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DOES PERFORMANCE GET ANY IMPACT FROM GREEN SUPPLY CHAIN MANAGEMENT OF RANONG THAILAND?

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ABSTRACT

The study aimed to evaluate the effect of green supply chain management (GSCM) on organisational performance. The study considered the case of Small Medium Enterprises (SMEs) sector operating in Thailand. The research design of the study was quantitative and the research instrument was a close-ended survey questionnaire, therefore, this research used the primary method of data collection. The final sample of the study was based on 420 participants based on employees working in the SMEs firms and were associated with supply chain practices. The analysis was conducted on SmartPLS and the technique which was implemented to attain the aim was Structural Equation Modelling (PLS-SEM). Considering this, the data was analysed using measurement model and path assessment with reflective constructs. The results revealed that the overall effect of GSCM on the SMEs sector's performance was significant. However, individually, the effect of cooperation with costumers, green information system, green manufacturing and reverse logistics has been computed to be significant. The study is limited to the SMEs sector only that is operating within the geographical bounds of Thailand. It has also undertaken limited factors depicting GSCM. Nonetheless, the research has various implications for the SMEs of Thailand, its managers and workers.

INTRODUCTION

With the increasing On the other hand, the awareness regarding environmental quotient of carbon footprint, the businesses are exploring alternative ways to execute their operations in a sustainable manner (Khan & Qianli, 2017). Similarly, the businesses are integrating sustainable aspects in their supply chain (SC) and this resulted in the emergence of the concept: 'Green Supply Chain Management (GSCM)'. Considering this aspect, the study of Qorri, Mujkić, Gashi, and Kraslawski (2018) asserted that mixed evidence exists related to GSCM's effect on the performance of the organisations. Another research carried out by Gandhi and Vasudevan (2019) implied that this concept becomes more crucial in developing nations. Therefore, it becomes inevitable to evaluate the impact of GSCM practices on the firms' performance. Hence, this research underpins this aspect where the case of Thailand will be considered specifically and the targeted industry is Small Medium Enterprises (SMEs).

sustainability has been increased among the people which has made it necessary for companies to focus on such practices which comply with sustainability practices. The study of Dubey and Bag (2018) implies that people prefer to purchase the products which are manufactured through sustainable practices. In this manner, it makes it necessary for the companies especially those operating in the SMEs to adopt GSCM. Therefore, it is significant for companies to assess the importance of GSCM and its impact on the performance of the company. Moreover, the increased competition in the industry due to globalisation has made it necessary for the companies to focus more on performance. In this manner, the company would be able to compete well in the industry. This has also been argued in the study of Madueno, Jorge, Conesa, and Martínez-Martínez (2016) that performance has become one of the major concerns for companies due to increased competition.

The significance of organisational performance has increased over the past decade since competition has become stiff. This has also been due to the reason that with the advent of technological innovation, it has made it easier for most of the companies to establish themselves in countries through e-marketplaces and platforms (Fan, Hossain, Islam, & Yahia, 2019; Rangone, 2020; Ross, 2016). This results in intense competition as local brands now have to compete with multinational brands. In this manner, this study has focused on identifying the different GSCM practices which help the company in terms of ensuring environmental sustainability. On the other hand, this study has also focused on identifying the impact of GSCM on the performance of the companies operating in the SMEs of Thailand.

The significance of green supply chain management has been well recognised in the existing body of literature (Jabbour & de Sousa Jabbour, 2016; Teixeira, Jabbour, de Sousa Jabbour, Latan, & De Oliveira, 2016) but when it comes to SME's sector the research requires more investigation, as most of the previous studies have been carried out in the context of large corporation. Particularly, in the context of Thailand there is found to be lack evidence pertaining to the impact of green supply chain management on firm performances. Therefore, one of the key rationale of this research is to fill this research gap by conducting this study in the context of Thailand's SMEs sector. In this regard, the outcomes of this research are promises to make an important contribution in academic literature. According to Matt, Modrák, and Zsifkovits (2020) SMEs sector holds huge importance for Thailand economy in terms of its contribution in the country's GDP and in generating employment. In accordance with the same report, in the year 2016, Thailand's SMEs were accounted for 42.2% of GDP.

