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## Management Model for Green Corporate Image

Roengsak Phethastrakul\*  
Napaporn Khantanapha  
Rapeepun Piriyakul

Doctor of Business Administration Program  
Southeast Asia University Bangkok, Thailand

\*Corresponding author

\*E-mail: roengsak.ph@gmail.com

### Abstract

The purpose of this research was to investigate the level of *green* supply chain management, its innovative orientation, product design practice, the involvement of employees and a *green* corporate image. The researchers studied (1) the product design practice and employee involvement as intermediary variables linking *green* supply chain management, (2) the focus on innovations toward the *green* corporate image, and (3) the ability of interstitial variables as transmission variables in the context of *green* supply chain management. The samples were 400 small and medium-sized entrepreneurs who operate their business with an emphasis on the environment; they were corporate executives focusing on environmental management and set into two sample groups of 200 each. The study used a two-stage sampling method and simple sampling to re-examine the causal model using AMOS program. The study results found all studied factors with a high mean level. The analyzed model of the small and medium-sized entrepreneurs who operate their business with an emphasis on environmental management on the Harmonious Index at  $\chi^2/df = 2.921$ , RMSEA = 0.074 and RMR = 0.035 which influenced the curve of all factors affecting the management model for green corporate image. This is a distinctive feature of small and medium-sized entrepreneurs under study with an emphasis on environmental management.

**Keywords:** *Management model, green supply chain management, innovative orientation, product design practice, employee involvement, green corporate image*

### 1. Rationale of the Study

The global trade situation is changing rapidly. The direction of the world economy has been transformed into a new economy by relying on the strength of Information Technology with speed and the ability to access information on a variety of communication formats. Therefore, entrepreneurs can take advantage by creating competitive potential with risks and opportunities. Long-term economic growth by minimizing negative social and environmental impacts includes the utilization and management of natural resources. Therefore, business operators need to adapt and develop themselves to survive and grow stably and sustainably. In such a scenario, organizational development toward sustainability must be integrated and driven concretely. An organization, sustainable development requires utilization of the global ecological potential (Edward, 2017) in technology, knowledge, creative design development—all leading to innovations that will affect the performance of the organization along with the integration of resource management and organizational capabilities derived from experience and knowledge of skilled entrepreneurs.

They are to create a structure that is permanently superior to competitors and differ in form, value, superior benefits, and profits above the norm to the organization (Barney, 2002). The Sustainable Economic Welfare Index is an adjustment of gross domestic product (GDP) reflecting the welfare or quality of people's life in society, and arising from economic development to protect the environment from the problems of economic unsustainability, particularly as caused by the management's inability to apply new knowledge against pollution before production to reach consumer group for maximum satisfaction. The sustainability activities must relate and connect with added value for products and services, as well as innovation-oriented development that includes practical training in the process of product design development. These activities are to create regular interactions from employees' participation (employee involvement) planned by the management and employees working as a team. The participation of employees contributes to learning and building mutual understanding (William, Smol & Birks, 2002) and can create employee engagement both at the employee and organization levels. Employees can feel they are part of the organization with a good corporate image, take pride in their work, stick to corporate ideals toward a common goal upon a long-term positive relationship with the organization and loyalty to the organization (Kotler and Keller, 2006).

In the context of business sustainability, the focus rests upon three goals: Human Resources, Planet and Pollution. These three parts form green organizations. It is the management of the supply chain management system in the field of green production from purchasing onto the design of green products with elements of both raw materials and green packaging. Green Packaging seeks maximum profits as sustainable profits. Doing business for the benefit of customers and society is considered a green product development approach. This approach requires an understanding of the product to supply quality materials and production processes that are effective in reducing waste, and having proper and appropriate disposal methods. The use of resources needs cost effectiveness and environmental friendliness for maximum benefits. Green products are for Green Corporate Image as an important factor demanded by stakeholders in promoting business growth. Sustainable development pays attention to the greenhouse effect on the ecosystem and biodiversity. Today, consumers are increasingly aware of the environment conservation in various aspects of daily use of products and services. Packaging is one obvious example that causes global warming. Its effects lead consumers and manufacturers around the world to use more environmentally friendly packaging materials that can decompose naturally in the disposal process. As seen, Thailand is no exception among various countries in following the trend in environmentally friendly packaging.

