

Maturity Levels for E-commerce Adoption among Australian Retailers

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Abstract

This study investigates the maturity levels of E-commerce (EC) among Australian retailers through developing a model that incorporates the possible levels of EC adoption by retailers and the factors that influence the adoption of each level using combination of the SOG model and the TOE framework. The findings show that some retailers reach a stagnation point in their EC adoption and are unlikely to proceed further. In addition, the analysis suggests that the defined levels are influenced by environmental and organizational factors. However, these factors were found to have a different effect on each level. The proposed model will be a useful tool for retail organisations to understand the current state of EC initiatives and to help them develop their EC business strategies.

Keywords: E-commerce, Adoption, Maturity Model, Retailer

INTRODUCTION

E-commerce (EC) has become a widespread business application. The first flush of adoption is now well passed and its use is considered 'de rigour' within most markets and industries, with the structural impact of this broad adoption evident in the changes in those markets and industries (Laudon and Traver 2012). EC is seen to have provided significant opportunities to many firms in accessing potential global customers and suppliers via the Internet (Lin et al. 2007). For the context of this study, E-commerce is defined as the "buying and selling of products, services and information over the Internet and the World Wide Web" (Kalakota and Whinston 1997; Kroenke et al. 2012). This study will also use the definition of those researchers and academics who considers e-business to be equivalent to E-commerce (Chen et al. 2006). The two terms will be used interchangeably throughout this study and business to consumer (B2C) E-commerce refers to online transactions with consumers such as retailing or services from businesses to individual shoppers (Simpson and Docherty, 2004).

Despite the proven potential of E-commerce in businesses and the wealth of research based guidance available for the adoption of this technology, the use of E-commerce in many sectors is still limited and the overall adoption level is still low, with many businesses still reluctant to use this business medium (Teo et al. 2009). The percentage of income generated through B2C E-commerce is remarkably lower than that generated from traditional sales channels as pointed out by Rodríguez-Ardura and Meseguer-Artola (2010) who also noted that EC is still considered an emerging distribution channel, even in developed countries. Studies have shown that E-commerce adoption remains relatively low among organisations (MacGregor and Vrazalic 2005; Sila 2013) and firms are still facing a series of obstacles and challenges in adopting E-commerce technologies (Johnson 2011).

The retail sector makes a significant contribution to the Australian economy with more than 156,668 businesses operating in the industry. These businesses employed more than 1.2 million people and generated a total income of A\$ 66130.4 million in December quarter, 2013 (ABS 2014). National Australia Bank reported that, for the 12 months ending February 2013, Australia's online retail spending totalled A\$13.1 billion, around 5.9% of Australia's traditional bricks and mortar retail sector (Burg 2013), a small percentage of total retail sales.

These figures indicate that, despite the optimism of the rapid growth of E-commerce and the anticipated 'better tomorrow' provided by this business model, many retailers are still reluctant to become involved in online trade and the adoption of B2C E-commerce is still low among organisations. It would seem that adoption of EC among businesses is both lower and slower than what was anticipated and while many business have successful adopted EC, for many others EC is still a frontier, in which the establishment a viable online presence (Chen

2005) and the incorporation of EC into their business strategies (Grandon et al. 2011) being considerable challenges. There appears a significant need to identify the reasons behind such slowness in adopting E-commerce and a need for continuing research efforts that seek to better understand the constraints on the evolution of an organisation to a state where it can take advantage of e-business possibilities (Morais 2012).

Little research has investigated the low level of adoption and sustained use of E-commerce within the retail sector. The literature that has addressed this area has suggested that the low level of adoption among retailers is due to the difficulties in understanding the organizational adoption process (Daniel et al. 2002; Ma 2011) and is related to the lack of understanding of how firms advance in the use of this technology (Alonso-Mendo et al. 2009; Daniel et al. 2002; Tarafdar and Roy 2003) and the poor identification of the factors that influence that adoption (Hsu et al. 2006; Kuan and Chau 2001; Ramdani et al. 2009). In addition, there is a tendency in these prior studies to view adoption as single stage process where firms are either adopters or non-adopters of EC, whereas it is clear that organisations are currently at different stages of implementing E-commerce systems and tools (as will be discussed further in the following section), and, as such, it seems important to investigate how the factors identified play different roles at different technology diffusion stages (Chan and Swatman 2004).

Accordingly, this study seeks to address the knowledge gap regarding B2C E-commerce adoption among organisations through the investigation of the following research questions:

1. What are the Business-to-Consumer (B2C) E-commerce maturity levels within the Australian retail industry?
2. What are the factors that influence the adoption of each B2C E-commerce level among Australian retailers?

To answer the research questions and provide a better understanding of B2C E-commerce adoption among organisations, this research proposes a model for E-commerce adoption that combines both the stages of growth (SOG) model developed by Daniel et al. (2002) and the technology-organisation-environment (TOE) framework developed by Tornatzky and Fleischer (1990). This combined model allows us to investigate the E-commerce adoption process and the drivers that influence the adoption at each level / stage of adoption, thus providing a more comprehensive understanding of the E-commerce adoption phenomenon and goes some way to fulfilling calls for better frameworks that exhibit greater explanatory power within this area (Oliveira and Martins 2011).

