E-Commerce in Adoption Developing Countries: A Literature Review of the Stages of E-Commerce Evolution and Adoption among SMEs

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ABSTRACT

E-commerce technologies assist SMEs in a wide range of activities, to provide information about the company, provide information about goods and services offered, take and place orders, receive payment, deliver goods and services, after sales service or contact and identify suppliers. It also involves purchasing inventory and non-inventory, communicating with internal and external parties, exchanging document and design with customers or suppliers, searching the information, advertising and recruitment activities. This paper examines the breadth of e-commerce use in business activities and how it reflects the level of e-commerce adoption where the wider the use of e-commerce the higher level of e-commerce adoption. It also explores the wider the scope of e-commerce use in businesses, and the likelihood of its contribution to the realization of even greater commerce benefits.

Keywords: E-commerce, technologies, adoption developing countries, consumers, Ghana

INTRODUCTION

There is no single definition of e-commerce with various definitions being offered by several authors. Turban (2010) defined e-commerce as “the process of buying, selling, transferring, or exchanging products, services, and/or information via computer networks, mostly Internet and intranets”. While, Tagliavini et al. (2012) argued that any economic activity conducted via the internet can be called e-commerce. In more detail, Clarke (2005) elaborated the detailed elements of e-commerce as: “support services for trading… encompass(ing) inter-organizational email, directories, trading support systems for commodities, products, customized goods and services, management information, and statistical reporting systems”. Even though the definitions vary in exact detail, it can be seen from the definitions above that the use of ICT, particularly internet technology, is a main component of e-commerce. Hence in this study the definition of e-commerce refers to the use of networked information and communication technologies (ICT), especially Internet technology, in any business activities.

According to Turban (2010), the transition of traditional commerce to electronic commerce depends on the level of digitization of the products/services sold, the process, and the delivery methods. If the digital element is found in any one of those then it can be said that the e-commerce exists, but only partial e-commerce. Whilst if all of these elements are digital, then it is considered as pure e-commerce. Buying a mobile phone from http://www.apple.com is one example of partial e-commerce, because there are physical dimensions to this transaction which are product and the delivery...
method. However, buying software from http://www.amazon.com is the example of pure e-commerce, because all of dimensions are digital (product, process and delivery method). It cannot be denied that the e-commerce technology was originally developed to meet the needs of large enterprises in developed countries. However, the application of e-commerce is still suitable for SMEs in developing countries. E-mail, websites, internet, intranet, extranet, Electronic Data Interchange (EDI), Electronic Fund Transfer (EFT) and barcode are some of basic e-commerce technologies that are most likely relevant for the SME (Kurnia et al. 2015; Mortezaz et al. 2011; Mustaffa and Beaumont 2014; Abell and Lim 2010).

The use of these technologies by SMEs is variable. Abell and Lim (2010) found that SMEs in New Zealand used the internet in order to communicate with internal and external parties, get information from suppliers, provide information, conduct R&D activities, to be seen at the forefront of technology, to do market and product research, place orders to suppliers, and take orders from customers. Drew (2013) found also that e-mail and intranet applications were used by SMEs for internal communication; whilst web sites were used to advertise, promote, recruit, and for procurement. In addition, Daniel and Wilson (2011) mentioned that e-commerce technologies assist SMEs in a wide range of activities, which are: providing information about the company, providing information about goods and services offered, taking and placing orders, receiving payment, delivering goods and services, after sales service or contact, identifying suppliers, purchasing inventory and non-inventory, communicating with internal and external parties, exchanging document and design with customers or suppliers, searching the information, advertising and recruitment activities. The breadth of e-commerce use in business activities reflects the level of e-commerce adoption where the wider the use of e-commerce the higher level of e-commerce adoption. The wider the scope of e-commerce use in businesses, the more likely the realization of even greater commerce benefits (Zhu and Kraemer 2005).