From the green production trend aforementioned, the researchers of the present study explored a possible management model for a green corporate image by bringing in current green knowledge and technology for environmentally friendly corporate management in creating a good green image by international standards.

## **2. Research Objectives**

There were three research objectives:

(1) To investigate the level of green supply chain management, innovative orientation, product design practice, employee involvement and green corporate image.

(2) To study the product design practice and employee involvement as an intermediary variable linking green supply chain management and the innovative orientation toward a green corporate image.

(3) To study the ability of interstitial variables as transmission variables in the context of green supply chain management.

### **3. Research Hypotheses**

The researchers formed two hypotheses for the study:

(1) Management of a green corporate image for supply chain management affects product design practice, innovative orientation, employee involvement and green corporate image.

(2) Management of a green corporate image with a focus on innovation influences product design practice, employee participation and green corporate image.

### **4. Scope of Research**

Content: a management model for a green corporate image in green supply chain management comprises product design practice, innovative orientation, employee involvement and green corporate image.

Participants: 400 small and medium-sized entrepreneurs who operate businesses with an emphasis on the environment, and as corporate executives have used environmental management according to the international environmental system standards.

Area and data time: Thailand in April 2020.

### **5. Research Terminology under Study**

*Green Packaging* refers to the packaging or container used to transport products from the manufacturer to the intended consumer. Natural materials are for the purpose of conserving the environment, reducing the amount of waste, and degrading naturally. They are harmless to the environment and save cost. Packaging can be reused. Selection of natural materials favors abundance and availability in the local area.

*Natural materials* refer to materials available naturally and harmless to the local environment. They are degraded naturally in the local ecosystem according to the positive relationship among the local organisms.

*Green Packaging Product Design* refers to the packaging design that supports natural material containers used for transporting products from manufacturers to the consumer destination. The design favors local natural materials that are environmentally friendly.

*Green Supply Chain Management (GSC)* refers to the process of planning and managing before the production of the product and distribution of the products to consumers for maximum satisfaction via suitable channels in the flow of raw materials, procurement, production, storage, applied technology, freight distribution--all processes linked together by the international standards in creating added value for products and services to consumers' satisfaction.

*Innovative Orientation (INO)* means promoting innovations toward change by creativity for invention. This could be a new technology, idea, process, or a product being creatively

modified and strengthened in new features--enabling businesses to create a sustainable competitive advantage.

*Product Design Practice (PDP)* refers to the design process and product development. There is a process of collecting data for analysis and applying the concept of problem-solving process in the design process and product development.

*Employee Involvement (EMI)* refers to the creation of activities in the organization to enable personnel in the organization to participate in the target activities. The purpose is to support personnel to feel they are part of the organization and can help solve problems at work so that they take pride in their work as contribution to success of the organization at large. They are expected to build a positive long-term relationship with the organization, adhere to its ideology and common goal to instill in themselves loyalty to the organization.

*Green Corporate Image (GCI)* refers to the overall image of an organization that an individual perceives through experience or knowledge or impression toward an organization as having a role of social responsibility regarding environmental conservation in its management of products and services.

## 6. Related Literature

Green Supply Chain Management (GSC) refers to the process of consolidating planning and management before the production of products and onto consumers for maximum satisfaction via various channels in the flow of raw materials, procurement, production, storage and applied technology, freight, distribution according to the international standards to create added value for products and services for consumers' satisfaction.

*Green supply chain management* influences a green corporate image. The process of environmental management combined with green supply chain management are to reduce the environmental impact of the supply chain process for efficiency in cost reduction and competitive advantage in terms of reputation and image (Ngyun & Lelanc, 2001; Vachon & Klassen, 2007). It is recognized as the most effective variable in stimulating operations and building a good image of the organization. The green image serves as an invaluable asset that can impress consumers to have positive attitudes toward the organization's practices, products, goods, and services. The feeling of quality is communicated between individuals and customers of the organization concerned. The green management and its green image are invaluable to an organization in reducing production costs while conserving the environment for a good corporate image.