BACKGROUND

Selection of the SOG model and TOE framework

Many theories and frameworks have been used to examine IS/IT adoption; the Technology Acceptance Model (TAM) developed by Davis (1989); the diffusion of innovation (DOI) theory developed by Rogers (1962, 2003); the stages of growth (SOG) model initially developed by Nolan (1973, 1979); and the technology-organisation-environment (TOE) framework developed by Tornatzky and Fleischer (1990). TAM is widely cited and used (Adams et al. 1992; Chin and Gopal 1995; Chuttur, 2009; Gefen et al. 2003) and sees that IT adoption is influenced by two perceptions, usefulness and ease of use.

The diffusion of innovation (DOI) theory (Rogers, 1962, 2003) has been used to investigate the diffusion of IS/IT and is also widely cited (Moore and Benbasat 1991). Despite of the importance of the DOI theory in diffusion research, it has many drawbacks. Of importance is the limitation that identified attributes were related to the adoption of new innovation by individuals rather than organisations (Oliveira and Martins 2011). Some have also questioned the usefulness of the diffusion of innovation (DOI) theory for understanding the spread of complex new technologies. Similarly TAM has been criticized for being too simplistic to explain a wide range of technologies, or adoption situations (Bagozzi 2007). In light of these short comings of extant theory, various researchers have called for new perspectives better suited to understanding the dissemination of technologies (Brown 1981; Kelly and Kranzberg 1978) as mentioned by Attewell (1992). Furthermore, Teo et al. (2004) pointed out that the innovation theories fail to accommodate many important factors that influence the adoption of E-commerce, such as the environmental factors (Oliveira and Martins 2011).

Stages of growth (SOG) models are useful for describing the typical development patterns of information systems (Benbasat et al. 1980; King and Toe 1997), technology adoption and maturity levels in organisations (Alonso-Mendo et al. 2009; Daniel et al. 2002; Jones et al. 2003) and have been applied to many areas of IS/IT (Layne and Lee 2001; Magal et al. 2008). Daniel et al. (2002) used SOG models to investigate E-commerce adoption and found that firms followed a sequential approach in the development of their adoption and identified four stages that retailers go through, starting with 'developers', then 'communicators', to 'web presence' and finally 'transactors'. Daniel et al.'s study was acknowledged for its significance in describing the E-commerce adoption phenomenon within organisations (Aguila-Obra and Padilla-Meléndez 2006; Boeck et al. 2009). Another important aspect of Daniel et al.'s (2002) identified stages is that they describe not only the initial stage

of E-commerce adoption but also address the continuous use of E-commerce after the initial adoption which indicates the success of this technology as a business model. In addition, Daniel et al. (2002) identified not only different E-commerce adoption clusters, but also investigated the impact of some factors on those clusters. However, most of the examined factors in their study were internal. In addition, these variations were not found to be significant on the adoption of E-commerce (Daniel et al. 2002).

Many studies have also investigated the factors influencing the adoption of new technologies in organisations with those factors grouped in various ways. Studies have investigated the factors that affect IS/IT adoption (e.g. Al-Qirim 2003; Grandon and Pearson 2004). Others (e.g. Kuan and Chau 2001; Premkumar 2003; Thong 1999) have defined the factors and classified them into different contexts: technological-organisational-environmental following the TOE framework developed by Tornatzky and Fleischer (1990). The review of extant E-commerce literature suggests that the TOE framework (Tornatzky and Fleischer 1990) provides a potential appropriate starting point for studying E-commerce adoption in organisations. The TOE framework has been tested and validated by many researchers in the context of IS adoption (e.g. Iacovou et al. 1995; Kuan and Chau 2001; Premkumar 2003). It provides a useful analytical framework that can be used for studying the adoption and assimilation of different types of IT innovation. Hsu et al. (2006) asserted that the TOE framework has a solid theoretical basis, consistent empirical support and the potential of application to IS innovation domains.

Tornatzky and Fleischer (1990) defined three contexts by which the firm adopts and implements technological innovations: technological, organizational and environmental. Understanding the factors that facilitate or inhibit the development of E-commerce is of great importance and will assist in understanding what a company can do to enhance its ability to strategically employ IT (King and Teo 1997). This study undertook an extensive research on the factors that influence E-commerce adoption within the three technology-organisation-environment contexts. The technological context represents the internal and external technologies relevant to the organisation's IT capabilities. The organizational context refers to internal factors within the organisation such as the financial resources, perceived direct and indirect benefits, the retailer's product category, retailer's available IT skill, the firm's size, and top management support. The environmental context included the external factors that influenced the adoption of E-commerce, such as competitors' pressure, suppliers' pressure, customers' pressure, security and fraud concerns, and government regulations.

E-commerce adoption is not the single stage adoption process that it was once thought to be (Chan and Swatman, 2004) as different organisations have been found to be at different stages of implementing E-commerce (Andersen and Henriksen 2006; Layne and Lee 2001). As such any model of E-commerce adoption should be able to cater for such differences and identify these stages and the drivers that influence their adoption (Chan and Swatman, 2004). Accordingly, this study is proposes a conceptual model that combines the two theories, Daniel et al.'s (2002) SOG model and technology-organisation-environment (TOE) framework developed by Tornatzky and Fleischer (1990) to investigate E-commerce adoption among Australian retailers as illustrated in Figure 1. This combination is important for understanding E-commerce adoption as it investigates the E-commerce adoption process and the drivers that influence the adoption of each level thus providing a more comprehensive understanding of the E-commerce adoption phenomenon (Oliveira and Martins 2011).

