

# Implementation of Green Innovation in the Logistics Industry

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*The purpose of this study is to examine the influences of organizational factors on the implementation of green innovations in the logistics industry. The data came from the questionnaire survey on logistics companies in Indore (M.P). Research findings reveal that organizational support for innovation and the quality of human capital are significantly positively associated with the implementation of green innovations. According to research results, managerial implications and opportunities for future research are discussed as well.*

**Keywords:** Logistic Industry, Green Innovations, Organisational Factors.

**Field of Research;** Management

## 1. Introduction

Environmental issues have become critical concerns all over the Country. Commitment to the natural environment has become an important variable within the current competitive scenarios while companies worldwide are continuously trying to develop new and to enhance their global competitiveness. Several companies have enhanced their competitiveness through improvements in their environmental performance to comply with mounting environmental regulations, to address the environmental concerns of their customers, and to mitigate the environmental impact of their production and service activities. As many realize that customers and other stakeholders do not always distinguish between a company and its suppliers (Bacallan, 2000), more and more companies have started to undertake significant efforts towards establishing green supply chain management (GSCM) initiatives (Srivastava,2007; Zhu, Sarkis & Lai, 2008). Logistics operations play a significant role in GSCM. With the rapid development of the GSCM, the importance of environmental management for the logistics industry has increased dramatically. Logistic company needs to put more efforts on environmental issues for delivering products and services to the customers environmentally (Murphy & Poist, 2003). Integrating environmental management and logistics services has become an important task for the logistic industry. Although there is a mushrooming body of literature involving the environmental issues in a variety of business disciplines such as manufacturing and marketing, the corresponding literature involving logistics has been still less but expanding. To date, only a few studies have examined environmental issues for the logistics industry (Murphy & Poist, 2003; Rondinelli & Berry, 2000; Wong & Fryxell, 2004).

Limited attention has been paid on how these possible factors influence the implementation of green innovations for logistics companies. The operation of logistics services often leads to several negative impacts on the natural environment, including air pollutants, hazardous waste disposal, solid waste disposal, fuel consumption, and others (Rondinelli & Berry, 2000). This suggests that it is necessary to study

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environmental issues in the logistics industry. Although a body of research on the implementation of green innovations in the manufacturing sector can provide some guidelines for the development of environmental management in the logistics industry, it is still required to conduct more research on environmental issues in the logistics industry, as firms in different industrial sectors may exhibit dissimilar attitudes toward environmental issues (Zhu et al., 2008).

Therefore, the main purpose of this paper is to explore the factors that affect the willingness to implement green innovations in the logistics industry. An understanding these factors is essential for practitioners to best implement green innovations, and for researchers to best understand what issues need to be addressed.

The paper proceeds as follows: Section 2 describes the theoretical background of the study whereas section 3 talks the methodology used for the study. The results and discussions are summarizes in section 4 and section 5 says conclusion and limitation of our study.

## 2. Theoretical Background

Innovation is the use of new technical and administrative knowledge to offer a new product or service to customers. It includes any practices that are new to organizations, including equipments, products, services, processes, policies and projects (Kimberly, & Evanisko, 1981). Because the application of green practices in the logistics industry is still in its infancy, the adoption of green practices can be taken as an innovative process for a logistics company. Among several factors influencing innovation, organizational factors are the most widely analyzed in research on innovation (Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990). This paper will examine the influence of organizational factors on the intention to implement green innovations.

Some features of organizations like structures, climates, and cultures of organizations will influence innovation (Kimberly & Evanisko, 1981; Tornatzky & Fleischer, 1990). The management skills, organizational encouragement for innovation, and support of innovation resources would help the improvement of organizational innovation. The support and encouragement of top management is considered an essential factor for the development of innovation strategies because the resources required for the implementation of new technologies will be more easily available if the major person responsible for these resources supports the plans. Moreover, many initiatives of adopting new technologies require the collaboration and coordination of different departments and divisions and this is easier to manage when such initiatives are endorsed from the top. Therefore, we would expect that support for innovation might influence the implementation of green innovations.

Informal linkages and communication among employees, the quality of human resources, top management's leadership behaviour, and the amount of internal slack resources would significantly influence the adoption of technological innovation (Tornatzky & Fleischer, 1990). Technologies can be viewed as one kind of knowledge (Grant, 1996.) An organization will have higher innovative capability when knowledge can be distributed more easily within the organization. Higher quality of human capital such as employees with better education or training is helpful to distribute technological knowledge in an organization. The higher the percentage of employees trained in learning innovative knowledge, the higher the development of the organization' s

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innovative approach will be. Therefore, it would expect that the quality of human capital might influence the implementation of green innovations.

