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Determinant Factors of Environment Management Practices Adoptions

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Abstract: There is an increasing growth of customers and regulators requesting enterprises to adopt the environmental management practices (EMP) over the last 15 years and this matter becoming an interest for researchers and practitioners. This paper will propose an integrated model that combines the theory of planned behavior (TPB) and Technology-Organization-Environment Model (TOE), the two theories that are most often used in environment and innovation studies. In this paper, a model is erected to indicate the relationship between TOE model, TPB theory and EMP adoption.

Key word: technological; organizational; environmental; behavioral attitude; subjective norms; perceived behavioral control

JEL codes: Q00, Q5, R00, R4

1. Introduction

The foundation of several previous new technology and innovation adoption studies was based on the theoretical frameworks derived from Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA), Ajzen's (1985) Theory of Planned Behaviors (TPB), Theory of Acceptence Model (TAM); Rogers's (1983, 1995), Diffusion of Innovations (DOI) theory and Tornatzky and Fleischer's (1990) Technological-Organizational-Environmental (TOE) model. Some of these theories are able to explain the organization level of innovation adoption, while others focused on the individual acceptance of new technology. This article proposes the integration of TOE model and TPB model for the framework of EMP adoption.

2. Background

2.1 Environment Management Practices (EMP)

An EMP or Environment Management Practices is a tool for an organization's managing their impacts activities toward the environment. It provides a structured approach to plan and implement environment protection measures. An EMP monitors environmental performance; similar to the way a financial management system monitors expenditure and income and enables for an organization to checks regularly company's financial performance. An EMP integrates environmental management into a company's daily operations, long-term planning and other quality management systems (Chavan, 2005; Marimon Viadiu, Casadesús Fa, & Heras

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Saizarbitoria, 2006; Zutshi, Sohal, & Adams, 2008). An EMP is one of the tools an organization can use to implement an environmental policy (Ann, Zailani, & Wahid, 2006; Chan & Wong, 2006; Fuong, 2010; Harangzó, Kerekes, & Zsóka, 2010). An EMP illustrates an extension of the core principles of total quality programs to managing the environment (Florida & Davison, 2001). In other words EMP can be described as the systematic application of business management to environmental issues (Florida & Davison, 2001).

2.2 Technology-Organization-Environment (T-O-E)

Technology-Organization-Environment (TOE) framework of Tornatzky and Fleischer (1990) undertakes a generic set of factors to predict the likelihood of innovations adoption. The theory suggests that innovations adoption is influenced by technology development (Kauffman & Walden, 2001), organizational conditions, business and organizational restructuring (Chatterjee, Grewal, & Sambamurthy, 2002), and industrial environment (Kowtha & Choon, 2001).

Technological context defines that adoption depends on the collection of technologies inside and outside the firm as well as the application's noticed relative advantage (gains), compatibility (both technical and organizational), complexity (learning curve), trialability (pilot test/experimentation), and observability (visibility/imagination).

Organizational context apprehends firm's business scope, top management support, organizational culture, complexity of managerial structure measured in terms of centralization, formalization, and vertical differentiation and the quality of human resource (Jeyaraj, Rottman, & Lacity, 2006; Tornatzky & Fleischer, 1990).

Environmental context conveys to facilitate and inhibited the factors in areas of operations. Substantial among them are competitive pressure, trading partners' readiness, socio-cultural issues, government encouragement, and technology support infrastructures (Al-Qirim, 2007; Jeyaraj et al., 2006; Scupola, 2003a, 2003b; Zhu & Kramer, 2005).

The major problem of the T-O-E is that the theory is lack of the influences of behavioral, attitudes, awareness and benefits construct on technological and innovation adoption decision (Awa, Emecheta, & Ojiabo, 2012). However, integrating the T-O-E with other models such as the TPB, with each theory offering larger number of constructs than the original, provides finer theoretical lenses to the understanding of technological and innovation adoption behavior.

