
Barriers of ICT Adoption in Small and Medium Sized Enterprises

SLM Thahir

Assistant Bursar, South Eastern University of Sri Lanka

GS Lani Mausudeen

South Eastern University of Sri Lanka

Abstract: Small and medium-sized enterprises (SMEs) make up a large part of Sri Lanka's economy. The spread of information and communication technologies (ICTs) is a prevalent fact in many parts of the globe, and for developing countries in particular, it provides tremendous prospects for solving persistent challenges of poverty and employment. According to the literature, SMEs are sluggish adopters of technology. The incorporation of information and communications technology (ICT) in business has radically altered the way businesses operate. In particular, the use of ICT in business has increased efficiency, fostered greater consumer interaction, and permitted customization, in addition to cost savings. ICT and e-commerce can help with a variety of company procedures. At the firm level, ICT and its applications can improve communication within the organization and make resource management more efficient. While information technology (IT) has grown rapidly in businesses, scholars have emphasized the importance of IT factors and aspects while paying little attention to the barriers and challenges to IT adoption. In light of this, we emphasize the significance of impediments to IT adoption inside Small and Medium Enterprises (SME). This study is to conduct in order to provide a better understanding of the hurdles to IT adoption within SME.

Key words: Small and medium-sized enterprises, Information and communication technology, barriers, adopt.

INTRODUCTION

Information and communication technology (ICT) have had an impact on practically every industry, including education, health, banking, and entertainment, to mention a few. Businesses are rapidly investing in ICT because of the numerous benefits it provides. Many studies have shown that there is a considerable impact on ICT and corporate success [1]. Small and medium-sized enterprises (SMEs) make up a large part of Sri Lanka's economy, with over one million SMEs accounting for approximately 75 percent of all businesses. These are found in all sectors of the economy and are estimated to contribute about 45 percent of total employment in Sri Lanka. (IFC World Bank) The today's business world is constantly changing. According to National Policy Framework for Small Medium Enterprise (SME) Development With the globalization trend, the SME sector is not merely seen as a sector for "protection and promotion" but, more importantly as driving force for "growth and development". Companies must be able to respond to such changes in order to thrive in today's competitive climate. The capacity to respond swiftly to these changes is becoming a competitive advantage for small and medium-sized (SMEs) organizations over those that are unable to be as flexible as other SMEs or larger corporations. These firms also demonstrate their capacity to collaborate with large corporations with whom they form new partnerships and strategic alliances [2]. These flexible organizations, functioning in a global context with the constant danger of new competition and changing markets, legislation, and suppliers, demonstrate the importance of having data, information, expertise, and valuing their employees' experience. Employees must constantly enhance their skills and knowledge to meet the

demand for new knowledge and skills; by improving their intellectual capital, employees contribute to a persistent increase in service and product innovation. The transformation of intellectual capital into new products and services, on the other hand, necessitates a fresh approach to organizational management, a flexible organizational structure, and the use of information and communication technology[3-5].

The spread of information and communication technologies (ICTs) is a prevalent fact in many parts of the globe, and for developing countries in particular, it provides tremendous prospects for solving persistent challenges of poverty and employment. In simpler terms, ICT stands for information, communications, and technology, and it refers to the modern science of collecting, storing, processing, and delivering information. ICTs are all sorts of technologies and products used to create, produce, analyze, process, package, distribute, retrieve, store, and transmit or receive information electronically in digital form. The incorporation of information and communications technology (ICT) in business has radically altered the way businesses operate. In particular, the use of ICT in business has increased efficiency, fostered greater consumer interaction, and permitted customization, in addition to cost savings. ICT and e-commerce can help with a variety of company procedures. At the firm level, ICT and its applications can improve communication within the organization and make resource management more efficient[6-8].

ICT can be used by small and medium-sized businesses to develop a list of contacts and to make use of available information in order to start and sustain new business operations. According to the literature, SMEs are sluggish adopters of technology, frequently purchasing long after release and dealing with handed down technology from other organizations. These concerns may have a negative impact on technology adoption. This issue is expected to grow in relevance as the supply and demand for more efficient and effective Internet communications technologies increase. While information technology (IT) has grown rapidly in businesses, scholars have emphasized the importance of IT factors and aspects while paying little attention to the barriers and challenges to IT adoption. In light of this, this paper emphasize the significance of impediments to IT adoption inside Small and Medium Enterprises (SME). This study is to conduct in order to provide a better understanding of the hurdles to IT adoption within SMEs [9-10].

