

The Determinant Factors of Green Practices Adoption For Logistics Companies in Malaysia. A Case Study of PKT Logistics Group Sdn. Bhd.

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ABSTRACT

This study examines factors that influence the intention to adopt green practices for logistics companies. The determinant factors include technological, organizational, environmental and environmental awareness. The data came from the questionnaire survey on logistics companies in Malaysia, and 150 samples were analyzed. The survey results reveal that three of the factors show insignificant result towards green practices adoption while one factor has positive influences on the intention to adopt green practices. Technological, environment and environment awareness factors exhibit insignificant influences on the willingness to adopt green practices while the organizational factors exhibit significant influences on the willingness to adopt green practices.

1. Introduction

Environmental issues have become critical concerns all over the world, and business owners are constantly under pressure to develop environmentally responsible and friendly operations (Subramaniam & Mohd Saleh, 2016). The business owners need to show commitment to the natural environment, and this obligation has become an important variable within the current competitive scenarios while companies worldwide are continuously trying to develop new and innovative ways to enhance their global competitiveness. Several business owners have enhanced their competitiveness through improvements in their environmental performance by complying with mounting environmental regulations, addressing the environmental concerns of their customers, and mitigating the environmental impact of their production and service activities (Kit, Waei, Kaur, & Kalsom, 2018).

The development of environmental issues in the logistics industry is still in its infancy and the adoption of green practices can be taken as an innovative process for the business owner. Innovation is the use of new technical and administrative knowledge to offer a new product or service to customers (Ibrahim, Jamil, & Halin, 2018). Therefore, this paper will study the topic about the adoption of green practices for logistics companies from the perspective of innovation. The main purpose of this paper is to explore the factors that affect the willingness to adopt green innovations for the logistics companies. An

understanding of the influencing factors is essential for practitioners to best implement green practices, and for researchers to best understand what issues need to be addressed.

The next section introduces the factors influencing the adoption of green innovations. The third section gives a description of the research methodology, while the fourth section focuses on the analysis of the results and the discussion of the findings. The final section gives research conclusions.

2. Determinants of Adopting Green Practices

This research is focused on the determinants that lead to green practices adoption in logistic companies in Malaysia. Logistics is the activities that involve the strategic management of procurement, storage of materials, components and finished products and their movement together with the flow of associated information in the organisation and by its marketing channels in order to ensure the cost-efficient processing of orders, to maintain the maximum current profitability and to seek future profitability (Ibrahim & Jaafar, 2016). In order for the logistics activities to be efficient, it requires communication as interaction between two or more areas of activities whose purpose is to ensure the planning, production, control and the effective movement of raw materials, material resources and products from the production point to the point of consumption.

Green practices are also known as Environment Management Practice (EMP) or Environmental Management System (EMS). Environmental Management System is a tool for an organization's managing their impact activities toward the environment. It provides a structural approach to plan and implement environment protection measures. An environmental management practice monitors environmental performance which is similar to the way a financial management system monitors expenditure and income and enables for an organization to checks regularly company's financial performance. It integrates environmental management into the company's daily operations, planning and their quality management systems (Ibrahim & Jaafar, 2015).

Environmental management practice (EMP) is one of the tools that organization use to implement environmental policy. In other words EMP can be described as the systematic application of business management to environmental issues. It involves a formal system and database which integrates procedures and processes for training, monitoring, summarizing and reporting of specialized environmental performance information to internal and external stakeholders of the firm (Ramírez, Morales, & Bendito, 2011). An EMP is aiming to develop, implement, manage, coordinate and monitor environmental activities to achieve two goals and they are compliance and waste reduction. Compliance means reaching and maintaining the minimal legal and regulatory standards for acceptable level of impact to avoid sanctions. Meanwhile, waste reduction goes beyond compliance and focuses a firm's activities on the dramatic reduction of negative environmental impact. An EMP represents the organizational change within corporations and a self-motivated effort at internalization of environmental concerns into the objectives of the firm (Ibrahim & Jaafar, 2016).

