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ENHANCE THE USE OF INTERNET BASED ADVANCED COMMUNICATION TECHNOLOGIES IN SMALL AND MEDIUM SCALE ENTERPRISES IN SRI LANKA

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Abstract:
With the advancement of Information and Communication Technology (ICT) and it diverse such as Internet and Electronic Commerce (E-commerce) gives many opportunities for businesses. Furthermore, businesses in the world today are heavily evolving with modern internet-based technologies such as E-commerce. Organizations need to rethink about their businesses models and operations with the use of E-commerce like technologies. Make more and more technologies enable business processes ultimately to make the business very competitive in the given business forums. But with current studies the usage of those technologies are well below the expectation in Sri Lanka. This study aims to describe the importance of using those technologies in Small and Medium Enterprises (SME) in Sri Lanka and to understand the related obstacles faced in the industry. Out of the many, this study has identified mainly Information Technology (IT) related issues are badly affected for E-commerce like technology adoption and that is due to unexplained few technology factors. This study further explains with available literate what are those IT factors which hindering the adoption to E-commerce and guidance to develop a framework to analyze the effect from each variable.

Keywords: information technology, information and communication technology, SMEs, relative advantage, information security, know-how

1. Introduction

Small and Medium scale enterprises are drivers of economic growth of developing countries (Carey, 2015; Wang, 2016). According to (Frantz et al., 2017) in the European Union, SMEs represent 99 percent of around 23 million enterprises and cover nearly

two-thirds of the jobs. According to (Wang, 2016) data from the Chinese National Bureau of Statistics, SMEs represented 99.4 percent of all enterprises in China in 2012, and they contributed to 59 percent of China's Gross Domestic Production (GDP) and accounted for 60 percent of total sales. According to the World Bank statistics, formal SMEs contribute up to 60 percent of total employment and up to 40 percent of national income (GDP) in emerging economies. These numbers are significantly higher when informal SMEs are included (Bank, 2015). Government of Sri Lanka (GOSL) also has identified the Small Medium Enterprise (SME) sector has strategic sector in the overall policy objectives of the country. SME helps for economic growth, regional development, employee generation and reduction to poverty. SME sector is envisaged to contribute to transform lagging regions into emerging regions of prosperity. Therefore Sri Lankan government identified SME as the backbone of the country economy (MIC, 2015).

Nowadays, different technologies are used heavily in business operations. Starting from mainframe computer to virtualized cloud computing enabling communication very effective and efficient in all aspects during last few decades in the world. Dedicated hardware and software infrastructure to virtual infrastructure is been introduced to modern businesses in the world (Gelsinger, 2012). Therefore, the evolution and spread of Information and Communications Technology (ICT) are revolutionizing businesses. During recent years, the so-called digital technologies such as cloud computing, mobile computing, big data, artificial intelligence (AI) and Internet of things (IoT), are rapidly penetrating society and being utilized in various business operations and scenarios. Generally, technology has been used to support or substitute human activities, and ICT has been introduced for optimization and cost reduction in business activities. However, because digital technology brings value beyond what humans could bring, there are high expectations for ICT to be a driving force in the transformation of business models and processes of organizations. It can be said that, in the future, a further acceleration of the "digital transformation" in which a wide range of industries are increasingly adopting digital technologies and rewriting principles of competition and conventional business formats (Fukui, 2016).

In recent history different researches have discussed about those technologies as key factors changing the businesses forever (Olson, 2017). Cloud computing technology is changing and will change completely the way people lives and companies do the business with providing service oriented and cloud computing based platforms to allow the people and companies to get and offer services in different business models (Yale, Guojian, & Xinjian, 2016). Mobile communication enabling communication more and more effective and achieve ubiquitous information access and seamless communication interaction (Ye & Zhuang, 2017). AI technology enables an extraordinary array of applications that forge new connections among people, computers, knowledge, and the physical world. Some AI enabled applications are information distribution and retrieval, database mining, product design, manufacturing, inspection, training, user support, surgical planning, resource scheduling, and complex resource management. AI technologies help enterprises

reduce latency in making business decisions, minimize fraud and enhance revenue opportunities (Bai, 2011). The Internet of Things (IoT) envisions the seamless interconnection of the physical world and the cyber space. This provides a promising opportunity to build powerful services and applications in modern business world (Yang, Shen, & Wang, 2016). By connecting physical objects with multitude of sensors, IoT generates new business opportunities in current and future businesses (Ju, Kim, & Ahn, 2016). In 2020 there would be more than 50 Billion nodes connected to internet (Marinissen et al., 2016). These global smart devices/objects interconnected network known as Internet of Things (IoT) enables novel application and services, in commercial and industry sector. Such as industrial control systems, modern vehicles, production systems and critical infrastructure (Vermesan & Friess, 2014).