2.3 Theory of Planned Behavior (TPB)

The TPB is an established general theory of social psychology, which emphasizes that specific significant beliefs influence behavioral intentions and subsequent behavior (Ajzen & Fishbein, 1975; Ajzen, 1985; T. C. Lin, Hsu, Kuo, & Sun, 1999; Netemeyer, Ryn, & Ajzen, 1991). The TPB extends the theory of reasoned action (TRA) (Ajzen & Fishbein, 1975) to explain for conditions where individuals do not have control over the situation (Kaiser, Wolfing Kast, & Fuhrer, 1999; Pavlou & Chai, 2002). The Theory of Planned Behavior has been used in several studies for examining the intention behavior to adopt innovation towards environment (Kumar, 2012). The theory of planned behavior would enables to complete the framework for exploring the factors which influence the decision to engage in behavior related to environmental issues and understanding different factors affecting the purchase behavior for environmentally sustainable products (Kumar, 2012).

2.4 Integration of the Technology-organizational-Environment Framework (TOE Framework) and The Theory of Planned Behavior Model (TPB Model)

Innovation involves of any practices that is new to organizations, including installment or upgrading new equipment, products, services, processes, policies, and projects (Ho & Lin, 2012; C. Lin, Ho, & Chiang, 2009; C.

Lin & Ho, 2011; C. Lin, 2011). It is important to understand the organizations' adoption behavior and identifying the determinants of innovation by distinguishing the types of innovation (Ho & Lin, 2012). As adopting environment management practices involves implementing new or modified processes, techniques, or systems to reduce environment damages, the adoption behavior can be regarded as a technical innovation process (Henriques & Sadorsky, 2008). Various researchers have analyzed environment management practice adoption from the perspective of technical innovation; however, little empirical research analyzes the influences of technological, organizational, and environmental factors simultaneously (Damanpour, 1991; Dou, 1999; Hoffman, Parejo, Bessant, & Perren, 1998; Worthington & Patton, 2005).

Although the TOE framework is applied to several innovation implementation research, the framework is better to be intregrated with other models preferably the Theory of Planned Behaviour (TPB), with several reasons.

Firstly, the constructs in the adoption predictors in TOE framework is only apply to large organizations (Angeles, 2013; Awa et al., 2012; Tornatzky & Fleischer, 1990). With the integration of TOE and TPB, the propose framework is suitable to be apply for individual level (Martins & Oliveira, 2008; Oliveira & Martins, 2011).

Secondly, TOE framework is not aiming to offer a concrete model describing the factors that influence the adoption process; it is rather for classifying factors in their respective context (Ven & Verelst, 2011). With the integration framework from the TPB model, construct of TPB will further the studies examining the intention behavior to adopt innovation towards environment (Kumar, 2012).

Thirdly, Henderson (2102) suggest that future researchers would reflect whether the significance of technological, organizational, and environmental variables change based on internally or inter-organizationally adoption (Henderson, Sheetz, & Trinkle, 2012).

Fourthly, Although the TOE framework covers the technological aspects and also explores their organizational and environmental contexts, its does not cover the perception and attitudes aspects on adopting the new technology (Wan Nur Syahida & Azwadi, 2013). With the construct from TPB, the variables covers the perception and attitudes aspect.

Fifthly, the TOE framework has consistent empirical supports in the study of supply chain related to new IT technologies. Nevertheless, management information systems researchers have often stated that due to different technologies' characteristics, the TOE models often need to be extended to incorporate different variable beyond the TOE framework (Chong & Chan, 2012). Since EMP is a new technology or innovation, the proposed framework will cover the variables on innovation adoption.

Sixthly, researcher describe that the TOE framework as a generic theory, thus they have seen little need to adjust or refine the theory itself (Baker, 2011; Zhu & Kramer, 2005). With the proposed framework, the integration of TOE and TPB will offers more alternatives for researchers to research on technology adoption (Chong & Chan, 2012).