According to OECD (2018) there were around 2.77mn SMEs operating in Thailand in the year 2015, which accounted for 99.72% of all the businesses. Apart from that, Thailand's SMEs also accounts for 80.44% of overall employment within private sector. The same report has projected the positive trends in terms of SMEs growth. Moreover, with the

growth of SMEs sector it is also imperative to highlight some important ways through which environmental sustainability can be ensured from the companies that fall under the category of SMEs. Therefore, this study holds huge significance from both academic and from practical relevance perspective.

LITERATURE REVIEW

Concerning the increased awareness of environmental sustainability, the preference of sustainable and environment-friendly products has been increased (D'Amico, Di Vita, & Monaco, 2016; Heo & Muralidharan, 2019; Wan & Toppinen, 2016). This has made it necessary for companies to manufacture products adopting green practices. In this manner, the companies will be able to improve their performance in the industry. It has also been argued in the study of Moktadir, Rahman, Rahman, Ali, and Paul (2018) that adopting green manufacturing practices helps companies in terms of gaining attention of consumers. It is more likely for the company to increase its sales due to green manufacturing practices. On the other hand, the preference of green manufacturing of FMCG products is yet to be identified in terms of performance of company. Therefore, the first hypothesis of this study is presented below:

H_1: Green manufacturing has a significant influence on the organisational performance of FMCG firms

On the other hand, the green purchasing discusses the procurement of services or products that have reduced or less consequence on the environment or human well-being in contrast to the competitor's services or products which serve the same purpose (Chekima, Wafa, Igau, Chekima, & Sondoh Jr, 2016; Liobikienė, Mandravickaitė, & Bernatonienė, 2016). This green purchasing has a huge impact in the performance of company. This is due to the reason that people are more diet conscious and concerned about their health (Her & Seo, 2017; Kamasak & Cansever, 2019). Therefore, sustainable products having green ingredients which can impose less threat to the health and environment are preferred by the consumers. In this manner, the involvement of these ingredients has a huge impact on sales of the company as these products are more preferred by consumers in contrast to other products of same purpose. This increased sale of the company can affect the performance positively. Therefore, the second hypothesis of this study in the context of Thailand FMCG industry has been presented below:

H_2: Green purchasing has a significant influence on the organisational performance of FMCG firms

Green information system relates to the practise of information systems which can endorse environment friendly and sustainable operations. It optimises the activities of enterprise towards green practices and green innovation (Corbett, 2013; Chayanan Kerdpitak, 2019; Watson, Boudreau, & Chen, 2010). In this manner, the employment of the green information system assists information distribution about the initiatives of environment sustainability in the endwise supply chain in terms of management. The green information system not only influences the integration and coordination with the supply chain member positively, but it also enriches the economic and environmental performance of organisation. The study of Khan and Qianli (2017) argued that the successful application of GIS in the supply chain of company can result in improved efficiency of organisation in relations of financial performance and operational performance with optimization of source allocation. Therefore, it can be argued that organisational performance can be increased with help of green information system. The third hypothesis of this study is provided below:

H_3: Green information system has a significant influence on the organisational performance of FMCG firms

In the environment of external stakeholders, the product stewardship incorporates into the development stages of eco-design through life cycle analysis. In this manner, the environment friendly invention can measure the influence of product on environment till its final consumption (Kerdpitak, Mekkham, & Girdwichai, 2019; Khan & Qianli, 2017). In addition to this, the first mover advantage provides the advantage to introduce eco-friendly innovations among the manufacturing of products which enhances the advantages including receiving green technology licensing and developing inimitable capabilities of manufacturing. Moreover, it also builds the patented information which helps the company to attain sustainable modest advantage. The study of Yusoff, Omar, Zaman, and Samad (2019) argued that there is a significant impact of eco-friendly product on the survival of enterprise which play a role of catalyst in attaining sustainable competitive advantage for the company. There is a significant and positive impact of eco-design products on the performance of enterprise while consumers are also willing to purchase environment friendly products for the purpose of achieving cost and environmental protection advantage (Ghorashi & Darabi, 2017; Mazrouei & Pech, 2015). Therefore, the fourth hypothesis of this study is presented below:

