



Contents lists available at ScienceDirect

Technological Forecasting & Social Change



Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization–environment framework

Hsiu-Fen Lin*

Department of Shipping and Transportation Management, National Taiwan Ocean University, No. 2, Beining Road, Keelung 202-24, Taiwan, ROC

ARTICLE INFO

Article history:

Received 15 February 2013

Received in revised form 17 August 2013

Accepted 1 September 2013

Available online xxxx

Keywords:

Electronic supply chain management systems

Technology adoption

Technology–organization–environment framework

Logistic regression analysis

ABSTRACT

Based on the technological innovation literature and technology–organization–environment framework, this study develops a research model to investigate the determinants of electronic supply chain management system (e-SCM) adoption across non-adopters and adopters. The research model examines the influence of technological context (perceived benefits and perceived costs), organizational context (firm size, top management support, and absorptive capacity), and environmental context (trading partners and competitive advantage) on e-SCM adoption. Data gathered from 283 IS managers (127 for non-adopters and 156 for adopters) in large Taiwanese firms were employed to test the relationships between the research model constructs using the logistic regression analysis. The results reveal that firms with certain perceived benefits, perceived costs, top management support, absorptive capacity, and competitive pressure are more likely to adopt e-SCM. While technological context is a major determinant of the decision to adopt, it has no direct effect on the extent of e-SCM adoption. The extent of e-SCM adoption is mainly determined by organizational and environmental contexts. Implications for practice and research are discussed.

© 2013 Elsevier Inc. All rights reserved.

1. Introduction

Electronic supply chain management system (e-SCM), as a form of Internet-based interorganizational system (IIOS), offers firms a platform to enhance communication, coordination, and collaboration across organizational boundaries, and thus is essential to increased competitiveness [1]. Compared to early forms of IIOS, such as Internet-based electronic data interchange (EDI), e-SCM relies heavily on socio-technical interactions (e.g., shared database and joint decision making support) to permit the integration of fragmented, silo-oriented supply chain processes with low cost and rich content [2,3]. E-SCM has been discussed in the literature as a technology that can provide adopters with several operational and strategic

advantages. While the short-term, operational goal of e-SCM is to increase productivity and reduce inventory and cycle time, the long-term objective focuses on the improvement and innovation of the end-to-end processes between companies, their customer, and suppliers [3–5]. Although e-SCM efforts sometimes fail to reach forecasted results, e-SCM is now a strategic management system to improve competitive position and a major concern for top-level managers [6,7]. Therefore, identifying and understanding the factors influencing the e-SCM adoption decision is one of the fundamental requisites for development of e-SCM solutions.

Although e-SCM adoption is considered a core competence that organizations use to achieve business success, organizations face several critical challenges to adopt e-SCM. These challenges are identified below. First, the *technological challenge* facing organizations is to analyze the costs and benefits associated with e-SCM adoption. E-SCM adoption requires investment in necessary Internet technologies, as

* Tel.: +886 2 24622192x 3409; fax: +886 2 24631903.

E-mail address: hflin@mail.ntou.edu.tw.

well as other supporting hardware, software and employee training [8]. Firms are often concerned with the expected costs versus benefits of adoption. Therefore, perceived benefits and costs of e-SCM influence its adoption and diffusion. Second, the *organizational challenge* is to foster a progressive and innovative organizational culture. The effectiveness of new technology adoption mainly depends on investment of time and effort in learning. Insufficient knowledge and skills for managers and employees can therefore become a serious barrier to e-SCM success [9]. Previous studies have shown that management commitment and employment involvement are important to new technology adoption [10,11]. Finally, the *environmental challenge* is to closely collaborate with trading partners (i.e., suppliers, carrier partners, and customers) and thus motivate e-SCM adoption and diffusion. Previous researchers have observed that firms can successfully adopt e-SCM both by establishing long-term mutual trust relationships and improving communication among supply chain members [12].

