DRIVERS and challenges of ICT adoption by SMES in Accra metropolis, Ghana.

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ABSTRACT:

The purpose of this study is to explore the key drivers and challenges of Information and Communication Technologies (ICTs) adoption by Small and Medium Sized Enterprises (SMEs) in the Accra Metropolis of Ghana. SMEs play a major role in developing and developed economies in job creation and diversification of economic activities. The literature shows that while there are many drivers of ICTs adoption by SMEs, there are equally many challenges from various factors. SMEs that effectively utilize ICTs can compete efficiently in both domestic and global arenas. Understanding the drivers, and challenges to ICT adoption by SMEs especially in the less developed countries, and in the Accra metropolis of Ghana in particular have not been addressed adequately. This paper attempts to address this gap. A survey questionnaire was used to collect data from 189 working MBA students from different SMEs in Accra, Ghana. Quantitative approaches were used for data analyses. The study identified the key challenges to ICT adoption as lack of internal capabilities, high cost of ICTs, poor infrastructure, financial constraints, and lack of information about suitable ICT solutions and lack of time to implement. The study also identified the key drivers of ICT adoption as the desire to increase customer service and responsiveness, increase ability to compete, improve overall communication, increase sales and profit, and to have better access to information. The result of the study will be beneficial to current and future SMEs in the Accra metropolis.

Keywords: ICTS, SMES, Challenges, Drivers, Ghana, Adoption.

INTRODUCTION

The use of Information and communication technologies (ICTs) is very widespread among businesses of all sizes. Many Small and Medium Sized Enterprises (SMEs) are increasingly adopting ICTs in both developed and developing countries. The perceived benefits and firm and sector-specific strategies seem to drive the adoption and use of ICTs. The object of this study is to investigate the drivers and challenges of ICT adoption by SMEs in the Accra metropolis of Ghana.

The literature shows that the desire for lower costs, improved productivity, higher product quality, higher customer satisfaction, and ability to focus on core areas are some of the key drivers of ICT adoption. The literature further shows that research in the adoption of ICTs by SMEs is growing. The advancement in ICTs has a major influence on globalization, and rapid revolutions in information and knowledge base (Kaynak et al., 2005; Pavic et al., 2007). The global proliferation of the use application of ICTs by organizations is not only for cost cutting and improving efficiency, but additionally for providing better customer services.

SMEs are also driven to adopt appropriate ICTs for the purpose of improving their internal processes, improving their product through faster communication with their customers, and better promoting and distributing their goods and services through online presence. Besides, governments around the world are adopting ICTs for the purpose of providing better services to their citizens. Invariably, the adoption of ICT by organizations requires a business environment encouraging open competition, trust and security, interoperability and standardization and the availability of finance for ICTs (UNCTAD 2004).

Despite these aforementioned drivers, there are an abundance of challenges to ICT adoption by SMEs worldwide stemming from both internal and external factors. Lack of internal capabilities, high cost of ICT acquisition, and lack of information about suitable ICT solutions and implementation are some of the factors. In many less developed countries, majority of SME customers tend to be local and may not ask for or require technology to do business. Besides, among other issues, SMEs markets also tend to need a high degree of human interaction. Other challenges in the literature will be visited in the literature review.

Information and Communications Technologies (ICTs)

Information and communications technologies (ICTs) is a term that includes any communication device or application, including radio, television, mobile phones, computer and network hardware and software, satellite systems and so on, as well as other associated various services and applications, such as videoconferencing and e-learning. ICT is basically any technology that is utilized to support information gathering, processing, distribution and use (Beckinkinsale and Ram, 2006).

