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### Electronic Commerce Adoption in SME: The Trend of Prior Studies

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## Abstract

Emergence of Internet, particularly Electronic Commerce (EC) application brings new landscape in conducting business. Apart of better efficiency, EC enables firm to diversify business strategy, to introduce newly accepted business model and to embrace globalization. Despite profound usage among large firms, EC is now getting attention of small medium-sized enterprises (SMEs). This is obviously raises concern as small firms have long been recognized for limited resources and capabilities than larger firms. Consequently, the issue of EC in SMEs attracts considerable research works in this area. This conceptual paper reports on the extensive review of prior studies pertaining to the EC usage among small firms. This paper, however, limits the review to several major aspects i.e. research themes, underpinning theories, research approaches, and the context/country of the study. The last section then outlines important findings of the previous studies and future research direction.

Keywords: **E-Commerce; E-Business; Small Business; SMEs; Literature Review**

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## INTRODUCTION

The widespread use of Internet facilitates greater opportunities to enhance efficiency and effectiveness of the firms. Specifically, EC benefits firms by reducing cost, expanding market potential, and providing new business opportunities (Beck, Wigand, & Konig, 2005; Fink & Disterer, 2006; Grandon & Pearson, 2004; OECD, 2004). In larger context, EC becomes a tool to embrace globalization as it enables cross-country transactions. In a narrower perspective, appropriate use of EC can help firms enhance internal operations while at the same time can support inter-organizational connectivity.

Despite its importance, prior studies indicated that EC usage is more pervasive among large firms than SMEs (Burke, 2005; Sharma, Ahmed, & Wickramasinghe, 2004). Furthermore, many researchers suggest that EC benefits to the SMEs are not in par with larger firms. This is partly due to the fact that SMEs generally have limited resources and technology capabilities (Thong, 2001). Despite the resource constraints, argues that the less complicated structures of smaller firms make them more flexible to adapt to changes, hence easier to fit with the EC application (Al-Qirim, 2004).

Issue of EC in SMEs need further attention as SMEs play vital roles toward nation's growth as they usually represent the largest proportion of established businesses in most countries. Apart of that, ICT becomes one of the potential means to facilitate SMEs business operations. Consequently, it is an appropriate time for SMEs to consider Internet and EC. Deploying IT enables firms to quickly respond to the environmental pressure, to fulfill customers' demand, and to embrace globalization (Bernadas & Verville, 2005).

For this reason, the issue of EC in SMEs does not only attract considerable numbers of

research works among academic researchers, but national, international, and professional agencies as well (e-Business Watch, 2008; OECD, 2004; PricewaterhouseCoopers, 1999). This paper attempts to analyze the trend of prior EC researches in SMEs from several perspectives including the issues that have been investigated, the common findings that have been reported and to facilitate future research direction.

The review considers published articles or working papers in year 2000 onwards considering the commercialization of EC that had taken place in the mid 1990s. The paper is organized as follow. The next section elaborates trend of prior studies with respect to the perspective of research, themes, theoretical background, research approaches, and the context/country of the study. Then, the discussion on main research findings of prior research works together with the future recommendation follows next. We then reserve the last section for conclusion.

## **TREND OF PRIOR STUDIES ON ELECTRONIC COMMERCE IN SMES**

### **The perspective of EC adapted**

A close review shows that researchers view EC adoption from several perspectives. The investigations either focus on the hardware or software infrastructure of the EC applications. Investigations on hardware infrastructure focus on Internet adoption in general (see for example: Beckinsale, Levy, & Powell, 2006; Dholakia & Kshetri, 2004; Mehrtens, Cragg, & Mills, 2001; Riquelme, 2002), while investigations on software infrastructure concern on website adoption (Fisher, Craig, & Bentley, 2007; Golden, Hughes, & Ruane, 2004). Alternatively, several studies contribute more meaningful insights by examining adoption practice from multiple lenses of EC technologies (Al-Qirim, 2007a; Raymond, Bergeron, & Blili, 2005). There are studies that investigate the issue on specific business model such as Business to Business (Elia, Lefebvre, & Lefebvre, 2007; Quaddus & Hofmeyer, 2007). This is consistent with the fact that EC field is relatively broad, thus, narrower scope of the study warrants meaningful findings.