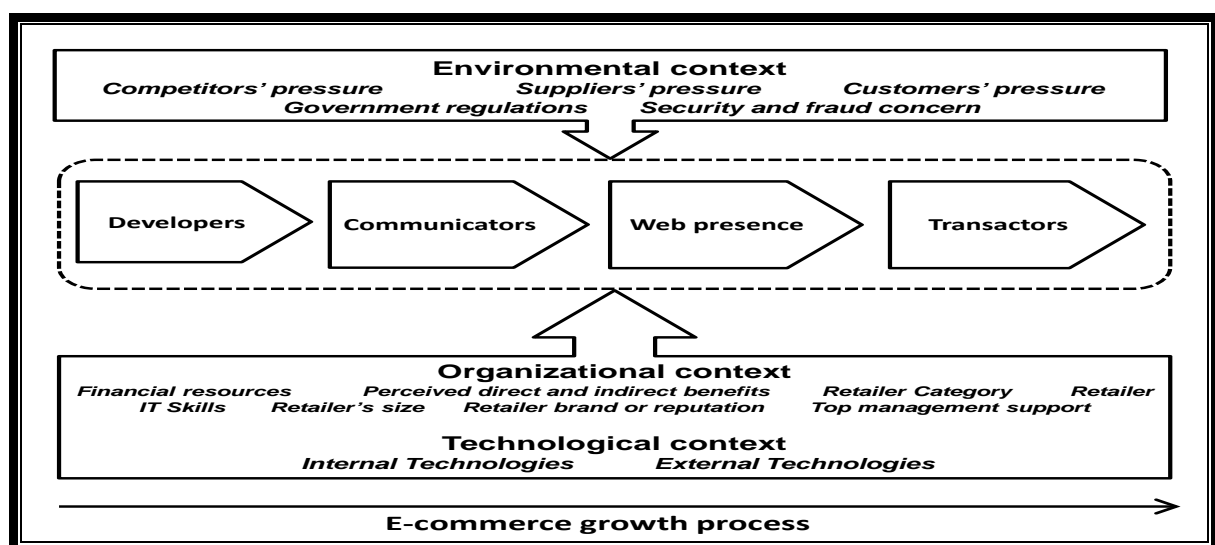


Figure 1: Research conceptual model

RESEARCH METHOD

A qualitative case study approach was taken to investigate the research questions because of its usefulness when the phenomena under investigation are within the context of the participants' perspectives and experiences (Silverman 2000), are complex and social in nature (Liebscher 1998; Weick 1984) and because it suits research investigating new relationships between phenomena and understanding the process by which events and actions take place (Maxwell, 2005). In addition, case studies are appropriate for situations where the boundaries between the context and the phenomenon are unclear and that it allows the phenomenon to be investigated in its real-life context Yin (2003), as is the case with the proposed research.

Seven retailers (R1, R2... R7) were studied and were chosen from different retail categories within the Australian retail industry, as defined by the Australian Bureau of Statistics (ABS 2013). The organisations' selection criterion was guided by "maximum selection sampling" strategies defined by Polkinghorne (2005) for selecting interviewed cases which was adopted in this study as it was found suitable in fulfilling the objectives of the research. A short list of target organizations in each category was created from publically available information, from which the participants were then drawn. The CEO or the employee(s) responsible for EC implementation within the organisation was interviewed. The recorded interviews were then transcribed and analysed.

The data were then sorted using MS-Excel so that all the data related to specific concepts were collated and organised into themes based on the e-commerce levels identified in the conceptual research model and the technological, organisational and environmental factors illustrated in Figure 1. Where it was not possible to associate any of the collected pieces of code with one of the identified themes, a new theme was created to facilitate the new identified concept.

RESULTS

This section analyses the collected data that were classified into different themes. It presents the data analysis finding on the adoption process followed by the interviewed case organisations and describes the path followed by those firms from entry into E-commerce until their current level of adoption. In addition, this section provides the results on the analysis conducted on the influence of the identified factors on the adoption of the defined EC adoption levels.

Identified E-commerce Maturity Levels for Participant Organizations

R1 had been selling computer products through their website for more than two years, with the online sales system separate from the physical store system. This represents the *E-commerce implementation* level, where the online and offline transactions are processed separately and the firm does not have an integrated Point of Sale (POS) system to manage both the online and physical store sales. The owner of R1 was sceptical about taking the next step to integrate the two systems because of the high cost associated with the upgrade of their software and hardware and the employment of new resources.

Therefore, this state represents an *anxiety point* where the business would like to move forward from their current adoption level to another new level defined here as *E-commerce integration* where the online transactions would be integrated with the physical POS system which would make the business operations more efficient. However, this approach is associated with high costs which make the business hesitant to implement it. This notion of *E-commerce integration* has been added as an extra possible phase to R1's adoption process.

R2 and R3 are two small / medium sized convenience stores, both established for more than 10 years. The two retailers do not have a website; instead, they frequently use email to communicate and exchange documents with their customers and to provide information about the company's products and services. This theme, *no web presence*, is similar to the 'communicators' stage of Daniel et al.'s (2002) SOG model.

