The Relationship between Green Procurement Practices and Organizational Performance in the Manufacturing Industry of Vietnam

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Abstract

Green procurement practices and management is one of the major elements that are adopted by various companies globally especially in the manufacturing industry to enhance the manufacturing sector to promote environment friendly practices. The research focuses on improving the manufacturing process via complying with the laws and regulations in the manufacturing department in Vietnamese companies. Deductive approach which is utilized in this approach is used for works with the practical reasoning and more practical ways to extract information. Questionnaire survey method is employed to carry out research method successfully. The survey was done to generate information as it is likely the most suitable way to collect reliable information from the mass target market. Research methodology section is important as this includes a variety of data collection approach, method and sample details that are significant for readers to understand. The findings show that there is a positive relationship overall between green procurement practices and organisational performance. Compliance with laws and regulations, and implementation costs have a significant impact on customer retention and sustainable performance. Contrarily, top management support and ICT have a significant impact on sustainable performance but insignificant on customer retention. Supplier selection, on the other hand, has a significant association with customer retention while insignificant association with sustainable performance. The study's scope was limited to only manufacturing industry in Vietnam while mono-method of quantitative design was selected to carry out the study.

Keywords

1. Introduction

Green procurement practices are now a modern-day supply chain method to procure raw materials and to enhance the manufacturing process in organizations. Green procurement process is also known as the sustainable procurement method. One of the emerging issues that are experienced by the companies is to reduce the wastage or to decrease pollution in the process of the procuring material in the manufacturing process while companies are taking effective measure to do so. Most of the regimes globally employ effective and strict measures for the manufacturing firms to establish green procurement concepts and performances that could add value in the manufacturing sector (Nderitu & Ngugi, 2014). Procuring methods are essential and an important way to contribute to the performance excellence. The purpose of this section is to provide the background information regarding the green practices of the procurement and to improve its performance from a global perspective with respect to Vietnam. Manufacturing firms are playing an important role in the economy where most of the firms are persuaded to take green initiatives in the raw material procurement process (Sánchez-Flores et al., 2020).

This section provides a detail overview of the objectives and aims for the study. Following are the set of objectives that are shaped for the report.

- To examine the major factors of green procurement practices contributing to the organisational sustainable performance.
- To determine the green procurement management adopted by the Vietnam companies to enhance supply chain performance.
- To analyse the relationship between green procurement practices and organisational performance in the manufacturing sector in Vietnam.
- To provide recommendations for the manufacturing firms regarding green procurement practices for effective performance.

This section provides research questions for the study.

- What are the major factors of green procurement practices contributing to the organisational sustainable performance?
- How companies enhance green procurement management to be adopted by the Vietnam companies to improve supply chain performance?
- What is the relationship between green procurement practices and organisational performance in the manufacturing sector in Vietnam?
- Provide which recommendations for the manufacturing firms regarding green procurement practices for effective performance?

The impetus of the research is to evaluate the relationship and to determine how the manufacturing firms are adopting the green procurement practices such as top management support, information and communication technology infrastructure to enhance manufacturing method for the sustainable performance. The research focuses on improving the manufacturing process via complying with the laws and regulations in the manufacturing department in Vietnam companies.

The customer retention is dependent on the quality of manufacturing and each company is adopting the corporate social responsibility (CSR) activities such as implementing the green technologies in their respective supply chain department. In response to the sustainable development, this paper analyses the ethical procurement methods and investigates the supplier selection criteria to affect the environment, society, and economy (Islam et al., 2017).

2.   Literature Review

This chapter provides a comprehensive overview of the literature and how the green procurement practices are impacting the manufacturing firm to enhance performance and to sustain it for the longer period of time. This section explains a detail literature regarding multiple aspect for the companies operating in the manufacturing industry and which factors are critical in adopting the green procurement practices. Sustainable development in the manufacturing process has become an important agenda for every manufacturing firm where each company demonstrates the sustainable development process distinctively (Sarhaye & Mirendi, 2017). Sustainable procurement practices focus on enhancing the sustainable development. The strategic role of purchasing and selecting suppliers is the main reason for adopting a sustainable procurement management in supply chain department (Kilonzo, 2014). Green procurement not only has impacted the organizational performance but also it has become increasingly significant for organizations to face competitive, regulatory, and community restrictions and environment.

