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INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ADOPTION BY SMALL AND MEDIUM ENTERPRISES IN DEVELOPING COUNTRIES: THE EFFECTS OF LEADER, ORGANIZATIONAL AND MARKET ENVIRONMENT FACTORS

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Abstract

Leader, organizational and market factors play important roles in a small and medium enterprise's (SME's) decision to adopt information and communications technologies (ICTs). The purpose of this research is to examine the role of leader factors (leader innovativeness, leader's attitude, leader's IT knowledge, leader's risk aversion), organizational factors (business size, firm age, financial slack, information intensity) and market environment factors (competitive pressure, influence of social network, ICT business support, perceived ease of use of ICTs) to an enterprise's decision to adopt ICTs. After an extensive review of the technology acceptance and innovation adoption literature, a behavioural model of innovation acceptance is presented, completed with a number of useful and insight propositions concerning SMEs operating in an underdeveloped, developing and developed country context.

Keywords: ICT Adoption; SMEs; developing world; leader, organization, market environment factors

INTRODUCTION

Information and communication technologies (ICTs) play an intrinsic role in assisting small and medium enterprises (SMEs) - firms with fewer than 201 employees (Taylor, 2015) - to evolve new business models and organizational structures (Corbitt, 2000), do business in new markets (Javalgi and Ramsey, 2001) and enhance their internal and external communication channels

(Barba-Sánchez et al., 2007). It is for these reasons and more that attention has been placed on how ICT use can be promoted among SMEs (Beckinsale, et al., 2011). Undoubtedly, the adoption of ICTs by SMEs enhances the ability of these firms to improve productivity and financial position, as well as bolster their capacity to gain competitive advantage (Brady et al., 2002; Thong, 1999). Matthews (2007) noted that ICTs are a major contributory factor in the growth of SMEs and contribute to their bottom-line, while Howard (1997) observed that business growth may require SMEs to implement ICTs to effectively manage such growth.

The technology acceptance and innovation adoption literature have proffered a number of variables that are likely determinants of why many firms adopt an innovation. A number of these studies have examined the influence of such organizational factors as firm size and employees' ICT knowledge on adoption of innovations. Apart from organizational factors, the role of leader's characteristics has also been explored (Street and Meister, 2004), since the leader is often the owner and the one who determines the direction of the firm (Qureshi and York, 2008). Moreover, most of these studies have either focused on the implementation of ICTs in small firms (Thong, 1999) or have examined the impact of leader and organizational factors on the adoption of innovations in large firms. Research on the unique nature and challenges affecting SMEs' efforts to adopt ICTs in developing and underdeveloped countries is sparse and accordingly warrants special attention. The main purpose of this research undertaking, therefore, is to ascertain the important determinants of ICT adoption by SMEs in a developing country context, by examining the role of leader factors (leader innovativeness, leader's attitude, leader's IT knowledge, leader's risk aversion), organizational factors (firm size, firm age, financial slack, information intensity), and market environment factors (competitive pressure, influence of social network, ICT business support, perceived ease of use of ICTs).

The rest of this paper deals with theoretical background, research model and propositions. This is followed by the discussion section. Finally, future research avenues are explored and conclusions are presented.

THEORETICAL BACKGROUND

The literature considers a number of perspectives on ICTs (see Brady et al. 2002). From an economic and management viewpoint, ICTs have been regarded as a social construction, an information provider, an infrastructure – hardware and software, and a business process and system. From a marketing viewpoint, ICTs have also been seen as a variety of separate applications (Internet, databases, PowerPoint), a marketing channel, and a communication/ promotional medium (Barba-Sánchez et al., 2007). Accordingly, ICTs can be defined as a collective of software, hardware, telecommunications and information management techniques

and devices that are used to process, store and transform information (e.g., Porter and Millar, 1985).

While information and communications technologies are often utilized to assist growth, SMEs frequently find it difficult to implement such technologies for a variety of reasons, including resource constraint (Raymond, Bergeron, and Blili, 2005). In this regard, Matthews (2007) noted that the main hindrances to the expanded use of ICTs by SMEs can be enumerated as financial (ability to invest in ICTs), infrastructural (bandwidth and power) and organizational (lack of skilled staff, lack of coherent strategy, inability to adopt new ICT enabled processes).

From a developing country perspective, a number of scholars have argued that although SMEs in developing countries have increased their ICT investments, the anticipated economic gains or benefits are not being realized (e.g., Duggan, 2008; Barclay and Duggan, 2008; Dewan, Ganley, and Kraemar, 2005). Moreover, for many SMEs undertaking ICT adoption for the first time, there are a number of innate risks and uncertainties. For example, the introduction of ICTs is likely to cause changes in work processes and cause anxiety among employees relating to the use of such technologies, as well as increase costs to address poor ICT implementation (e.g., Dewan, Ganley, and Kraemar, 2005).