### 3. Methodology

To examine the possible factors influencing the intention to adopt green practices for the logistics service provider, data was collected by mailing questionnaires to logistics companies in Indore (M.P). This region is suitable for our study because, lots of industries, and organizations of Madhya Pradesh are situated here and have started giving much emphasis on environmental issues for the sustainable development of Indore. Moreover, due to the trend in globalization, M.P's government has delivered several policies to make Indore become a global logistics centre.

As efficient and effective logistics is one of the key success factors that makes Indore become one of the important sources of electronic products in the India (Shan & Marlow, 2005), it is necessary for Indore's logistics industry to implement environmental innovations to help M.P's manufacturing companies develop their green competitiveness. The sample frame was drawn from members of the Logistics Council in M.P. One hundred questionnaires were mailed to the sampled companies. In total, 58 completed questionnaires were returned. Of these respondents, 06 unconfident questionnaires were excluded. The overall response rate is 34.6 percent.

The green innovations for the logistics industry suggested by Murphy and Poist (2003) are taken as the green practices in this study. Factors like "Organizational support for innovation" are measured according to the degrees that companies' resource supports (Tornatzky & Fleischer, 1990). Also factor like "Quality of human capital" is measured according to employees' information skills and innovation capabilities (Tornatzky & Fleischer, 1990). Each item is measured using the 5-point Likert scales anchored by 'strongly disagree' and 'strongly agree'. The measured scales were submitted to factor analysis. Factors with Eigen values greater than 1.0 for each characteristic are summarized. The result of factor analysis confirms the construct validity of this study. According to the reliability coefficients, the smallest value of Cronbach's alpha for this study is 0.7991. This implies that the sampling results are reliable (Nunnally, 1978).

### 4. Results and Discussions

To find the influences of organizational factors on the implementation of green innovations, the method of multiple regression analysis was used in this study. Support for innovation, quality of human capital, company history and company size are taken as independent variables and the willingness to implement green innovations is taken as the dependent variable. Moreover, company history and company size are taken as the control variables in the regression analysis (Spencer, 2003). The standardized results of regression analysis are shown in Table 1. It has been found that the proposed organizational factors have positive influences on the implementation of green innovations. Support for innovation, quality of human capital, all exhibit significantly positive influences on the willingness to implement green innovations for logistics companies in Indore. This means Factor such as "Organizational support for innovation" can give employees motivation and support to adopt new logistics technologies, such as green innovations and "High quality of human capital" can enable the employees to learn and use innovative green technologies.

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**Table 1: Standardized Regression Results for the Green Innovation Implementation**

Independent/Control Variables	Coefficient ( $\beta$ )	t - value
Support for Innovation	0.174	4.912**
Quality of human Capital	0.199	5.117**
Company History	0.036	0.873*
Company Size	0.102	4.543**

Dependent variable: Willingness to implement Green Innovations.

$R^2 = 0.558$

Adjusted  $R^2 = 0.517$

$F = 8.336^{**}$

\*=  $P < 0.05$ , \*\*=  $P < 0.01$

## 5. Conclusions

It is generally perceived that green innovations help to enhance environmental performance. Many companies have undertaken significant efforts towards adopting green innovations. The motivation and driving forces for implementing green innovations have been examined in a body of research; however, most of them focused on manufacturing sectors. There are some explanations as to why manufacturing firms should engage in environmental activities. Yet, all companies are not exposed to the same types of pressure or to the same extent. Thus, there is a clear research need to determine the potential factors that will influence the willingness to adopt green practices for service sectors.

This paper gives some explanations as to what organizational factors influencing the intention to implement green innovations for the logistics industry. Based on the research results, we can find that logistics companies can also increase their abilities to implement green innovations by accumulating more related technologies, by encouraging or supporting their employees to learn new technology and by training and educating their employees to become knowledge workers. There are some limitations to our research. Because we used the questionnaire survey, it is possible that the results of this study might suffer from the respondent bias. As we know, logistics companies cover a wide range of service types. In this study, we did not take the influences of service types of logistics companies on the adoption of green innovations. There might be different effects of organizational factors on green innovation implementation for different logistics service types. Moreover, other possible influential factors on the implementation of green innovations will also be taken into considerations in a further study. In addition, this paper only studies logistics companies in Indore and some places of Bhopal.

The current study may be limited in its generalizability. While there are differences between India and other countries in political structures, cultural background, historical perspective, social value, and so on, logistics companies in different countries may have different views on the influences of these organizational factors on the implementation of green innovations. It will be worthwhile to advance a cross-national

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comparative study on green innovation implementation among logistics industries in India and in other countries.

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