But due to list of identical reasons, the SMEs do not use new technologies mentioned above to their full potential. Furthermore, their principle focus is financial figure: further most of these technologies considered as a cost rather than an investment. Technologies are not trusted by the SMEs. This is common in use of technologies like E-commerce as well (Malawige & Nanayakkara, 2014). One of the better approached to understand the use of the technology is analyzing the usage of technologies like E-commerce is vital. E-commerce is the direct approach to use those technologies in business. There is no worldwide accepted definition for electronic commerce. According to (O'Brien, Marakas, & Behl, 2010) E-commerce is buying, selling and marketing, and servicing of products. Services and information over variety of computer networks (Grandon & Pearson, 2004). Another definition of e-commerce as "*the process of buying and selling products or services using electronic data transmission via the Internet and the www.*" In this research will look at this as all information communicated via Internet Protocol (IP) based computer network.

However having all the advantages, still the usage of E-commerce and/or ICT in business in SMEs is well behind the expectation both developing and developed countries due to different organizational factors (Hajli, Sims, & Shanmugam, 2014; Muslim & Sandhyaduhita, 2016; Savrul, Incekara, & Sener, 2014). In Sri Lanka more than 70 percent of businesses are SMEs But usage of electronic commerce is well below the expectation (Jayasekera, 2016). Compared to companies who do not practice E-commerce, adopters are well ahead (Paris, Bahari, & Iahad, 2016). Therefore, finding the reasons for not using those technologies in business is known as an important topic to be discussed. In the literature survey different factors, effecting for the E-commerce use in SME sector will be discussed. This paper has several section including literature review, discussion and managerial implications and conclusion and future research directions.

2. Literature Review

SMEs are one of the essential sectors of all countries' economies and in some countries consist more than 90 percent of businesses (Sandy, 2008). In general, SMEs are usually

enterprises that employ no more than 250 employees. But the technical definition varies from country to country as it does not have a global definition. In the Asia-Pacific region, it is usually based on:

1. Employment.
2. Assets.
3. Combination of the Employment and Asserts.

Some countries have different definitions for SMEs in the manufacturing and services sector and may exempt firms from specialized industries or firms that have shareholdings by parent companies (Kotelnikov, 2007). According to Ministry of finance in Sri Lankan context annual turnover in between 16 Mn LKR to 275 Mn LKR and if in manufacturing sector employees 11 -300 and in service sector 11-200 (Ministry of Finance, 2015).

According to (Dasanayaka, 2009), the small and medium scale enterprises are functioning as a lifeline in the informal sector of Sri Lanka due to contribute to the economy in terms of employments, tax income, exports innovation distribution, social stability, domestic resources usage, equitable income and regional development. In numbers, SME contribution to the country economy is very wide. Depicting the SMEs' contribution to employment and income generation reported that 75 percent of Sri Lanka's labor force was employed in the SME sector with the domestic market being the main outlet (Kapurubandara & Lawson, 2007). According to the National Policy Framework (Ministry of Commerce, 2015) for SMEs more than 75 percent of the total number of enterprises, provides 45 percent of the employment and contributes to 52 percent of the Gross Domestic Production (GDP). Beside the GDP contribution, it is very evidence that SME's provides more and more opportunities to women and youth participation in economic development of the country.

E-commerce is a powerful concept and process that has fundamentally changed the current human life (Nanehkaran, 2013). E-commerce transcend physical boundaries and reach the end customer different form traditional store (Xiao & Gang, 2017). In E-commerce, there are two essential sorts of online business: business-to-business (B2B) and business-to-consumer (B2C). B2C is the most popular among public but most of the revenue generated via B2B form. B2B is dominating the E-commerce (Amin & Hussin, 2014).

E-commerce adoption has a significant, positive relationship between SME's average sales growth rate (Abebe, 2014). Therefore, adopters of e-commerce technology have significantly higher average sales growth rate than non-adopters. Adoption of E-commerce and technologies strengthening the SMEs (Kapurubandara, Arunatileka, & Gnige, 2004). Through E-commerce, globalization will be achieved. Further it gives opportunities for investment funds and business to move beyond domestic and national markets to other markets around the globe, which allowing them to become interconnected with different markets (Savrul et al., 2014). Having all the advantages of using E-commerce in SMEs to improve the usage barriers should be identified and

removed. In the following section those barriers will be discuss and emphasize on main IT factors.