In response, researchers such as Barclay and Duggan (2008) and Duggan and Virtue (2004) have called for a reconceptualization of the digital divide phenomenon toward a focus on digital effectiveness. Digital effectiveness refers to the capability to maximize ICTs to obtain positive economic returns from ICT adoption (Duggan, 2008; Barclay and Duggan, 2008). For this to happen, however, firms in developing and underdeveloped countries, for example, must find ways to creatively implement and use ICTs to add value (Duggan and Virtue, 2004).

Previous research has found a number of drivers for SMEs IT adoption, however only a few factors were found to actually influence the adoption behaviors, for example, innovativeness and IT knowledge (Thong, 1999); firm size (Bridge and Peel, 1999; Premkumar and Roberts, 1999), ease of use and perceived usefulness (Igbaria, et al. 1998), and top management support (Foong, 1999; Premkumar and Roberts, 1999). Also, within the ICT adoption literature, the drivers for ICT adoption have tended to be focused on perceived benefits (Poon and Swatman, 1999; Mehrtens et al., 2001) such as efficiency improvements, organizational/ operational effectiveness and new business opportunities (Levy et al., 2005); and SME promotion; organizational readiness (Levy and Powell, 2003; Merhtens et al., 2001).

Overall, previous studies have identified key factors influencing the dynamics of ICT adoption and use based on characteristics of the firm, strategy and business intent, information systems adopted, limited or supporting internal capabilities, and external factors (see for e.g., Beckinsale et al., 2011).

RESEARCH MODEL AND PROPOSITIONS

After a review of the technological innovation literature, a research model was developed (see Figure 1). As the objective of this study is to identify primary relationships, a one-stage behavioural model of ICT adoption has been proposed, consisting of Adoption of ICTs as the dependent variable and a number of independent variables. As this research develops, the model can be refined to, for example, include intermediate variables.

