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Evaluating the impact of GSCM practices on Organisational performance for SMEs in Vietnam

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Abstract. Green Supply Chain Management (GSCM) has become one of the key strategies for enhancing enterprises and achieving sustainable improvement. This study aims to evaluate the impact of GSCM practices on the organisational performance of SMEs in Vietnam. This study considers four GSCM practices: green product development and design, green purchasing, green production management and marketing, and green logistics. Whereas the organisation performance elements are operational performance, economic performance, and environmental performance. A set of hypotheses is proposed to evaluate the impact of GSCM practices on organisational performance. A questionnaire survey is used to validate the GSCM practices and performance outcomes. One hundred twenty participants completed the questionnaire and data is collected from the available SMEs and used in the empirical analysis. Multi-linear regression analysis tests the proposed hypotheses and identifies the research outcomes. The results revealed that green practices led to improvement in all elements of organisational performance. However, Green Logistics is the only one that does not positively impact the economy and environmental performance due to inappropriate implementation of the green logistics. The paper provides a clear understanding of various aspects of GSCM implementation and can help practitioners improve their GSCM performance.

1 Introduction

Environmental sustainability and green environment are the most significant challenges for supply chain practitioners and researchers in recent years. In this context, green supply chain management has emerged as a key strategy for enhancing enterprises and achieving sustainable improvement [8]. GSCM focuses on adopting green materials, green manufacturing, green backing, and green logistics by utilising environmental solutions to improve operations and achieve effective organisational performance [7]. [10] stated GSCM is an approach for reducing waste of resources and minimising energy consumption, decreasing emission levels into the air, water, and solid, and contributing to the sustainable development of the environment, community, and society. Thus, firms can approach more customers and enhance sales revenues [9]. However, studies such as [7] and [8] argued that there is a lack of consensus about the relationship between GSCM implementation and organisational performance. Nonetheless, other studies claimed there might be some barriers to organisational planning for adopting GSCM [5]. Accordingly, this study attempts to address this gap by evaluating the impact of GSC practices on the organisational performance in the Vietnamese SMEs industry.

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1.1 GSCM practices

GSCM practices are strategic drivers for implementing GSCM and achieving sustainable organisational performance. GSCM practices have been identified based on the literature review, which are (green Product development and design, green purchasing, green production management and marketing, and green logistics,) [8]. Green product development and design (GPD&D) is concerned with the development related to the requirements of environmental protection and sustainability. It focuses on the whole production process, which refers to the practice of designing and developing a product with the ability to achieve positive environmental impact [8] and [6]. Green purchasing (GP) is a term that indicates purchasing materials or products based on environmental policies and systematised environmental measures. [2] stated that the key strategies of green procurement include purchasing goods and services that cause minimal negative environmental impact. Green Production Management and Marketing (GPM&M) is a complete system that focuses on managing the entire manufacturing operations, including marketing, by employing cleaner technologies to achieve various aspects of environmental protection, such as reduction of pollution and saving resources by using renewable energy and waste reduction by implementing innovation technologies. While green marketing is the practice of enhancing products and services to make them sustainable and environmentally friendly [9], it is an important method for organisations to stay competitive and profitable. Green logistics (GL) is a management system integrated with all supply chain activities that focus on moving products through the value chain [9]. It is about delivering goods directly to user sites. However, Green Logistics mainly uses grouping orders to reduce the number of shipping and, hence, reduce adverse environmental effects [9].

With respect to organisational performance, three organisational performances have been considered: environmental, economic, and operational performance [6]. Operational performance (OP) is concerned with improving the operations processes of an organisation by implementing GSCM practice [4]. OP relates to improving the quality environment of processes and products by decreasing production waste and increasing productivity [5]. Economic performance (EP) is associated with reducing the cost of purchasing materials and energy consumption and decreasing several expenses related to GSCM practice [4]. Environmental performance (ENP) is a performance measure concerned with assessing the environmental management system of an organisation, it relates to monitoring the environmental behaviour of a firm based on the roles and objectives [11].

1.2 Research hypotheses

Based on the literature review, many studies, such as [8],[4] and [7], stated that the effective implementation of GSCM practices and its potential impact on the outcomes could be influenced by organisational performance. Thus, the study developed the Following three sets of hypotheses to evaluate the impact of GSCM practices on organisational performance:

1- The impact of GSCM practices on operational performance:

H1- Green Product development and design, (GPD&D) has positive impact on operational performance (O P).