REVIEW OF LITERATURE

Conducting a literature review provides the researcher with an understanding of previous studies, potential opportunities for additional research, and drawbacks in relation to the research topic (Gil-Salom & Soler-Monreal, 2014; Macfarlane et al., 2015). The systematic literature review helps lower the barriers between the researcher and the practitioners in the community, leading to more collaborative efforts for future studies (Borrego, Foster, & Froyd, 2014). To prepare the literature review, We searched peer-reviewed journal articles, government reports, government-sponsored reports, articles from professional publications, conference proceedings, and past dissertations available through University websites. We also reviewed several databases, including ProQuest Central, SAGE Premier, and EBSCO. Some of the main keywords we used in the literature review and annotated bibliography search were SME, DOI model, e-commerce platform adoption, barriers to e-commerce adoption, e-commerce in Sub-Sahara. This study includes a total of 249 references, out of which 215 (i.e., 86%) are peer-reviewed. The literature review section contains 89% peer-reviewed references. A total of 87% of the references used in this study were published within 5 years

Stages of E-commerce Adoption

In order to explain the level of e-commerce adoption, the concept of “stage of growth” or growth models are often used in previous studies. This concept recognized that information system(s), including e-commerce, in an organization are not fixed but experience several levels of development. Information System literature recorded several growth models developed by previous researchers. The first growth model was developed by Richard L. Nolan during the 1970s, which is well known as “Nolan’s stages of growth model”. In this model, there are six stages faced by the firm in respect of information system usage, namely: initiation, contagion, control, integration, data administration and maturity. Each stage has different features, and all of them will exist together. Then, Rao et al. (2013) proposed four stages—presence, portal, transaction integration, and enterprises integration, to illustrate the evolution of e-commerce in an organization. Each stage has different characteristics and different problems, and Fig. 1 shows the detail of this model.

In this model, the subsequent stage is better than previous stage. Even though the evolution is described sequentially, there is no necessity for a business to start from the beginning stage (presence stage). Business can start from any stage. In line with this, Prananto et al. (2013) also proposed six stages of e-commerce development (see Fig. 2), which are no presence, static online, interactive online, e-commerce, internal integration, and external integration. This model links the level of e-commerce adoption with the investment required and its potential benefit.

Consistent with Rao et al. (2013) and Prananto et al. (2013) also mentioned that the characteristics of each stage are different and business can start the adoption in any level of the stages. Figure 2 above shows that a higher level of e-commerce adoption will require greater investment and that more benefits will be gathered.

E-Commerce in Developing Countries

Access to the web in developing countries was primarily restricted to e-mail communication and many people thus continue to view the internet and its application as simply a medium for e-mail communication, faxing and majorly web surfing, making majority of them not fully aware of other web-based applications. UNCTAD, 2016 reports that these trends are particularly common in Africa. Electronic business (e-business) generally provides new ways and opportunities for organizations to broaden their participation into new national and international markets. There are lots of SMEs adopting e-business at the moment all over the world. This adoption has brought with it many benefits including market changes, controlling business cost, customer expansion, and creation of wealth. Others are creation of job opportunities, ability to be reachable worldwide, production gain and system efficiencies, as well as value creation.

However, there are still lots of challenges for SMEs in adopting e-business because they are small and are challenged by lack of adequate resources and training, inadequate infrastructures, lack of push from the supply chain, lack of vision and a persistent poor security measures (Davis et al., 2012). SMEs rely on an environment in which structures and processes must remain simple, flexible, and adaptable (Carmichael, Turgoose, Older Gary, Todd, 2010). These unique characteristics affect Internet technologies adoption in SMEs. Research suggests that there is a correlation between the size of a business and the level of IT adoption (McDonagh and Prothero, 2010). A typical small enterprise exhibits much lower rates of e-business activities than larger firms when excluding smaller high-technology firms (Smyth and Ibbotson 2012). Small and medium-sized firms lack a general pattern on adoption of Internet technologies (Chavez, Leiter, and Kiely, 2010) and the extent of adopting them often vary widely (Kula and Tatoglu, 2013).

Today, because the internet can facilitate the quick and efficient movement of information among trading partners at a greatly reduced cost, e-business is gaining ground globally (Ministry of Commerce Barbados, 2005) as cited in Emma and Georgia (2016). The adoption of e-business technologies is influenced by many factors. A study conducted by Ramsey et al., (2013) found that the growing awareness and understanding of the benefit of e-commerce among SMEs could positively influence their desire and interest in adopting e-business. Peer pressure or industry standard is also a driving force to pushing firms up the ladder of adoption of e-business technologies (Kula et al., 2013). However, this could become an inhibitor of adopting new technologies if there is no industry leader or champion to innovate and to demonstrate the strategic advantage of using advanced e-business technologies. A study conducted by Lacovou et al., (2005) found that the owner’s lack of awareness of the technology and perceived benefits is a major factor to a take up of electronic business. Other factors, according to Olatokun and Kebyone (2010), such as the size of the enterprise and the type of business enterprise also influence its adoption. According to these studies, size, as well as the enterprises’ activities has an influence on e-business adoption.