R4 is a medium size firm that has an online presence and sells sports products through its website. The online POS system is integrated with its physical one. The data analysis found that R4 initially used to communicate with its customers through email. They then built their online presence to provide information about their firm and their products and services followed by developing their website to include selling products online. The firm moved from the initial level, *no web presence*, to what has been defined by Daniel et al. (2002) as *web presence* where they presented their products and services without conducting sales online. They then developed their website to include taking orders online and providing after sales services. R4's online sales were integrated with their physical POS system which represents the new theme identified as *E-commerce integration*.

R5 is a large firm that sells books and has been established for more than 50 years. The firm sells products and provides after sales services through its website. The firm went through different levels in its E-commerce adoption starting by communicating with its customers through email, to building its own website. It then

developed its website to include selling products, finalising sales and providing after sales services. Currently, the firm has its online POS system integrated with its physical one. Therefore, R5 was involved in B2C trade through several different stages starting from developing a website where they provided information about their firm, and about products and services. They then developed their website to include selling products online. The organisation moved from their initial level, the *web presence* stage defined by Daniel et al. (2002), to developing their website to include taking orders online and providing after sales services. Their online sales were integrated with their physical POS system which represents the theme identified earlier as *E-commerce integration*.

However, the organisation stopped at this level and did not take further steps to integrate its other business systems with its website, which was defined in this study as *enterprise integration*. The decision to not integrate its other business systems online was influenced by many factors that will be discussed further in the following section. The firm at this level was at *stagnation point* where it had integrated its sales system to be accessed and updated online and through its physical store. However, the firm was currently not considering taking further steps in its E-commerce adoption to integrate all its physical systems over the Internet.

R6 is a large organisation that sells books and DVDs online for over 13 years. R6 provides different online payment options, product delivery for goods bought through their website and after sales services. R6 started its online appearance through developing a website that presented its products and services. It then developed its online capabilities so that selling products, online payments and product delivery arrangements could be conducted through its website. An interesting aspect of the adoption of E-commerce by R6 was that it did not follow the usual sequential order of E-commerce adoption levels. Instead, the organisation went from the *web presence* to *E-commerce integration*, skipping *E-commerce implementation*. In the *E-commerce integration* level the firm's online POS is integrated with its offline system and the organisation is in the process of integrating other systems so they can be accessed, modified and updated online or through its physical stores. This represents a new theme identified as *enterprise integration* similar to the one identified in R5, where the organisation is integrating all its online systems with the offline ones and the systems used by the organisation's physical locations can be accessed, updated and modified online.

R7 is a retailer that sells men's clothing and is located in Sydney's central business district (CBD). The firm does not sell products online and it does not even have an online presence. The R7 interviewee mentioned that the firm had no intention of developing a website in the near future. This decision to not have an online presence was influenced by many factors that will be discussed in more detail in the following section. This firm stopped on the first level, 'communicators', with no plans in the near future to proceed further to the following level *web presence* or any of the more advanced E-commerce levels. This represents a *stagnation point* from where the organisation is not interested in going further to more advanced levels in the use of E-commerce.

Therefore, the data analysis found that the case organisations followed different levels in their E-commerce adoption than the ones identified by (Daniel et al., 2002). While Daniel et al. (2002) identified four stages in which organisation follow in their E-commerce adoption this paper identified five E-commerce adoption levels, *no web presence*, *web presence*, *E-commerce implementation*, *E-commerce integration* and *enterprise integration*. In addition, not all interviewed cases advance sequentially in their adoption of EC which is different from the sequential approach described by Daniel et al. (2002).

EC Stagnation and anxiety points

The data collection and analysis which has been carried out revealed that retailers varied widely with respect to their E-commerce adoption. The data analysis suggests that retailers are in different levels in their EC adoption. However, the interesting findings indicate that organisations reached different stagnation points with respect to their EC adoption where they are unlikely to proceed further. While some retailers don't have a website, others have been implementing EC for more than ten years. R2, R3 and R7 don't have websites with no intention to develop one in the near future. Therefore, they have reached a stagnation point on the first level, no web presence. Those retailers have no intention in the short term to move further to the following level.

In addition, the study identified an *anxiety point* where the business would like to move forward to another new adoption level defined as *E-commerce integration* where the online transactions would be integrated with the physical POS system which would make the business operations more efficient. However, this approach is associated with more expenses which make the business hesitant to implement it as the case with R1.

Factors Affecting E-commerce Adoption

The three TOE contexts (Technological, Organizational and Environmental) in regard to the adoption and implementation of E-commerce were addressed in the interviews, with information about the adoption level of E-commerce and the impact of competitive environment on E-commerce adoption also being sort. The following sections discuss the data analysis on the investigated factors.

Technological Context:

The findings suggest that the technological context, which refers to the internal and external technologies relevant to the organisation's IT capabilities, has minimal impact on the adoption of B2C E-commerce among the interviewed case organisations. All interviewed retailers, except R7, have suitable IT Context and adequate internal and external technologies to implement B2C EC. They all have fast broadband Internet connections. Their employees have direct access to computers and emails are used widely among those retailers as a main communication tool among internal staff and external organisations.

Organizational Context:

Financial resources: The data analysis indicates that the interviewed retailers acknowledge the significance of the financial resources factor on the adoption of EC, except R2 who thinks that it has no effect on their decision to adopt EC. R1 mentioned that they are facing a problem with financial resources "because we need to hire a specific person to look after the website and keep updating prices and items".