H2- Green Purchasing (GP) has a positive impact on operational performance (OP).

H3- Green Production management and marketing (GPM&M) has a positive impact on operational performance (OP).

H4- Green Logistics (GL) has a positive impact on operational performance (O P).

2- The impact of GSCM practices on economic performance:

H5- Green Product development and design, (GPD&D) has a positive impact on economic performance. (ECP).

H6- Green purchasing (GP) has a positive impact on economic performance (ECP).

H7- Green Production management and marketing (GPM&M) has positive impact on economic performance. (ECP).

H8- Green Logistics (GL) has a positive impact on economic performance (ECP).

3- The impact of GSCM practices on environmental performance :

H9- Green Product development and design (GPD&D) has a positive impact on environmental performance. (ENP).

H10- Green Purchasing (GP) has a positive impact on environmental performance (ENP).

H11- Green Production management and marketing (GPM&M) has a positive impact on environmental performance. (ENP).

H12- Green Logistics (GL) has a positive impact of environmental performance (ENP).

2 Research methodology and research design

The questionnaire survey was used to collect primary data from manufacturing professionals and managers of several SMEs in Vietnam's manufacturing sectors. The purpose is to evaluate the impact of GSCM practices on the organisational performance and to test the proposed research hypothesis. The questionnaire was designed and divided into three sections: section one concerned with the questions related to the respondent's information, section two comprised the questions related to identifying the current state of GSCM practices of SMEs in Vietnam based on a five-point scale (1- not considering it, 2- planning to consider, 3- considering it currently, 4- initiating implementation, 5- Implementing successfully) [8]. Section three includes the questions related to evaluating the organisational performance (Operational, economic, and environmental performance) based on a five-point scale (1- not at all, 2- slightly, 3- to some extent, 4- relatively significant and 5- significant) [8]. Two hundred questionnaires were sent to different chief executives and managers in various SMEs in Vietnam. SPSS software was used to analyse the data collection to present data in a meaningful way and simple interpretation multi linear regression analysis was utilised to check the impact of GSCM practices on the organisational performance, and also to test the proposed hypothesis [1].

3 Results and discussion

One hundred twenty valid responses were returned, indicating 60 percent response rate [3]. With regard to the status of GSCM implementation and its organisational performance. Table 1 shows that all the items of GSCM practices have mean values between 3.12 and 4.79 i.e. either being considering it currently or in the process of implementation being initiated, hence it can be inferred that most organisations have adopted GSCM practices and are moving towards successful implementation of it. Additionally, the results of Cronbach alpha as a reliability test demonstrated that the coefficient alpha values of the items are greater than 0.7 [3] and ranged from 0.937 to 0.985, which confirmed that all the items are consistent and reliable. More information about the results will be included in the conference presentation.

Table 1. The status of GSCM implementation of SMEs in Vietnam.

	N	Numbers of Likert-scale	Mean	Cronbach alpha
Green Purchasing				0.985
Involving suppliers/ vendors with Org objectives	120	5	3.73	
Environmental auditing of suppliers/vendors	120	5	3.71	
Specification with environmental requirements.	120	5	3.78	
Purchasing products environmentally friendly	120	5	3.75	
Green Product development and design				0.983
Design for environment	120	5	3.79	
Design for disassembly objectives	120	5	3.78	
Design for recycling	120	5	3.78	
Use of lifecycle analysis	120	5	3.84	
Green production management and marketing				0.977
Use of lean/flexible manufacturing	120	5	4.18	
Use of cleaner technology	120	5	4.20	
Reduction of air emissions, liquid and solid wastes	120	5	4.15	
Use of environmentally friendly packaging	120	5	4.05	
Green logistics				0.930
Use of environmentally friendly transportation	120	5	3.13	
Use of environmentally friendly distribution	120	5	3.12	
Reusing of materials or products	120	5	3.38	
Reduction in air emissions and solid wastes	120	5	3.23	

3.1 Multi regression analysis

In this study, the multi-regression test was conducted to investigate the impact of the independent variables (GP, GPD&D, GPM&M, and GL) on the three dependent variables which are (OPP, ECP, and ENVP) and hence to test the three sets of the proposed research hypothesis.

Table 2. The status of GSCM implementation of SMEs in Vietnam.