Green procurement practices are associated with various factors including top management support, information and communication technology infrastructure, supplier selection, compliance regulations set by the authorities to protect the environment. Total quality management is one of the major concerns for the companies and various manufacturing firms are setting and devising their supply chain approaches to shape the procurement strategies. This leads to the efficiency and increases the confidence of the employees to satisfy the needs and wants of the stakeholders of the firm (Kipkemoi, 2017). Procurement practices are vital and procurement process is generally a critical part of the supply chain. Procurement method involves selecting a vendor, inventory management and actual purchasing of the material to manufacture products in order to cater the demands and needs of the mass customers to sustain performance. The procurement process is a major part of the manufacturing industry and the supply chain process is highly dependent on procurement material that improves the organisational performance (Leiyan, 2016).

Factors related to the green procurement impacting the firm's performance are the critical part of manufacturing firms. Following are the green procurement factors explained.

H1: Top management support has a significant impact over the organisational performance.

Top management support is the critical factor of the green procurement practices. The pivotal top position that are making all the decisions regarding the supply chain processes requires a support to implement those decisions in the supply chain process. The role of implementing the green procurement practices at firms is dependent on how the managers of the company are acting and behaving in terms of the incorporating sustainable procurement practices (Jepkoech, 2017). The consistent involvement of the managers and implementing the green energy and practices to reduce the wastage and other polluted hazards activities are regulated or restricted.

H2: Information and communication technology infrastructure has a significant impact over theorganisational performance.

Major green practices are adopted by the managers to change the supply chain structure and to influence the major practices that assist to enhance the supply chain performance. Top management support is an essential part for the implementation process of the green practices at organisation and senior management supports the ethical aspect that enhances the authoritative development. Green procurement can be easily implemented with the top management support and its positive impact can be observed on organisational performance.

The capabilities of the IT technology and infrastructure provide companies with the organisational core competencies and the organisational performance to interact with the each other in the corporate sector. Information and communication technologies are considered as the most vital element in implementing the green procurement practices that enhances the organisational performance (Jabbouria & Zaharib, 2015). Capabilities of the informational technologies are one of the most essential factors and a strategic element to influence the supply chain department of the manufacturing firms. Core competencies of the organisations include the informational and communication technologies that could assist the firm to promote their manufacturing process via implementing the green procurement practices. However, the motive of senior management in organisation includes the effective procurement process of the company to enhance performance. Moreover, the dynamic capabilities of the organisations could be accessed with high information and communication technologies adopted and implemented by the supply chain department that is the major requirement in the 21st century (Jalagat & Al-Habsi, 2017).

H3: Supplier selection has a significant impact over the organisational performance.

Adopting a green procurement process is highly dependent on the supplier selection that adds value to the supply chain process. It is essential for the top management to select suppliers that promote and deal with the green practices adopted by the firm. Adoption of the green procurement practices is an essential part for the firm as the rules and regulations that are employed by the governmental bodies on the management of the firm are one of the major elements (Blome et al., 2014). Nowadays, most of the companies are operating integrated supply chain methods to select a supplier that are dealing with the green practices such as building raw materials and to influence the process of the wastage and the cycling system that could enhance the environmental responsibilities. The corporate ethics is one of the major aspects for the firm in order to influence the environment. Sustainability is referred to the environmental management such as purchasing, operational management, social and business perspective (Zhou & Xu, 2018).

H4: Compliance of laws and regulations has significant impact on the organisational performance.

The important aspects of the green procurement practices implemented by the firm are laws and regulations implied on each firm and how each organisation is regulated by the authorities to enhance corporate performance. Every firm is bound to work on the ethical boundaries and various supply chain process in the manufacturing industry are regulated by the environmental rules and regulations. Lack of awareness is one of the important issues that are considered as the barriers in implementing the green procurement practices. The procurement managers are experiencing various threat in the domain of the green practices such as climate change, green house effects, pollution and various other factors that are impacting the manufacturing department of the company (Chan et al., 2018). Laws and regulations are implied on the manufacturing firms to comply with the policies of the country and to act accordingly to the provided policies. Sustainable energy management in each firm plays an important part for the company to implement and sustain the green procurement process under the rules and regulations that are set by the regime of the region (Grandia & Voncken, 2019).