The challenge can be resolved by identifying various contextual factors that determine firm adoption decisions regarding e-SCM, which can be either internal or external to the organizations. For example, IS studies have suggested that the advantages and disadvantages of supply chain software, including its perceived benefits and costs, significantly determine adoption decisions in organizations [13]. Since adopting e-SCM involves substantial effort in development organizational change and significantly impacts business processes, many organizational factors may influence this adoption decision [4,14]. Moreover, Ke et al. [2] and Wu and Chang [15] suggested that environmental factors related to customers, business partners, as well as competitors influence Internet-enabled supply chain innovations. Despite growing recognition of the importance of technological, organizational, and environmental factors in e-SCM adoption intention, we know of no prior empirical studies that directly explored the influence of technological, organizational, and environmental factors on the decision to adopt e-SCM and the extent of e-SCM adoption.

This study aimed to examine the influence of technological context (perceived benefits and perceived costs), organizational context (firm size, top management support, and absorptive capacity), and environmental context (trading partners and competitive advantage) on e-SCM adoption. The research model and hypothesized relationships are tested by data collected from IS managers in Taiwan. Furthermore, the findings of this study contribute to empirical research on contextual factors that influence e-SCM adoption decision using a broad data set rather than a few isolated cases. From the managerial perspective, given the importance of e-SCM adoption in contemporary organizations and also in the future, the findings of this study are designed to enable e-SCM project managers and practitioners in formulating policies and targeting appropriate contextual factors to support effective e-SCM adoption.

2. Theoretical background

The two main areas of research that provide theoretical foundations for this study are the technology adoption

perspective and the contexts of e-SCM adoption. Key research on these areas is briefly reviewed below.

2.1. Technology adoption perspective

The relationship between IS applications and organizational change is always a central concern in the field of IS innovation [16]. The phenomenon of IS-driven organizational change can be termed an information technology (IT) innovation [17]. According to the technological innovation literature [18,19], IT innovation adoption generally refers to the adoption of new methods, processes, or production systems; it intends to maintain or improve firm performance and to respond to changes in the external environment [20,21]. Unlike early forms of IIOS, e-SCM uses different features, including information exchange capabilities, joint decision making support and business process integration, to conduct value chain activities [2,3].

The adoption of e-SCM also significantly impacts business process change, collaborative relationships among trading partners, and even business transformation [22,23], therefore, e-SCM adoption can be viewed as an "IT innovation adoption". The process of IT innovation adoption has been divided into a variety of stages; for instance: initiation, adoption, and implementation [24]; comprehension, adoption, implementation and assimilation [25]; knowledge awareness, evaluation, adoption, implementation and expansion [26]; and initiation, adoption and routinization [27]. As stated earlier, these stages can be grouped into two more general stages of initial adoption decision and post-adoption (continued use), often referred to as initiation (adoption decision) and implementation [19,28]. Therefore, based on the above theoretical considerations and literature review, this study specifies two levels of e-SCM adoption: likelihood of e-SCM adoption and extent of e-SCM adoption. The former refers to whether the firm has begun to adopt e-SCM. The latter involves the extent to which the firm had implemented e-SCM to support various business functions in the supply chain.

2.2. The contexts of e-SCM adoption

A theoretical model for e-SCM adoption must consider factors that influence the propensity to evaluate, adopt, and implement the IT innovation, which are rooted in specific firm technological, organizational and environmental contexts. The technology–organization–environment (TOE) framework serves as an important theoretical perspective for studying contextual factors [29]. The TOE framework identifies three aspects that may influence organizational usage of IT innovation: (1). technological context refers to adopter perceptions of technological attributes; (2). organizational context refers to descriptive characteristics of the organization, including firm size and scope, complexity of firm managerial structure, and quality and degree of its human resources; and (3). environmental context refers to the firm industry and its dealings with trading partners, competitors and government [29].

The TOE framework has consistent empirical support in the IS domain. For example, empirical studies using the TOE framework have examined and consistently found support for

Download English Version:

<https://daneshyari.com/en/article/7257201>

Download Persian Version:

<https://daneshyari.com/article/7257201>

[Daneshyari.com](https://daneshyari.com)