H_4: Eco-design has a significant influence on the organisational performance of FMCG firms

In supply chain, the customers are considered as the key stakeholders which probably exert pressure on the companies to reduce the negative or harmful possessions in their activities. In other words, consumers can distress the practices of organisation (Harms, Hansen, & Schaltegger, 2013). With the implementation of green practices of supply chain, the company ensures strong relationship with the customer which leads to enhanced marketing and financial performance. In addition to this, the competitive pressure enhances the economic performance of the company. The study of Khan and Qianli (2017) argues that synchronisation and close partnership with the clients and suppliers in the manufacturing industry helps in better performance of the organisation. In this manner, the requirement of customers regarding the eco-friendly products cannot be determined without their collaboration along with their involvement in valuable feedback. Therefore, the cooperation with customers is necessary for the company in terms of increasing performance of the company. In this manner, the fifth hypothesis of the study has been presented below:

H_5: Customer Cooperation has a significant influence on the organisational performance of FMCG firms

For the purpose of reducing the pressure of government and customers, most of the companies have intensive more on practices of GSCM along with their implementation in the endwise business processes (Gülsün, Yıldız, & Yılmaz, 2017; Khan & Qianli, 2017). In addition to this, the operations like reverse logistics benefits the company to achieve better reputation in the minds of consumers. Companies are encouraged by consumer's pressure in implementation of green practices in their operations and processes. It has been argued in the study of Kumar, Kumar, Brady, Garza-Reyes, and Simpson (2017) that reverse logistics includes the returning of product to the distributor or manufacturer for the purpose of forwarding it for recycling, servicing and refurbishment. This creates the positive image of company in the minds of consumers. This helps companies in terms of increasing their sales which eventually increase the performance of the company. Therefore, the reverse logistics can influence the performance of company. In this manner, the sixth hypothesis of the study has been presented below:

H_6: Reverse Logistics has a significant influence on the organisational performance of FMCG firms