Sustainability derived from innovative orientation involves a change in corporate philosophy and value that guide specific objectives to create and realize sustainable social values and economic returns (Doherty et al., 2015). Business model innovation arises from transforming processes, products and organizations in order to more successfully integrate sustainability into their core businesses (Schiederig, Tietze & Herstatt, 2012) as well as new business models or replace products with alternatives in solving technological problems regarding how to use, organize activities, and increase performance within the scope of the organization. There is a goal for change in mobility, response to requirements and the pursuit of increased efficiency in creative approaches to sustainability (Alston and Roberts, 1999). Existing innovation capability is the beginning of corporate culture promotion. It has clearly defined goals at the product level (Petala et al., 2010) and organizational

involvement in motivating employees to perform successful tasks. The concept of innovation paradigm is an important role of business in today's society of corporate development for sustainability. In turn, strategic sustainability in product innovation will reflect the obstacles of the organization and corporate culture (Petala et al., 2010).

As for product design practice (PDP), there is a process of collecting data for analysis and apply the concept of problem-solving process in the design process for product development. Product design management aims to improve the coordination of design activities for design practicality. The organization needs to verify the practice and organizational processes in support of creative and knowledge-based product design. The importance of leveraging a wide range of knowledge in effective product design and in brainstorming to create creativity during the product development process will lead to a new body of knowledge in the practice by *design thinking* (Kalogerakis, Luthje & Herstatt, 2010). This can be seen as a problem-solving activity, reasoning, understanding things, and giving meaning for the product. Design thinking is regarded as an innovation with a belief that anyone can be a designer by learning why (Dunne & Martin, 2006). Product design management requires innovative ideas for production. It is possible to evaluate the thought process empirically in order to develop it into a new idea in the future decision-making process. Problem-solving can be done by visualizing the value of the solution. Novelty initiative indicates the taste and uniqueness of the organization's solution and its flexibility to improve and change products to meet the needs of customers. The design department as a coordinator for design management operations will allow the organization to make improvements in product development to meet the needs of customers as part of sustainable growth.

Employee involvement (EMI) allows personnel in the organization to participate in the activities to feel they are part of the organization. They can help with problem-solving tasks for the organization's common goal on personnel loyalty. Personnel participation in the process of development, co-thinking, co-decision making, problem solving and allocating resources is to achieve goals on organizational planning (Williamson, 2008). According to Cohen & Uphoff (1977), there are four dimensions of decision-making: (1) what to do and how to do it; (2) the effort in developing and implementing the decision; (3) sharing of operating benefits; (4) project evaluation of participatory management as the process of involving subordinates in the decision-making process. The active involvement of individuals using their creativity and expertise in handling important administrative problems is based on the division of power in the process of participatory management. It is associated with the concept of belief in the assumption about human nature on appropriation and participation in work without compulsion. The concept of organization encompasses a place for life and thinking development, leadership style, management of the business context engaging employees to improve efficiency within the job for the benefit of the organization. This requires a two-way relationship between the employer and employees (Mone & London, 2011). It is an employee's sense of focus on personal initiative to work toward the expected goals of the organization. The personnel's deep relationship with the organization will create willingness to go above and beyond what is expected for success for their organization (Johnson & Johnson, 2011).

Green corporate image (GCI) presents the overall image of an organization perceived by the public. Consumers have knowledge or impression as well as feelings toward an agency or institution by looking at the role or organizational behavior in the economy and the society as a whole in terms of environmental conservation through the management of products and services. Environmentally friendly organization management aims to achieve a green corporate image. Beliefs and impressions about the organization's environmental activities are for customers to have positive attitudes toward the products or service (Zameer et al., 2020). Commitment to preserving the environment for the future and sustainability through social responsibility practices are embedded in a business model that assesses the impact of actions on social considerations for environmental friendliness as the vision of the organization. Environmentally friendly action leads to the value of environmentally friendly products. Positive perception and trust from consumers will result in functional and emotional benefits (Lin et al., 2017). Creating a sustainable corporate image on products and services based on employees' participation in activities will increase the organization's competitiveness and market share (Bathmanathan & Hironaka, 2016). As consumers are increasingly concerned about ecological issues, organizations are encouraged to support employees to participate in environmental protection activities (Saran & Shokouhyar, 2021). The benefits of an environmentally friendly brand influence consumer loyalty toward a product or service as their primary concern when making a decision on their purchase. Especially in an industry where there are high negative external factors, a good green image will benefit in greater financial performance (Aivazidou et al., 2018). In this regard, organizations should build a green image to attract potential customers both in the short and long run.

## **7. Research Methodology**

The researchers used quantitative research in the Causal Model Exam using data obtained from the questionnaire and the structural equation performed on latent factors in green supply chain management and innovative orientation. The interstitial factor consists of the product design practice factor, and employee involvement. Another factor is the image of green organization.