Direct Benefits: Direct benefits related to the increase of the firm's revenue and reduction of its expenses. Two of the firms (R4 and R5) pointed out that EC adoption increases income, although the increase is not significant to the total revenue; however they indicated that they were satisfied with the generated income from B2C EC trade. Although they sell products and services online, R1 thinks that it has no significant effect on the increase of revenue because of the expenses associated with the development of the EC. R3 mentioned that they have a major concern about spending some money towards the development of EC without getting any benefits; *"The Company is worried, as an example, of spending more money and you are not sure about the outcome how it's going to be, look like. It might end up to be a waste of money rather than giving benefits"*, whereas R2 doesn't think that adoption of EC will increase their income.

Indirect Benefits: The data analysis show that the indirect benefits of EC; such as EC attracts more customers, customers get to know more about our products and services, helps in entering overseas markets, saves time in serving customers and provides better customer service, are significant factors in the adoption of B2C EC for the firms (R1, R4, R5) where as they are not for R2 and R3. For example, R4 mentioned that *"we managed or succeeded in attracting more customers to the online trade, new customers that wouldn't have usually heard of us or found us. Yeah, particularly overseas"*.

Retailer product category: The analysis found that the retailer category and the type of products they are selling as an important factor that influences their decision to develop an EC presence. R1, R4 and R5 products (Computers, sports and books respectively) found to be suitable to be sold online where as R2 and R3 indicated that their products and the type of business they are running can't be transferred online. R2 who is a grocery retailer considered that EC is not suitable for their type of business *"our customer doesn't go to the Internet to buy a cigarette or to buy chewing gum or to buy chips"*.

Available IT skills: The data analysis found that all respondents had surprisingly showed no concern with regards to the existence of EC expertise and did not consider it barrier to their EC adoption, however, they emphasized on the need to find the suitable ones. R6 interviewee indicated that the skills required to develop an E-commerce website were available in the market; however, it was pointed out that you needed to look for the right person to do the job. *"Yes, it is one of the issues that [you] need to consider when building a website. Although skills are available, but you need to employ someone who really does know the job and only then they can have the confidence to actually know that the decisions that they are making are the wise ones and they're not just burning money because it is so easy, especially in terms of online marketing, if you can't find the right skills then your money is just going to burn"*. This finding is contrary to other research, which found that lack of skills is barrier to the adoption of EC (Lawson et al. 2003).

Size: The data analysis suggests that retailer size is not significant factor in the initial stages of the adoption of EC among small and large organisations. However, it becomes an important factor in the implementation and integration levels as more adequate financial and organizational resources are required, which is more affordable by large organisations that can also bear the risk of failure.

Top management support: All interviewees who were in top management levels demonstrated a good understanding of IT and EC technologies and its potential benefits and threats. The interviewees acknowledged the significance of EC as a business channel, even among those who don't have web presence.

Environmental context:

The findings suggest that competitive pressure is influencing the organisation's adoption of B2C EC. Three of the interviewed retailers (R1, R4 and R5) experience the influence of customers and competitors in adopting EC, although they are different in size (R1 small, R4 medium and R5 large). In addition R1, R4 and R5 had already developed their EC business sites. Whereas R2 and R3 are two grocery retailers with different size (R2 small and

R3 medium) don't have any online presence. The results show that the suppliers do not have an effect on the adoption of B2C EC on all of the firms despite the difference in their size and the nature of their business. Only in the case of R3, they experienced the need to buy one of their products from one of the supplier's website as it was the only way to order that product.

DISCUSSION AND CONCLUSION

This study investigated the B2C EC adoption among retailers using the SOG Daniel et al.'s (2002) model and TOE framework. Daniel et al.'s (2002) a set of four sequential stages through which firms pass when adopting E-commerce. However, our findings did not support this suggestion. The study proposed B2C maturity levels that are different to Daniel et al. (2002) identified levels, they are: *no web presence*, *web presence*, *E-commerce implementation*, *E-commerce integration* and *enterprise integration*. The findings suggest that case interviewed organisations followed a different approach in their E-commerce adoption. Some of the interviewed firms started at the first level then advanced sequentially through different levels until they reached the advanced E-commerce maturity level, while others started at a more advanced level in their first online presence.

The analysis indicated that firms varied widely with respect to their E-commerce adoption. Five levels of E-commerce adoption among retailers were identified, with some retailers reaching *stagnation points* within those levels. The *stagnation point* exists when the firm has been at its current E-commerce level for a long period of time and is unlikely to move to the following E-commerce adoption level or any other advanced level in the short term. Some of the businesses involved in the study were found to have been at the same E-commerce adoption level for a long period of time with no interest to proceed further to the following one.

Although these retailers have fast broadband connection and communicated with their suppliers and customers through email, they did not have a web presence. They had also been at the "*no web presence*" level for many years with no intention to develop a website for their business in the short term. These retailers had reached a *stagnation point* from which they were unlikely to further proceed and echoed the studies of Lefebvre et al. (2005) and MacKay et al. (2000) that had identified stage 00 and 'no presence' stages, respectively. Lefebvre et al. (2005) found firms within stage 00 (i.e. non-adopters) who did not develop a website and had no intention of getting involved in any E-commerce initiative.