H5: Implementing cost has a significant impact on organisational performance.

Developing the green procurement practices is the initial development process for the operational management in the supply chain department. Tender management is directly linked with the cost management. The low-cost implementation is the main part of every management and each shareholder is striving to reduce the cost of the implementation of the technologies and assets that are required to influence the organisational performance (Rüdenauer et al., 2007). Green criteria such as noise reduction, consumption of fuel, avoiding harmful

substance and recycling manual system requires a heavy cost and expertise and its implementation process is also an expensive part of the green procurement practices.

3. Theoretical framework

This section provides a detailed overview of the theories that are essential to understand the research subject.

The institutional theory explains the companies undertaking certain strategies that are based on the forces outside the company. However, acceptance by the customers and stakeholders is an essential part for the firm. Each company is shaping effective measures for the corporate social responsibility (CSR) and how every firm is adopting practice within the environmental context to lower the pressure from the external parties such as government and other environment regulative agencies (Pembere, 2016). The theory is used to cope with the institutional pressures that are taken by the institution on green procurement.

Resource based view theory is an important aspect and concern for the companies to acquire the essential resources that are useful in implementing the green management practices. The field of purchasing a raw material and to procure the material to manufacture products are essential part for the companies. Each firm is regulated by the certain policies and it is essential for the manufacturing firm to procure the materials that are used to build a quality product. The resources should be adequate to procure the materials that are essential to enhance supply chain management (Bohnenkamp, 2013). The natural resource-based view is an essential part for the firm to connect between the environmental performances and to attain the competitive advantage in the corporate market. It is in firm's capacity to deploy the resources usually in the combination of the organisational processes in order to gain competitive edge in their manufacturing department (Chacón Vargas & Moreno Mantilla, 2014).

This section provides a model that is used to explain the relationship between the independent and dependent variable.
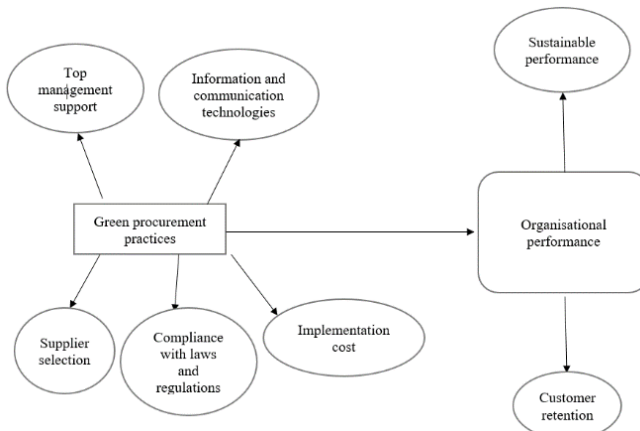

Figure 1: Relationship between the independent and dependent variable

The above figure explains the relationship of both the independent and dependent variables. This study takes the independent variable as the green procurement practices and sub-independent variables as the supplier selection, compliance with the laws and regulations, implementation cost, top management support, ICT technologies and how it is impacting the organisational performance which is dependent variable. The dependent variable undertakes the 2 sub-dependent variables including suitable performance and customer retention.

4.   Research Methodology

This section provides a detailed overview of the research method and the data collection procedure taken by the investigator to execute and conduct information that is relevant for the research. The study method includes the research approach, research philosophy, and sample size that is taken for the study to conclude the study. Research method is a significant part of the study and influences the data gathering process.

Positivism philosophy is used to analyse the spectrum of the research data collection method. The philosophy is significant for the quantitative method and to analyse the data in quantitative research. The research philosophy refers to the belief and system that is used to develop knowledge regarding the research and it provides a roadmap to conduct the information for the quantitative research (Saunders et al., 2009).

Deductive approach is used in this study as it is suitable for the quantitative research. Deductive approach works with the practical reasoning and more practical ways to extract information is utilized in this approach. Moreover, the approach is also called top to down approach that is used to follow logical conclusions (Burney, 2008). The observation is set out by the investigator and more logical and specific reasoning regarding the green procurement practices are followed to obtain information.

