A Study on Environmental Management of Automobile Parts Industry in Thailand

Pichai Komutmanee[1]
Suparatchai Vorarat[2]
Adilla Pongyeela[3]

Abstract

This research aims to study the relationship between environmental management and the performance of the automotive parts industry in Thailand (Supplier Tier 1-3). The population in this study is small and medium enterprises (SMEs) in the automotive parts industry in Thailand that are in Tier 2 and Tier 3 suppliers in a total of 1,100 companies, but only 293 ones were selected as the samples. The instrument used for data collection was questionnaire with the reliability value in the range of 0.992-0.989. The data were analyzed to find by Pearson's Coefficient Correlation. The research found that the environmental management in the areas of planning, implementation, evaluation and improvement was related to the performance of the automotive parts industry in Thailand in terms of finance, customers, internal procedures, learning, and statistically significant growth at 0.05. The relationship was ranged from high to very high. (0.704-0.822), and, when considering overall, it was found that the relationship was very high (0.880). Also, it was found that the environmental management in various aspects including planning, implementation, evaluation, and improvement had a significant correlation with the performance of the automotive parts industry in the country in terms of the internal procedures higher than other aspects of the performance.

Key words: environmental management, automobile parts in Thailand, performance

[1]Ph.D student, Doctor of Business Administration (D.B.A), Dhurakij Pundit University.
9/212, Petchkasem 79 road, Nong Khang Ploo, Bangkok
E-mail: pichai_faucon@hotmail.com
[2]Asst.Prof.Dr, Faculty of Business Administration, Kasetsart University
9/212, Petchkasem 79 road, Nong Khang Ploo, Bangkok
E-mail: pichai_faucon@hotmail.com
[3]Asst.Prof.Dr, Faculty of Business Administration, Kasetsart University
9/212, Petchkasem 79 road, Nong Khang Ploo, Bangkok

Introduction

Under the 2012 – 2016 masterplan of automobile industry, the vision was to focus on development to enhance the competitiveness of the automotive industry to achieve excellence from a regional level to an international one and to make benefits and stress on energy-saving, environmental friendly and safety standards. Setting the direction for future development of the automotive industry was an important mechanism for the government in driving the development of Thailand's automobile components industry to sustainability in the global arena (Automotive Industrial Cluster, 2017). However, an environmental issue caused by manufacturing process and chemicals involved is a consequence of the development and advancement of the industry and produces pollution to the environment. If the management and control are performed improperly, the government agencies must accelerate the control and monitoring so that the industrial sector complies with the country's environmental laws and regulations strictly.

Research Objective

To study the relationship between environmental management and a performance of the automotive parts industry in Thailand.

Concepts, Theories and Literature Review

1. Environmental issues and identifying characteristics of the issues

To identify and understand characteristics of environmental issues, various factors were taken into consideration such as environmental properties, legal information, identification of environmental problems and impacts of environmental management related to activities, products and services from the past to the present and even in the existing ones in the action plan. Organizations would need to consider operations in both normal and conditional situations as environmental issues that can be directly controlled include the problems associated with products and services that are used and delivered by them. Besides, there were other factors must be considered including the laws, agreements, policies, local and regional issues, and obligations and responsibilities of agencies involved as well as issues related to the environmental

implementation.*(Automotive Industry Cluster, 2017) To identify and understand the nature of the environmental issues, organisations have to collect both quantitative and qualitative data about the features of the activities, products and services, for instance, importing factors and outcomes of materials or energy, applied process and technology, facilities and location, and transportation methods and human factors (such as viewing or hearing). In addition, they should collect information regarding 1) the relationship of causes and effects between various components of the activities, products and services and environmental changes that are occurring or may occur; 2) environmental concerns of relevant organisations; 3) possible environmental problems that are mentioned in the rules and permission in the government bodies, other standards, industrial associations, and educational institutions.

2. ISO 14000 (Environmental Management System) and the guidelines for the development of environmental management system

The components of the environmental management system according to the ISO 14001 and ISO 14004 Standards through the PDCA Management (Plan-Do-Check-Act) (Jirawaswong, 2010) are as follows:

2.1 "Plan" means identifying the nature of problems and impacts on the environment, identifying the relevant laws and regulations, defining objectives and goals on the environment, and making measuring indicators on the operations and adoptions.

2.2 "Do" means identifying a structure of the environmental administration, resource allocation, staff training, internal and external communications, preparation, and the emergency management.

2.3 "Check" means continuously assessing and tracking the results of activities, improving and preventing for cases that do not comply with the requirements, and continuously doing the internal audit of the environmental management system.

2.4 "Act" means reviewing the environmental management system by the administrators and identifying opportunities for improvement.

