E-commerce technology adoption: A Malaysian grocery SME retail sector study ☆

Sherah Kurnia [a], Jyoti Choudrie [b], Rahim Md Mahbubur [c], Basil Alzougool [d]

[a] Computing and Information Systems, Melbourne School of Engineering, The University of Melbourne, Level 10, Room 16, Doug McDonell Building 168, Victoria 3010, Australia
[b] Hertfordshire Business School, University of Hertfordshire, DeHavilland Campus, Hatfield, Herts AL10 9EU, UK
[c] Faculty of Information Technology, Monash University, Australia
[d] Department of Business Administration & e-Marketing, King Talal School for Business & Technology, Princess Sumaya University for Technology, Khalil Saket Street, Al-Jubaiha, P.O. Box 1438, Amman 11941, Jordan

ARTICLE INFO

ABSTRACT

Electronic commerce (EC) has substantial potential to foster the growth of small and medium-sized enterprises (SMEs) in developed and developing countries alike. However, EC adoption by SMEs in developing countries has faced many challenges that have not been adequately addressed due to the complex nature of EC adoption in such countries. The aim of this study is to systematically examine the influence of organizational, industry, and national readiness and environmental pressure on the adoption of diverse EC technologies by SMEs in developing countries. A quantitative survey was conducted with retail SMEs within the Malaysian grocery sector to validate the proposed multi-level model. Findings indicate significant influence of environmental pressure on the adoption of various EC technologies. Organizational and national readiness have different influences across diverse EC technologies, while the influence of industry readiness is shown to be insignificant. This study extends the current understanding of the influence of micro-, meso- and macro-level factors and has important implications for researchers, practitioners, and policy makers.

© 2014 Published by Elsevier Inc.

1. Introduction

Small and medium-sized enterprises (SMEs) typically offer significant contributions to the national economy, particularly in developing countries (Kotelnikov, 2007). Even though SMEs provide a strong stimulus to the national economy, they generally suffer from a lack of nationwide geographical presence and an inability to extend their services 24 h a day and 7 days a week. The adoption of EC technologies alleviates these conditions and enables SMEs to access larger markets without expanding their physical presence (Quaddus & Hofmeyer, 2007). EC technologies have a strong appeal to SME retailers as EC can make geographic locations, distances and time irrelevant (Premkumar & Roberts, 1999). Due to the impacts of EC technologies on SMEs, EC technologies have become important entities of consideration within business and entrepreneurship literature (Peltier, Zhao, & Schibrowsky, 2012). However, SMEs in developing countries are slow to adopt EC technologies into their

business processes (Alam, 2009; Hussain & Noor, 2005). This slowness is due to the unfavorable social, economic, technological and political conditions that prevail in many developing countries (Esselar & Miller, 2002).

Although a steady stream of EC studies for developing nations is slowly emerging (Hussain & Noor, 2005), the existing literature of EC studies focuses largely on developed nations. Moreover, much of the current literature typically has a wider focus on general EC technology adoption across industry sectors. Few studies therefore exist concerning the adoption of EC technologies in a particular industry sector such as the grocery retail sector. In fact, because of the large number of products carried and the low profit margin, the grocery retail sector is generally known to pioneer the adoption of innovative technologies to enhance efficiency (Al-Sudairy & Tang, 2000; Reardon & Hopkins, 2006) and therefore provides an appropriate and useful context to examine EC technology adoption. Furthermore, this sector plays an important role in the economies of developing nations like Malaysia. Systematic efforts are thus needed to determine how SMEs within this particular sector are responding to the call of EC adoption to improve their efficiency, productivity and overall performance.

Additionally, much of the existing literature on SMEs' adoption of EC technologies seeks to explain EC adoption behavior from the perspective of technology adoption, using popular theoretical frameworks such as the Theory of Reasoned Action (Ajzen & Fishbein, 1975), the Theory of Planned Behavior (Ajzen, 1985), the Technology Acceptance Model (Davis, 1989) and the Diffusion of Innovation (DOI) (Rogers,

1995). This is because EC technologies are considered to be novel innovations facilitating the growth of SMEs (Grandón, Nascob, & Mykytyn, 2011). Innovations are also viewed as a key driving factor for corporate success (Cardozo, McLaughlin, Harmon, Reynolds, & Miller, 1993). However, for a typical SME, successfully introducing innovation is a complex task as it has limited resources and expertise (Avermaete, Viaene, Morgan, & Crawford, 2003). By selecting various constructs from the related technology adoption theories, EC scholars have developed different research models that resulted in contradictory outcomes (Tan, Chong, Lin, & Eze, 2009). Furthermore, most existing studies assess the effect of a number of factors related to technology and/or organization on the adoption (Alam, Ali, & Jani, 2011; Cloete & Courtney, 2002; Hussain & Noor, 2005). Few studies assess factors related to the national environment (Feghali, Sahyoun, & Gemayel, 2009; Wong, 2003; Zhu, Kraemer, & Xu, 2003; Zhu & Thatcher, 2010) but without simultaneously considering technological and organizational factors. Additionally, those studies which assess some aspects of environmental influences (Molla & Licker, 2005; Zhu & Thatcher, 2010) have not specifically considered the industry the focal organization is part of, and environmental pressure. In fact, organizations do not exist in isolation but in an environment that leads to the inclusion of the industry and national readiness levels (Boyer-Wright & Kottemann, 2009; Damsgaard & Lyytinen, 1998; Gregor & Johnston, 2000; Kurnia & Johnston, 2003; Zhu & Thatcher, 2010). Therefore, the influence from three institutional levels (organization, industry and country) and environmental pressure needs to be considered simultaneously in one study to develop a more comprehensive understanding of the EC adoption phenomenon.