Small and Medium Sized Enterprises (SMEs)

SMEs play very essential role in the general economy of any country, especially in the developing ones because of job creation and development of the social economy for the region (Barba-Sanchez et. al, 2007). SMEs are often the main driver for a country's economic growth. It is estimated that more than 95% of enterprises across the world are SMEs, accounting for approximately 60% of private sector employment (Ayyagari et al. 2011). In Ghana, SMEs are even more prominent in the local economy, representing about 92% of Ghanaian businesses and

contributing about 70% to Ghana's GDP (Abor and Quartey, 2010). Besides, SMEs in Ghana provide over 80% of total employment (Abor and Quartey, 2010).

Although there is no universally agreed definition of SMEs, some define it in terms of the number of employees, annual turnover, capital employed or size of the organization. The definition of an SME maybe regional or country-specific. For developing countries, the definition can be based on economic context or as defined by the national government. By the Formula proposed by Brookings Global Economy Development Agency, an SME in Ghana would be defined as having annual turnover of between $23,700 and $2,370,000. (Gibson and van der Vaart, 2008). The national government of Ghana defines an SME as any enterprise with maximum of 100 employees. (Kayanula, D., & Quartey, P., May 2000).

Ghana is a developing country in Africa with Accra as the capital and largest city. The categories of SMEs in Ghana range from urban to rural enterprises. Their main activities include soap and detergent making; fabric weaving; cloth designing and tailoring; textiles and leather production; village blacksmithing; firing ceramics; timber production and mining; bricks and cement making; brewing beverages; baking and food processing; creating wooden furniture; electronic products assembly; agro-processing; production of chemical based items; mechanical activities (Kayanula and Quartey, 2000). These are very clear indications that SMEs in Accra may have a significant impact on the economic growth, income and employment of the metropolis. Besides, the recent oil discovery in Ghana has made her one of the fastest growing economies in the world. The International Monetary Fund (IMF) has predicted that Ghana's economy will be the fastest growing in the world in 2011.

Many studies exist on the drivers and challenges of ICT adoption by SMEs in advanced and developed regions of the world such as Europe, Asia, and North America; however, a comprehensive review of the existing literature reveals that relatively few number of studies of this type have been conducted in the less developed countries Sub Saharan African cities on the drivers, and challenges to ICT adoption by SMEs, and in the Accra metropolis of Ghana in particular. This paper attempts to address this gap. Thus, this study attempts to identify the drivers and challenges of ICT adoption by SMEs in the Accra metropolis of Ghana. Information from this study could assist other organizations in this location and other similar metropolis to make informed decisions on ICT adoption.

This paper is organized as follows. Section 1 presents the introduction. In section 2, the literature review of the drivers and challenges of ICT adoption in SMEs in developing countries are presented. Next, in section 3, the research methodology is presented. Data and results follow in section 4. Finally, in section 5, the summary and conclusions are presented.

LITERATURE REVIEW

Researchers in several studies have identified the drivers and challenges of ICT adoption by SMEs in developing countries. SMEs are broadly known to play a very important role in the economy of a country. Studies have revealed that large organizations generally have the resources to adopt ICTs whereas the SMEs that are desirous to adopt are handicapped by financial and human resources. Although ICTs are much cheaper than before, they still represent a considerable investment for SMEs that usually lack such funds. Besides, SMEs usually do not have the appropriate skills available in-house and thus have to train existing staff or outsource most ICT functions of the organization.

Drivers of ICT adoption

A majority of the SMEs in the literature have reported a positive performance and other benefits by utilizing ICTs in their businesses. Overall, the following main drivers have repeatedly appear in the literature in both developing and developed nations: perceived benefits and increased sale (Dubelaar et al., 2005; Scupola, 2009), and improved customer services (Scupola 2009; Osmonbekov, 2010; Tan et al., 2010). In their study, (Esselaar et al., 2007), presented ICT usage and its impact on profitability of SMEs in 13 African Countries.

A study by Akomea-Bonsu and Sampong (2012) on the impact of ICTs on SMEs in the Kumasi Metropolis in Ghana, found that most of the SMEs in Kumasi reported a positive performance and other benefits of ICT adoption. A literature survey by (Barba-Sanchez, et aTheir study however did not include any reference to ICT adoption in any African country.