3. Pressure from the Environmental Laws and the Organisations' Performance

The Act of Promotion and Preservation of Environmental Quality B.E. 2535 aiming at preventing and resolving environmental issues mentioned different principles such as environmental impact analysis, pollution control standards, compensation-paid polluters, and civil and criminal penalties of polluters. The pressures from the environmental laws and the Promotion and Preservation of Environmental Quality Act B.E. 2535 make the entrepreneurs follow them strictly; in the meantime, they are the tools to clearly control the operations to be in accordance with the rules and regulations. (Sektheerak, 2015)

4. Performance Measurement by Balance Scorecard

A Balance Scorecard (BSC), developed by Robert S. Kaplan and David Norton, is a managerial tool that links a measurement with a vision and strategy of an organization. BSC measures and evaluates four aspects of an organization: finance, internal management process, customers, and learning and growth. It is determined that the indicators of each dimension must be balanced, not focusing on any side, for example, if an organization puts a focus on many profits based on its financial view, it will reduce the costs of staff enhancement that may bring about a problem on the organization's full potential in the future.

Based on the relevant literature review, the researcher defined the concept as shown in Figure 1.

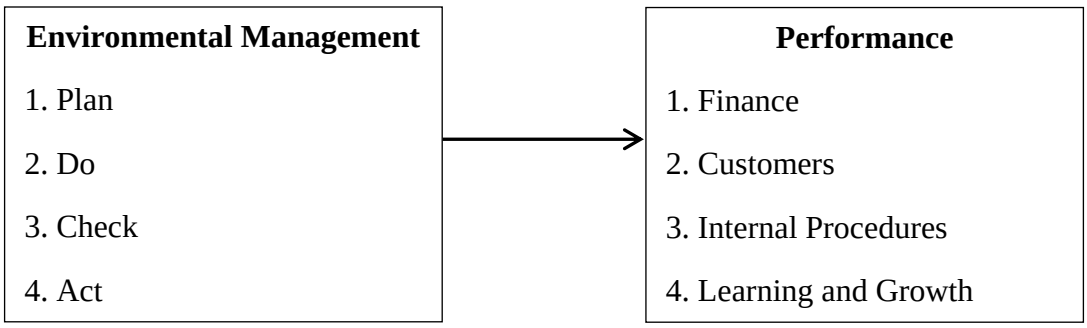

Figure 1 Concept

Research Methodology

The researchers used the quantitative research method by distributing the questionnaires to Tier 2 and Tier 3 suppliers in Bangkok and its suburbs. The population in this study was small and medium enterprises (SMEs) in the automotive parts industry in Thailand. They were in Tier 2 and Tier 3 suppliers in a total of 1,100 companies, but only 293 ones were selected as the samples. Based on the Yamane sample size calculation, a simple sampling method was used as the sampling units in the population were equally likely to be selected.

The questionnaire tested by the experts was tried out 30 samples that had similar characteristics to the target group. The reliability of the questionnaire was used to find the alpha coefficient by applying the Cronbach's formula. The variables of the environmental management affecting the operation had the value at 0.992, and the performance variable had the value at 0.989. This questionnaire was based on the reliability criteria. That meant the questionnaire was divided into 2 parts:

Part 1: Information on the environmental management affecting the operation of the automotive parts industry in Thailand.

Part 2: Performance of the automotive parts industry in Thailand.

The questions were determined with the level of scale as a weight value according to the Likert Scale that consists of 5 levels of opinion. From Level 1-5, the data analysis was done to find the Pearson's Coefficient Correlation among the observed variables in order to know the relationship of the variables in the questionnaire that were used to analyze the accordance of causal relationship. The interpretation of the correlation coefficient (r) is as follows: (Ellen Marshall, 2004) There was almost no relationship (r <0.20). The relationship was low (0.21 <r> 0.40). The relationship was moderate (0.41 <r> 0.60). The relationship was very high (0.61 <r> 0.80). The relationship was very high (0.81 <r> 1.00).

Results

The result of analysis on the relationship between the environmental management and the performance of automotive parts industry in Thailand is shown in Table 1.

Table 1: Result of the analysis on the relationship between the environmental management and performance of the automotive parts industry in Thailand

Performance of the automotive parts industry in Thailand	Plan		Do		Check		Act		Overall	
	r (Sig.)	Level of relationship	r (Sig.)	Level of relationship	r (Sig.)	Level of relationship	r (Sig.)	Level of relationship	r (Sig.)	Level of relationship
Finance	0.761* (0.000)	related	0.765* (0.000)	related	0.781* (0.000)	related	0.784* (0.000)	related	0.814* (0.000)	related
Customers	0.775* (0.000)	related	0.800* (0.000)	related	0.811* (0.000)	related	0.805* (0.000)	related	0.840* (0.000)	related
Internal Procedures	0.783* (0.000)	related	0.816* (0.000)	related	0.822* (0.000)	related	0.803* (0.000)	related	0.849* (0.000)	related
Learning and Growth	0.704* (0.000)	related	0.732* (0.000)	related	0.756* (0.000)	related	0.738* (0.000)	related	0.772* (0.000)	related
Total	0.811* (0.000)	related	0.836* (0.000)	related	0.852* (0.000)	related	0.840* (0.000)	related	0.880* (0.000)	related

*Statistical significance was at 0.05.