Motivated by the knowledge gaps, this study aims to assess the influence of factors related to organizational, industry and national readiness to adopt EC technologies as well as environmental pressure on the adoption of diverse EC technologies that facilitate Business-to-Business (B2B) activities in the retail SME sector. An integrative approach is applied by combining constructs from the DOI and National Institutional Perspective (NIP) theory. NIP suggests the prevalence of entrepreneurial activities associated with specific dimensions of a country's institutional environments (Spencer & Gomez, 2004). As SMEs represent a part of an industry sector within a country (Damanpour, 1991), there are important influences from the industry and the country levels on their adoption decision regarding EC technologies (Feghali et al., 2009; Zhu & Thatcher, 2010) which should be considered alongside organizational factors influencing the adoption. Government policy, legal framework, physical infrastructures, economic condition and human capacity are examples of possible influences at industry and country levels (Boyer-Wright & Kottemann, 2009; Feghali et al., 2009; Molla & Licker, 2005; Zhu & Thatcher, 2010). The integrated model developed in this study is then empirically evaluated within the Malaysian retailing context employing a quantitative survey study.

Utilizing the responses from 125 Malaysian retail SMEs, a set of factors is identified which helps differentiate between adopters and non-adopter of six specific types of EC technologies. The survey analysis indicates that factors related to the three levels of readiness influence the adoption, as does environmental pressure, but the influence of industry readiness is not found to be significant. In fact, the most salient factor influencing the adoption of EC technologies is environmental pressure which is internally and externally driven.

The remainder of this paper is organized as follows. Section 2 presents the background literature and lays out the theoretical foundation of this research. Section 3 reports on the development of the research framework guiding this study. Section 4 outlines the research methodology. Section 5 presents the empirical findings of this study. Section 6 discusses these findings in light of the existing literature. Finally, Section 7 concludes the paper, highlights the implications of the findings, acknowledges some limitations and identifies future research directions.

2. Background literature

2.1. E-commerce and SMEs

Diverse definitions of e-commerce (EC) exist in the literature (Holsapple & Singh, 2000). As EC is understood differently by individuals, researchers have used the term EC according to the scope of their research. This study adopts an EC definition provided by Turban, Lee, King, Mckay, and Marshall (2008) because it is simple, yet comprehensive. According to Turban et al. (2008; p. 4), EC refers "to the process of buying, selling, or exchanging products, services and information via computer networks, including the Internet". When successfully adopted, EC can provide organizations with enormous opportunities for improving many key business activities such as trading relationships, exchanging information, co-ordinating logistics and communications via global or regional supply chains (Humphrey, Mansell, Pare, & Schmitz, 2003). Popular EC technologies, particularly those supporting B2B exchange, include the Internet, e-mail, Electronic Data Interchange (EDI), Electronic Funds Transfer (EFT) and barcodes (Gunasekaran, Marri, McGaughey, & Nebhwani, 2002).

Recognizing the enormous potential benefits that EC technologies can bring to organizations, many scholars have paid considerable attention to the study of EC adoption by SMEs. Such EC adoption has been investigated within the contexts of both developing and developed nations. A high level summary of the literature on EC adoption by SMEs across various countries (with a focus on developing countries) is provided in Table 1. Although the list of studies included in Table 1 is not exhaustive, it is adequate to gain some insights into studies assessing the phenomenon of EC adoption in developing countries. Specifically, there are two important observations: a) with a few exceptions (Chen, 2003; Kim, 2006), most focus on EC adoption across multiple industry segments and b) many studies have applied Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory as the primary theoretical lens to study the EC adoption phenomenon, with limited attention being given to constructs derived from other theoretical frameworks (e.g., environmental pressure and industry characteristics).

Researchers use the significance of EC for the Malaysian SME context has been recognized by a few scholars as well. For example, Hussain and Noor (2005) studied 107 manufacturing SMEs. By drawing on the DOI theory (Rogers, 1995), they found that relative advantage, complexity and observability influence the SMEs' use of e-commerce. They have, however, used only a single perceptual item to measure EC adoption. In another study, Tan et al. (2009) apply an integrated model by combining constructs from DOI (Rogers, 1995) with security and costs associated with EC technologies. Using a survey and a sample population drawn from SMEs of the southern region of Malaysia, the importance of relative advantage, complexity and security on SMEs' adoption of EC is reported. Finally, Alam (2009) investigates Internet adoption by Malaysian SMEs and finds that perceived benefits, cost, and organizational culture influence Internet adoption. Although the findings of these studies are useful, the current level of EC technologies within the grocery SME retailers sector in Malaysia and the influence from the environment are still not clear. Moreover, like most EC studies conducted in other countries, these studies also examine EC adoption phenomenon primarily from the DOI and/or TAM perspectives.

A small stream of studies has investigated national factors that may influence the adoption of EC in different countries. For example, Gibbs and Kraemer (2004) suggest that the scope of EC adoption across ten different countries is influenced by national factors such as government policy and EC legislation. Likewise, in another study, Boyer-Wright and Kottemann (2009) examine the relationship between national factors and level of e-business activities. Using data from the World Bank and UNESCO, they found that ICT laws, higher education, and a nation's innovation capability affect its level of e-business activities. Recently, Zhu and Thatcher (2010) employ the National Information Ecology