### **Major Themes of Earlier Research**

Generally, the researches fall under one or more of the following themes:

- a. *E-readiness*: The studies generally review potential readiness factors which SMEs perceived as important to influence their decision (Ramayah, Yan, & Sulaiman, 2005; Raven, Huang, & Kim, 2007). To some extent, the studies propose an e-readiness model as a basis of considering firm readiness to embrace EC (Fathian, Akhavan, & Hoorali, 2008; Molla & Licker, 2005). Such studies concern on the pre-adoption stage issue by addressing the potential motivations and barriers of EC acceptance.
- b. *EC adoption*: This theme dominates most of the earlier studies. The main aim was to explore the drivers that motivate or impede the EC adoption by SMEs. There were at least two approaches of examining EC adoption. Firstly, the descriptive studies that are simply identify list of motivations and barriers of EC

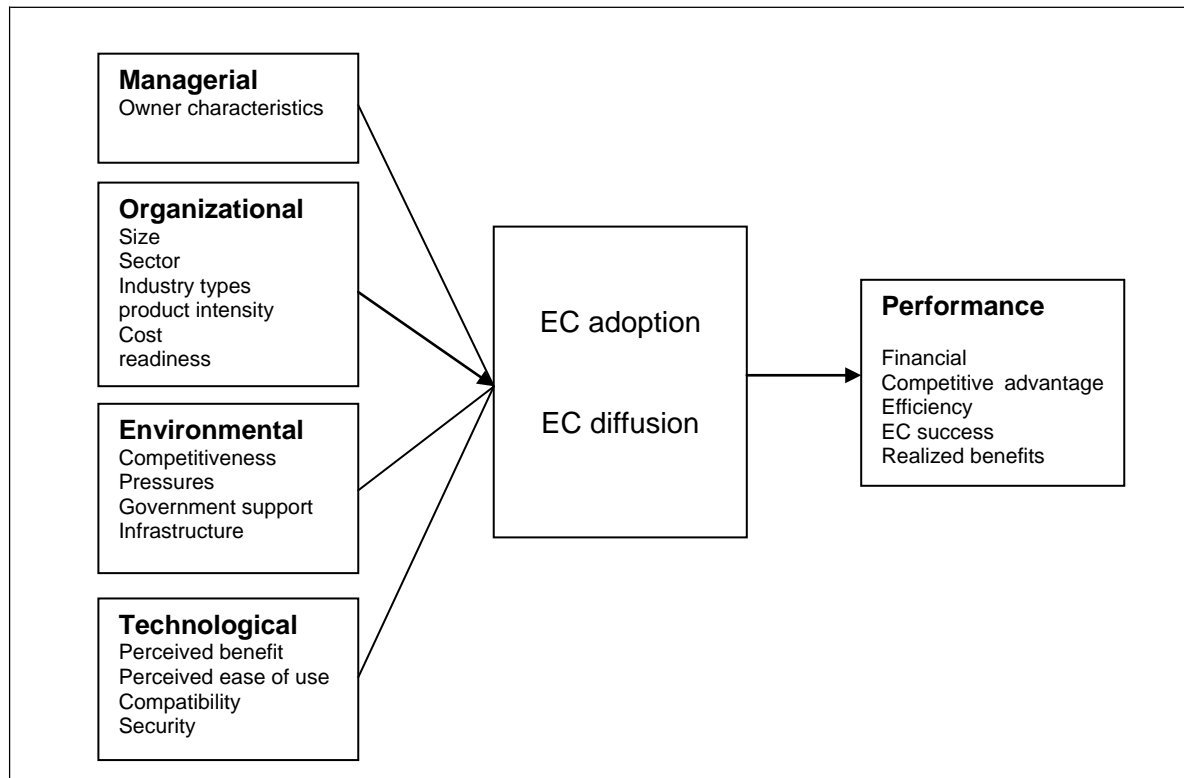
adoption (Lawson, Alcock, Cooper, & Burgess, 2003). Secondly, the determinant studies that assess strength of the influence of each factor towards adoption decision (Grandon & Pearson, 2004; Jeon, Han, & Lee, 2006; Kartiwi & MacGregor, 2007; Lal, 2002). Despite its contribution, the second approach appears to be more meaningful to explain the scenario than the former approach.