The *anxiety point* existed when the firm had already developed an online presence and was selling products online; however, the firm was anxious to move to the following level where it would integrate its online and offline POS systems due to resources and spending concerns. R1 had been selling products through the Internet. However, they were still anxious about the effectiveness and success of this sale channel and were still assessing the benefit they would achieve from online trade. This created an *anxiety point* between the *E-commerce implementation* level where the firm had two separate POS systems and the *E-commerce integration* level where the firm had integrated their online and physical POS systems into one system.

Factors affecting E-commerce adoption among retailers

The research investigated the influence of the organizational, environmental and technological factors on the different maturity levels defined in the research conceptual model illustrated in Figure 1. The analysis findings, however, suggested that the defined factors might have different impacts on each level. The study found that while some factors had significant impact on the adoption of one E-commerce maturity level, they could have negligible impact on the adoption of another one.

The results show that the type of products the retailer sells has significant impact on EC adoption in all levels, which agrees with previous studies (Hart et al. 2000), although which types of products does appear to vary with books, computers and sports equipment being more likely to succeed and grocery businesses is less likely to succeed, which contrast with Hart et al. (2000) and suggest that demand of certain products sold over the Internet could vary from one country to another.

The competitive pressures from customers and competitors have a significant impact on the firm's decisions about web presence and EC implementation. Lack of knowledge about the perceived benefits is found to be an important factor that inhibits retailers from EC adoption, specifically indirect benefits, where customers get to know more about the retailer's products and services. In addition, the findings indicate that the financial resources, is an important factor that influence the B2C EC implementation and integration levels.

The size of the organisation is found to have negligible impact on the second EC adoption level, however, the study found a relationship between the size and the financial resources of the business especially at the more advanced E-commerce adoption levels. Large organizations are found to have better financial capabilities than the small ones and give more consideration to the maintenance of their reputation when developing their EC presence.

Interestingly security and fraud concerns had a negligible impact on the levels of the B2C EC adoption process among retailers, as these organisations believe that security on the Internet is now more mature, however, security is an important issue to be considered when developing EC websites. Some retailers mentioned that they had issues with fraud, but that did not affect their decision to implement or continue the use of EC.

This study aimed to provide a better understanding of the E-commerce adoption phenomenon among Australian retailers and to identify factors that influenced their online presence. The study developed five B2C E-commerce maturity levels which organisations go through in their E-commerce adoption process and identified levels that are different to the ones mentioned by Daniel et al.'s (2002) SOG model. Although the study used the SOG model as the basis from which to investigate online trade among the case organisations, the research found that while some firms followed the sequential approach in their E-commerce adoption, others did not follow incremental stages in their E-commerce development.

In addition to the B2C E-commerce identified levels, this paper investigated factors that affect the adoption of each level. The study investigated the role of those factors in facilitating or inhibiting the use of this emerging technology. The identified factors were categorised into three contexts: environmental, organizational and technological. The findings suggested that the proposed factors had different influences on the identified levels and business models. This research builds on Daniel et al.'s (2002) SOG model by including the TOE framework which included organizational and environmental factors that were not investigated by their model. The study found that the identified factors within the organizational and environmental contexts had significant impact on the adoption of E-commerce at certain levels whereas their impact on other levels was negligible.

This research makes a valuable contribution to the literature on E-commerce adoption by businesses through the identification of B2C E-commerce maturity levels. This helps firms better understand the E-commerce adoption process and how to embrace this technology. The proposed model would be useful to practitioners as it improves their awareness of e-commerce adoption and assists them to establish a consistent approach toward the adoption of this evolving technology through identifying their current e-commerce adoption level and the e-commerce business opportunities that had been implemented by other firms in the retail industry.

These findings do however need to be read within the limitations of the study. While the developed combined model worked well in providing better understanding to the E-commerce adoption phenomenon, the combined model was tested on limited number of firms. In addition, while the study focused on investigating the impact of the internal and external technical infrastructure on the adoption of E-commerce, it did not specifically address the technology used to implement E-commerce. Future research could investigate the use of an alternative technology that can be introduced to provide better infrastructure with less expense such as the cloud computing which is an emerging technology that could have major ramifications with respect to hardware and software acquisitions and the high cost of entry into the market.

REFERENCES

- Adams, D. A., Nelson, R. R., and Todd, P. A. 1992. "Perceived Usefulness, Ease of Use and Usage of Information Technology", A Replication. *MIS Quarterly*, (16:2), pp 227-247.
- Aguila-Obra, A. R. D., and Padilla-Meléndez, A. 2006. "Organizational factors affecting Internet technology adoption", *Internet Research*, (16:1), pp 94-110.
- Alonso-Mendo, F., Fitzgerald, G., and Frias-Martinez, E. 2009. "Understanding web site redesigns in small- and medium-sized enterprises (SMEs): a U.K.-based study on the applicability of e-commerce Stage Models", *European Journal of Information Systems*, 18, pp 264-279.
- Al-Qirim, N.A.Y. 2003. "E-Commerce in the Aerial Mapping Industry: A New Zealand Case Study", *Journal of Systems and Information Technology*, (7:1), pp 67-92.
- Andersen, K. V., and Henriksen, H. Z. 2006. "E-Government maturity models: Extension of the Layne and Lee model", *Government Information Quarterly*, (23:2), pp 236-248.
- Attewell, P. 1992. "Technology Diffusion and Organizational Learning: The Case of Business Computing", *Organization Science*, (3:1), pp 1-19.
- Australian Bureau of Statistics. 2013. "8501.0 - Retail Trade Australia", *Australian Bureau of Statistics*, Canberra, Retrieved 15 January, 2014 from <<http://www.abs.gov.au>>
- Bagozzi, R. P. 2007. "The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift," *Journal of the AIS*, (8:4), pp 244-254.
- Benbasat, I., Dexter, A. S., and Mantha, R. W. 1980. "Impact of organizational maturity on information system skill needs", *MIS Quarterly*, (4:1), pp 21-34.
- Boeck, H., Bendavid, Y., and Lefebvre, E. 2009. "Evolving B2B e-commerce adaptation for SME supplier", *Journal of Business and Industrial Marketing*, (24:8), pp 561 – 574.
- Brown, L. 1981. *Innovation Diffusion*, London: Methuen