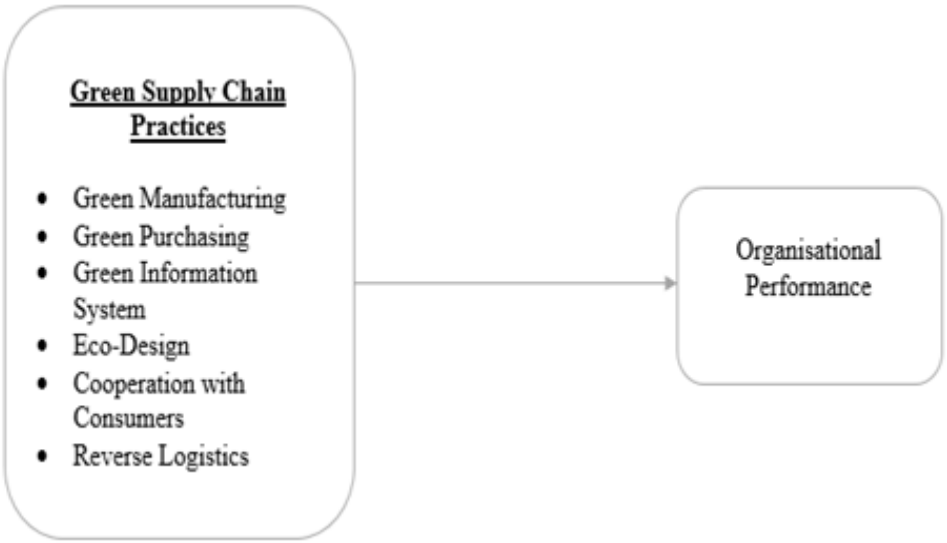
THEORETICAL FRAMEWORK

The GSCM practices has been accepted by most of the companies with hopes that it will impact environmental and financial performance of the company positively (Qi, Shen, Zeng, & Jorge, 2010; Zhang & Yang, 2016). In this manner, the stakeholder theory relates to the adoption of GSCM for the purpose of increasing the performance. As stated in the stakeholder theory, that the stakeholders are considered as the persons or clusters who can indirectly or directly influence the decision-making of company while being affected from the actions of the company (Penz & Polsa, 2018). In this manner, the company's production externalities are put forward by this theory which can influence the stakeholders to exert burden on companies for reducing damaging effects on the environment ultimately leading to sustainability (Khan & Qianli, 2017). It has also been argued in the study of Zhang and Yang (2016) that compression from stakeholders can act as the motivating factor which can force the companies to accept and implement atmosphere friendly practices. Therefore, the stakeholder theory has been adopted in this study for identifying the impact of GSCM on the performance of companies.

CONCEPTUAL MODEL

In the following section of the study, the conceptual model has been derived based on the theoretical evidence discussed earlier. The independent constructs of the research include green manufacturing, green purchasing, eco-design, green information system, reverse logistics, and cooperation with customers. The dependent construct is the performance of FMCG industry of Thailand. The model has been illustrated in Figure 1 which is supported by Khan and Qianli (2017); Qorri et al. (2018) and Gandhi and Vasudevan (2019).

Figure 1: Conceptual Model of the Study.



RESEARCH METHODOLOGY

Research design and data collection process

The research is supported by quantitative design in which the data has been analysed based on numbers and figures. For this purpose, the primary method of data collection has been used by the researcher in which, the data has been gathered through a survey questionnaire. The use of a close-ended survey questionnaire helped in data collection which was based on a 5 points Likert scale that ranged from strongly disagree to strongly agree and were coded from 1 to 5. In this manner, the data has been gathered from the employees working in the SMEs of Thailand and specifically associated with the supply

chain practices. To approach the participants the researcher various platforms, for instance, some of the questionnaires were floated using Google Forms and some were distributed using emails and some physically in order to have a high response rate.

Sampling technique and sample size

Since the research underpins GSCM, therefore, the employees associated with the supply chain department of their companies have been recruited only. This implies that the sampling strategy in this research is purposive sampling which is non-probability sampling. This is due to the reason that the study involves the impact of GSCM on the organisational performance and for that reason, the associated employees have been considered. Moreover, the researcher approached 420 employees working in the supply chain department of companies operating in the SMEs of Thailand. However, the response rate was calculated to be 100% because 420 respondents returned the survey questionnaires that were eligible for the analysis.

Data analysis technique

For the purpose of analysing the data in order to obtain the results, the researcher has used the Structural Equation Modelling (SEM) in which the Confirmatory Factor Analysis (CFA) and path analysis has been employed. This identifies the reliability and validity of the instrument along with identifying the impact of each variable. Besides, blindfolding has also been conducted to determine the predictive relevance of the model theorised in this study in terms of Q square. Also, the quality of the model has been determined with the help of R-squared and adjusted R-squared. In this manner, the analysis has been conducted on SmartPLS which does not require the data to be normally distributed because it is based on PLS-SEM.

RESULTS

Measurement model- partial least square algorithm (PLS)

In this section, the researcher has conducted a CFA analysis to determine the measurement model. Firstly, the reliability of each latent construct has been tested and according to Avkiran and Ringle (2018) the minimum acceptable value in terms of composite reliability and Cronbach Alpha is 0.6. Considering this, the results in Table 1 depicts that all the variables or latent constructs of the study are reliable as the least value in terms of composite reliability is calculated to be 0.89 whereas, in terms of Cronbach's alpha, the minimum is computed to be 0.81. Provided this, another significant aspect of CFA analysis is the assessment of outer loading whose threshold is also 0.6 according to the study of Vinzi, Chin, Henseler, and Wang (2010). In this concern, Table 1 asserts that there is no need to drop any variable since all the factor or outer loadings are above 0.6 and the minimum computed value is 0.85. Moreover, the significance of those outer loadings using bootstrapping and they were found to be statistically significant. In terms of convergent validity, the association and relatedness of latent constructs are tested, therefore, AVE is one of the most used metrics whose threshold value is 0.5 (Gofe & Tulu, 2019; Jefferies & Cubric, 2015). With respect to the model theorised in this study, all the variables possess convergent validity since the least AVE is calculated to be 0.72. These aspects are also depicted in Figure 1 and according to this, the model comprises of reflective constructs where latent variable causes the indicators as asserted by Hair Jr, Hult, Ringle, and Sarstedt (2016).