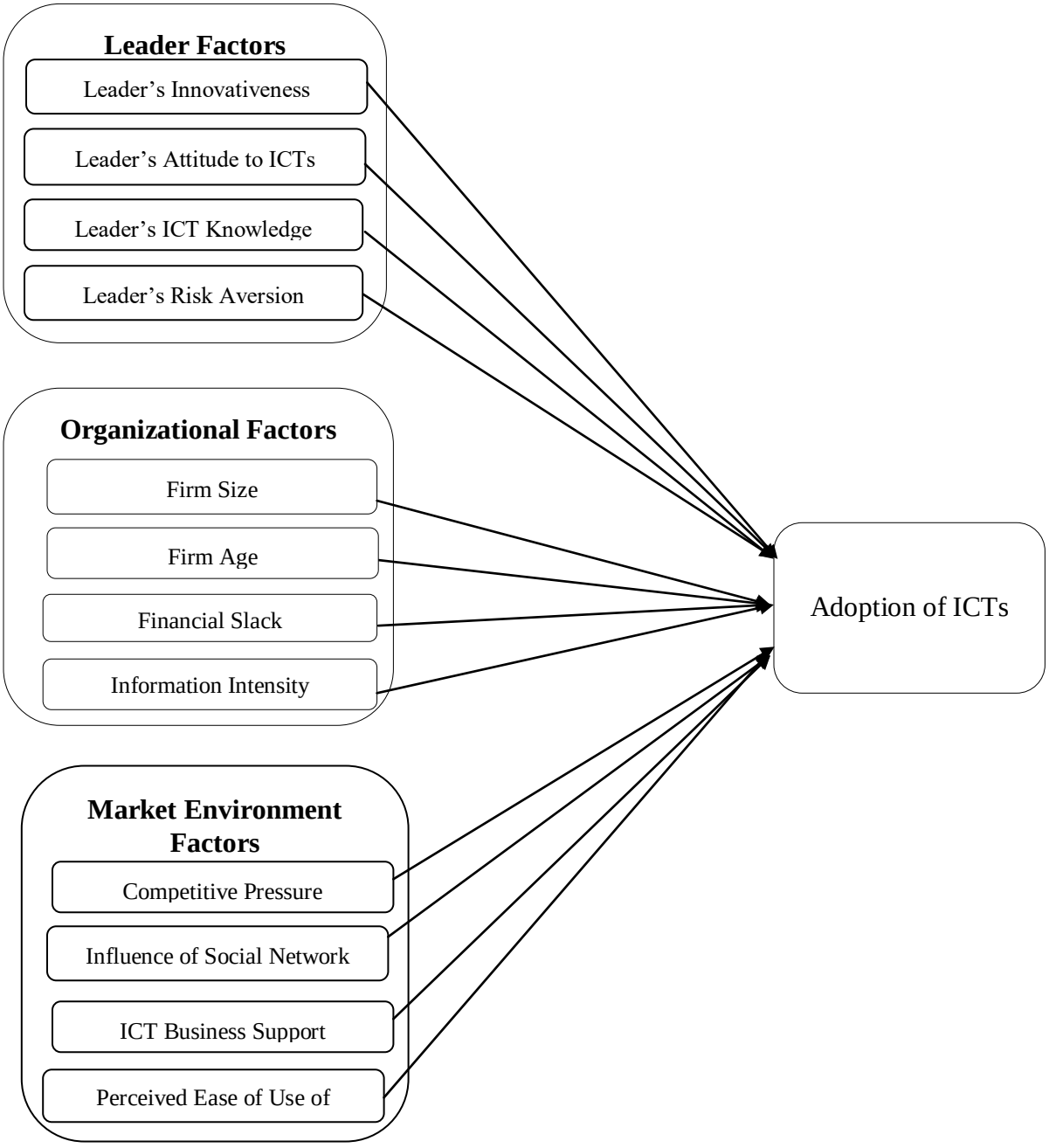

Figure 1. Proposed Research Model – Behaviour Model of ICT Adoption

Adoption of ICTs

In the model, adoption of ICTs is the dependent variable. In this article, ICT adoption is defined as the use of information and communication technologies (ICTs) tools including computer hardware, software, and networks required for connecting to the internet" (Tan et al., 2009, Ghobakhloo et al., 2011). Within this context, adoption of ICTs can be described as a consisting of three defined stages namely, initiation, adoption, and implementation as Nguyen (2009), Rogers (2003) and Thong (1999) observed. The initiation stage has to do with assessing the ICT innovation. The adoption stage is one where a decision is made to adopt an ICT innovation. The implementation stages is concerned with effecting the ICT innovation in the firm. This implies that ICTs are used productively and enhances the operations of SMEs.

Leader Factors

Leader's innovativeness

The SME leader or owner is an entrepreneurial figure who determines the innovative attitude of the SME (Schumpeter, 1934; Witt, 2002). This person plays a key role in the growth and development of the SME based on his or her abilities and proclivities (Barba-Sánchez et al., 2007). In other words, it is the leader who ultimately determines the level of the innovativeness of the business. Further, it has been found that the SME leader allocates organizational resources and so influences innovation adoption in the firm (Kimberly and Evanisko, 1981). In many SMEs, expertise and control over resources are often vested entirely in the owner or leader (Bigoness and Perreault, 1981). Therefore, if the SME owner is not motivated to innovate, there is not much that other team members of the firm can do to hasten ICT adoption in the business (Prescott and Conger, 1995; Thong, 1999). Accordingly, if the SME leader believes that an ICT innovation will enhance the productivity of the firm, he or she will most likely adopt that innovation.

Proposition l: Innovative SME leaders are more likely to adopt ICTs.

Leader's Attitude toward ICTs

Researchers have noted a relationship between the attitude of owners or leaders of SMEs and adoption of ICTs (Jarvenpaa and Ives, 1991; Winston and Dologite, 2002). The theory of planned behaviour posits that perceptions influence intentions and intentions influence the actual behavior of the individual (Grandon and Pearson, 2004). This link has been studied and the results suggest that leaders' perceptions and attitudes toward other types of information technologies are strongly related to the use of these technologies (Jarvenpaa and Ives, 1991). In arriving at their conclusions, these researchers discovered strong support for the relationship

between favorable perceptions of IT (attitude) and progressive use of IT. Furthermore, in examining the decision making processes about IT adoption in small businesses, Harrison et al. (1997) discovered strong support for a decision process based on attitude or perceived positive and negative consequences for the firm, social expectations, and resources to overcome obstacles) regarding IT adoption. Other researchers have posited that the more the SME owner's perception that ICTs are compatible with their businesses, the more likely they are to adopt them (Tornatzky and Fleischer, 1990), while Winston and Dologite (2002) have noted that small business owners' attitudes toward information system is understood to be an important factor in determining implementation success (Winstonand Dologite, 2002).

Proposition 2: SMEs with leaders who view ICTs favourably are more likely to adopt them.