- Burg, G. 2013. "Online Retail Sales Index monthly update", *Business Research and Insights*. Retrieved March 3, 2013, from <http://business.nab.com.au/online-retail-sales-index-monthly-update-february-2013-3099/>
- Chan, C., and Swatman, P.M.C. 2004. "B2B e-commerce stages of growth: the strategic imperatives", *Proceedings of the 37th Hawaii International Conference on Systems Sciences*, 80230a
- Chen, A.N.K., Sen, S. and Shao, B. M. M. 2006. "Strategies for Effective Web Services Adoption for Dynamic e-businesses", *Decision Support Systems*, (25:5), pp 123-144.
- Chen, R. 2005. "Modelling of User Acceptance of Consumer E-commerce Website", WISE, LNCS 3806, and pp 454-462.
- Chin, W. W., and Gopal, A. 1995. "Adoption Intention in GSS: Relative Importance of Beliefs", *Data Base for Advances in Information Systems*, (26:2and3), pp 42-64.
- Chuttur M.Y. 2009. *Overview of the Technology Acceptance Model: Origins, Developments and Future Directions*, Indiana University, USA. *Sprouts: Working Papers on Information Systems*, 9(37), Retrieved 10 December, 2013 from <http://sprouts.aisnet.org/9-37>
- Daniel, E., Wilson, H., and Myers, A. 2002. "Adoption of e-commerce by SMEs in the UK: Towards a stage model", *International Small Business Journal*, (20:3), pp 253-270.
- Davis, F. D. 1989. "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, (13:3), pp 319-339.
- Gefen, D., Karahanna, E., and Straub, D.W. 2003. "Trust and TAM in online shopping: an integrated model", *MIS Quarterly*, (27:1), pp 51-90.
- Grandon, E. E., and Pearson, J. M. 2004. "Electronic commerce adoption: an empirical study of small and medium US businesses". *Information and Management*, 42, pp 197-216.
- Grandón, E. E., Nasco, S. A., and Mykytn, P. P. 2011. "Comparing theories to explain e-commerce adoption", *Journal of Business Research*, (64:3), pp 292-298.
- Hart, C., Doherty, N., and Ellis-Chadwick, F. 2000. "Retailer adoption of the Internet; Implications for retail marketing", *European Journal of Marketing*, (34:8), pp 954-974.
- Hsu, P.F., Kraemer, K.L. and Dunkle, D. 2006. "Determinants of e-business use in us firms", *International Journal of Electronic Commerce*, (10:4), pp 9-45.
- Iacovou, C. L., Benbasat, I. and Dexter, A. S. 1995. "Electronic data interchange and small organizations: adoption and impact of technology". *MIS Quarterly*, (19:4), pp 465-485.
- Johnson, M. 2011. "Upstream supply chain benefits from e-markets in the UK higher education sector", *International Journal of Business Information Systems*, (7:1), pp 93-119.
- Jones, C., Hecker, R. and Holland, P. 2003. "Small Firm Internet Adoption: Opportunities Forgone, a Journey Not Begun", *Journal of Small Business and Enterprise Development*, (10:3), pp 287-297.
- Kalakota, R., and Whinston, A. 1997. *Electronic Commerce: A Manager's Guide*, Addison-Wesley, Reading, MA
- Kelly, P. and Kranzberg, M. 1978. *Technological Innovations: A Critical Review of Current Knowledge*. San Francisco: San Francisco University Press.
- King, W. R., and Teo, T. S. H. 1997. "Integration between business planning and information systems planning: Validating a stage hypothesis", *Decision Sciences*, (28:2), pp 279-308.
- Kroenke, D., Bunker, D. and Wilson, D. 2012. *Experiencing MIS*. 2nd ed., Pearson International
- Kuan, K. K. Y., and Chau, P. Y. K. 2001. "A Perception-Based Model for EDI Adoption in Small Business Using a Technology-Organization-Environment Framework", *Information and Management*, (38), pp 507-512.
- Laudon, K. C. & Traver, C. G. 2012. *E- Commerce 2012; Business, Technology and Society*. 8th Edition, Pearson International Edition
- Layne, K., and Lee, J. 2001. "Developing fully functional E-government: A four stage model", *Government Information Quarterly*, (18:2), pp 122-136
- Lawson, R., Alcock, C., Cooper, J. and Burgess, L. 2003. "Factors affecting adoption of electronic commerce technologies by SMEs: an Australian Study", *Journal of Small Business and Enterprise Development*, (10:3), pp 265-76.
- Lefebvre, L., Lefebvre, E., Elia, E., and Boeck, H. 2005. "Exploring B-to-B e-commerce adoption trajectories in manufacturing SMEs", *Technovation*, (25:12), pp 1443-1456.
- Liebscher, P. 1998. "Quantity with quality? Teaching quantitative and qualitative methods in an LIS Master's program". *Library Trends*.
- Lin, C., Huang, Y., and Tseng, S. 2007. "A Study of Planning and Implementation Stages in Electronic Commerce Adoption and Evolution: The Case of Australian SEMs", *Contemporary Management Research*, (3:1), pp 83-100.
- Ma, Z. 2011. "An analysis on the problems of development of e-commerce for small and medium size enterprises within Heilongjiang province", *Business Management and Electronic Information*, 1, pp 101-103.