RESULTS AND DISCUSSIONS

The influence of ICT on SMEs performance in order to assess the literature on potential direct and indirect effects of ICT on SMEs performance and identify those that could determine a business's success. The research methodologies used are methodical, logical, and comparative analysis. According to the author, in order to get a significant competitive edge, 12 main competitiveness components must be investigated: institutions, infrastructure, macroeconomic environment, health and primary education. Advanced education and training, Efficiency in the goods market, labor market efficiency, and financial market development Technological preparedness, market size, business sophistication, and innovation are all factors to consider. Which is highlighted in the World Economic Forum's Global Competitiveness Reports. Furthermore, a review of the literature reveals two types of SMEs performance: financial and strategic (operational), which include several aspects that are interrelated in the same way as the previously mentioned 12 elements. Strategic (or operational) performance characteristics may be viewed as those that produce indirect effects of ICT on the performance of SMEs. For maximum performance, the authors' findings stress the need of integrating ICT investments with internal competencies and organizational procedures. As a result, strategic (operational) performance measurements include not only changes in the company's economic activities, but also improvements made, satisfaction, and so on. The findings of the author's scientific investigation demonstrate that ICT has an impact on improving external and internal communication, and that ICT plays an important role in the performance of SMEs in terms of innovation. The importance of technology is overshadowed by the resulting social and economic successes.

The barriers to ICT adoption in SMEs and how to overcome the digital gap Conducted on micro and small businesses (SMEs) in chosen regions of Spain, Portugal, and Poland, and compared to

the findings of a comparable study conducted in California (USA). The information gathered through face-to-face interviews with SMEs' owners/managers and employees in Spain, Portugal, Poland, and the United States was used to conduct a comparative study using descriptive statistical methods. Analyzing the constraints that prevent SMEs from incorporating information and communication technology (ICT) and e-Business solutions into their business processes allowed researchers to pinpoint the reasons why SMEs are on the "wrong side" of the digital divide. According to the researcher, the main barrier to better ICT and e-Business utilization, and thus the main reason why SMEs face a digital divide, is a lack of proper knowledge, education, and skilled owner managers and employees within the enterprise ("skills access" barrier), rather than a lack of access to information technology ("material access" barrier). As long as European SMEs fail to accept this fact, the extent of Europe's digital divide will grow [11].

An exploratory study carried out to learn about the use and impact of Information and Communication Technologies (ICT) on Small and Medium Sized Enterprises (SMEs) in Oman. Researchers investigated into ICT infrastructure, software used, drivers for ICT investment, perceptions of ICT's commercial benefits, and SMEs' outsourcing tendencies. The findings of this study shed insight on the barriers to ICT adoption. A survey tool was used to obtain data on various aspects of ICT from 51 SMEs. According to the research's findings, only a tiny proportion of SMEs in Oman are aware of the benefits of ICT adoption. The primary motivators for ICT investment are to deliver better and faster customer service and to remain competitive. The majority of the SMEs indicated improved performance and other benefits from incorporating ICT into their operations. The majority of SMEs outsource the majority of their ICT activities [12].

Antlová traced the motivations and barriers to ICT adoption in 2009. In small and medium-sized businesses. The five-stage model proposed was used in this investigation. These are the five stages of development: Beginning, Survival, Market Positioning, Expansion, and Maturity. The author establishes a link between business and information strategy by discussing current business strategy, future business strategy, and information strategy. The elements that influence the acceptance of information and communication technology. Individual barriers include technological constraints, organizational impediments, and environmental barriers. As technological barriers, security issues and insufficient infrastructure have been mentioned. Barriers resulting from the surrounding environment include management style, a lack of financial resources, and insufficient market understanding. Author also mentioned insufficient knowledge and personal relationships in the organization in Individual obstacles [11].