Leader's IT knowledge

Research has found that SMEs with leaders who know about IT are more likely to adopt IT (Thong et al., 1995). Also, studies have found that many SME leaders are not knowledgeable of ICTs and the advantages that these technologies can provide to their businesses (Gable and Raman, 1992; see also Barba-Sanchez et al., 2007). These findings would seem to indicate that if more SME leaders were educated on the benefits of ICTs, they may be more willing to adopt such technologies (Levy et al., 2001).

Proposition 3: SME leaders who are well-informed about ICTs are more likely to adopt ICTs.

Leader's Risk Aversion

Studies have suggested that entrepreneurs who are not risk-averse, possess a higher need for achievement, and have a higher preference for innovation (Begley, 1995; Stewart Jr et al., 1999) are more inclined to adopt ICTs (e.g. Ács and Varga, 2005). SME owners tend to be entrepreneurial, risk-friendly and innovative which are considered key factors in assessing the SMEs' readiness to adopt ICTs (Poon and Swatman, 1999; Levy and Powell, 2003).

Proposition 4: SMEs leaders that are risk-friendly (more risk tolerant) are more likely to adopt ICTs.

Organizational Factors

Firm size

In general, SMEs are confront with more barriers to ICT adoption and are less likely to adopt ICTs than large firms (Ein-Dor and Segev, 1978). Researchers have found that even larger SMEs are better positioned to employ more qualified staff, who possess important IT skills, and are thus in a position to more readily adopt ICTs than their smaller counterparts (see for e.g.,

Alpar and Reevs, 990). Similarly, the size of SMEs has been found to be correlated with ICT use (Premkumar and Roberts, 1999; Poon and Swatman, 1999).

Proposition 5: Larger SMEs are more likely to adopt ICTs than their smaller counterparts.

Firm Age

All things being equal, the older an SME, the more it is likely to adopt ICTs. The logic here is that the older a firm, the more experience, and financial resources it is able to amass, as compared to younger firms (Palvia and Palvia, 1999). Notwithstanding, it is also recognized that some SMEs, particularly those in the software sectors, adopt ICTs from the start, e.g. born globals in high-tech industries (Weerawardena et al., 2007). However, in developing countries, the born global SMEs are not as pronounced as in a developed country context. All things considered, it is therefore reasonable to suggest that age and experience are important factors in the successful adoption of ICT by SMEs (Palvia and Palvia, 1999).

Proposition 6: Younger SMEs are less likely to adopt ICTs than older ones.

Financial Slack

Generally, many SMEs do not possess the capital and financing required to achieve business success quickly (Fuller-Love, 2006).For these firms, ICT adoption tend to be more difficult (Premkumar and Roberts, 1999). Also, the lack of financial resources might hinder many SME owners from being able to strategically implement ICTs to facilitate the growth of their businesses (see Beckinsale et al., 2011; Levy et al., 2001). SMEs that possess adequate financial resources in excess of that required to maintain their operations, solve organizational problems, and undertake social responsibility projects, are better positioned to invest in technologies that facilitate business growth (see Ang and Straub, 1998; Bourgeois, 1981). Accordingly, SMEs with financial slack or excess financial resources can build up technology resources and implement ICT innovations quicker than SMEs with limited financial resources.

Proposition 7: SMEs with financial slack are more likely to adopt ICTs than SMEs who possess limited financial resources.

Information intensity

Some products and services are produced and marketed, for example, through the exchange of information than other products and services. The degree to which information is present in the product or service of a business reflects the level of information intensity of that product or service. A small publishing firm, for example, may have more information processing needs and

are thus is more information-intensive, than a small farm business. In this regard, Yap (1989) found that businesses with high information processing needs, and those in more information-intensive sectors are more likely to adopt ICTs and exploit its strategic advantages (Porter and Millar, 1985).

Proposition 8: Information-intensive SMEs are more likely to adopt ICTs.

Marketplace Factors

Competitive/External Pressure

Many SMEs have had to adopt ICT because their counterparts have done so or competition impels them to (Nguyen, 2009). Also, customers' demand for quality service propels many SMEs to adopt ICTs (Levy and Powell, 2003; Poon and Swatman, 1999). Moreover, research has shown that competition fuels SMEs drive to adopt new technologies when SME leader conclude that the adoption of new technologies will improve their business performance and competitive position in the marketplace (Ghobakhloo et al., 2010). Other researchers have also found that external pressures from customers, suppliers, competitors, and government have influenced SMEs adoption of ICTs (Beckinsale et al., 2006; Premkumar and Roberts, 1999; Mehrtens et al., 2001).

Proposition 9: The greater the competitive pressure, the more SMEs will adopt ICTs.