### **7.1. Research Data**

Research data consisted of theory and research from primary data sources. The researchers collected information from related research papers, looked at relevant theories and academic work obtained from preceding documents, books, articles and other media sources. The obtained documents were on Thailand and international contexts for good understanding of concepts, theories and principles of Management Model for Green Corporate Image. As for the main data, the researchers used a constructed questionnaire (validated by three green management experts) to collect data from two sample groups under study.

### **7.2 Population and Sampling**

The two populations used in this quantitative research study were small and medium-sized entrepreneurs as corporate executives focusing on environmental management by the

environmental standards and the management system standards (ISO 1400, NTC). The sample size determination was based on the model and therefore relied on minimum values guaranteed to test structural equations. Using the principle of Cohen (1988) and Westland (2010) as the determination of power of test = 0.80, significance level 0.05, the researchers identified 5 latent variables and 21 empirical variables. The results were calculated with n sample size steps. Low was at 150 samples. This research used a total sample size of 400 respondents--200 from each population, to be tested by structural equations according to the principle of Cohen (1988) and Westland (2010).

**7.3 Population Scheme**

The researchers used two-step sampling in two steps: Step 1: Randomized small and medium-sized entrepreneurs who operate businesses with an emphasis on the environment. Step 2: Entrepreneurs in four regions were in the north, central, northeastern, and southern region, and 50 samples were secured per region, totaling 200 samples. These executive samples worked by the management system standards (ISO 1400, NTC), environmental standards for corporate executives, and TIS standards for executives. There were four groups of executives, 50 samples per group, a total of 200 samples per small/medium-sized entrepreneurs—making a grand total of 400 samples.

**8. Research Results**

This section reports results on (1) the level management model for green corporate image of the sample group for each factor, and (2) hypothesis testing from the research conceptual framework.

**8.1 The Level Management Model for Green Corporate Image of the Sample Group for Each Factor**

Table 1 reveals the management of the Green Supply Chain Management (GSC) and the Innovative Orientation (INO) sectors as similar in data distribution and direction. As for the intermediary factor, it was found that Product Design Practice (PDP) and Employee Involvement (EMI) also showed similar outcomes.

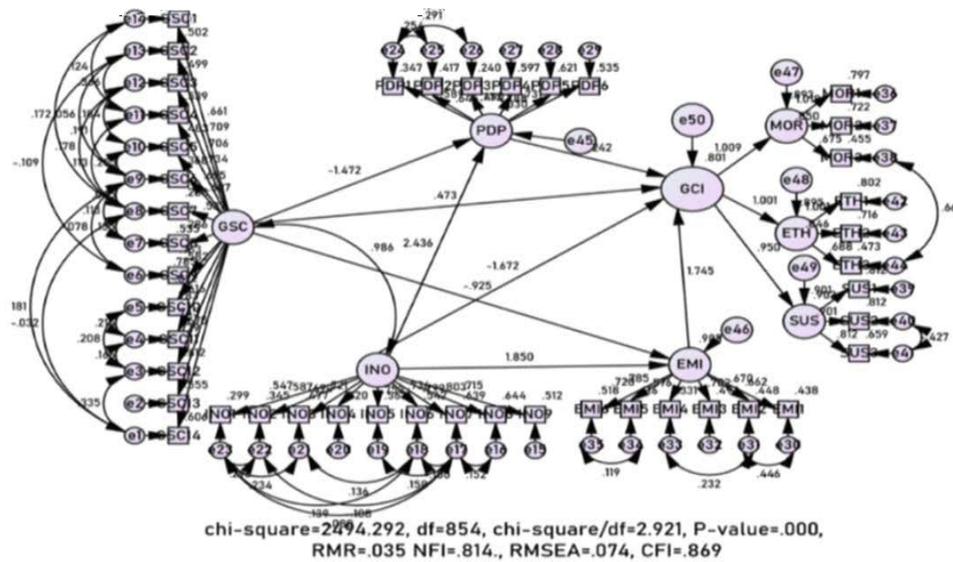
**Table 1:** The Management Level Statistics for Green Corporate Image in Various Factors

<b>Factor</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Coefficient of Variation</b>	<b>Meaning</b>
Green Supply Chain Management (GSC)	4.51	0.36	0.14	very high
Innovative Orientation (INO)	4.44	0.65	0.15	high
Product Design Practice (PDP)	4.51	0.34	0.14	very high
Employee Involvement (EMI)	4.54	0.36	0.16	very high
Green Corporate Image (GCI)	4.44	0.51	0.11	high

**8.2 Hypothesis Test from the Research Conceptual Framework**

Figure 1 displays five clusters of variables of each factor as shown earlier in Table 1, and their interrelationship via covariance-based structural equation analysis.