Overall, the factors that influence adoption can be classified into several categories i.e. managerial, organizational, environmental and technological related factors. The trend revealed that several factors were relatively dominant among researchers. Firstly, individual factors such as management's characteristics, top management support, and IT knowledge. Secondly, organizational-related factors like cost, size, industry sector, and firm's readiness. Thirdly, environmental factors particularly vendors/consultants support, government role, trading partners or competitors' pressure. Lastly, technological related factors such as security, relative advantage, compatibility, and perceived usefulness.

- c. EC diffusion: Studies in this category investigated the extent to which EC technology assimilates into the firm's operation or the degree of EC intensity (see: Beck, Wigand, & König, 2005; Migiro, 2006; Raymond, 2001; Raymond et al., 2005). The diffusion effect had been viewed either on the extent of EC technologies that the firm adopted e.g. e-mail, intranet, EDI and web (Al-Qirim, 2005, , 2007a) or the business functions that EC support e.g. communication, interaction, and transaction (Raymond et al., 2005). Hence, investigation of diffusion issue imparts further understanding on types of EC applications that are highly beneficial to the firm and aspects of the business operation that EC supports most.
- d. Impact/Consequence of EC. At this stage, the studies attempted to examine the likely impact of EC adoption or EC diffusion towards firm's performance. Nevertheless, authors construed performance in different manners. Some of the indicators used were financial related performance (Beck, Wigand, & König, 2005; Johnston, Wade, & McClean, 2007; Raymond et al., 2005), competitive advantage (Fisher et al., 2007; Maguire, Koh, & Magrys, 2007; Teo, 2007), business efficiency (Beck, Wigand, & König, 2005), information system success (Caldeira & Ward, 2003) or implementation success/satisfaction (Chong, 2008). This type of study is highly welcomed as SMEs use of EC depends on its expected benefits apart of the cost that firm have invested.

The following diagram summarizes the research themes of EC in SMEs. Overall, there are four broad categories of drivers/antecedents to EC adoption/diffusion specifically managerial, organizational, environmental and technological factors. On the right side of the diagram are the impacts of EC to various aspects of firm performance particularly financial, competitive advantage, efficiency, and EC success.

Table 1  
Trend of Research on EC among SMEs



### Theoretical Background

As EC is a multi-disciplines area (Kalakota & Robinson, 2001), the investigations of EC practice had been viewed from several perspectives especially strategic management, information systems, as well as entrepreneurship. Consequently, several theories emerged to underpin the previous researches. As indicated in Table 2, Diffusion of Innovation theory (Rogers, 1995) dominated most of the researches followed by Technology Acceptance Model (Davis, 1989). This is somewhat consistent with our earlier discussion that most researches are mainly concentrate on upstream issues of EC i.e. e-readiness, EC adoption and EC diffusion (Molla & Heeks, 2007). As such, these two theories are well-established innovation theories that are potentially able to provide explanation of the adoption issue. These two models together with Technology Organizational Environment (TOE) model are highly applicable in predicting adoption behaviour of the firm in considering new technology. Other less common theories applied include Network Theory, Institutional Theory, Contingency Theory, and Theory of Planned Behaviour. In addition, rare studies deploy multiple theories to explain the scenario. (Riemenschneider & Kinney, 2001).