2.1 Information Technology factors effecting for E-commerce adoption in SME development

In Sri Lanka with the importance of SME sector, barriers were identified as challenges for development of the country. Many researchers identified those barriers in very wide spectrum and there is no proper evaluation based on clear framework. According to the (Weerasiri, Zhengang, & Perera, 2012), it has identified that in Sri Lanka there are considerable barriers for innovation in SMEs. Further they have identified that technology barrier is one of the barriers among those in SME in Sri Lanka. Different researches identified those barriers respect to the local environments. Thus, there is a need of analyzing the main factors which are affecting to hinder the adoption to innovation. Among them, factors in Information Technology is emphasized by researchers (Dubelaar, Sohal, & Savic, 2005; Kotelnikov, 2007; Maqbool Khan, 2016). Those information ion technology factors are summarized below paragraphs.

Factors effect from developing to developed countries in adopting to E-commerce is different (Rahayu & Day, 2015) and they have identified different perspectives which are included with Technology perspective, Organization perspective, Cost of adoption and Return on Investment (ROI), Individual Factors and Information and Network Security.

Manager's response to innovation, awareness of adoption and its usefulness effecting to the adoption (Syed, 2009). According to (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011) the perceived relative advantage, perceived compatibility, CEO's innovativeness, information intensity, buyer/supplier pressure, support from technology vendors and competition are effecting factors for E-commerce adoption.

In the study (Premkumar & Roberts, 1999) indicates significant variable is the relative advantage. Further to that management support and firm size also influencing. In a case study based research done by (Maryeni, Govindaraju, Prihartono, & Sudirman, 2012) found that technology factors and organizational factors effecting the adoption. In technology: simplicity, compatibility makes adoptability easy and equipped with proper infrastructure, ability to observe and good planning make E-commerce adoption.

A research study done to address factors effecting the E-commerce adoption by seller's side has identified "perceived ease of use" or compatibility, availability of infrastructure, improvement of customer communication, environmental culture. Further it has identified compatibility, benefit gain also can improve the adoption (Muslim & Sandhyaduhita, 2016).

E-commerce adoption factors discussed in a research done in Singapore SMEs they found that willingness, relative advantage, perceived benefit and compatibility is considered as important adoption factors. In one of the researches done to understand the E-commerce technology usage in organizational view point, found that technology

cost-benefit, risk and task-fit are issues are considerable (Rosli, Yeow, & Siew, 2012). Further in a similar study found that little knowledge on technology and unawareness of technological based advantages also considered critical in adoption to innovation and technologies (Iacovou, Benbasat, & Dexter, 1995).

IT expertise is one of the direct influences in E-commerce adoption. Without having IT expertise organizations may unaware of net technologies and may not like to take the risk of adoption (Premkumar & Roberts, 1999). According (Ajmal & Yasin, 2012) to one of the delays experienced by organizations in E-commerce adoption is lack of knowledge, skill and expertise. Therefore, having IT knowledgeable staff and expertise is a driving force for IT adoption. According to (Allison, 1999) for successful implementation of technology skilled and knowledgeable workforce is needed. Further to those studies also state that the lack of suitable staff with technical and ICT expertise adoption to technology is difficult and SMEs always lack of skills among ICT workforce is a common scenario (Alam & Noor, 2009). Lack of expertise is seriously hinder the adoption of technology. To find expertise from outside in the form out sourcing is costly and this has become a barrier for E-commerce adoption (Ghobakhloo et al., 2011). This is most of time addressed issues in adoption to technologies in general in most develop counties. Lack of ICT expertise and training in terms of skills and maintaining required hardware is identified as areas to improve the adoption to E-commerce (Kabanda & Brown, 2017). In the study (Kapurubandara & Lawson, 2006) concluded results with that skill of technology is a barrier for E-commerce adoption. In Sri Lanka lack of necessary skills and knowledge is ranked as highest barriers for adoption of E-commerce technologies (Kapurubandara & Lawson, 2008). Finding IT skill workers and use IT process outsourcing like mechanism would make a difference to this lack of skill and talent issues.