Table 1: Reliability and Convergent Validity

Variables	Indicators	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Cooperation with Consumers	CwC1	0.85***	0.87	0.92	0.79
	CwC2	0.91***			
	CwC3	0.91***			
Eco-Design	ED1	0.90***	0.90	0.94	0.83
	ED2	0.94***			
	ED3	0.90***			
Green Information System	GIS1	0.89***	0.88	0.93	0.81
	GIS2	0.92***			
	GIS3	0.90***			
Green Manufacturing	GM1	0.89***	0.86	0.91	0.78
	GM2	0.90***			
	GM3	0.86***			
Green Purchasing	GP1	0.79***	0.81	0.89	0.72
	GP2	0.90***			
	GP3	0.86***			
Organisational Performance	OPER1	0.93***	0.92	0.95	0.87
	OPER2	0.94***			
	OPER3	0.93***			
Reverse Logistics	RL1	0.87***	0.84	0.91	0.76
	RL2	0.86***			
	RL3	0.89***			

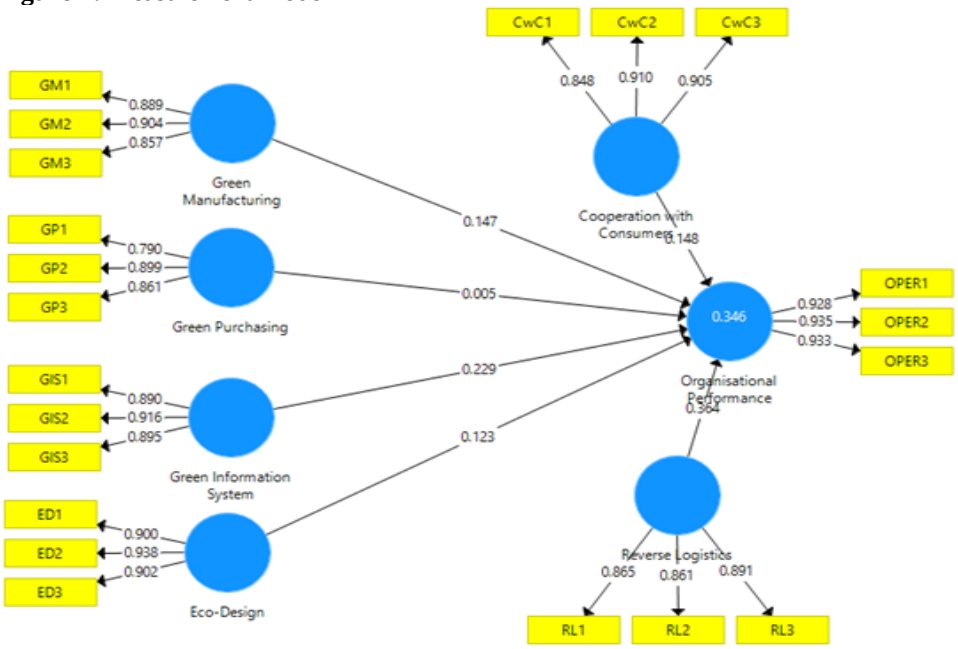
Note: ***: depicting significance at 1%

In addition to the determination of reliability and convergent validity, it is also necessary to determine the distinctiveness of the variables (Ahram, Karwowski, & Taiar, 2018). Considering this, HTMT ratio is utilised to determine whether or not two variables are distinct and the maximum acceptable value is 0.85 as a conservative criterion (Kergroach, 2017). Hence, the results presented in Table 2 depicts that none of the values is violating the criterion for HTMT ratio and this infers that these variables can be used for path analysis because of the fact that the maximum computed value is 0.72.

Table 2: Discriminant Validity using HTMT Ratio.

