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Research paper

The Influence of Green Training on Green Supply Chain Management Practices and Firm's Performance

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Abstract

This research was conducted to study the influence of green training on green supply chain management (GSCM) and firm's performance. By using institutional theory to explain the driving force of reducing the impact of environmental processes on the firm. The population of this study are firms that have been certified to ISO 14000 which is an environmentally relevant standard. The research proposes are to study 1) top management support, competitor pressure, and customer pressure that influence on green supply chain management practices; 2) green training that influence on green supply chain management practices; 3) the influence of green supply chain management practices and green training on the firm's performance. Systematic random was used, Questionnaires were distributed . Structure equation model technique was employed for data analysis.

In data analysis by SEM technique, top management support, competitor pressure, customer pressure, and green training play positive effect to the GSCM practices with statistical significant. Furthermore, GSCM practices play positive effect to the firm's performance with statistical significant. Under the literature foundation, customer pressure, top management support is primary factor to achieve GSCM practices and capabilities for establishment the firm's performance. To do further on GSCM practices more efficiency, a firm is able to have green training. The literature review also showed that special training must be aligned with improvements in the organizational process. It is evident that green training works through green supply chain management and the relationship between green training is not clear. The results of this study showed that the training did not have correlation to the performance but was related to green supply chain management practices.

Keywords: *GSCM, Supply Chain Management, Green Training, SEM, Institutional Theory*

1. Introduction

Green supply chain management (GSCM) combines knowledge in the field of supply chain management and environmental management. The further development of the concept of sustainable development. There is a clear pattern in practice and is linked to a group of stakeholders in the supply chain: to take part in operations by the thought of the impact on the environment; to make a difference in the dark origins of the organization; and to create a competitive advantage for the organization. [1]

Green supply chain management practices have 5 dimensions including internal environmental management [2], green purchasing, green manufacturing, green transportation[2], environmental design[3,4]. Zhu et al. (2014)[4] found supply chain management practice affects a firm's performance. It also has a relationship with a comparative advantage, which is consistent with the research of Zhan et al. (2018) [5] and Choi & Hwang (2015) [6]. However, building green supply chain efficiency in the organization requires the cooperation of the employees within the organization to be successful.

Green training to improve staff awareness of environmental issues in order to change attitudes of the employees about the environment and lead to a better understanding of the organization's environmental management policies and practices that encompass and complies with company policy

to ensure environmental management within the organization is going in the same direction [7]. Jabbour (2015) [8], found green training influences positive environmental management within the organization.

This research is to study the influence of top management support, competitor pressure, customer pressure and green training affecting the green supply chain management practices (GSCM practices), and firm's performance in the firm that has been certified ISO 14000 in Thailand. This knowledge has led to the development of understanding and improving the knowledge of green supply chain management that benefit to the industry, organizations and governments, and to use their knowledge to promote green supply chain management in Thailand.

2. Literature review

2.1. Isomorphism Institutional Theory

Isomorphism institutional theory describes the pressures that influence an organization to make changes. The theory can be applied to

understand how organizations can develop implementation strategies for success. In the context of GSCM, members of a supply chain must operate to meet customer requirements and regulations set by the government[9,10,11,12,13,14]. Founders of the theory DiMaggio, P. & Powell, W. W. (1983) [15] explain the three forms of institutional pressure as follows.

1) Coercive pressure may be either official or unofficial and comes from an agency that has the power to enforce. In the context of GSCM, coercive pressure tends to originate in laws, regulations, and practices. An organization that does not follow government-issued rules may be punished, possibly forced to undergo the harshest disciplinary action.

2) Mimetic pressures result from the uncertainty of the situation and the uncertainty of management. In response to environmental pressures from outside, organizations benchmark their own progress relative to their competitors, which leads to copying of competitors, especially the more successful ones.

3) Normative pressure: Firm are under pressure to define or form their own methods to achieve competitiveness and to survive in the industry. Corporate training consultation or associations of experts build legitimacy and standards to establish understanding on the basis of common interests and values within the organization.

While the theory described in this section explicates institutional pressures on a firm, the pressure from within the organization itself is a key factor in the process. The concept of environmental management partly explains the impact of pressures on an organization, to promote GSCM efficiency. [14,16]

2.2. Green training

Green training implies job training and continuing education. Cooperation within the organization, for the strategy of the organization and with the support of senior management, leads to the achievement of environmental management goals. Jabbour (2015) [8] found that green training is associated with environmental performance and also affects environmental management within an organization. This is consistent with findings by Paille et al. (2013) [17], which show that green training is associated with environmental management and affects performance.