Overall, existing literature indicate that many SMEs are aware of the benefits derived from the adoption of ICT but are faced with numerous challenges. While SMEs in developing countries are driven to adopt ICTs due to their many potential benefits (Irefin ET. Al, 2012), the study reveals that many SMEs are yet to reap these benefits due to the challenges discussed in the following section..

Generally, ICTs provides numerous benefits across a wide range of intra-firm and inter-firm business operations and transactions. SMEs are slowly realizing the positive impact that ICTs, which include increased sales due to web presence, better communication via e-mail and effective processes due to their utilization in their organizations. With ICT use, businesses can interact more efficiently and become digitally networked (Buhalis, 2003). Spanos et. al (2002) stated that ICT eliminates distance and time constraints in accessing required information flows and hence improves coordination of activities within organizational boundaries.

It is therefore now common find small firms, including some with fewer than ten employees, to have at least one computer terminal and with Internet access. The application of various types of business software can improve information and knowledge management within and outside the firm, leading to more efficient business processes and productivity.

Challenge to adoption of ICTs

Existing literature reveals that SMEs face numerous challenges to the adoption and use of ICTs. Challenges of ICT adoption are common among SMEs in both the developed and developing countries, but developing countries are largely faced with more challenges. In the literature, the most frequently cited challenges are poor telecommunications infrastructure, lack of skilled or limited ICT personnel, ineffective integration ICT into business processes, high costs of ICT equipment, and government regulations for e-commerce (Tan, et al., 2010). Other studies have determined that technology constraints due to unskilled technicians, including ignorance on the worth of ICTs and return on investment have been the major reasons for lower rate of adoption (Duan et al., 2002; Fulantelli and Allegra, 2003; Hashim, 2007; Jones et al., 2003; Khatibi et al., 2003; Kogilah et al., 2008). Other challenges include nongovernmental support, expensive initiative, risk, complex procedure, managerial leadership, costs and benefits, security, legal issues, business complexity, human capital deficiency, turnover of technical staff, and customer services (Chong et al., 2001; Fink and Disterer, 2006; Jones et al., 2003; Khatibi et al., 2003; Tan and Teo, 2000; Yeung et al., 2003).

In a study by Debrick and Kraemer (2001), they state that the major challenges to ICT adoption 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. Looi (2003) states that lack of external pressure from suppliers and customers inhibit e-commerce adoption.

The literature indicates that many of these challenges can be successfully addressed by large organizations due to their resources and skilled personnel. As SMEs suffer from severe scarcity of resources (Riquelme, 2002), the perceived challenges of ICT adoption by SMEs may differ considerably from those of large organizations. As such, some researchers (e.g. Heung, 2003; Tan, Tyler and Manica, 2007; Tan et al., 2009; Tan et al., 2010; Johnson, 2010) examined the perceived challenges to ICT adoption by SMEs. The study by Tan (2007), find a lack of management willingness to utilize ICT to be a major inhibitor for SMEs.

A study by Chau and Turner (2002) argue that the owner's lack of knowledge of ICT technology and perceived benefits is a major challenge to the adoption of ICT. According to a study by (Mehrtens et al 2001) economic, political and cultural factors also present challenges to ICT adoption by SMEs in Africa. Akomea-Bonsu and Sampong (2012) reported that lack of internal technical capabilities, financial constraints, poor or lack of infrastructure and personal factors were the main challenges to ICT adoption in the Kumasi Metropolis of Ghana. Many developing countries still have poor communications infrastructure. Poor communications infrastructure results in limited internet access and higher costs. Outdated equipment and state-owned monopolies often result in expensive charges and limited coverage, especially in rural areas. This discourages SMEs from adopting even the basic ICTs of fixed lines or mobile phones.