Table 2  
Applicable theories

Theories (author)	Selected Articles using the theory
Diffusion of innovation (Rogers, 1995)	(Al-Qirim, 2007b; Brand & Huizingh, 2008; Grandon & Pearson, 2004; Hussin, Noor, & Suhaimi, 2008; Lee, 2004; Lee & Runge, 2001; Quaddus & Hofmeyer, 2007; Saffu, Walker, & Hinson, 2008; Seyal & Rahman, 2003)
Technology Acceptance Model (Davis, 1989)	(Dembla, Palvia, & Krishnan, 2007; Grandon & Pearson, 2004; Quaddus & Hofmeyer, 2007; Riemenschneider & Kinney, 2001)
Technology-Organization-Environment (Tornatsky & Fleischer, 1990)	(Al-Qirim, 2007a; Kuan & Chau, 2001; Raymond et al., 2005; Seyal, Rahman, & Mohammad, 2007)
Theory of Planned Behaviours (TPB)	(Nasco, Toledo, & Mykytyn, 2008)
Contingency theory/Fit theory	(Khazanchi, 2005; Pai & Yeh, 2008; Raymond & Bergeron, 2008; Vatanasakdakul, 2008)
Resource based view	(Caldeira & Ward, 2003; Soto-Acosta & Merono-Cerdan, 2008)

### Approaches of Research

Previous authors deployed several approaches to unleash the issues. Two most common approaches were cross sectional survey and case study. Although both approaches have their own advantages and limitations, survey approach appeared as more popular among researchers. Survey method enables generalization of the finding but unable to provide in-depth explanation of the possible cause and effect relationship. Meanwhile, a case study allows in-depth investigation of the issue to justify the cause and effect of the phenomena by sacrificing the generalization ability. Web examination appears as another unique way of resolving some aspects of the issues concerned (Al-Qirim, 2007c). This approach indicates actual practice of EC as the website sophistication reflects the degree of firm's commitment on EC (Fisher et al., 2007; Hashim, 2006). This would definitely brings more value on the research findings rather than merely solicit firm's perception upon EC adoption (Parker & Castleman, 2007). Above all, several studies delved into the issue using multiple techniques (Al-Qirim, 2007c)

Deployment of mixed methodologies enables researchers to strengthen their findings and conclusion by having mixed-level data (Gallivan, 1997). Table 3 highlights some of prior studies by their research approaches.

Table 3  
Research Approaches

Research Approach	Authors
Survey	(Bharadwaj & Soni, 2007; Chong, 2008; Dembla et al., 2007; Dholakia & Kshetri, 2004; Grandon & Pearson, 2004; Hussin et al., 2008; Johnston et al., 2007; Karagozoglu & Lindell, 2004; Kula & Tatoglu, 2003; Lawson, Alcock, Cooper, & Burgess, 2001; Lawson et al., 2003; Lee, 2004; Lertwongsatien & Wongpinunwatana, 2003; Levenburg, Magal, & Kosalge, 2006; Quaddus & Hofmeyer, 2007; Raymond & Bergeron, 2008; Reimenschneider, Harrison, & Mykytyn, 2001; Saffu et al., 2008; Sam & Leng, 2006; Seyal & Rahman, 2003; Seyal et al., 2007; Sulaiman, 2000; Wymer & Regan, 2005)
Case Study	(Al-Qirim, 2007b, , 2007c; Beckinsale et al., 2006; Caldeira & Ward, 2003; Fillis & Wagner, 2005; Fink & Disterer, 2006; Fisher et al., 2007; Marasini, Ions, & Ahmad, 2008; Mehrtens et al., 2001; Scupola, 2008; Stockdale & Standing, 2006; Tucker & Lafferty, 2004)
web analysis	(Al-Qirim, 2007c; Fisher et al., 2007; Hashim, 2006; Mendo & Fitzgerald, 2005)
Mixed Methods	(Al-Qirim, 2007c; Beck, Wigand, & König, 2005; Chong, 2008; Golden et al., 2004; Johnston et al., 2007; MacGregor & Vrazalic, 2005)