Data collection method is the main aim for the investigator and two methods are used to collect the information. Primary and secondary means to collect the authentic data are used as the literature section is extracted via the secondary method. However, new information is extracted that is called the primary way of obtaining information that is used via the techniques explained in the research technique (Ajayi, 2017). Questionnaire survey method is used to carry out research method successfully. The survey was done to conduct information as it is the most suitable way to collect reliable information from the mass target market.

Multiple research techniques are used to analyse the data to conclude the findings of the study. The study includes the Cronbach alpha that is used as the statistical technique to analyse the data and form relationship of the variables. Statistical technique of regression and correlation is used to analyse the data to

analyse the effect of the green procurement practices on the organisational performance (Bewicket al., 2003).

The sample size that is taken for the study is 465 respondents that is taken to extract the valid information regarding the independent and dependent variables. A sample size provides a required information that is needed about the population. The number of target respondents that are used for the study was accessed in order to increase the validity and reliability of conducted data. It is noted that a larger sample size increases the chances of the credible findings (Heckmann et al., 2014).

The investigator has followed the ethical boundaries that are set in order to follow the rules and regulations of conducting research. All the data that is gathered is plagiarism free and properly cited. All the data that is taken for the research whether it is primary or secondary it is conducted professionally and no personal information was gained for the purpose of the research (Fleming & Zegwaard, 2018).

5.   Findings and Analysis

In preceding section, the discussion has been presented regarding the most suitable methods of data collection and data analysis. Thereafter, this section is concerned with the analysing the collected data through different statistical measures to gain the required information. For the purpose of analysing the collected data, the use of SEM (structural equation modeling) technique has been made in this study. According to Lowry & Gaskin (2014), SEM is one of the most effective technique to analyse structural associations, as it helps the researcher to associate the complex path models with latent variables. Hence, by using the SEM technique, researcher in this study has conducted path analysis and confirmatory factor analysis.

5.1. Confirmatory Factor Analysis

Confirmatory factor analysis is considered as one of the important aspects of structural equation modelling (SEM), and a useful method to analyse quantitative data. As mentioned in the study of Marsh et al., (2020), the confirmatory factor analysis is commonly used to determine whether or not the data fits the hypothesised measurement model. As per the study of Al-Emran et al., (2018), for labelling all the constructs as valid, the values of Cronbach's Alpha, factor loadings, and composite reliability should need to be at least 0.6 or greater than 0.6. Hence, the same criteria have been followed in this study, as researcher has set the same benchmark in this study for all the metrics including composite reliability, Cronbach's alpha, and factor loading. On the other hand, CFA also investigate the convergent validity with the help of Average Variance Extracted (AVE). With respect to the benchmark of Average Variance Extracted (AVE), there is no consensus has yet been formed as different studies employs different benchmark for AVE values. According to the study of Ahmad et al., (2016), for the purpose of proving the convergent validity of constructs, the AVE value should need to be at least 0.5 or greater. The table

presented below outlines the values of different metrics for analysing the reliability and convergent validity of each variable of this study.

Table 1: Factor Loadings, Reliability and Validity

	Factors Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
		0.911	0.944	0.849
CLR1	0.914			
CLR2	0.937			
CLR3	0.913			
CR1	0.837	0.902	0.932	0.773
CR2	0.885			
CR3	0.891			
CR4	0.903			
IC1	0.901	0.892	0.933	0.822
IC2	0.938			
IC3	0.881			
ICT1	0.791	0.808	0.886	0.723
ICT2	0.892			
ICT3	0.864			
SP1	0.810	0.846	0.890	0.620
SP2	0.825			
SP3	0.808			
SP4	0.731			
SP5	0.759			2
SS1	0.727	0.678	0.823	0.608
SS2	0.827			
SS3	0.783			
TMS1	0.882	0.861	0.915	0.783
TMS2	0.905			
TMS3	0.867			

Table 1 highlights the Cronbach Alpha values of each construct that have been incorporated in this study. In this regard, all the Cronbach's Alpha values that are presented in Table 1 are above 0.6, and no value is found to be less than 0.6. This means that all the set of scale or test items that are incorporated in this study are internally consistent and reliable. On the other hand, all the factor loadings values presented in table 1 are also found to be above 0.6. Hence, based on this result there is no constructs of the study have been dropped from analysis to make sure the reliability of overall research outcomes. Moreover, the AVE value of all the variables have also been highlighted in table, which explains the extent of variance within all the variables that latent construct is demonstrating. As mentioned in the Table 1, all the AVE values are found to be over 0.5, which proves the sufficient convergent validity of all the constructs. Overall, the findings of CFA confirm that all the variables that have added in the model are suitable and appropriate enough to analyse the association between the variables.