3. Research Framework

A review of the literature shows that factors supporting an organization's green supply chain operations and affecting performance include pressures from outside as well as from within the organization. The factors influencing GSCM practices include top management support, competitor pressure, and customer pressure. That is, firm tend to adopt green training according to improve GSCM practice and firm's performance. Therefore, GSCM practices and green training may have an impact on firm's performance.

3.1. The Relationship between Top Management Support, Competitor Pressure, Customer Pressure and GSCM Practices

top management support, competitor pressure, customer pressure play an important role in pushing traditional management practices toward environmental management practices, as well as in promoting improved efficiency in management. Green, et al. (2012) [18] found that top management support, competitor pressure, customer pressure lead to positive GSCM practices and to improvements in the firm's performance. Therefore, this research proposes the following hypothesis:

H1: There is a positive relationship between top management support and GSCM practices.
H_2: There is a positive relationship between competitor pressure and GSCM practices.

H_3: There is a positive relationship between customer pressure support and GSCM practices.

3.2. The Relationship between Green Training, GSCM Practices, and Firm's Performance

Green training plays an important role in enhancing the efficiency of green supply chains. Daily, Bishop, & Massoud (2012) [19] found that green training has a positive influence on the environmental performance of an organization, which corresponds to a study by Gunasekaran, & Gallear (2012) [20] found that green training has a positive influence on the introduction of complex environmental management technologies or processes. This is consistent with findings by Gunasekaran, & Ngai (2012) [21], which show that green training has the potential to improve prospective management processes. The literature review also showed that special training must be aligned with improvements in the organizational process. Therefore, this research proposes the following hypothesis:

H4: There is a positive relationship between green training and GSCM practices.

H5: There is a positive relationship between green training and firm's performance.

3.3. The Relationship between GSCM Practices and Performance

Kuei et al. (2013) [22] found that GSCM practices result in environmental, economic, and performance improvements for a firm. According to Zhu, Sarkis, and Lai. (2007[23], GSCM practices have resulted in organizations in China improving their performance. A study by Wu et al. (2015) [24] found that environmental management is a strategic asset that influences organizational performance. Therefore, this research proposes the following hypothesis:

H6: There is a positive relationship between GSCM practices and firm's performance.

4. Methodology

The research population for this study is industrial firms in Thailand which have been certified with the ISO 14000 standard. An inventory maintained by the Thai Industrial Standards Institute under the Ministry of Industry of ISO 14000-certified firms in Thailand.

There are 990 firms. The sample size was determined based on Krejcie & Morgan's (1970) [25] table for determining sample size from a given population. Thus, the sample in this study comprises 286 firms. However, the response rate of the respondents was 32 percent [26], so the 900 questionnaires were distributed. Managers and senior operators were selected from within the sampling frame.
The questionnaire used for this study uses a rating scale to query respondents on their views regarding various issues. The questionnaire has been created including 5 first order variables: top management support (top), competitor pressure (com), customer pressure (cus), green training (gta), performance (per), and green supply chain management practices (GSCM) including 5 variables: environmental design (end), internal environmental management (ine), green purchasing (gpu), green manufacturing (gma), green transportation (gtr). All variables are measured using a 7-point Likert scale anchored by "strongly disagree" (1) to "strongly agree" (7). The questionnaires were disported that completed to analyze on multivariate analyze. Program R software is used to analyze the model.

5. Result

The respondent's characteristics are displayed. By the gender of the respondents, the most are male by 65.28 percent and female is the next lower by 34.72 percent. Moreover, by age, most of them are in 35-49 years by 54.01 percent. To represent further with Bachelor Degree which is the most frequency of education level, it is 75.96 percent.

Assessing Measurement Model Validity

Construct Validity refers to the items that are displayed in a specific construct, they commonly share or converge a high proportion of variance. On the same way, the observed variables in the same construct should determine latent variable in common. To consider convergent validity, Factor loading (≥ 0.7), Average Variance Extracted: AVE (≥ 0.5) and Construct Reliability: CR (> 0.7) ((Bagozzi & Yi, 1988) [27]. The detail is proved in Table 1.

Table 1: Convergent validity

Variables	Loading (observed variable)	α	CR	AVE
Top	Min = 0.692, Max = 0.854 (top1-top5)	0.898	0.892	0.626
Com	Min = 0.728, Max = 0.836 (com1-com5)	0.928	0.900	0.618
Cus	Min = 0.769, Max = 0.820 (cus1-cus4)	0.919	0.877	0.641
End	Min = 0.760, Max = 0.820 (end1-end5)	0.935	0.897	0.635
Ine	Min = 0.785, Max = 0.887 (ine1-ine4)	0.928	0.907	0.710
Gpu	Min = 0.768, Max = 0.800 (gpu1-gpu3)	0.874	0.835	0.627
Gma	Min = 0.732, Max = 0.840 (gma1-gma5)	0.932	0.893	0.624
Gtr	Min = 0.692, Max = 0.889 (gtr1-gtr4)	0.850	0.866	0.620
Gta	Min = 0.798, Max = 0.862 (gta1-gta5)	0.942	0.921	0.699
Per	Min = 0.715, Max = 0.885 (per1-per3)	0.859	0.837	0.633

This research inspected multicollinearity analyzed using Peason's product moment correlation for measure the correlation between variables. Variables should not be too closely related with other. This will cause errors in the analysis. The correlation coefficient should not exceed 0.8 (Hair et al., 2010) [28]. The results show no exceed value of the correlation.