Limited attention has been paid to the influences of technological and environmental awareness characteristics on EMP implementation (Ibrahim & Harlina, 2016). Characteristics of a new technology may affect its adoption. Additionally the characteristics of environment awareness may influence the implementation. Technological and environmental awareness characteristics should be taken into account when analyzing environmental issues. The need to understand environment management practices adoption by logistics companies calls for a thorough assessment of the technological, organizational, environmental factors and environmental awareness, which influence logistics companies acceptance of environment management practices implementation.

2.1. Technological factors

Technology can be known as a source of knowledge. Besides, technology can also be referred to as automated devices or systems that can reduce one's effort to complete a task which mainly used in the

business world for sharing information among companies. Technological factors refer to the relative advantage, compatibility and complexity of the performance that a company wants to achieve by adopting green practices. In terms of relative advantage, it revolves around the idea of using technology to provide a better environmental performance. Also, it can give higher economic benefits and enhance the company's reputation. As for compatibility, the practices recommended to be implemented are compatible with the existing logistics operations which really encourage the company to adopt those practices into their operations. Other than that, companies also adopt green practices as it is consistent with the company's values. Lastly, companies adopt green practices due to the ease of integrating the practices with company's existing system so they would see it a chance to improve their performance (Lin & Ho, 2011).

2.2. Organizational factors

Organizational factors also can be referred as the internal factor which means that the reason for adopting green practices is because of the sense of responsibility towards the environment. Organizational factors are commonly analysed in research on technical innovation and environmental management. A variety of organizational characteristic variables such as quality of human resources, top management's leadership skills, organizational support, organizational culture, and organizational size have been discussed on their influences on technical innovation and environmental strategy (Lin, Ho, & Chiang, 2009). Therefore, this study focuses mainly on the organizational support, quality of human resources, and company size because they are organizational resource-related variables widely analysed in research on technical innovation and environmental management.

2.3. Environmental factors

The environmental factors in this study refer to the external environment in which a company conducts its business. Several environmental variables such as stakeholder pressure, environmental uncertainty, environmental munificence, governmental support, competition, and network relations have been discussed in the literature of technical innovation (Lin et al., 2009). Stakeholder pressure, external resource availability, and environmental uncertainty are consistently regarded as primary environmental factors influencing technical innovation. As external factors are concerned, the government, the stakeholder and customers play a big role as the logistics company must run their operation based on their preferences (Tornatzky, Fleischer, & Chakrabarti, 2008).

2.4. Environmental awareness

Environmental awareness is about having the awareness on the importance of the environment to the world. Since the beginning of the action to preserve the environment in the early 1970's, adults have generally become more aware of the negative impacts towards the environment which is resulted from the moment that technology was used on a large scale without an adequate understanding of its environmental consequences (Lee & Chen, 2010). Therefore, it is safe to assume that many environmental education programs which makes the person more knowledgeable regarding the environment or develops a higher level of TEAL (Technological, Environmental and Agricultural Literacy), will develop more concern for the environment and thus, causing that person to choose technologies which cause less harm towards the environment compared to those who do not possess knowledge regarding environmental impacts . However, programs which simply provide knowledge for the learner doesn't necessarily guarantees success, especially if the learner has a negative environmental attitude (Gadenne, Kennedy, & McKeiver, 2009).

2.5. Technological factors and green practices adoption

Technological factors have often been taken into account in the literature on technical innovation. However, their influences on green practice adoption are rarely analysed. Several technological factors have been discussed on their influences on technical innovation, including relative advantage, compatibility, complexity, triability, observability, ease of usage, perceived usefulness, intensity of information, and uncertainty. However, in this research, only relative advantage, compatibility and complexity will be focused on (Tornatzky & Fleischer, 1990).

Relative advantage is the degree to which an innovation is perceived to be more advantageous than its substitute idea. The perceived benefits can be measured in terms of economic or social such as performance, satisfaction, reputation and convenience. Most companies are more likely to adopt a technology that gives the best performance and higher economic gains than the rest. Positively, related advantage is related to adoption of innovation (Rogers, Melamed, & Lembke, 2012; Tornatzky et al., 2008).