Security is a broader context of internet-based E-commerce systems. It is included with confidentiality, authentication, message integrity, privacy. This is more and more concerned in web transaction payments. Using different techniques like cryptography, encryption researchers tries to protect information from above issue but still the lack of some concerns it has inhibits the E-commerce adoption (Awa, Awara, & Lebari, 2015). In a study done in Singapore on E-commerce adoption state when using internet security is a most important consideration especially for merchants. Retailers are still confidents with traditional forms (Kendall, Tung Lai, Chua Khoon, Ng Chia Hong, & Tan Suan, 2001). According to (Savrul et al., 2014) security is one of the latest issues in E-commerce adoption in SMEs. In a study done in online shopping and E-commerce in developing countries found that security is effect the confidence in E-commerce (Khan, Xu, Dou, & Yu, 2016). Need of security is explained in terms of carried out the business with privacy, correctly and timely (Ajmal & Yasin, 2012). In a study conducted to find internal organization factors effecting for E-commerce adoption mentioned that security is one the items in IT readiness (Herzallah & Mukhtar, 2015).

European Union has categorized 5 main obstacles for E-commerce adoption. Among many in the list one of the concerns they have identified is problems related to ICT security and data protection (Savrul et al., 2014). Not having the confident on online communication security in payments effect the use of the technology in online shopping in developing countries (Khan et al., 2016).

As this transactions in businesses are happening via mobile based systems, they have identified those trust on mobile banking systems decide the adoption to E-commerce (Slade, Williams, & Dwivdei, 2013). Trust is discussed in other studies also in related to IT (Rehman & Coughlan, 2012). Further security and privacy is considered as research areas in this domain to improve the use of technology in business (Chatterjee, 2015). Security in web transactions also identified as a concern in this domain and it has discussed in terms of integrity and confidentiality of payment information (Emecheta, 2015).

3. Discussion and Managerial Implications

According to the literature analysis in section two, 3 different variables were identified. In this study, mainly three different areas were identified those can be listed as:

1. Technology Perspective.
2. Technology know-how or Expertise.
3. Information and Network Security concern.

Firstly, Technology perspective explains the effect in terms of relative advantages of using technology in business, Compatibility of new technology and simplicity of technology to be introduced. In relative advantages, focus goes to understand the SME owners perception if he/she understand the advantages of using technology in the business. If a company moves towards the E-commerce, they should be aware of the strategic advantage of new technology. Compatibility is another technological characteristic in E-commerce adoption, which was suggested in Diffusion of Innovations (DOI) theory by Rogers in 1983 as a driver of the decision to adopt a new system. This characteristic can be defined as the extent to which E-commerce is consistence with the existing technical infrastructure and finally under technology perspective. In simplicity, main concern is the easy access to E-commerce technology. Further it means easy to understand and easy to work with existing resources as much as possible.

Secondly, IT expertise or know-how is a well-known barrier. Comprehensive knowledge and skill of ICT is important to absorbing a technology is significant. But the skill levels are low in Sri Lanka compared to developed countries. In Sri Lanka majority of SMEs are ignored continues improvement and continue with existing old technologies. With majority of family based SMEs do not recognize the value of E-commerce and other new technologies (Weerasiri.S, Zhengang.Z, & Perera.T.R, 2012). Therefore, need of an evaluation of expertise is a need of the domain.

Thirdly, information and network security concerns. Security is an important component for financial health of every organization. Applications like E-commerce required mission-critical networks that accommodate all different types of information formats (Voice, Video, Data).

Therefore, when analyzing empirical studies summarized above, it is clear that IT factors are influencing the E-commerce adoption in SMEs. Studies done in both developing and developed countries states the same. In Sri Lanka even though the number of studies is limited, those limited studies states IT factors influences. Therefore, in this study this gap will be analyzed in detail with respect to IT perspective, IT expertise and Information and Network Security. Therefore, finding alternatives for above issues will make a positive difference in using IT based technologies in Small and Medium Scale businesses.

4. Conclusion and Future Research Directions

In view of the researches who are significant contribute to understand the factors influencing the adoption in both developed and developing countries, it is rather surprising that it has no clear evidence in recent literature identify Information Technology factors effecting to the use of advance communication technologies in SMEs. Most of the publications are towards organizational issues, environmental concerns and technology in general. As a matter of fact, there is no clear publication at least discussing technical barriers to move towards E-commerce like advance communication systems in a business.

In an emerging global competitive business environment, Sri Lankan SME sector contribute to the economy widely, but this study shows that the contribution is not up to the required level. Therefore, analyzing the areas that could improve the SME performance is becoming a valuable contribution to the economy. Therefore, all stakeholders need to work towards addressing those issues to improve the SME performance.

Identifying the technical or information technology factors which can influence organizations to overcome adoption barriers and start using advance communication technologies in SMEs is valuable today. Therefore, need of an IT factors analyzing framework is useful and measuring effect from each independent variable through the framework to find out the effect from each of those areas should be a research study in future. Further to recommend, a mechanism to configure E-commerce solution to improve business performance also will become key research area.

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