	Cooperation with Consumers	Eco-Design	Green Information System	Green Manufacturing	Green Purchasing	Organisational Performance
Eco-Design	0.57					
Green Information System	0.44	0.71				
Green Manufacturing	0.28	0.63	0.72			
Green Purchasing	0.27	0.49	0.58	0.67		
Organizational Performance	0.43	0.41	0.45	0.24	0.31	
Reverse Logistics	0.40	0.35	0.41	0.36	0.48	0.55

Figure 2: Measurement Model



Path assessment

Following the assessment of the measurement model which helped in the determination of factors' validity and reliability of the latent constructs, the significance of the hypothesised paths has been tested in the SEM model. The effect and its significance have been tested using bootstrapping and the results have been presented in Table 3 and Figure 3. Bootstrapping is referred to as the process of resampling and subsampling to determine the significance (Gu & Prah, 2020; Hair Jr et al., 2016). In terms of the results presented in Table 3, it can be seen that the effect of cooperation with the customers is significant on the SMEs's organisational performance operating in Thailand (B= 0.148; p-value= 0.023< 0.05). It has been inferred because the p-value or significance value was below the threshold of 5%. Moreover, the effect is computed to be positive which is concluded based on the coefficient value and this implies that improvement in cooperation with customers can result in improvement in the performance of the SMEs

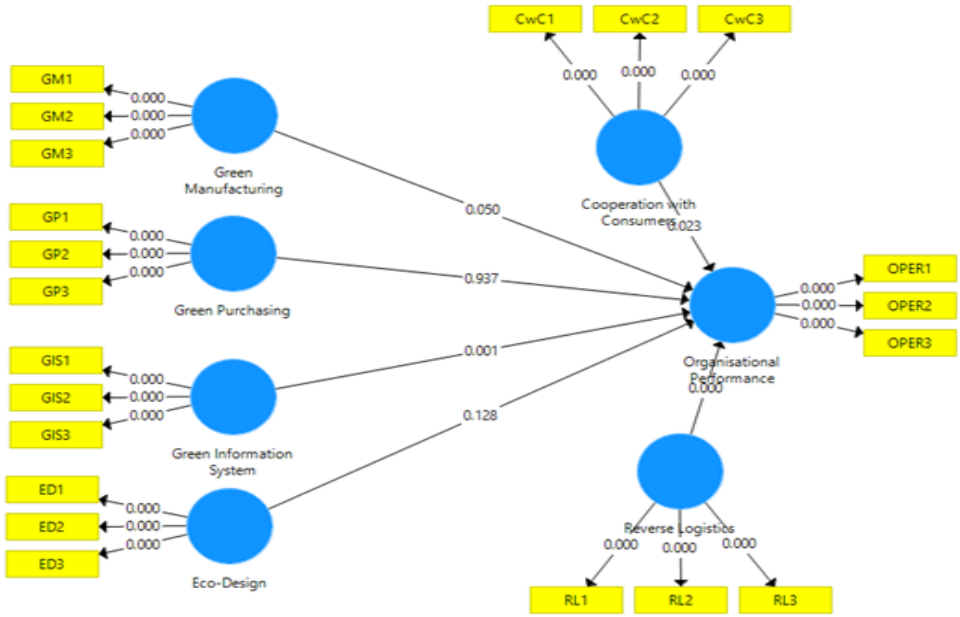
sector of Thailand. In furtherance, the effect of GIS is also computed to be significant and positive on the organisational performance which means that improving the sustainable information system (B= 0.229; p-value= 0.001< 0.01) can lead to enhanced performance. Table 3 is also depicting that the impact of green manufacturing is also positive and it is significant as well (B= 0.147; p-value= 0.050< 0.1). Furthermore, the effect of reverse logistics in the case of SMEs sector of Thailand is also computed to be statistically significant (B= 0.364; p-value= 0.000< 0.01). Hence, the most prominent factors of GSCM are cooperation with customers, green information systems, green manufacturing and revere logistics. On the contrary, the effect of green purchasing and eco-design is computed to be statistically insignificant (p-value> 0.05). The results in Figure 3 have been presented following the application of bootstrapping with p-values.