As for compatibility, it is the degree to which an innovation is perceived as being conforming with the current values, experiences, and needs of the firms. How the new technology fits in with the operational knowledge that a company already possesses is an important factor that influences technical innovation. In order to reduce objections against the diffusion of a new technology that is about to be adopted, a company will be more likely to adopt the new technology that is more compatible with the company's current operational knowledge for they don't want to jeopardize the ongoing operation (Rogers, Melamed & Lembke, 2012). As several green practices are additions to companies' current technologies and processes, adopting green practices is not a single event but can be described as a process of knowledge accumulation and integration. Green practices will be more easily diffused within a company when the practices are more compatible to the company's current technologies and processes. Combinations between previous experiences and environmental actions may generate a greater effectiveness in preserving the environment (Etzion, 2007).

2.6. Organizational factors and green practices adoption

Perceived organizational support is the general opinion of the employees in regard to the given value and care about him or herself by the organization and demonstrating that the support received from the organization is improving the relationship inside the organization. Perceived organizational support is employees feeling secure and knowing that the organization have their backs (Lee, 2008). Green logistics is a relatively young but rapidly evolving field. However, Even if many enterprises set off the green awareness movement by incorporating corporate social responsibility programs into their business plans, they continue to lack integrated practices in terms of green logistics networks (Geroliminis & Daganzo, 2005). An increase of development in environmental management has led companies to a realization that this is the key area for companies wanting to be competitive in the modern global economy. A key area for improvement in many companies is the requirement for environmental management to be taken using a systemic rather than systematic approach. For instance, analysing how decisions will impact not only on environmental aspects but also on the overall business and operations strategy.

2.7. Environmental factors and green practices adoption

Environmental factor refers to the external factors which are the surroundings of the company. Because of that, the government, stakeholders and the customers plays a big role in making these logistic companies to adopt green practices into their daily operations. This is because the availability of external resources influence the adoption of green practices. Munificence of resources in the business environment increases the degree to which a company engages in environmental management (Holt & Ghobadian, 2009). The government can raise the munificence by providing governmental subsidies or tax incentives

for alternative energy technologies, bank financing at lower rates for environmentally friendly technologies, and lower insurance premiums for lower environmental risks (Aragón-Correa, Hurtado-Torres, Sharma, & García-Morales, 2008) . The study also suggests that governmental support in green initiatives has a positive influence on the company's willingness to participate in the green supply chain. Therefore, this study expect that governmental support will positively affect the adoption of green practices for Malaysian's logistics companies. As adopting green practices can be regarded as a technical innovation process that can improve a company's environmental performance, green practice adoption is expected to be positively associated with the environmental uncertainty and expected that companies are more likely to adopt environmental innovations to generate the capacity to improve environmental performance in uncertain environments.

2.8. Environmental awareness and green practices adoption

As campaigns or training in environmental management increase in numbers, the more the awareness of the employees towards the impacts of their actions toward the environment. From this, more of the employees all around the world will want to be involved in sustainable development. Sustainable development is one that focuses on making progress in terms of social, economic and politics in order to satisfy global human needs, desires, aspirations, and potential without causing harm to the environment. Through involving in sustainable development, the environment can be well managed and protected from any unnecessary harm (Sharma & Gadenne, 2014). Based on above discussions, this paper suggests that the intention to adopt green practices is positively associated with the technological factors, organizational factors, environmental factors and environmental awareness factors and consequently proposes the following four hypotheses based on the following research framework:

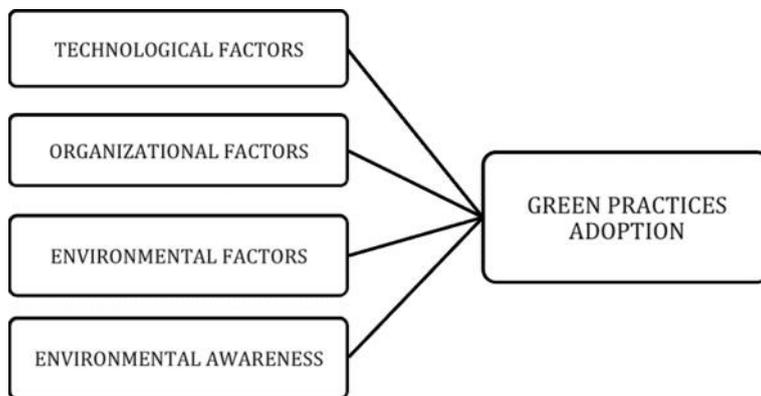


Fig. 1. Research framework

Hypothesis H1 : There is a relationship between technological factors and green practices adoption

Hypothesis H2 : There is a relationship between organizational factors and green practices adoption

Hypothesis H3 : There is a relationship between environmental factors and green practices adoption

Hypothesis H4 : There is a relationship between environmental awareness and green practices adoption

3. Methodology

3.1. Data collection

In this study, all information will be collected and gathered from the primary data. The primary data are the questionnaire regarding the determinants of green practices adoption in PKT Logistics Group Sdn Bhd. For this study, the primary data are obtained from the respondents of the questionnaire which are the employees of PKT Logistics Group Sdn Bhd.

3.2. Evaluation of data

The data will be tested and evaluated by using statistical software or SPSS. This research is done by using the information gained from the questionnaire to get the data on the determinants of green practices adoption in PKT Logistics Sdn Bhd.

3.3. Survey instruments

This study will be using a set of questionnaire. After a questionnaire was developed, fieldwork was conducted to collect data on the determinants of green practices adoption in PKT Logistics Group Sdn Bhd. For the questionnaire, this study used 47 questions that can measure the relationship between the independent variables (technological factors, organizational factors, environmental factors and environmental awareness) and dependent variables (green practices adoption). 250 questionnaires were distributed and 150 were returned through self-administered questionnaires to the managers and employees of PKT Logistics Group Sdn Bhd. The entire respondents have knowledge regarding the ISO 14000 implementations. In addition, participants were assured of confidentiality and anonymity of their returned questionnaires. The selection of appropriate respondent is done at the time of data collection (fieldwork) process. All of the questionnaire's construct items consist of multiple variables, and a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with 3 (cannot determine) as a neutral anchor point was used to measure the variables.

3.4. Pilot study

To check for content validity for generated items in this study, a pilot test was conducted with 30 selected respondents to examine on the clarity and appropriateness of the questionnaire developed. The results were then analysed by using the SPSS on the reliability analysis test. Thus, as the result shown in the table below, all the variables have results that are above 0.7 except for the environmental factors. Therefore, all the variables are reliable to the adoption of environmental management practices with the exception of environmental factors.

Table 1. Validity

Variables	Cronbach Alpha
Technological	.770
Organizational	.867
Environmental	.524
Environmental Awareness	.896
Adoption of EMP	.811

4. Analysis

To find the influences of technological, organizational, environmental, and environmental awareness factors on the intention to adopt green practices, the method of regression analysis was used and the results are as follows :

Table 2. Regression Results for the Determinants of Adopting Green Practices

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
(Constant)	2.246	.932		2.409	.020
Technological factors	.273	.181	.233	1.507	.139
Organizational factors	.379	.140	.392	2.712	.009
E	.003	.146	.003	.019	.985
EA	-.037	.119	-.049	-.311	.757

Since, only the p-value of organizational factors is less than 0.05 which means only organizational factor that has a positive effect on the adoption of environmental management practices in logistic companies. Meanwhile, technological factors alongside environmental factors and environmental awareness factors were to be found not significant towards the adoption of environmental management practices.