Independent variables	Dependent variables					
	Model 1		Model 2		Model 3	
	Operation performance		Economic performance		Environmental performance	
	β	P-value	β	P-value	β	P-value
Consent	0.090	0.00	0.346	0.00	0.463	0.00
GPD&D	0.95	0.00	0.404	0.00	0.37	0.000
GP	0.78	0.02	0.207	0.31	0.189	0.364
GPM &M	0.65	0.03	0.365	0.01	0.202	0.322
GL	0.64	0.03	-0.123	0.523	-0.005	0.981
F value	254.47	0.00	38.299	0.00	34.515	0.00
R square	0.898		0.571		0.546	
Adjusted R square	0.895		0.556		0.530	

The results of multiple regression analysis in (Table 2) showed that Model 1 represents the first set of hypotheses which assess whether the GSCM practices (GPD&D, GP, GPM&M and GL) has a positive impact on Operations performance as indicated by (H1 – H4), with regression coefficient values are ($\beta = 0.95$, $\beta = 0.38$, $\beta = 0.45$, and $\beta = 0.34$) respectively. Also,

the results showed that all of these relationships are statistically significant with P value < 0.05. Consequently, the research results supported H1 – H4.

Similarly, Model 2 represents the second set of hypotheses, which assesses whether the GSCM practices (GPD&D, GP, GPM&M and GL) have a positive impact on economic performance as indicated by (H5 – H8). The results showed (GL) has an adverse impact on the economic performance with $\beta = - 0.123$. In contrast, the result showed that the other elements of GSCM practice (GPD&D, GP, and GPM&M) have a positive impact on economic performance with regression coefficient values are ($\beta = 0.404$, $\beta = 0.207$, and $\beta = 0.365$).

Likewise Model 3 represents the third set of hypotheses, which assesses whether the GSCM practices (GPD&D, GP, GPM&M and GL) have a positive impact on environmental performance as indicated by (H9 – H12). The results showed (GL) has an adverse impact on the environmental performance with $\beta = - 0.005$. In contrast, the result showed that the other elements of GSCM practice (GPD&D, GP, and GPM&M) have a positive impact on environmental performance with regression coefficient values ($\beta = 0.37$, $\beta = 0.189$, and $\beta = 0.202$).

Adjusted R Square, which indicates the explanatory power of the regression model, also represents the percentage of variance in the dependent variable explained by the independent variable [1]. Therefore, the results in Table (2) showed that Model 1 explained 89.5% of the variability in the Operational performance, the results also showed that $P < 0$ for all the independent variables (GPD&D, GP, GPM&M and GL), which statistically significant this may be indicated that Vietnamese SMES succeeded to adopt GSCM practices. Similarly, Model 2 explained 55.6% of the variability in economic performance. This due to (GPM&M) using cleaner technologies and (GPD&D), while (GL) have an adverse impact on economic performance. It can be inferred that Vietnamese SMEs are going towards successful adoption of (GP) and (GPM&M).

Likewise, Model 3 explained 53% of the variability in the environmental performance which is due to only (GPD&D); it could be inferred that poor implementation of (GL) caused an adverse impact on environmental performance.

Based on the above results, Model 1 explained high variance in the operational performance and Models 2 and 3 explained moderate variance for economic performance and environmental performance. Also, it can be noticed that most of the GSCM practices (GPD&D, GP, and GPM&M) positively impact the three elements of organisational performance (operations performance, economic performance, and environment performance). However, Green Logistics (GL) has a negative effect on economic and environmental performance. It can be understood that this finding is in line with the SMEs in Vietnam in the initial stage of implementing GSCM. Again, this is due to inappropriate implementation of the GL.

4 Conclusions

In this study, GSCM practices were identified based on the literature review to evaluate their impact on organisational performance. The results revealed that operational performance, economic performance, and environmental performance improved by implementing GSCM practices (GPD&D, GP, and GPM&M). However, since some GSCM practices are in the early stages, green logistics practices have an adverse impact on economic and environmental performance. The study demonstrated that there is a growing awareness among SMEs of the manufacturing industry in Vietnam of environmental issues, and most enterprises strive for being more environmentally friendly and sustainable supply chain, whereas other enterprises have already taken steps in this direction. The paper provided a clear understanding of various

aspects of GSCM implementation and can help practitioners and decision-makers to improve their GSCM performance.

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