Literature also identified the benefits of e-business on businesses stating their ability of enabling easy access to global market, adequate and efficient market research, removal of business intermediaries, reduced transaction costs and value creation.(Almeida et al., 2016; Kapurubandara and Lawson, 2016; Moodley, 2013; Alemayehu,2005; Turban et al., 2014). SMEs appear to encounter many challenges in adopting new technologies. The cost of
implementation, security, perceived customer readiness, lack of knowledge of IT and e-business are some of the challenges encountered by SMEs in adopting electronic business technologies (Department of Enterprise, Trade and Employment, 2014) cited in Emma and Georgia (2016). The literature indicate that many studies have been carried out which militate the adoption of electronic business. These studies have looked at owner/manager perspectives, firm perspectives and costs and return on investment (Akkeren and Caraye, 2010).

A number of related studies such as the status of Internet commerce in the manufacturing industry (Cooper and Burges, 2010), deploying internet banking and e-business (Kanabiran and Narayan, 2005), e-business adoption in the electronic industry (Parish et al., 2011) have focused mainly on multinationals and larger organizations as regards their suitability to the technology. Based on Kapurubandara and Lawson (2016) and the E-Adoption Ladder (DTI, 2012), which are the models underpinning this study, the main aim of this paper was to present the level of adoption and use of e-business technologies by small and medium scale enterprises (SMEs) in Sub-Sahara Africa and the factors that promote or inhibit adoption.

**SMEs and E-commerce**

SMEs have gradually recognized the positive impact that ICTs, such as computer terminals, e-mail and the Internet and their applications can have on their business. In advanced countries, most small firms, including micro-enterprises with fewer than ten employees, now have at least one computer terminal, usually with Internet access. Many types of business software can improve information and knowledge management within the firm, leading to more efficient business processes and better firm performance. Communication via e-mail and the Internet can help to improve external communication, in either business-customer or business-business contexts, or may reduce transaction costs, increase transaction speed and reliability, and extract maximum value from each transaction in the value chain (OECD, 2011).

At inter-firm level, the Internet and e-commerce have great potential benefit for reducing transaction costs and increasing the speed and reliability of transactions. They can also reduce inefficiencies resulting from lack of co-ordination between firms in the value chain. Internet-based business-business interaction and real-time communication can reduce information asymmetries between buyers and suppliers and build closer relationships among trading partners (Moodley, 2011). In fact, adoption of e-business reduces transaction costs, increase transaction speed and reliability, and extract maximum value from transactions in their value chains (OECD, 2011). In the business to customer context, the Internet and e-business can be effective tools for better communication. A corporate web site that provides information on products, services or technologies can enhance the quality of a firm’s services to customers and attract new ones. E-business can describe companies operating in the ICT producing sectors as well as new emerging sectors and industries such as in the areas of digital content. However, at a more fundamental level, the term e-business also describes the application of information and communication technologies to business processes in all sectors of the economy to reduce costs, to improve customer’s value and to find new markets for products and services (Crawford, 2014).

Electronic business methods enable companies to link their internal and external data processing systems more efficiently and flexibly, to work more closely with suppliers and partners, and to better satisfy the needs and expectations of their customers. Ebusiness also offers the opportunity to small and medium-sized enterprises to take on and compete with larger enterprises. Small companies, despite their size can also have a global presence through their Internet website which is a cost-effective medium to expand the organizations network and provide immediate awareness in the markets serving as a means for competition in the global marketplace. Kalanje (2011) also stated that ICTs rapid pace of change combined with its developments in international trade have resulted to the opening of a wide range of opportunities and challenges for SMEs as they are now able to reach potential customers in distant market which a decade ago was a dream. Therefore e-business adoption is a key concept that will help businesses to be more competitive in the marketplace where new competitors will use the technology to carve a niche in the market, lower transaction costs and enhance competition through cheaper communication and information (Alemayehu, 2005).