Cultural Barriers in the Adoption of Emerging Technologies (Beekhuyzen et al., 2005) explores technology adoption in small and medium-sized firms (SMEs) and analyzes the literature on technology adoption in various national cultures. The author noted the expected e-commerce-related challenges and benefits; nevertheless, it also highlighted that market availability of relevant technologies is a major factor influencing ecommerce adoption and implementation. The author attempted to identify particular cultural impediments to technology adoption across cultures. The author also noted that the cost of e-commerce adoption and implementation was never mentioned by the SMEs of Southern Italy. Italy discovered significant adoption hurdles for SMEs due to organizational environment, notably resistance to change. Firm characteristics in Australia include organizational preparedness (people, suppliers), market pressures from competitors, size, sector, and even structural sophistication. The Irish SME industry appears to have been under-informed on the benefits of technology, with "majority of the SMEs in the inspected enterprises deriving only low-level gains from the usage of e-commerce platforms." Egan and colleagues (2003) this study found the following to be helpful in overcoming adoption difficulties in Ireland: A focus on advantages and direct expenses involved will be critical aspects in attracting future consumers and Strong systems. When the size and complexity of utilizing portable gadgets lowers, individuals are more inclined to accept them. Author conclude Identified cultural differences in technology adoption in Technology Spending, Centralized versus Decentralized Environments, Hardware & Telecommunications, Innovation/Risk taking, IS and Strategic Planning Integration and in Information Sharing [13].

The demographic characteristics of small and medium enterprises (SMEs) with regards to their patterns of internet-based information and communications technology (ICT) adoption, taking into account the dimensions of ICT benefits, barriers, and subsequently adoption intention. The research is being conducted to ascertain the internet-based ICT benefits based on the different demographic characteristics of SMEs, as well as the internet-based ICT barriers based on the different demographic characteristics of SMEs, and to examine internet-based ICT adoption intention based on the different demographic characteristics of SMEs. Among the most common benefits of ICT adoption, the author mentioned lower operating costs in communicating with customers and suppliers; increased speed in the delivery of goods by suppliers through better communication; increased efficiency through better co-ordination of firms in the value chain; closer working relationships among trading partners; effective communication tool with customers; and increased market exposure, which opens the enterprise to new business opportunities.. Among the most widely mentioned barriers to ICT adoption are: unsuitability for business because SMEs are not convinced of the financial benefits to be obtained; a lack of qualified IT personnel to develop and maintain the enterprise's e-commerce system; a lack of a proper network infrastructure in the company; a high cost of IT equipment and setup; expensive software prices; and an imbalance between investment costs and return on investment.[3] Imply that ICT adoption is no longer a choice but a requirement for various types of SMEs working in various sectors. SMEs should be conscious that they must be innovative not just by producing distinctive products and services, but also by being quick to adopt new technologies to complement their market offerings and boost their internal operations. Owners or managers of SMEs may acquire a more favorable attitude and become more receptive to the idea of adoption if they have a better awareness of the possible benefits of internet-based ICT adoption.

An exploratory study was conducted in Sri Lanka to identify hurdles to ICT and E-Commerce adoption among developing-country SMEs. The main tool of this exploratory study was a questionnaire, which was developed after evaluating a few earlier research studies on SMEs in developed countries. It was designed to investigate the internal and external barriers, as well as the internal and external support required by businesses, as well as their significance and influence. External impediments are classified as Cultural, Infrastructure, Political, Social, Legal, and Regulatory. All of the SMEs acknowledge that they encounter several internal and external challenges. They all, whether internal or external, inhibit the adoption process. The SMEs appear to agree that the constraints can be removed through internal and external help activities. Priority with external support operations, particularly legal and regulatory, demands direct government involvement for replies. Internal hurdles such as a lack of needed skills and a lack of awareness of any return on investment restrict SMEs from implementing ICT and e-commerce technology. Another barrier appears to be that e-commerce is not suited to the way business is conducted. According to the author's poll, the majority of respondents believe that political constraints have a substantial impact on any innovation or expansion [14].

The questionnaire was distributed to small business owners in Gauteng and KwaZulu Natal who have registered their small businesses with an approved state institution for SMEs. An item analysis was performed to see whether the seven items on the theme "Barriers to ICT" are connected. The seven questions were subjected to a 2-step cluster analysis to determine whether there are distinct trends among respondents indicating how important they regarded the various elements as barriers to SMEs when they embrace ICT to communicate and/or conduct business. The most significant impediments to using ICT – to communicate and/or conduct business – are a lack of financial resources and the high expenses of ICT systems. This is followed by a lack of experienced people capable of handling or maintaining ICT systems, as well as a lack of expertise required to set up the ICT systems. Other impediments include a lack of expertise and comprehension of ICT, the fact that few consumers and suppliers have internet connection, that it is not widely employed in their existing business operations, and that ICT carries too many dangers.