Influence of Social Network

Social networks have been acknowledged as being an important influence on ICT adoption (Yap et al., 1992). Information and ideas flow more easily among people who are closely connected and, have a sense of community or personal ties (Granovetter, 1973). Accordingly, these social networks provide useful information on a range of matters including, ICTs which, in turn, motivates SMEs to adopt these technologies. Researchers have observed that SMEs in the same industry often adopt the same technologies and view these technologies in similar ways (Salmeron and Bueno, 2006). Moreover, the need for strengthening social networking among industry participants is itself being assisted by lower costs of ICTs, which facilitates better business relationship among firms, and closer cross border trade and coordination among firms (Barba-Sánchez et al., 2007; Summut-Bonnii and McGee, 2002). Thus, ICTs enhance SMEs' ability to forge new relationships (Prasad et al., 2001) to grow and prosper.

Proposition 10: SMEs social networks influence their adoption of ICTs.

ICT Business Support

Research has shown that IT support is a critical factor in facilitating ICT adoption by SMEs. In fact, it has been noted by researchers that quality business support and guidance of IT consultants, vendors, government, and other IT experts have greatly enhanced the success of ICT adoption efforts by SMEs (Ahuja et al., 2009; Morgan et al., 2006). Also, Yap et al. (1992) have found a positive relationship between quality external advice provided by consultants and ICT adoption.

Proposition 11: ICT business support positively impacts ICT adoption by SMEs.

Perceived Ease of Use of ICTs

A technology that is viewed to be easier to use when compared with another, will tend to be adopted by the user over the other technology. In other words, a technology that is seen as being easier to use than some other is likely to be adopted (Moore and Benbasat, 1991; Succi and Walter, 1999). Accordingly, perceived ease of use refers to the extent to which an individual believes it is easy or effortless to use a particular technology (Davis, 1989), in that that technology provides a benefit to the user (Riemenschneider et al., 2003). Research by Igbaria et al. (1997) have found perceived ease of use of personal computer and web site by SMEs, respectively, is a statistically significant determinant ICT adoption.

Proposition 12: An SME will more like adopt an ICT when the SME owner feels that ICT is easy to use.

AVENUES FOR FUTURE RESEARCH

This study is in its embryonic phase and is primarily aimed at contributing to the innovation adoption literature by providing potential and important determinants of ICT adoption in the context of SMEs in developing countries, such as those in Caribbean region. Despite numerous research efforts to date, there has not been a focus on determinants of SME ICT adoption in the context of such countries, given the particularities of such factors as leader, organizational character (e.g., limited financial resources), and market factors, e.g. competitive pressure and ineffectual ICT deployment. This article provides a useful ICT adoption behavioural model which can be employed in an underdeveloped, developing or developed country context. The model serves to guide further research and will be used in further empirical studies to test the propositions to provide further insights to the research community, in the underdeveloped, developing and underdeveloped world context. In this regards, the moderating and mediating role of some of these constructs on ICT adoption will also be explored, as well as the extent to which these constructs are significant in not only the decision to adopt ICTs, but also the

implementation of ICT projects. Additionally, future research will examine the role that the entrepreneurial orientation (EO) of SME owners plays on the decision and readiness of SMEs to adopt ICTs. This, so as to provide useful insights to SMEs owners and managers, as well as policy-makers involved in SME development.

CONCLUSION

Utilizing theories from the technological innovation literature, this study advances a number of propositions for testing ICT adoption by SMEs, particularly in developing economies. This study examines leaders, organizational and market environmental factors on the decision of SMEs to adopt ICTs and proposes a behavioural model of ICT adoption by SMEs, which recognizes some of the peculiar concerns of SMEs in developing countries. Indeed, while research has found that SMEs, in general, have increased their ICT investments, a number have yet to adopt such technologies, let alone maximize the returns from ICT use in their firms. This may be due to a lack of knowledge of ICTs and their benefits by some SME owner-managers (Barba-Sanchez et al., 2007; Thong et al., 1995). On the other hand, organizational and environmental factors may also play a role in the decision of SMEs in developing countries to adopt ICTs. Research has shown, for example, that SMEs in developing countries who are apart of strong social networks often receive useful information on ICTs which spur their decision to adopt such technologies (Salmeron and Bueno, 2006). While a number of these factors have been found to play a role in SMEs in developed countries, little is known about their effects in developing countries, such as those in the Caribbean. It is therefore important that further research is done to not only investigate the efficacy of the proposed model, and the constructs which constitute it, but also that the moderating and mediating role of such constructs on ICT adoption by SMEs in developing economies, so as to provide further insights on the use of ICTs to spur SME growth and maximize economic gains.

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