**Figure 1:** The Results of Covariance Based Structural Equation Analysis



As seen in Table 2, the test results on the negative influence of Green Supply Chain Management (GSC) factors were consistent with the heavy workloads in Green Supply Chain Management, and negatively affected Levels of Product Design Practice (PDP) and Employee Involvement (EMI), while Innovative Orientation Management Factors (INO) promoted both Product Design Practice (PDP) and Employee Involvement (EMI). Green Supply Chain Management (GSC) and Innovation Oriented (INO) issues did not directly affect the Green Corporate Image (GCI). Green Supply Chain Management (GSC), which encompassed Innovative Orientation Management (INO), and Employee Involvement (EMI) needed transmission through interstitial factors to represent the image of a Green Corporate Image (GCI).

**Table 2:** The Coefficients Standard Deviation and t-Statistic in Hypothesis Testing

Hypothesis	Standard coefficient	S.E.	t-test	P-value	Conclusion
GSC-> PDP	-1.472*	0.393	-2.050	0.040	negative influence
GSC -> EMI	-0.925*	0.275	-2.093	0.036	negative influence
GSC -> GCI	6.446	6.965	6.648	6.428	non influence
INO-> PDP	2.463***	0.463	6.666	6.666	positive influence
INO -> EMI	1.850***	6.325	4.653	6.666	positive influence
INO -> GCI	-1.672	1.867	-0.705	0.481	non influence
PDP-> GCI	0.242	1.568	0.194	0.846	non influence
EMI -> GCI	1.745**	0.611	3.160	0.002	positive influence

\*p=.05, \*\* p=0.01, \*\*\*p=0.001

Table 3 reports the results of the influence of both Exogenous Factor and Endogenous Factor causal factors in that the Innovative Orientation Management factor (INO) had a total high influence on Green Corporate Image (GCI) at 2.144, where Green Supply Chain Management (GSC) gave the opposite negative result at the -1.494 level, consistent with the explanation given in the hypothesis testing results. The interstitial factor between INO and GSC most accounted for the transmission of such influence. The

Employee Involvement factor (EMI) was 1.445, equivalent to 4.2 times the Product Design Practice Factor (PDP) in acting as an interstitial variable as well.

**Table 3:** Direct Influence, Indirect and Collective Sample  
(Calculated from Standard Coefficient)

Factors	Influence	GSC	INO	PDP	EMI
PDP	DE	-1.472	2.436	NA	NA
	IE	NA	NA	NA	NA
	TE	-1.472	2.436	NA	NA
EMI	DE	-0.925	1.850	NA	NA
	IE	NA	NA	NA	NA
	TE	-0.925	1.850	NA	NA
GCI	DE	0.473	-1.672	0.242	1.745
	IE	-1.970	3.819	NA	NA
	TE	-1.497	2.147	0.242	1.745

Model Harmony Index Based on SEM Covariance based analysis

Tests for the harmony of each model of empirical data were as follows:

$\chi^2/df = 2.921$ , RMSEA = 0.074, NFI = 0.814, CFI = 0.869, IFI = 0.870, RFI = 0.795, RMR = 0.035, which pass the judging criteria; unless the RFI value is at the Acceptable level (>0.75), it can be concluded that it can be accepted. That is appropriate for passing the judging criteria; unless the RFI value is at the Acceptable level (>6.45), it can be concluded that it can be accepted and appropriate.