From Table 1, the results of data analysis with the correlation coefficient showed that the environmental management in various aspects including plan, do, check and act had a relation to the performance of the automotive parts industry in Thailand in terms of finance, customer, internal procedures, and learning and growth with a statistic significance at 0.05 with a high to very high correlation (0.704-0.822). When considering overall, it was found that the relation was very high (0.880).

Furthermore, it was also found that the environmental management in various aspects including planning, implementation, evaluation, and improvement had a significant correlation with the performance of the automotive parts industry in Thailand in terms of the internal procedures higher than the performance in other aspects.

Conclusion and Recommendations

The study of the relationship between environmental management and the performance of automotive parts industry in Thailand found that

environmental management was related to performance of the automotive parts industry in Thailand in terms of finance, customers, internal procedures, and learning and growth. This may be because in the initial stage of environmental management required to invest in various resources including finance and internal procedures as Financial Internal process. These investments had a relationship and may affect the operation of finance and internal procedures. When it came to the operation of environmental management, it had relationships with customers, such as building trust or satisfaction with customers and other stakeholders. This investment in environmental management may not be worth to the capital in a short time. However, it would affect the long-term performance. Therefore, environmental management was related to the performance of the automotive parts industry at a high to very high level. This was in accordance with the study of Pairatch Wongyuthakrai, Thawatchai Rattanathamma and Wiwat Kraipisitkul (Wongyuthakrat, et al. 2009) that found that Siam Ratchaburi Industrial Co., Ltd. had the value of production of each product, electricity, water, electricity, palm shell and the total cost (Baht)/box that decreased after the announcement of the policy on environmental management. The cost could be reduced to 5 satang per box or equivalent to 12,525 Baht per month, or 150,300 Baht per year. Nowadays, the environment is the main focus around the world as a result of various pollutions, for example air, water pollution and waste disposal that cause a huge impact on the world population. This impact occurs with every country the world and becomes a pushing factor to organizations pay attention to environmental management. The course of care and preservation of the environment stimulates the stakeholders of the industry to pay attention and have realization on social responsibility, so the concept of environmental friendliness is an important paradigm to give businesses a competitive advantage in the future and sustainable development. For a trend of the development of the Thai automotive industry in a new era, the SMEs entrepreneurs in this industry should be prepared to cope with the occurring changes that range from the general level to the production structure level. The entrepreneurs who are ready have the opportunity to adjust themselves and

considerable benefits of the changes. Consequently, in order to maintain Thailand's production standard, they need to adjust themselves greatly to increase their global competitiveness with a quality of the production process and environmental friendliness as well as a supply chain meeting the needs of customers and society. In addition, the impact caused by changes in the business environment and the pressure from external environments that the businesses cannot control is an important factor that drives the business to set policies and change the direction of its operations in line with the changing external environment or to support external pressures. This is in accordance with the literature review by (Maneemai et al., 2016) that found that external factors affecting the organization were economic conditions, customers' attitudes, competition in markets or the industry, technology, laws and regulations, and economic liberalization.

Since this study put a focus on customers only, researchers or interested persons should study further about other stakeholders including individual groups, organizations, institutions, or communities that are affected positively and negatively by decision/policy/projects of the automotive parts industry in Thailand. Moreover, they should also study more about current situation analysis and trends in environmental management of the automotive parts industry in the country to apply the study results to solve problems or plan the risk management of environmental management of the automotive parts industry in Thailand.

References

Automotive Industry Cluster. (2017). **"Direction to Sustainability".** [Online], from http://www.aic.or.th (June 15, 2017).

Chanchai., Atchara (2008). **"Strategic Planning and Using BSC".** 11th ed. Bangkok : Chulalongkorn University Press.

Kittipong Jirawaswong. (2010). **"ISO 14004 Guidelines for Development of Environmental Management System (Part 1)"**. [Online], from http://www.thailandindustry.com/indust_newweb/articles_preview.php?cid=11780 (May 13, 2017).

Pairatch Wongyuthakrai, Thawatchai Ratanathamma and Wiwat Kraipisitkul. (2009). "Environmental Management by Siam Ratchburi Industry Co., Ltd.", **Industrial Journal**, 3(2): 12 – 17.

Parichart Maneemai (main author), Patarapong Charoenkitcharukorn, Patchanon Chooset, Aranya Saetung, Ratiporn Raksawong, Tapanee Premchit (2016). "Quality and Factors Affecting Quality Control Practices of Thai Small and Medium Accounting Firms". **Modern Management Journal**, 14 (1): 117 – 128.

Sektheera, Narumol. (2015). "Effectiveness of the Act of Promotion and Preservation of Environmental Quality B.E. 2535 for Preventing and Resolving Environmental Issues"**. Law Journal, Naresuan University,** 8(1): 46 – 62.

Yamane, Taro. (1973). **"Statistics: An Introductory Analysis"**. 3rd ed. New York: Harper and Row Publicaton.