Seventhly, the TOE framework may have seen relatively little evolution because it has been viewed as aligned with other explanations of innovation adoption rather than offering a competing explanation to them (Baker, 2011). Since every technologies and innovations have different characteristics, the construct of both framework would cover the need of the studies on technology adoptions (Chong & Chan, 2012).

Finally integrating TOE with other models offering larger number of constructs than the original and provides richer theoretical lenses to the understanding of adoption behavior (Awa et al., 2011)

Accordingly, it has been suggested that a integration can be accomplished when the strength of some of the most widely used theories in adoption research for explaining individual behaviour (e.g., Theory of Technology Acceptance Model (TAM), Theory of Technology Acceptance Model 2 (TAM2), Theory of Planned Behavior (TPB), and Unified Theory of Acceptance and Use of Technology (UTAUT)) could be combined with the strength of a TOE framework to describe organizational behaviour (Baker, 2011).

The Theory of Planned Behavior (TPB) is a suitable model to be integrated with TOE framework in this research because for several reasons. The reasons are, the literature on technology adoption by businesses suggests that most research are based on the Theory of Planned Behaviour (TPB) (Netemeyer et al., 1991; Wan Nur Syahida & Azwadi, 2013). Although the TPB theory on focuses on perception and attitudes, the TPB theory are highly applicable in predicting adoption behaviour of the firm in considering new technology (Wan Nur Syahida & Azwadi, 2013). The TPB theory will focus on technological perspective which based on perceptions and attitudes, and have commonly been used as groundwork for new technology implentation at the individual level (Oliveira & Martins, 2011). Additionally, the TPB is a well-researched intention model that has been proved successful in predicting and explaining behavior across a wide variety of domains (T. C. Lin et al., 1999). Nevertheless there is scarce research concerning adopting any environment management practices or environment management system that use the TPB as a base theory to explain the behavioral intention of individuals (C. Lin & Ho, 2011).

2.5 Proposed model of Environmental Management Practices Adoption

In this research, a modified version of the Technology-Organizational-Environmental Framework (TOE) (Tornatzky & Fleischer, 1990) and the Theory of Planned Behaviour (TPB) (Ajzen, 1985) have been developed for researching the adoption of environment management practices. Based on the TOE framework, it covers the aspects of an enterprise's context that influence the process by which it adopts and implements a technological innovation or new technology system (Tornatzky & Fleischer, 1990). While in TPB, the intention to use a "system" is explained by attitudes toward certain behavior, subjective norm and perceived behavioral control (Ajzen, 1985). TOE or TPB have both been widely used among researchers and found to be very useful in explaining consumers' attitudes and intentions toward a given behavior (Awa et al., 2012; Min, 2008; Oliveira & Martins, 2010; Pavlou & Chai, 2002; Yoon, 2011). TPB is a general theory of human behavior while TOE is specific to innovation adoption. Studies on acceptance of new technology indicate that traditional adoption models need to be extended and modified to better explain the adoption of the innovations (Ervasti & Helaakoski, 2008).

This study modifies TOE by integrate the construct from TPB. Therefore, this research will explore the influences of technological, organizational, and environmental factors and the mediating factors of environment and awareness attitudes on the adoption of environment management practices in Malaysia logistics industry.

Figure 1 below illustrates the research framework of the study. The technological factors include the relative advantage, compatibility, and complexity of green practices; the organizational factors include organizational support, quality of human resources, and company size; and environmental factors include customer pressure, regulatory pressure, governmental support, and environmental support. For the mediating factors include environment attitude, general awareness and cost benefits awareness. As this article aims to analyze the influences of technological, organizational, environmental, and environment awareness and attitudes factors on environment management practices adoption, the potential relationships between the proposed determinant factors will not be considered in the current study.