The results from the study by Irefin et. al (2012) on the factors that affect the adoption of ICT in SMEs in Lagos, Nigeria, revealed that cost, availability of ICT infrastructure, government support, management support and business size were major barriers. Obiri-Yeboah and Odei-Lartey (2013) studied the factors that drive internet usage among SMEs in Kumasi, Ghana. Their study showed that access to internet facilities was not a critical challenge. There were strong relationships between factors such as age, education, usage experience, and the pattern of internet usage in business operations as drivers ICT adoption.

Although, as reflected above, some studies have been conducted on the drivers and challenges of ICT adoption by SMEs in Ghana, however, such study has not been conducted in the Accra metropolis of Ghana. Accra is the largest city and capital of Ghana. Thus, this study attempts to add to the body of studies by investigating the drivers and challenges of ICT adoption by SMEs in this Metropolis.

RESEARCH METHDOLOGY

Approach and Participants.

To meet the aims and objectives of this research, a questionnaire was developed to assess the perceived and experienced drivers and challenges of ICT adoption by SMEs in the Accra Metropolis of Ghana. A survey approach was adopted since it is useful capturing the characteristics of a population. An online survey (Zoomerang) methodology was utilized for data collection from participants. The online survey approach proved to be beneficial due time reduction and flexibility of the participants to complete the questionnaire and also in the production of an automated data analysis.

The target survey participants were 230 working individuals from different SMEs located in the Accra Metropolis in Ghana who were enrolled in an MBA program. They were provided login information to the website to complete the online survey. Only 189 students completed the questionnaires. The questionnaire collected information of demographic profile of participants and included questions on firm type, respondents' job title, firm size, annual revenue, and age of the business. As indicated in Tables 1, 2, and 3 (Appendix) were the survey instruments utilized to collect the participants' demographic profile, drivers of ICT adoption, and challenges of ICT adoption respectively.

Questionnaire Design

The questions included in the questionnaire were grounded in the extant literature on ICT adoption drivers and challenges. The perceived drivers and challenges were measured by fifteen and sixteen items respectively from previously cited factors in the literature. From the analysis of the literature, a set of drivers and challenges of ICT adoption were identified, and were the basis of the questionnaire design.

The main sections of the questionnaire were split and grouped by subject area (e.g. drivers of ICT adoption, challenges of ICT adoption). In each section, respondents were asked to indicate their agreement with statements relating to ICT adoption issues using a five-point Likert scale, anchored by 1 = (strongly disagree) to 5 = (strongly agree) to provide a detailed scale response. Five-point Likert scales are a common approach in management research. Other questions on the survey were pre-determined answer options, which respondents had to select from. These were used to allow classifications and respondents demographic profile to be collected.

RESULTS AND DISCUSSION

This section provides the results and discussion on the findings from the data analysis from the survey. The respondents were deemed a good representative of the SME population in the Accra Metropolis of Ghana based on a face to face discussion the researcher had with them in terms of industry association. Based on the 189 completed survey questionnaires, simple statistical analyses were performed.

As indicated in Table 1 (Appendix), a summary of the key characteristic of the participating respondents which includes Job Title, Type of Organization, Firm Size, Annual Revenue, local or International organization, and age of organization are presented. From the analysis of the data from the questionnaire, industries represented included construction (2.9 per cent), engineering (1.7 per cent), catering equipment and food manufacturers (1.7 per cent), pharmaceuticals and healthcare (3.4 per cent). Other industries represented include telecommunications (4.6 per cent). A total of 8.4 per cent of the respondents were manufacturers, and 7.2 per cent personal services. The largest organizational type is banking/finance with 25.1 percent.

Drivers of ICT Adoption

The analysis of the survey data reveal that SMEs in the Accra Metropolis of Ghana perceived and experienced that the adoption of ICTs could deliver a number of potential benefits for them. As indicated in Table 4 (Appendix), are the mean (M), standard deviations (SD), and

ranking (Rank) for the key drivers of ICT adoption. The ratings scale ranged from 1 (strongly disagree) to 5 = (strongly agree). Only results with a mean score of more than 3 are discussed here.

