productions, limited resources, and the uncertainty of effective change in implementing GSCM within the organization. For an organization to successfully and effectively implement GSCM, an organization's responsibility and sustainability framework across the supply chain has to align with GSCM practice. Environmental and sustainability continue to be the main focus for the new generation, for any organization that implements green practices will have the advantage.

References

- Agi, & Nishant, R. (2017). Understanding influential factors on implementing green supply chain management practices: An interpretive structural modeling analysis. *Journal of Environmental Management*, 188, 351–363.
<https://doi.org/10.1016/j.jenvman.2016.11.081>
- Green, K. W., Inman, R. A., Sower, V. E., & Zelbst, P. J. (2019). Impact of JIT, TQM and green supply chain practices on environmental sustainability: IMS. *Journal of Manufacturing Technology Management*, 30(1), 26-47. <http://dx.doi.org/10.1108/JMTM-01-2018-0015>
- Green, Kenneth W., Jr, Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: impact on performance. *Supply Chain Management*, 17(3), 290-305. <http://dx.doi.org.ezproxy.uwplatt.edu/10.1108/13598541211227126>
- Kirchoff, J. F., Tate, W. L., & Mollenkopf, D. A. (2016). The impact of strategic organizational orientations on green supply chain management and firm performance. *International Journal of Physical Distribution & Logistics Management*, 46(3), 269-292.
<http://dx.doi.org.ezproxy.uwplatt.edu/10.1108/IJPDLM-03-2015-0055>
- Lee, & Choi, D. (2021). Supply Chain Governance Mechanisms, Green Supply Chain Management, and Organizational Performance. *Sustainability (Basel, Switzerland)*, 13(23), 13146–. <https://doi.org/10.3390/su132313146>
- Liu, Feng, Y., Zhu, Q., & Sarkis, J. (2018). Green supply chain management and the circular economy. *International Journal of Physical Distribution & Logistics Management*, 48(8), 794–817. <https://doi.org/10.1108/IJPDLM-01-2017-0049>
- Sanket, D., Kadam, Akshay, A., Karvekar, & Vishal, J., Kumbhar. (2017). Traditional & Green Supply Chain Management – A Review. *International Advance Research Journal in*

- Science, Engineering and Technology*. <https://iarjset.com/upload/2017/si/NCDMETE-2017/IARJET-NCDMETE%2011.pdf>
- Song, & Choi, D. (2018). Dynamic Capability of the Firm as Driver of Green Supply Chain Management Implementation. *Sustainability (Basel, Switzerland)*, 10(7), 2539–. <https://doi.org/10.3390/su10072539>
- Yildiz Çankaya, S., & Sezen, B. (2019). Effects of green supply chain management practices on sustainability performance. *Journal of Manufacturing Technology Management*, 30(1), 98–121. <https://doi.org/10.1108/JMTM-03-2018-0099>
- Younis, H., Sundarakani, B., & Vel, P. (2016). The impact of implementing green supply chain management practices on corporate performance. *Competitiveness Review*, 26(3), 216–245. <http://dx.doi.org.ezproxy.uwplatt.edu/10.1108/CR-04-2015-0024>
- Zheng, K., & Jia, S. (2017). Promoting the Opportunity Identification of Industrial Symbiosis: Agent-Based Modeling Inspired by Innovation Diffusion Theory. *Sustainability (Basel, Switzerland)*, 9(5), 765–. <https://doi.org/10.3390/su9050765>