### Context of the Study (Country)

As expected, the progress of EC acceptance was relatively more widespread among developed nations as compared to developing countries. Nevertheless, the trend indicated that studies among developing countries were slowly catching up. Table 4 provides summary of selected studies across different regions. Interestingly, several authors had initiated to conduct cross-country study (Beck, Wigand, & König, 2005; Chong, 2008; MacGregor & Vrazalic, 2005). The comparison were either between developed countries (Chong, 2008; Johnston et al., 2007) or a comparison of EC practice between developed and developing countries (Johnston & Wright, 2004) or between developing countries (Raven et al., 2007).



Table 4  
Context of Study

Regional area	Cited studies
United Kingdom / European Countries	(Aguila-Obra & Padilla-Meléndez, 2006; Aragon-Correa & Cordon-Pozo, 2005; Beckinsale et al., 2006; Caldeira & Ward, 2002, , 2003; Daniel, 2003; Eikebrokk & Olsen, 2007; Fillis & Wagner, 2005; Golden et al., 2004; Levy & Powell, 2003; Maguire et al., 2007; Marasini et al., 2008; Matlay & Addis, 2003; Rao, Metts, & Monge, 2003)
United States / Canada	(Archer, Wang, & Kang, 2008; Johnston & Wright, 2004; Pflugheoft, Ramamurthy, Soofi, Yasai-Ardekani, & Zahedi, 2003; Raymond & Bergeron, 2008; Raymond et al., 2005)
New Zealand / Australia	(Al-Qirim, 2007a, , 2007c; S. Chau, 2003; J. Chen & McQueen, 2008; Fisher et al., 2007; Lawson et al., 2003; McCole & Ramsey, 2005; Mehrtens et al., 2001)
Asia	(C. Y. K. Chau, Lai, & Li, 2008; S. Chen & Ning, 2002; Hussin et al., 2008; Jeon et al., 2006; Kurnia, 2007; Lertwongsatien & Wongpinunwatana, 2003; Riquelme, 2002; Seyal & Rahman, 2003; Seyal et al., 2007; Sutanonpaiboon & Pearson, 2006; Tsao, Lin, & Lin, 2004; Vatanasakdakul, 2008)
Africa	(Cloete, Courtney, & Fintz, 2002; Elliott & Boshoff, 2005; Migiro, 2006; Molla & Heeks, 2007; Molla & Licker, 2005)
Comparative studies	(Beck, Wigand, & Konig, 2005; Bernadas & Verville, 2005; Chong, 2008; Fink & Disterer, 2006; Johnston et al., 2007; Johnston & Wright, 2004; Raven et al., 2007)

## DISCUSSION OF SELECTED ISSUES

The review of prior researches brings up to the fore several issues of EC and SMEs that appear to be important. This would be a good starting point in pursuing impending research in this area.

- a. *Slow acceptance and progress in EC usage:* Majority of studies have reported that the e-readiness and EC acceptance among SMEs is relatively slow (Lee, 2004; UNCTAD, 2004). This is particularly more obvious when developing countries are concerned (Karanasios & Burgess, 2006). Above all, the adoption is limited to the least sophisticated applications such as e-mail and basic web presence. The common use of is for communication and advertising purpose while online transaction is relatively rare (Lawson et al., 2003). Despite the fact that EC offers extensive list of applications for business use, advanced applications are rarely found as strategic for the SMEs (Mehrtens et al., 2001). Future studies should closely examine the possible reasons for the slow progress in EC usage. Further, it is also essential to establish links between the extents of EC usage with the benefit that the firm realized from EC.