The most important driver the respondents associated with ICT adoption is an increase in customer service and responsiveness (M=4.27, SD=0.72, Rank =1). It is not surprising that the results for this particular element also had the highest consistency of opinion (SD=0.72).

The second most important driver of ICT adoption is an increased ability to compete (competitive advantage), (M=3.98, SD=0.67, Rank=2). These two drivers - customer responsiveness and ability to compete seem to support each other and highlight the relational priorities of ICTs to SMEs in the Accra Metropolis. These results indicate that SMEs in the Accra Metropolis of Ghana have a good understanding of its benefits, not just on their own organization, but on the needs of the end customers and other organizations.

Improved communication within and outside the organization was cited as the third main driver of ICT adoption with (M=3.94, SD=0.80, Rank = 3).

The fourth among the key driver is that the adoption of ICT would assist in increasing profit in their various organizations. (M=3.80, SD=0.99, Rank = 4).

The next key driver is the ability for managers to have better access to information, (M=3.48, SD = 0.71, Rank =5).

The final key driver are the perceived benefits of ICT adoption (M=3.42, SD=0.15, Rank =6).

Challenges to ICT Adoption

In spite of the major contribution of SMEs to a countries' economy, SMEs continue to face numerous challenges with the adoption of ICTs. In general, SMEs experience challenges in both developed and developing countries (Schreiner and Woller, 2003). A report by Lane et al (2004) stated that SMEs are not prepared to adopt e-commerce and web portals and that web based selling of goods and services are not yet practical. Taylor and Murphy (2004) argued that SMEs occupy small/clearly defined niche markets that do not need global connectivity as reluctance to ICT adoption.

The analysis of the survey data reveal that SMEs in the Accra Metropolis of Ghana perceived and experienced that the adoption of ICTs could deliver a number of potential benefits for them, however there were also expressions of challenges to adoption.. As indicated in Table 5 (Appendix), some of the main challenges to ICT adoption for SMEs in the Accra Metropolis of Ghana. The results in the Table represent mean scores, standard deviations, and rank of the barriers. Again, only results with a mean score higher than 3 are discussed.

First among the main challenges is cost which was cited as the most hindrance to ICT adoption with a (M=4.1, SD=0.25, R=1).). (Harindranath et al 2008) also identified cost as the single most factor threatening future investment in ICT. High ICT acquisition and implementation cost is a challenge for SMEs. Difficult financing options may also limit SMEs ability to purchase ICTs. Most SMEs have limited or nonexistent IT budgets. Besides, there are costs of upgrading and maintenance due to rapidly changing technologies

Second, unreliable power supply and inadequate telecommunication infrastructure (M=3.58, SD=0.44, R=2) were cited as challenges. Many developing countries still have frequent power outages and poor communications infrastructure. Outdated equipment and state-

owned monopolies often result in expensive charges and limited coverage, especially in rural areas. This discourages SMEs from adopting even the basic ICT of fixed lines or mobile phones.

Third, lack of technical expertise to engage in ICT (M=3.33, SD=0.61, R=3), was also cited as a major challenge. This is consistent with other studies that SMEs do not have enough human resources (Wymer and Regan 2005). The shortage of technical expertise to engage in ICT may become impediments to implementation once adoption decisions are made. The poor ICT literacy of employees in SMEs often hinders ICT adoption. So when mangers of SMEs decide to adopt ICT, they face an obstacle of unskilled personnel. Skill upgrading is usually costly both in time and money. Outsourcing some of the high-skilled jobs therefore becomes one way of overcoming these shortcomings.

Fourth among the main challenges is lack of time to implement ICTs (M=3.60, SD=0.38, R=4).