5.2. Discriminant Validity

Researcher in this study has added different variables in order to examine the association between green procurement practices and organisational performance. Therefore, it is imperative to conduct discriminant validity to assess the constructs for determining that whether or not those constructs which requires to be unparalleled are actually unrelated or not. For that purpose, the following table presents the results pertaining to discriminant validity of all the incorporated variables:

Table 2: Discriminant Validity

Heterotrait-Monotrait Ratio (HTMT)	Complia nce with Laws and Regulatio ns	Custo mer Reten tion	Implem entation Costs	Informati on and Commun ication Technolo gy	Suppl ier Select ion	Sustain able Perfor mance
Customer Retention	0.533					
Implementation Costs	0.502	0.801				
Information and Communication Technology	0.503	0.420	0.372			
Supplier Selection	0.519	0.675	0.655	0.570		
Sustainable Performance	0.762	0.815	0.813	0.634	0.669	
Top Management Support	0.607	0.351	0.330	0.675	0.399	0.682

The Heterotrait-Monotrait ratio is viewed as a useful tool to conduct the assessment discriminant validity. As per the study of Ab Hamid et al., (2017), for the purpose of confirming that all the variables of the study are dissimilar and are not associated with each other, the value of Heterotrait-Monotrait Ratio needs to be less than 0.85. Similarlsy, researcher in this study has followed the same criteria by taking 0.85 as the criteria to assess the discriminant validity of each variables. Based on this criterion, all the values of each variables that are presented in Table 2 are found to be less than 0.85, which make sure the discriminant validity of each variable.

5.3. Model Specification

Table 3 presented below explains the strengths of all the variables in defining the changes that occur on dependent variables. In accordance with the study of Rights & Sterba (2018), the R-square value shows the percentage of changes that is explained by all the independent variables added in regression model. On the other hand, the adjusted R square value is normally viewed as the more altered version of R-squared, which is improved for the several variables in regression model.

Table 3: Model Specification

	R Square	R Square Adjusted
Customer Retention	0.709	0.706
Sustainable Performance	0.723	0.720

In accordance with the values presented in Table 3, the R square values of customer retention and sustainable performance are 0.709 and 0.723 respectively. This infers that 70.9% and 72.3% variability of the customer retention and sustainable performance is being explained by all the independent variables respectively.

5.4. Path Assessment

The main rationale of this study has been to analyse the association between green procurement practices and organisational performance. For the purpose of achieving this objective, researcher has outlined different sub-variables of both independent and dependent variable. In this regard, the independent variable of green procurement was investigated through five key sub-variables including compliance with laws and regulations, implementation costs, information and communication technology, supplier selection, and top management support. On the other hand, the dependent variable of organisational performance was analysed through customer retention, and sustainable performance. The path assessment test was conducted to analyse the association between the independent and dependent variables of this study. According to Aimran et al., (2017), path assessment allows the researcher to recognise causal association between two or more variables, where p-value serve as an important statistical measure that demonstrate the acceptable range for the variables to be referred as significant.