**Factors that promote e-business adoption among SMEs**

Business driver has been regarded as a main driving force for technology adoption as in the Staircase model adopted by the British Library. The model shows four stages and technology sophistication, the
model includes non-technology driving forces (e.g., external pressure, increased ICT skills, business driver). These forces may push SMEs up the stairs, but influential factors (e.g., lack of resource and skills, system changeover, etc.) may send the firm down the stairs. Gary (2013) positively commented that the British Library Staircase model takes the perspective of the SMEs owner-managers, linking technology evolution to their capability to learn, to manage new ICT knowledge, and to introduce business changes. Levy, Powell, and Yetton (2011) suggest that SMEs tend to be driven by short-term efficiency and operational benefits to the detriment of strategic, long-term business benefits. SMEs gained immediate operational benefits from using Internet technologies, for example, cost reduction, sharing information, improved marketing, and communication. The alleged popularity of e-business adoption is due to a multitude of perceived operational benefits it could bring to purchasing practices. Examples of these are: cost savings resulting from reduced paper transactions; shorter order cycle time and subsequent inventory reduction, resulting from speedy transmission of purchase order related information. It also includes enhanced opportunities for the supplier/buyer partnership through the establishment of a web of business-to-business communication networks (Gulledge, and Sommer, 2010).

Another key benefit is faster responses to customers needs. Carmichael et al., (2010) suggest that the key driver for SMEs to innovate e-business is competition and customer feedback. SMEs realized that they need to remain competitive in order to survive, thus responding to customer feedback is an important weapon of competition. These operational benefits and response to competition needs clearly constitute the main driving forces that push firms up the adoption ladder. Ramsey et al., (2013) argue that growing awareness and understanding of the benefits of e-commerce among SMEs can positively influence their desire and interest in adopting e-business. The adoption of e-business has to do with the age of the organization. The older the organization, the higher the level of adoption. Freeman, Caroll, and Hannan (2013) stated that older organizations have an advantage over younger ones because reliability and accountability tend to increase with age, and failure rates tend to decrease as firms grow older. According to Olatokun and Kebonye (2010), the big size of an enterprise promotes the adoption of internet technology and the small size is an important factor, as it can hinder adoption. The type of business enterprise also influences the adoption of e-business. Olatokun and Kebonye (2010) studied the relationship between various types of businesses (governmental, local or foreign organizations; characteristics of products, number of product categories, etc) and adoption of the internet. Their findings revealed that size, as well as the enterprises types of activities have an influence on the adoption of e-business (Olatokun and Kebonye, 2010). Kula et al., (2013) suggest that most SMEs innovate only when they clearly perceive business opportunities for their firms, or because they are under pressure from suppliers and clients. Peer pressure or industry standard is also a driving force to pushing firms up the ladder of adoption of e-business technologies. However, this could become an inhibitor to adoption if there is no industry leader or champion to innovate and demonstrate the strategic advantages of using advanced e-business technologies.

**Factors that Inhibit the Adoption of E-business Among SMEs**

Various studies have reported that SMEs are generally lagging behind to large organizations as far as the adoption and usage of e-business is concerned. Recent research work by Kapurubandara and Lawson (2016) identified a variety of factors that could be grouped into several categories. Also, Chau and Turner, 2012; OECD, 2011 identified factors relating to three major categories: owner/manager characteristics, firm characteristics and costs and return on investment (Akkeren and Caraye, 2010). Some of these inhibitors are discussed in some detail in the next sections.

**Owner/manager characteristics**

The adoption of electronic business is a decision made by the business owner and the manager. Successful companies that embrace IT and Internet technologies are often those whose owners take on the role as innovation champion. SMEs owner perceive email as an important function for their business (Ramsey et al., 2013). However, many SMEs prefer the comfort of what they perceive as familiar over indulging into any new venture. They are reluctant to “think outside the box” in order to seek new business solutions (Cyert and March, 2010). Some SMEs don’t perceive (or are not convinced by) the potential strategic benefits of being the first to utilize new technologies. Some do not perceive the relevance of using new technologies to their business, although they understand the online buying and selling functions offered by the technologies. Gary (2013) argues that whether the adoption is driven by business demand or technology push, the SMEs need
to be personally ready before moving on to the next stage and that the process involves learning and new knowledge.

Organization/Firm characteristics

A number of factors influencing adoption of e-business have to do with the organization itself. For instance, the age of the organization is a major factor - the older the organization, the higher the level of adoption. Freeman, Caroll, and Hannan (2013) stated that older organizations have an advantage over younger ones because reliability and accountability tend to increase with age, and failure rates tend to decrease as firms grow older. The nature of the industry, the size, the common practice, and the traditional way of doing business impose a significant impact on the adoption of new technologies. The high level of intangibility of the service/product mix can be viewed as one of the major impediments to future utilization of Internet commerce. Ramsey et al., (2013) addresses the unique nature of an industry in relation to utilization of Internet technology. Adoption has also been found to be largely dependent on external pressure from the business competitors as well as its supply chain (Thong and Yap, 2005). Business might adopt electronic business as a result of their competition using it as not to lose their competitors advantage. Fillis et al., (2014) speculate that there may be a sense that business is dictated mainly by the end customer, supplier or distributor who does not want to embrace e-business technology, instead preferring conventional, traditional methods. If an organization has large amount of data and transaction, then it is more likely to adopt electronic business which can help streamline operations and offer process efficiencies within the organization (Thong and Yap, 2005).