Table 3: Path Analysis

Path	**Path Coefficient**	**T Statistics**	**P Values**
Cooperation with Consumers -> Organisational Performance	0.148**	2.273	0.023
Eco-Design -> Organisational Performance	0.123	1.521	0.128
Green Information System -> Organisational Performance	0.229***	3.197	0.001
Green Manufacturing -> Organisational Performance	0.147*	1.962	0.050
Green Purchasing -> Organisational Performance	0.005	0.079	0.937
Reverse Logistics -> Organisational Performance	0.364***	5.170	0.000

Note: ***: depicting significance at 1%; **: depicting significance at 5%; *:depicting significance at 10%.

Figure 3: Bootstrapping with p-values



Quality criterion of the model and predictive relevance

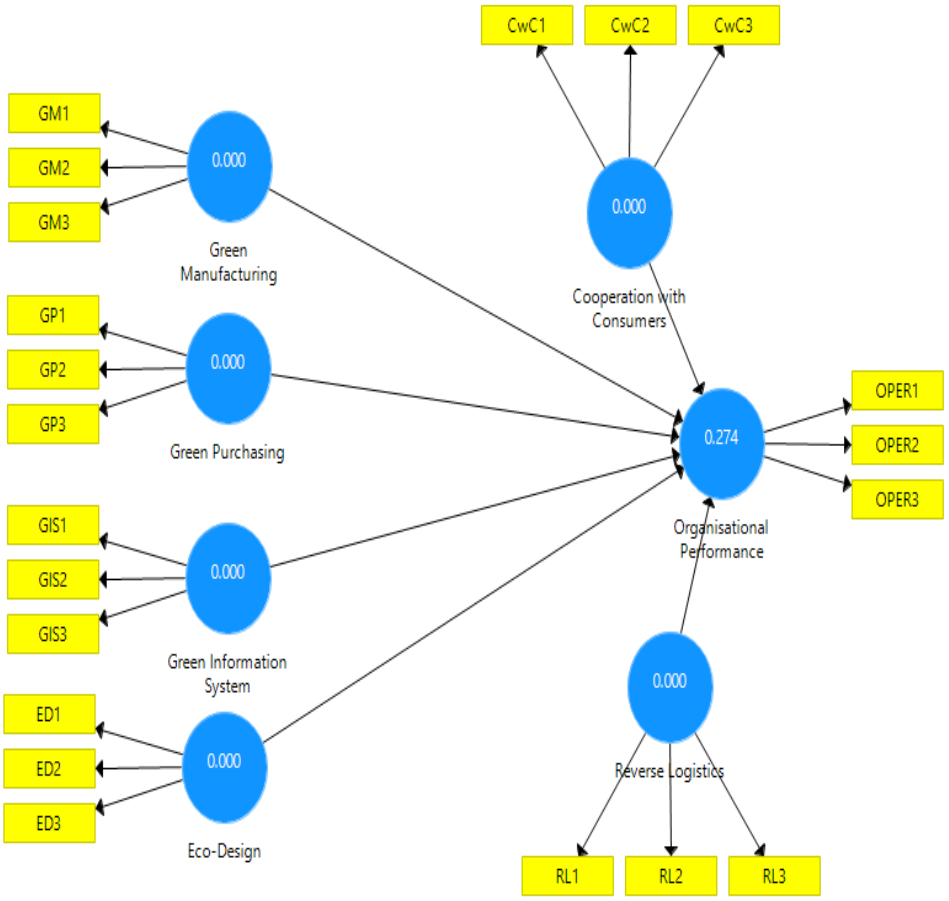
After the assessment of the measurement model and the path analysis of the model, it is relevant and important to evaluate the quality of the model and its predictive relevance.

The study carried out by Miller (2014) implied that R-squared and adjusted R-squared help in the evaluation of the model's quality. In terms of this study, the results have been presented in Table 4 and the variance in all the factors including CwC, GIS, ED, RL, GP and GM is explaining 34.58% variance in the SMEs's organisational performance operating in Thailand whereas, following the adjustments of the errors, the value is reduced to 33.47%. On the other hand, the study conducted by Wong (2011) stated that to deem a model having predictive relevance, the value of Q square should be above 0. Hence, the results depicted in Table 4 presents that Q square is computed to be 0.274 which is above 0 and therefore, the model of this study possess predictive relevance.