Table 4: Path Coefficients

	Original Sample	T Statistics	P Values
Compliance with Laws and Regulations -> Customer Retention	0.100	2.887	0.004
Compliance with Laws and Regulations -> Sustainable Performance	0.270	5.750	0.000
Implementation Costs -> Customer Retention	0.711	22.187	0.000
Implementation Costs -> Sustainable Performance	0.458	12.192	0.000
Information and Communication Technology -> Customer Retention	0.052	1.614	0.107
Information and Communication Technology -> Sustainable Performance	0.119	3.187	0.001
Supplier Selection -> Customer Retention	0.108	3.125	0.002
Supplier Selection -> Sustainable Performance	0.046	1.423	0.155
Top Management Support -> Customer Retention	-0.011	0.287	0.774
Top Management Support -> Sustainable Performance	0.225	5.440	0.000

As per the results presented in Table 4, the independent variables including compliance with laws and regulations, and implementation costs are found to have a significant and positive association with both customer retention and sustainable performance, as p-value is fall under the threshold of 0.05. On the other hand,

information and communication technology and top management support are found to be significantly associated with sustainable performance, however their association with customer retention is found to be weak and insignificant. Lastly, the variable of supplier selection is found to be significantly associated with customer retention, whereas its association with sustainable performance is found to be insignificant.

6.   Discussion

The main purpose of this research has been to analyse the association between green procurement practices and organisational performance. In this study, researcher has conducted the detailed review of previous literature to comprehend different important aspects of the research. Based on the review of previous literature, researcher has also outlined some important sub-variables of green procurement and organisational performance, which have been investigated in this study. In this regard, the key sub-variables of green procurement have been top management support, supplier selection, information and communication technology, implementation costs, and compliance with laws and regulations. On the other hand, the dependent variable of organisational performance was examined through customer retention and sustainable performance. The overall findings of this study show the positive relationship between green procurement practices and organisational performance. This has also found to be consistent with most of the previous studies, in which green procurement practices have been identified as an important factor that makes a significant influence on organisational performance (Tan et al., 2019; Saad et al., 2016; Rehman et al., 2016).

With respect to the findings of this study, the variables of compliance with laws and regulations, and implementation costs are found to be significantly associated with customer retention and sustainable performance. On the other hand, the variables of top management support, and information and communication technology are found to have significant influence on sustainable performance, whereas their influence on customer retention is found to be insignificant. In contrast, the variable of supplier selection has a significant relationship with customer retention, whereas it has an insignificant association with sustainable performance. Conclusively, the findings of this study reveal the significant relationship between green procurement and organisational performance, which is also validated from most of the previous studies. As mentioned in the study of Bag (2016), the high commitment from any organisation towards green procurement practices often leads towards making a positive influence on customer retention. On the other hand, the study carried out by Chan et al., (2018), identifies positive associations between green procurement and sustainable performance from the organisations.

7. Conclusion

The study explains the green practices approach and how it impacts the organisational performance. The green procurement practices are essential part to increase and to maintain the sustainable performance. Organisations are operating in the environment where most of the manufacturing firms offers and sustain green practices that could influence to obtain competitive advantage to satisfy needs and wants of the mass customers via operating under the regulations set by the government to protect environment. The study includes the quantitative research data and various statistical techniques are used to analyse the data. The primary form of the research in form of questionnaire survey is used to conduct the information. The section of findings that analyse and determine the data that is collected and to form a new set of understanding for the study. The last chapter concludes the whole study and provide critical recommendations and future implications that are essential for the study.

8. Recommendations

Based on the overall findings of this research, following recommendations are proposed to the manufacturing industry of Vietnam regarding integrating green procurement practices in supply chain management:

- It has been recommended to manufacturing companies to must make the effective use of ICT systems to support green procurement practices. In this regard, it is important for the management to leverage ICT systems to make sure that all the processes are conductive to the environment, and business operations are not harmful to the environment.
- It has also been recommended to the management to must set the clear code of conduct in their organisation, and show high commitment towards abiding the environmental laws and regulations that are set by the government.

On the basis of research findings, the management manufacturing companies are also advised to make the right selection of their suppliers. This will help successfully incorporating green procurement practices in overall supply chain management operations.

9. Limitations

The major limitations of this study have been linked with its research design. Since, this study has been entirely based on quantitative research design, thus it has limited the value of this research in terms of not incorporating the detailed human perspective about the study. Therefore, future researchers can carry out the same study with mixed research design in order to provide more conclusive findings. On the other hand, the overall scope of this research has been restricted to manufacturing industry of Vietnam, hence the outcomes of this research cannot be

applied to other context or industry. In order to broaden the scope of this study, future researchers can consider carrying out the same study larger context by covering several regions and industries.

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