The fifth among the main barriers is the uncertainty about the benefits or return on investment of ICT adoption (M=3.12, SD=0.29, R=5). This finding also confirms findings of (Harindranath et al 2008), (Chibelushi 2008) and (WestFoucs 2007) study who found concerns over costs and uncertainty over the business benefits.

The sixth and least among the key challenges to ICT adoption is the high level of complexity associated with ICT Implementation (M=3.01, SD=0.77, Rank=6). The literature shows that the planning and management of ICT projects has a very poor record in developing countries (Galliers et al.1998, Qureshi 1998).

SUMMARY AND CONCLUSIONS

Information and communications technologies are increasingly becoming part of the daily activities of consumers and businesses alike. Small and medium sized enterprises are exploring the use of or are using ICTs more than ever before to improve their business processes and to link with customers and business partners**.**

This study has identified the key drivers and challenges of ICT adoption by SMEs in the Accra Metropolis of Ghana. A survey of 230 working MBA students from SMEs in the Accra Metropolis of Ghana was conducted and analyzed to ascertain the results.

The study first reveals the six key drivers of ICT adoption are the desire to 1.) Improve customer service, 2.) Increase ability to compete with other organizations, 3.) Improve communication within and outside the organization, 4.) Increase profit from online sales and web marketing, 5.) Provide managers better access to information, and 6). The perceived benefits of ICT adoption.

The study also reveals that the six key challenges to ICT adoption amongst SMEs in the Accra Metropolis are 1), Financial ability to invest in ICTs, 2). Poor or lack of infrastructure due to low bandwidth, and epileptic electric power supply, 3). Lack of skilled personnel to engage in ICT, 4). Lack of time to implement ICTs, 5). Uncertainty of the benefits or return on investment, and 6). The high level of complexity associated with ICT Implementation. Furthermore, managers' perceptions of the benefits of technologies which depends depend on previously adopted technologies, firm size, financial strength, manager's ICT skill, business location, the age of the business, local or international, type of business, are all factors to some extent.

The literature review and the results of this study suggest that it is probable that the adoption of ICT in the Accra Metropolis of Ghana by SMEs will contribute to their growth and increase in sales, and competitive edge despite the identified challenges. The study also confirms

that ICT adoption can provide them a better method to process and store information, communicate with customers and business partners and thereby improving efficiency.

The result of the study will be beneficial to current and future SMEs in the metropolis in decision making for ICT adoption. Furthermore, it is of motivational value to SME owner-managers and IT professionals to explore deployment of ICTs in their various organizations.

This study, however, does not address the relationship between respondents' characteristics and ICT adoption. This is a subject for future studies.

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APPENDIX

TABLE1. Summary of Respondents demographic profile

JOB TITLE	***Frequency***	***Percentile***
Owner/CEO	*29*	*15.2*
Non IT Manager	*47*	*24.8*
Staff	*106*	*55.9*
Other	*8*	*4.1*
ORGANIZATION TYPE		
Engineering	*3*	*1.7*
Personal Services	*14*	*7.2*
Investment Firm	*4*	*2.2*
Accounting/Banking/Finance	*47*	*25.1*
Transportation	*17*	*8.9*
Pharmacy/Medical/Health	*6*	*3.4*
Power Management and Utility	*15*	*7.9*
Insurance	*15*	*8.1*

Construction / Real Estate	*5*	*2.9*
Manufacturing	*16*	*8.4*
Marketing/Distributive Sales	*3*	*1.4*
Import/Export	*5*	*2.6*
Education	*15*	*7.9*
Government	*4*	*1.9*
Restaurants and Hotels	*3*	*1.7*
Telecommunication/Communication	*9*	*4.6*
Others	*8*	*4.1*
FIRM SIZE		
1-9	*11*	*5.6*
10-19	*16*	*8.4*
20-29	*11*	*5.9*
>=40	*151*	*80.1*
ANNUAL REVENUE ($)		
<500,000	67	35.3
500,000- 1 million	52	27.4
1-3 million	45	23.9
3-10 million	25	13.4
LOCAL or INTERNATIONAL		
Local	154	81.3
International	35	18.7
AGE OF BUSINESS (Years)		
Ten years or less	105	55.7
More than ten Years	84	44.3