5. Findings

After analysing the data it can be concluded that:

Research objective	Hypotheses constructed	Results
To determine whether technological factor leads to green practices adoption.	There is a positive relationship between technological factors and green practices adoption.	H1 is rejected because p-value > 0.05
To determine whether organizational factor leads to green practices adoption.	There is a positive relationship between organizational factors and green practices adoption.	H2 is accepted because p-value < 0.05
To determine whether environmental factor leads to green practices adoption.	There is a positive relationship between environmental factors and green practices adoption.	H is rejected because p-value > 0.05
To determine whether environmental awareness leads to green practices adoption.	There is a positive relationship between environmental awareness and green practices adoption.	H is rejected because p-value > 0.05

6. Discussion

The main reason that this research is being conducted is to determine whether the determinant really does have a positive relationship with the green practices adoption in PKT Logistics Sdn Bhd. Altogether, there were four hypotheses and all four of them are tested during this research. These hypotheses were

tested to determine the significance of the determinants towards green practices adoption. The hypothesis test involves all the independent variables which are technological factors, organizational factors, environmental factors and environmental awareness. In order to ensure that good data were to be obtained, a suitable target of respondent has been selected by using convenience sampling as the sampling procedure. The target respondents will be people who are working in PKT Logistics Sdn Bhd. During this research, 250 questionnaires are being distributed using Likert scale measurement which consists of rating from one to five, ranging from “strongly disagree” to “strongly agree”. (1 = strongly disagree, 2=moderately disagree, 3 = marginally disagree, 4 = neutral, 5= marginally agree, 6=moderately agree and 7= strongly agree). The first 8 questions are regarding the demographic profiles of the respondent through descriptive statistic such as frequency test. Then, it was followed by factor analysis and reliability that enables to test various hypotheses that shows in more detail the green practices adoption while being related to the four determinants (independent variables). Among all four hypotheses that were being tested, only one of the factors has been proven to be significant to the green practices adoption in PKT Logistics Sdn Bhd. Based on the result, the three independent variables which are to be insignificant, few of the reasons can be identified through observation on the operations and possible reasons are found.

First of all, warehouse operation is not fully automated for it mostly manually operated thus causing the operations vulnerable to human error. Because the warehouse is not fully technologically oriented, the employees do not consider technology as the factors influencing the adoption of environmental management practices.

As for environmental factors, it was to be found not significant by the employees due to lack of encouragement on green initiation from the customers. In other words, the major concern is regarding the success of delivery of the parts. So as long as the delivery is successful, there will be no complaint. In addition, the location of the warehouse is located in the city so in a way that the warehouse are not exposed to the environment therefore the employees are not able to see the direct impact of their actions towards the environment.

Next will be the environment awareness factor. This refers to awareness inside the individuals themselves. For it to be not significant, that means that the employees in the company are not convinced that the environmental management practices really bring an impact towards the environment and improve their performance to meet the customer needs. This can be assumed that the employees are not being briefed clearly and fully as to how does the practice can impact the environment in a good way thus leading lack of awareness. However, it is not fair to say that the employees lack of awareness towards the environment because some people are profit oriented which means that all they ever concern about is how to make profit. That is their main objectives. Therefore, all of the unrelated subjects were to be ignored.

7. Recommendation

There are several ideas and suggestions that can be brought upon this research that could bring better result regarding the impact of the independent variables namely technological factors, organizational factors, environmental factors and environmental awareness on green practices adoption. The main recommendation is that each individual must feel responsible for their actions. Therefore, both internal and external must play their roles in order to raise environmental awareness among every individual. Internal refers to organization itself while external refers to the government, customer and other organization that has a link with the organization. Campaigns, training, talks and many other events can be used as a way to encourage everyone towards being more environmental friendly. Governments can also give few benefits or advantages to companies that implement environmental management practices to encourage others to follow this beneficial trend.

8. Future studies

This study is important to the researcher that planning to investigate or conducting a research on green practices. There are few recommendations that encourage other researcher to extend this study. Regarding this research, future researchers must identify other possible variables or factors that could lead to green practices adoption. Also, future researchers also have to consider the company's status if were to relate it to the determinants. For instance, as the warehouse is not fully automated, it is hard to find any significance of technology towards green practices adoption. Furthermore, company's reputation also must be taken to consideration. Therefore, if one were to conduct research on green practices, one must be able to identify what is the true factor which drives people to adopt green practices. Hopefully, these recommendations can give some insights for the future researchers on the determination on green practices adoption in logistic companies.

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