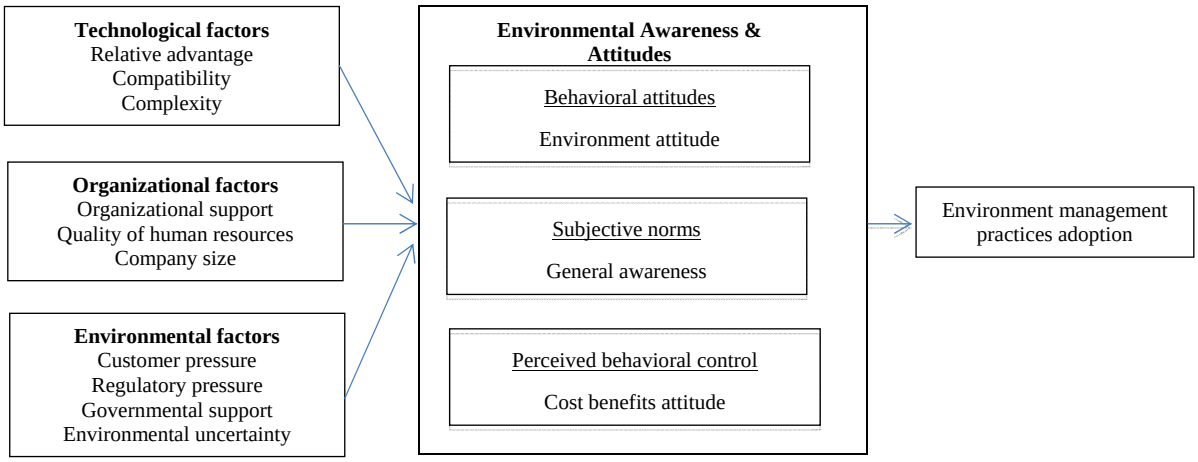

Figure 1 Proposed Model for Adoption of Environment Management Practices

3. Hypothesis Development

Based on the foregoing review of the literature, it is hypothesized that the factors of technological, organizational and environmental factors have impact on environmental awareness and attitudes, which in turn are associated with the environment management practices adoption. The diagram in Figure 1 illustrates the relationships between the theoretical constructs and variables under analysis in this research. Figure 1 shows the fourteen theoretical constructs representing by five main factors of technological factors, organizational factors, environmental factors, environmental awareness and attitudes factors and environment management practices adoption factors. Technological factors include relative advantages, compatibility and complexity factors. Organizational factors include organizational support, quality of human resources and company sizes. Environmental factors include customer pressure, regulatory pressure, governmental support and environmental uncertainty. Environmental awareness and attitudes support includes environmental attitudes that represent behavioral attitudes, general awareness that represent subjective norms and cost benefits attitude represent perceived behavioral control. Based on the proposed research model, the following hypotheses were formulated:

H1: The technological factors have a positive influence on environmental awareness and attitude for Malaysian logistics companies.

H2: The environmental factors have a positive influence on environmental awareness and attitude for Malaysian logistics companies.

H3: The organizational factors have a positive influence on environmental awareness and attitude for Malaysian logistics companies

H4: The environmental awareness and attitudes have a positive influence on environment management practices adoption.

4. Discussion and Conclusion

In this article, we have proposed a new conceptual adoption model based on the TOE theoretical framework and the Theory of Planned Behavior framework. Through conducting an in-depth literature review, the researcher uncovered initial concepts, constructs, and a set of preliminary detriments that may influence knowledge map

adoption. The proposed conceptual model for the adoption of EMP was founded by integrating two theories, the TOE framework and the TPB framework. The factors are covering six broad contexts (technological, organizational, environmental, behavioral attitude, subjective norms, and perceived behavioral control) that could potentially influence EMP adoption. As stated above the literature argues that the majority of the current research of EMP and innovation adoption generally focuses on the technical aspects of adoptions with a particular lack of discussion on the factors that influencing the adoption of EMP. Therefore, we believe this model can offer a valuable tool for managers to understand the factors that influencing the adoption of EMP in order that they could proactively design further strategy to improve their employee's attitudes to adopt EMP. So far, the initial research model is still untested. Thus, developing an instrument for survey and testing of the research model is crucial for future research.

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