Table 2: Survey Instrument for Drivers of ICT adoption

Drivers of ICT Adoption	**1. Strongly Disagree**	**2. Disagree**	**3. Neutral**	**4. Agree**	**5. Strongly Agree**
Improve customer service					
Increased ability to compete – competitive advantage					
Increase profit from online sales and web marketing and globalization					
Provide managers better access to information					
Improved communication within and outside the organization					
Improve productivity					
Better production planning					
Improve Quality Control					
Change in technology / current trend					

Perceived benefits					
IT experience of Owner					
Reduce Cost and Time					
Nature of Business					
Demand by customers and other businesses					

Table 3: Survey Instrument for Challenges to ICT adoption

Challenges to ICT Adoption	**1. Strongly Disagree**	**2. Disagree**	**3. Neutral**	**4. Agree**	**5. Strongly Agree**
Lack of time to implement ICT					
Frequent power interruption					
The high level of complexity associated with ICT implementation					
High implementation cost					
Lack of in-house technical expertise to engage in ICT					
Resistance to changing work practices due to adoption of ICTs					
Lack of compatibility between current technical infrastructure and ICTs					
Management concerns about ICT security					
Lack of sufficient interest of your major business partners to participate in ICT initiatives					
Business model is not suitable to adopting ICTs					
Lack of management willingness to engage in ICT					
Unsure of benefits or return on investment					
Poor or inadequate telecommunication infrastructure					
Limited ICT literacy of SME managers					
Small scale operation (firm size)					
Lack of financial capacity/high interest rates.					

Table 4: Summary statistics of drivers of ICT adoption

Drivers	Mean	Standard Deviation	Rank
Improve customer services	4.27	0.72	1
Increase ability to compete – competitive advantage	3.98	.67	2
Increase profit from online sales and web marketing	3.80	0.99	4
Provide managers better access to information	3.48	0.71	5
Changing technology / Current trend	2.99	0.96	7
Improve communication within and outside the organization	3.94	0.71	3
Improve productivity of the managers	2.80	0.99	9
Reduce Cost and time	2.91	0.90	8
Improve production planning	2.67	1.11	10
Improve Quality Control	2.45	0.43	11
Perceived benefits	3.42	0.15	6
IT experience of owner	2.51	0.56	14
Nature of business	2.65	0.25	13
Demand by customers and other businesses	2.72	0.19	12
Age of Business	2.45	0.12	15

TABLE 5: Summary statistics of challenges to ICT adoption

Challenges	Mean	Standard Deviation	Rank
Lack of time to implement ICTs	3.60	0.38	4
Frequent power interruption	2.87	0.77	10
High level of complexity with ICT Implementation	3.01	0.77	6
High implementation cost	4.1	0.25	1
Lack of in-house technical expertise to engage in ICT	3.33	0.61	3
Resistance to changing work practices due to ICT adoption	2.73	0.54	14
Incompatibility between current infrastructure and ICTs	2.91	1.01	8
Management concerns about ICT security	2.8	0.55	12
Insufficient interest of key business partners participation	2.93	0.67	7
Your business model is not suitable to adopting ICTs	2.75	0.25	13
Lack of management willingness to adopt ICT	2.89	0.44	9
Unsure of benefits or return on investment	3.12	0.44	5
Poor or inadequate telecommunication infrastructure.	3.58	0.44	2
Limited ICT literacy of SME managers	2.85	0.95	11
Small scale operation (firm size)	2.6	0.15	16
Lack of financial capacity/high interest rates.	2.7	0.11	15