The Information and Communication Technology Adoption in Sri Lankan SMEs, including current levels of ICT usage and perceived barriers. 70 entrepreneurs were chosen at random from those who registered for the Diploma Course in Small Business Management at the University of Colombo, Sri Lanka, using the convenience sampling approach. Entrepreneurs responded to the survey questions over a four-week period, but three were eliminated because they were answered incorrectly. As a result, the final sample included 67 SMEs. Principal component factor analysis with varimax rotation was used to assess responses to perceived barriers. The author concludes that the biggest perceived impediment to ICT adoption in SMEs is a lack of sufficient IT infrastructure. The author prioritized the following factors: lack of sufficient internal IT infrastructure, second, lack of trust, third, lack of personal motivation, fourth, Internet connection issues, and fifth, lack of understanding [15].

The SMEs in the manufacturing, service, and retail sectors to assess and analyze the benefits of e-business adoption in Yemeni SMEs Considering the challenges to implementing e-business in developing nations' SMEs as in Yemen. This study adds to the existing literature on e-business adoption by identifying the elements involved in e-business adoption in Yemeni SMEs. This study accomplishes this by creating a unique e-business Measurement Evolution model based on current literature and the e-adoption ladder model. The disparities in the size and age of the SMEs, as well as the significant link between the size and age of the SMEs and the level of e-business adoption, were discovered using an independent sample t test. Linear regression was used to investigate the association between predictor factors and the extent of e-business adoption. The biggest barriers to SMEs adopting e-business mentioned by the author include company size, a lack of government backing, a lack of ICT infrastructure, the high cost of the Internet, and a shortage of electricity. Author confirm that the barriers mentioned above while also presenting new barriers such as a low level of technology usage within the organization, a lack of qualified staff to develop, implement, and support websites, an unconvincing benefit to the organization, and limited financial, computer software, and hardware resources.

Table 1. Overview of selected articles on Barriers of ICT Adoption in SME's

Authors	Barriers of ICT Adoption in SME's
Murtaza & Ashrafi, 2008	<ul style="list-style-type: none"> • Lack of necessary internal skills is a major barrier • Monetary costs of implementation • Time to implement ICT • Uncertain about return on investment • Lack of available information about relevant technologies • Lack of top-management support/direction/ planning [12]
Tan, 2010	<ul style="list-style-type: none"> • Unsuitability for business • Lack of qualified IT personnel • Unavailability of a proper network infrastructure • High cost of IT equipment and setup • Expensive software prices • Imbalance between investment costs and return on investment [16]
Cant et al., 2016	<ul style="list-style-type: none"> • Lack of financial resources • High costs of ICT systems • Lack of skilled workers • Lack of knowledge and understanding [17]
Tarutė & Gatautis, 2014	<ul style="list-style-type: none"> • High investments and / or usage costs • Owner/manager characteristics • Infrastructure • Firm characteristics • Social barriers

	<ul style="list-style-type: none"> • Adoption and implementation cost • Cultural barriers • Return on investment Political • Legal and regulatory barriers [18]
Arendt, 2008	<ul style="list-style-type: none"> • Lack of funds or access to the technology • Low quality of human capital of SMES – the biggest barrier is the lack of knowledge and skills [11]
Antlová, 2009	<ul style="list-style-type: none"> • Higher investment • problems of security, insufficient infrastructure • Management style, shortage of financial sources. • insufficient knowledge of the market • Insufficient knowledge, personal relations in organization). [19]
Kapurubandara & Lawson, 2001	<ul style="list-style-type: none"> • Lack of skills required • Lack of awareness • Structure of organization [14]
Athapaththu & Nishantha, 2018	<ul style="list-style-type: none"> • Lack of proper IT infrastructure • Lack of personal motivation • Internet connection issues • Lack of trust • Lack of knowledge [15]

CONCLUSION

This study provides insight into the problems that SMEs experience when adopting ICT in developing nations. SMEs are under intense competitive pressure. They must seek out new business prospects in order to survive the existing commercial competition. This attempt must be greatly aided by information and communication technologies. However, the implementation of ICT can generate a variety of challenges for SMEs, such as limited financial resources, a lack of expertise with ICT, and staff with insufficient knowledge and abilities in the area of computer literacy. SMEs should be more aware of ICT devices and internet-based ICT activities in order to improve their capabilities. The findings of this study will help managers, SME owners, experts, researchers, and IT adopters in general establish a better knowledge and understanding of the barriers impeding IT adoption inside SME, for both IT professionals and IT researchers in both developing and developed countries.

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