## 9. Discussion of Results

The study evaluated five factors in the research conceptual framework, and it appeared that the sample of the GSC factor had the highest mean of the coefficient of variation (0.14). It was classified as a business-level strategy with emphasis on green products offering differences or green services that are different from those from competitors. Differentiation serves as a guideline or strategy for market expansion to expand market share (Market Penetration), strategy for market development (Market Development), strategy for product development, and strategies to expand to other businesses (Diversification) through the selection process for appropriate business strategies. As seen from the results, the supply chain as a structure to manage business, marketing and production in an efficient operational process covering upstream raw materials to the sale of environmentally sustainable downstream products (Christopher, 2016). On the INO factor, the highest average coefficient of variation (0.15) is a function-level strategy. Since this research focused on the production department for innovative commercial products that were environmentally friendly, the INO factor supported the earlier study by Alston and Roberts (1999) that described innovation as a response to requirements for creative-to-practice approaches in the design of sustainable production processes. The PDP factor had the highest mean coefficient of variation (0.14), indicating that the implemented strategy coined as Strategic Deployment in the questionnaire focused on production; this point corresponded with the research finding by Paige (2021) in that product development and rigorously executed sales, analysis, iteration and care for the product—all being appropriate for the lives of consumers. Communities and environmental

systems by human-centered design need to be coupled with material selection and sustainable production.

As for the EMI factor, the mean coefficient of variation (0.13) was the highest level of employee participation. Emphasis was on teamwork where employees can make decisions on reducing the waste of resources. The EMI result supported the research of Watson (2010) in that participative decision-making accounted for successful organizational management. For PDP and EMI, their role was to promote GSC through the push of INO. Moral and ethical aspects—determined by average and coefficient of variation—as seen in the high average scores for all sub-items. This pointed to the importance of doing business in the environmental dimension to create a good conscience for society and the environment as a whole. Ethical values in business fundamentally related to nature enable business entrepreneurs to deal with environmental problems particularly in reducing energy consumption and using clean energy as a key element in sustainable business operations for environmental conservation. This point signifies how new technologies can help increase efficiency and flexibility of production processes and distribution channels to meet the needs of consumers (Chen, 2006).

### **9.1 Research Benefits**

The researchers would like to present the benefits of this research in two folds:

(1) As for the management, the image of a green organization via Green Supply Chain Management should serve as a business strategy that covers multiple functions, such as purchasing, production, human resources and marketing activities. Hence, organizations should beware the opportunities and risks from supply chain management in the global market. This is a move from the traditional system to a modern management system with concrete behavioral patterns. Obviously, customers' role comes into play with their demand for innovations and new technologies in exchange of knowledge and news via social media. This will lead to one of the main factors affecting business operations, namely cost reduction for added value. Innovation and marketing promotion the organization has adopted will be intertwined with sustainable development practices with integrity under good corporate governance under a sustainable supply chain management. The concept of Green Supply Chain is undoubtedly related to reducing environmental impacts to show corporate social responsibility and create a reputation for the organization. This is to create a good image to attract customers and win over their loyalty.

(2) Businesses need to adapt themselves to survive and grow steadily in the context of sustainable development of the organization. It is important for a business to integrate itself into sustainable development for the quality of human life on the ground of the global ecological potential and business growth based on technology, knowledge, and creative design. The key innovation factors would certainly affect an organization's performance and its green corporate image. In all, the principles of management for the green image need to appeal to consumers' acceptance by the international standards in support of sustainable business operations now and beyond.

### **9.2 Future Research**

As reported in this paper, the Management Model for Green Corporate Image is a strategic management principle as an organization's mission. The management for a green

corporate image has a concern over the deteriorating environment of the world tremendously affecting life on earth. It is necessary to balance the economy, society and the environment. Environmentally friendly innovations in the use of resources for production show themselves as the current trend in sustainable management.

The researchers felt that there should be further research into green production in different industries. The government's role on encouragement and support for entrepreneurs to operate on green supply chain management should be stated as a long-term policy, and such issues need research into the government's planning, production process, implementation and evaluation.

Research into business innovations in the leading industries should deserve more attention from research agents and government authorities. Cultivating awareness in protecting the environment can help improve green supply chain management (GSC) as a working management model. It should be noted that policy implications of an organization need to cover all departments for success in the target corporate-level strategies in the environmentally friendly context.

## 10. The Authors

The first author Roengsak Phethastrakul is a graduate student in the Doctor of Business Administration Studies Program at Southeast Asia University Bangkok, Thailand. The second and third authors--Napaporn Khantanapha and Rapeepun Piriyaikul--are the dissertation advisors and lecturers in the Business Administration Department, Southeast Asia University Bangkok, Thailand. Their field of specialization and research interest deal with current management issues and sustainability trend in business operations.

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