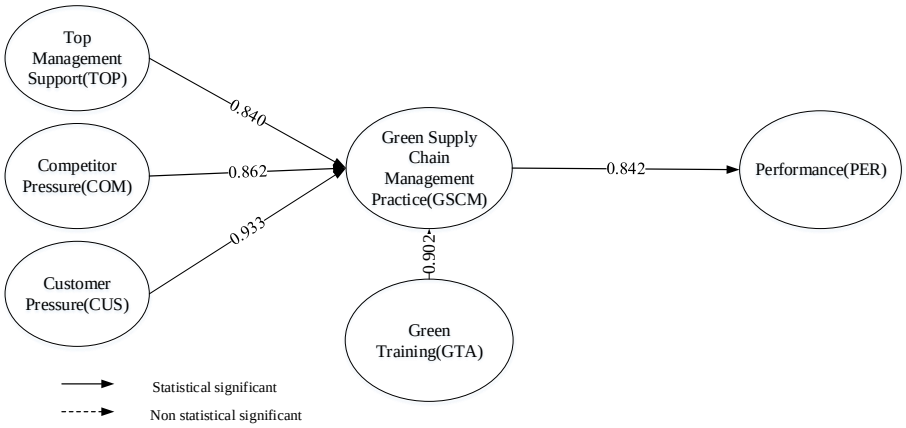

Fig1: Result of Structural Equation Model: Full Model

Main model analyzing by R program. The researcher analyzes the structural model to determine the model's consistency with empirical data and performs the model improvement using MI (Modification index). The appropriate model has as $\chi 2 = 2191.379$, df = 1202.073, p-value = 0.000, GFI = 0.921, AGFI = 0.923, CFI = 0.930, NFI = 0.926, TLI = 0.926, RMSEA = 0.048, SRMR = 0.046. By the model fit indices meet the criteria that GFI, AGFI, CFI, NFI, TLI should excess 0.90, and RMSEA, SRMR should less than 0.05.
In conclusion, GSCM practices (GSCM) have 5 dimension. Green purchasing (GPU)(beta=0.918, t-value=13.015, p-value= 0.000) is the most importance, followed by environmental design (END)(beta=0.913, t-value=12.944, p-value= 0.000), green transportation (GTR)(beta=0.906, t-value=12.770, p-value= 0.000), internal environmental management (INE)(beta=0.891, t-value=12.632, p-value= 0.000), (GMA)(beta=0.886, t-value=12.448, p-value= 0.000), respectively.
According, the loading of latent variables, GSCM practices (GSCM) is obtained from the 3 observe variables. Customer pressure (CUS) (beta=0.933, t-value=12.418, p value= 0.000) is the most important, followed by competitor pressure (COM) (beta=0.862, t-value=12.403, p value= 0.000) and top management support (TOP) (beta=0.840, t-value=11.902, p value= 0.000), respectively.

Performance (PER) is obtained from the 2 observe variables. Green supply chain management practices (GSCM)(beta=0.842, t-value=7.467, p value= 0.000) is the most important, followed by green training (GTA).

Table Result of Hypothesis Testing

Hypothesis	Hypothesized Relationship	Estimate	Std.Error	t-value	Pr(>ltl)	R2	Result
H_1	TOP → GSCM	0.840	0.071	11.902	0.000	0.778	Supported
H_2	COM → GSCM	0.862	0.069	12.403	0.000	0.817	Supported
H_3	CUS → GSCM	0.933	0.075	12.418	0.000	0.757	Supported
H_4	GTA → GSCM	0.902	0.072	12.612	0.000	0.730	Supported
H_5	GTA → PER	0.029	0.094	0.308	0.758	-	Not supported
H_6	GSCM → PER	0.842	0.113	7.467	0.000	0.730	Supported

6. Conclusion

Under the environmental condition which is indicated for this study, the finding is generalizable. In general, most of the firm are in the green supply chain management. That mean most of them are able to complete all process to be firm's performance. To promote environment having pressure from competitors, customer, top management support, and green training is very importance and significant. Even they cannot lead firm's performance directly, it should be applied with green supply chain management practices. That mean they have to be manage effectively in order to develop green supply chain management practices.

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