- MacGregor, R. C., and Vrazalic, L. 2005. "A basic model of electronic commerce adoption barriers: A study of regional small businesses in Sweden and Australia", *Journal of Small Business and Enterprise Development*, (12:4), pp 510-527.
- Magal, S. R., Koslage, P., and Levenburg, N. M. 2008. "Towards a Stage Model for E-Business Adoption among SMEs: Preliminary Results for Manufacturing and Service Firms", *AMCIS 2008 Proceedings*, paper 148.
- Maxwell, J. A. 2005. *Qualitative Research Design*, SAGE Publications.
- McKay, J., Marshall, P., and Prananto, A. 2000. "Stages of maturity for e-business: The SOG-e model", *Proceedings of the 4th Pacific Asia Conference on Information Systems, Hong Kong University of Science and Technology, Hong Kong*.
- Moore, G. C., and Benbasat, I. 1991. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation", *Information Systems Research*, (2:3), pp 192-222.
- Morais, E. P., Pires, J. A., and Gonçalves, R. M. 2012. "E-Business Maturity: Constraints Associated With Their Evolution", *Journal of Organizational Computing and Electronic Commerce*, (22:3), pp 280-300.
- Nolan, R. 1973. "Managing the computer resource: A stage hypothesis", *Communications of the ACM*, (16:7), pp 399-550.
- Nolan, R. 1979. "Managing the Crisis in Data Processing", *Harvard Business Review*, (5:2), March-April, pp 115-126.
- Oliveira, T., and Martins, F. M. 2011. "Literature Review of Information Technology Adoption Models at Firm Level", *The Electronic Journal Information Systems Evaluation*, (14:1), pp 110- 121.
- Polkinghorne, D. E. 2005. "Language and meaning: Data collection in qualitative research", *Journal of Counselling Psychology*, (52:2), pp 137-145.
- Premkumar, G. 2003. "A meta-analysis of research on information technology implementation in small business", *Journal of Organizational Computing and Electronic Commerce*, (13:2), pp 91-121.
- Ramdani, B., Kawalek, P., and Lorenzo, O. 2009. "Knowledge Management and Enterprise Systems Adoption by SMEs: Predicting SMEs' Adoption of Enterprise Systems", *Journal of Enterprise Information Management*, (22:1/2), pp 10-24.
- Rodríguez-Ardura, I., and Meseguer-Artola, A. 2010. "Toward a Longitudinal Model of e-Commerce: Environmental, Technological, and Organizational Drivers of B2C Adoption", *The Information Society*, (26:3), pp 209-227.
- Rogers, E.M. 1962. *Diffusion of Innovations*, 1st ed, Free Press, New York.
- Rogers, E.M. 2003. *Diffusion of Innovations*, 5th ed, Free Press, New York.
- Sila, I. 2013. "Factors affecting the adoption of B2B e-commerce technologies", *Electronic Commerce Research*, (13:2), pp 199-236. doi:10.1007/s10660-013-9110-7
- Silverman, D. 2000. *Doing Qualitative Research: A Practical Handbook*. London, Sage Publications Ltd.
- Simpson, M., & Docherty, A.J. 2004. E-commerce adoption support and advice for UK SMEs. *Journal of Small Business and Enterprise Development*, (11:3), pp 315-28
- Tarafdar, M., and Roy, R. 2003. "Analyzing the Adoption of Enterprise Resource Planning Systems in Indian Organizations: A Process Framework", *Journal of Global Information Technology Management*, (6:1), pp 31-51.
- Teo, T. S. H., Lin, S., and Lai, K. H. 2009. "Adopters and non-adopters of e-procurement in Singapore: an empirical study", *Omega*, 37, pp 972-87.
- Teo, T.L., Chan, C., and Parker, C.M. 2004. "Factors affecting e-commerce adoption by SMEs: a meta-analysis". *Proceedings of the 15th Australasian Conference on Information Systems*, 1-3 December, Hobart, Australia.
- Thong, J. Y. L. 1999. "An Integrated Model of Information Systems Adoption in Small Businesses", *Journal of Management Information Systems*, (15:4), pp 187-214.
- Tornatzky, L.G., and Fleischer, M. 1990. *The Process of Technological Innovation*, Lexington Books, Lexington, MA.
- Weick, K. 1984. "Theoretical assumptions and research methodology selection", in McFarlan, F. (Ed.), *The Information Systems Research Challenge*, Harvard Business School, Boston.
- Yin, R. K. 2003. *Case Study Research, Design and Methods*. 3rd ed., Sage Publications, Newbury Park, CA

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