Costs and Return on Investment

Limited resources (e.g., financial, time, management, training, personnel) are often highlighted as major factors impacting the decision to adopt e-business. Lawrence (2011) argues that resource limitations such as time and capital coupled with preferences for traditional mechanisms to do business, inhibited firms from gaining benefits from introducing e-commerce technology. SMEs have been seen as spending little on technology, therefore they do not use the optimum solutions for much of their business. SMEs are also concerned with return on investment. The pressure to show a return on the investment often leads to small firms being more concerned with medium term survival rather than long-term viability (Akkeren and Caraye, 2010). As a result, owners are often hesitant to make substantial investments when short-term returns are not guaranteed. As a result, they are unable to invest in new technologies that could actually help put them on the fast track. Dedrick and Kraemer (2012) contended that the major factors inhibiting the uptake of ecommerce by SMEs include inadequate transportation and delivery, limited diffusion of computers, lack of online payment processes, limited availability of banking services and uncertain taxation rules. Cloete (2012) and Cloete et al., (2011) reported several factors which affect the adoption of e-commerce including lack of information options, lack of time to investigate options, lack of access to computers, lack of access to hardware and software, limited knowledge of e-commerce models and methodologies. Study carried out by Cloete et al., (2011) revealed that low use of electronic business by customers and suppliers, concern about security, legal and liability aspects, high costs of development and computer and networking technologies for electronic business, limited knowledge of electronic business and unconvincing benefits to the company are among some factors that negatively affect electronic business adoption by SMEs. Brown (2011) contends that SMEs lack strategic vision and e-commerce adoption is perceived a distraction from core business. Kaynak et al., (2005) report on the difficulty of finding and retaining qualified personnel with required skills and knowledge and the risk of dissipation of company specific knowledge. Bolongkikit et al., (2016) found among other issues that SMEs markets needed a high degree of human interaction, while Scupola (2013) contended that e-commerce is perceived a constant interruption and distraction, too many junk mails and technology change and evolution inhibit e-commerce adoption. Looi (2013) espoused that lack of external pressure from suppliers and customers inhibit e-commerce adoption. Similarly, Lawson et al (2013) contended that poorly trained staff and not being sure how many people are using the Internet impede the adoption and diffusion of electronic commerce among SMEs. A study conducted by Lacovou et al., (2005) found that the owner’s lack of awareness of the technology and perceived benefits is a major factor to a take up of electronic business. The lack of knowledge on how to use the technology and the low computer literacy are other contributing factors for not adopting electronic business (Knol and Stroeken, 2012). Mistrust of the IT industry and lack of time are two other factors that affect the decision to adopt electronic business (Akkeren and Caraye, 2010).
Related research studies carried out on the inhibitors of adoption of e-business noted that in China, shopping is regarded as a social activity in which personal face-to-face contacts with sellers is an important part of the shopping experience (Storensen and Buatsi, 2011). A study conducted by Cloete et al., (2011 cited in Kapurubandara and Lawson, 2016) in South Africa, found that SMEs adoption and acceptance of e-business is largely influenced by factors within the organization, lack of access to computer, software, hardware and telecommunications at a reasonable cost, low e-business use by competitors and supply chain partners, concern with security and legal issues, low knowledge of management and employee and unclear benefits from electronic commerce were found to be the major factors that affect adoption. El-Nawawy and Ismail(2010 cited in Kapurubandara and Lawson, 2016) also carried out a research on electronic business adoption by SMEs found that the main factors contributing to the non adoption of electronic business in Egypt are awareness and education, market size, e-commerce infrastructure, financial infrastructure, legal system, government’s role, pricing structure and social and psychological factors. A lack of understanding of the benefits (Goode, 2011) and the difficulties of evaluating them contribute to the low level of e-commerce adoption in SMEs (Stockdale and Standing, 2014). Bada et al., (2016) stated that in Nigeria, poor electricity service, lack of infrastructure and an unprogressive monopoly in the sector is the major problem.

List of References