Prior studies revealed various factors that were consistently to have significant influence on decision to adopt EC. These include individual related factors (CEO/owner characteristics), organizational factors (EC skills, firm's size, industry types), technological factors (relative advantages and compatibility), and environmental factors (government and external expertise support, technological infrastructure, or pressures from business partners and customers). These factors were also found to remain consistent since the early stage of EC introduction in mid 1990s (Raymond et al., 2005). However, there are several factors which received least attention in prior studies despite their importance such as networking intensity (Raymond et al., 2005), international market/export intensity (Chong, 2008; Kula & Tatoglu, 2003), location of business (Bharadwaj & Soni, 2007), and communication channel (Chong, 2008). Hence, these factors deserve further investigation in future research.

EC investigations had taken place across multiple applications as well as process domain. Earlier works found strong support that different factors influence the adoption of different EC-related applications (Al-Qirim, 2007a). Similarly, different factors influence firm deployment of EC at various process domains (Roberts & Toleman, 2007). Meanwhile, Rao (2003) also reported similar trend across EC business models. As such, further confirmation seems vital to ascertain the fact that single EC adoption model does not fit all types of EC applications (Roberts & Toleman, 2007).

- b. *Inconsistent EC practice across countries:* Investigation across countries receives less attention to date. Although the cost of conducting comparative study is considerably high, it is an exciting area to explore further. Comparative investigation facilitates understanding of different practices by firms in different environment (Chong, 2008; Kartiwi & MacGregor, 2007). Developing countries slowly adopt EC while majority of them remain at the least sophisticated stage (Migiro, 2006; Sam & Leng, 2006; Sulaiman, 2000). In fact, different factors were found to influence firms' decision to adopt EC applications in different countries. While developing countries consider organizational factors as the most prevalent barrier, the technical factors are the major impediment in developed countries (Kartiwi & MacGregor, 2007). Hence, inclusion of cultural impact to the future comparative studies would provide better explanation on this issue.
- c. *EC and its Impact on Firm Performance.* Studies reported mixed findings on the impact of EC adoption on firm performance. There are many evidences to support the positive impact of EC on firm performance such as firm growth (Raymond et al., 2005), financial gain (Johnston et al., 2007) and competitive advantage (Teo, 2007; Teo & Pian, 2003). Nevertheless, the benefits gained were inconsistent in different sectors, regions and sizes (Johnston & Wright, 2004). On the same vein, the realized benefits were positively associated with the extent of EC usage (Raymond et al., 2005; Sam & Leng, 2006). This aspect of EC requires further investigation as SMEs are relatively concern about the perceived benefits of having EC in place. Additionally, earlier researches concern mostly on firm level performance while least attempt to examine the EC benefit at process level (Elia et al., 2007).

## CONCLUSION

This paper examines prior studies on EC practice among SMEs. The review mainly concentrates on selected aspects specifically the major themes, underlying theories, research approaches, and context of study. This article, therefore, ends with several conclusions. Firstly, prior studies mainly attempt to explain adoption EC and the extent of it uses. However, limited studies investigate the EC subsequent impacts to firm performance, particularly at business process level. Secondly, Innovation-related theories dominated most of the previous works such as Technology Acceptance Model and Diffusion of Innovation Theory. Hence, deploying other theoretical perspectives such as marketing, entrepreneurial or strategic management in future researches promise useful outcome. Third, diversifying the research approaches or deploying multiple approaches in a single study is highly commendable to ensure richer findings. Related to methodological concern, future studies might stress on the actual use of EC instead of focusing on firm's perception toward EC by using case studies or examinations of web content. Such approaches definitely give more senses about the EC usage in reality. Finally, the digital divide is currently exists between developing and developed countries. Hence, more studies especially comparative studies between developing countries and between developed and developing countries would bring new perspective to our current understanding of EC. In sum, despite the rigorous studies on the issue of EC and SMEs, there are still wide opportunities that remain unexplored in this promising research domain. It is worth recognizing the limitation of this paper. Authors do not claim that the review covers all existing research works on this specific area but we believe that the articles included somehow represent the actual research pattern.

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