Table 4: Quality Assessment of the Model

	R Square	R Square Adjusted	Q Square
Organisational Performance	34.58%	33.47%	0.274

Figure 4: Blindfolding



Summary of hypotheses

The hypotheses theorised in section 2 of this paper have been summarised in this section based on the results obtained, interpreted and evaluated. In this concern, the two hypotheses underpinning green purchasing and eco-design are rejected whereas, all other hypotheses have been accepted and those results have been summarised in Table 5.

Table 5: Table of Hypotheses Assessment Summary

Propositions	**Decision**
H1: Green manufacturing has a significant influence on the organisational performance of SMEs firms	Accepted
H2: Green purchasing has a significant influence on the organisational performance of SMEs firms	Rejected
H3: Green information system has a significant influence on the organisational performance of SMEs firms	Accepted
H4: Eco-design has a significant influence on the organisational performance of SMEs firms	Rejected
H5: Customer Cooperation has a significant influence on the organisational performance of SMEs firms	Accepted
H6: Reverse Logistics has a significant influence on the organisational performance of SMEs firms	Accepted

DISCUSSION

The previous section outlines the major outcomes of this study through the application of different statistical measures and methods. This section pertains to the brief discussion of the overall research outcomes. Based on the analysis of CFA, all the latent constructs or variables were found to be reliable in terms of the value of both composite reliability and Cronbach's alpha. Apart from that, based on the value of outer loading no variable from this study has been dropped. On the other hand, with respect to discriminant validity, the value of HTMT ratios suggested that all the variables carries out enough distinctiveness to be included in path analysis.

In order to achieve the main objective of this study, the researcher has conducted path assessment. In accordance with the overall analysis of path assessment, some of the main variables of this study including green information systems, cooperation with customers, reverse logistics, and green manufacturing are found to have a significant influence on the organisational performance of SMEs firms. In contrast, the variables of eco-design and green purchasing were found to have an insignificant association with organisational performance. The results of this study are also found to be consistent with most of the previous studies. As mentioned in the study of Moktadir et al. (2018) the adaptation of green manufacturing practices helps the organisations to attain customer attention, which eventually leads towards increasing the overall sales of the company. Moreover, there are several studies as well that have identified cooperation with customers, green information system and reverse logistics as an important determinant of organisational performance (Corbett, 2013; Gyebi, Owusu, & Etroo, 2013; Khan & Qianli, 2017; Kumar et al., 2017; Watson et al., 2010). Considering these aspects, the study has certain implications for the SMEs of Thailand.

CONCLUSION

The main goal of this research has been to investigate the influence of green supply chain management (GSCM) on organisational performance within the context of the SMEs sector of Thailand. For that purpose, the use of quantitative research design has been made in this study to gain statistical information about the research topic, which was analysed through path assessment and measurement model on SmartPLS. The main factors of GSCM that have been examined in this study included green manufacturing, green information system, green purchasing, eco-design, reverse logistics, and cooperation with customers. As per the overall analysis of this study, the variable of the green information system, green manufacturing, reverse logistics, and customer cooperation is found to have a significant impact on organisational performance. However, other variables including green purchasing and eco-design were found to have an insignificant impact on organisational performance. Conclusively, the overall effect of

GSCM is significant on the performance and therefore, the organisations can consider the most significant aspects for policymaking.

LIMITATIONS AND FUTURE RESEARCH DIRECTION

The main limitation of this study has been associated with its research design, as this study was entirely based on quantitative research design. The incorporation of only quantitative research design has limited the value of this research, as more detailed and comprehensive information could have been gained through utilising both quantitative and qualitative methods. Therefore, for future research direction, it has been recommended to incorporate mixed research design to provide more conclusive and strong research findings. This will also allow future researchers to validate their research outcomes by comparing both quantitative and qualitative results. On the other hand, the scope of this study has been limited to the SMEs sector of Thailand; thus, the findings of this research cannot be applied in another context. Based on this, it has been recommended to future researchers to broaden the scope of this research by investigating multiple regions and industries.

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