Conceptual Model for Assessment of the Use of ICT among Small and Medium Scale Enterprises (SMEs) in Oyo State, Nigeria

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Abstract

Purpose

Small and medium enterprises (SMEs) have emerged as promising opportunities to eliminate and reduce unemployment globally, and at the same time, brought about increased levels of technological advancement which has equally revolutionized the dynamics of the business terrain. Contrarily, many SMEs in Nigeria are not utilizing ICT due to some major barriers as identified in the literature. To this end, this study aims to propose a conceptual model for assessing the influential factors of ICT use among the SMEs.

Design/methodology/approach

To complement this, a survey was conducted in Oyo South Senatorial district of Oyo State, Nigeria. A total number of Seventy-three (73) SMEs operators were randomly selected as the sample size. The descriptive statistics which includes frequency counts and percentages were used to describe the sample and to assess ICT use. Regression analysis was used to assess the relationship and influence of technology, organization and environment characteristics on use of ICT.

Findings

The findings revealed that ICT use has significant positive relationship with the constructs of the TOE Framework. the TOE Constructs also have joint influence on the use of ICT by the SMEs. Discussion of findings, summary and conclusion along with research contribution were also presented in this study.

Originality/value

The Technology, Organization, and Environment (TOE) framework has been widely used in examining the factors influencing IT adoption generally, but few studies have attempted to use this framework to measure ICT use among the SMEs.

Keywords: Information and Communication Technology, e-commerce, business applications, TOE framework, Small-and medium enterprise.

1. Introduction

Information and Communication Technology (ICT) has virtually affected every aspect of human activities and Small and Medium-Scaled Enterprises are not left out. Modern information and communication technologies have created a "global village," in which people

can communicate with each other across the world as if they were living next door. For this reason, ICT is often studied in the context of how modern communication technologies affect society. Although there may be no single universal definition of ICT, but the term is generally accepted to mean all devices, networking components, applications and systems that combined and allow people and organizations (i.e., businesses, non-profit agencies, governments and business enterprises) to interact in the digital world. This development became possible through intensified investment in various computer applications, such as; word processing and data manipulation appliances in the manufacturing and service industries as well as telecommunications infrastructure based on its widespread usage by government agencies, educational organizations, and, at the home front. Owing to this technological trend, the involvement and deployment of IT is a significant driving force behind much of socioeconomic advancement, thus the adoption of ICT by SMEs provides the ability of rapid access to data, assessment, processing, storage and dissemination of large data volumes. Consequently, only those SMEs which use the state - of –the -art technologies have the opportunity to enter the international market and remain competitive despite the numerous advantages of globalization, liberalization, scientific and technical progress (Ongori, 2010).

SMEs use of ICT ranges from basic technology such as radio and fixed lines to more advanced technology such as email, e-commerce, and information processing systems. The first ICT tool that most SMEs engage is basic communications with a fixed line or mobile phone, whichever is more economical or most convenient for the business. This allows the SMEs operators to communicate with its suppliers and customers without having to pay a personal visit. After acquiring basic communication devices, the next ICT tool is usually a 'Personal Computer with necessary software. Even without Internet connectivity, SMEs can use PCs for basic word processing, accounting, and other business practices. With the Internet, SMEs are able to use more advanced communications capabilities such as email, file sharing. However, creating advanced communication technology is more complex because it often relies primarily on the Internet and the intranet, which thus, allow people within the firm to share files with each other over the same network. Having Internet connectivity enables firms to do faster research, set up websites, conduct e-commerce, and set up video conferences. (Irefin, Abdul-Azeez, & Tijani, 2012). However, some associated factor synonymous with the adoption of ICT includes; key infrastructure, government policy, human resource, innovations among others, while the decision to adopt ICT is preceded by the intention to provide a solution to the existing needs of the organisation. For this study, ICT is defined to include the 'technologies, hardware or software applications used to increase business efficiency, effectiveness or growth such as the internet, Electronic Data Integration (EDI), e-commerce, word processing applications, information systems, Decision Support Systems, Computer networks, mobile phones and accounting software applications. The emergence of the T.O.E framework has made it easier to relate adoption of technology with the corresponding organisational trends, as well as the environment considerations. Meanwhile, SMEDAN (2005) defined enterprise as a businesses with ten to forty-nine people with an annual turnover of five to forty-nine million Naira while a medium scale enterprise has fifty to one hundred and ninety-nine employees with a year turnover of fifty to four hundred and ninety-nine million Naira. In Nigeria, SMEs cover economic activities in almost all sectors of the nation's economy. The SME sector is

responsible for creating job opportunities; it also provides goods and services, steers competition and innovation as well. However, there are several challenges facing SMEs and as such curtailing their full potential to deliver value. In view of this, ICT can liberate SME sectors in the developing nations like Nigeria from their constraints through facilitating domestic and international market access, networking, competitive positioning, information gathering, production of quality products, reduced logistic costs and enhanced business transactions.

World governing bodies and multi-lateral institutions have also turned their lenses on this business group and have established their intention and support by identifying funding and other initiatives aimed at facilitating SMEs growth and the consequent development of their competitive advantage. One such initiative according to Clarke, Gray, Morgan, Nelson, Paul, Shelley, and Wainwright-Crooks (2009) led the World Bank Review on Small Business Activities to attract the commitment of the World Bank Group to the development of the SME sector as a core element in its effort to foster economic growth, employment and poverty alleviation with approved fund of about US$2.8 billion in support of micro, small and medium enterprises in 2004 alone. Therefore, SMEs and entrepreneurship are now seen world-wide as key sources of drive, innovation and flexibility among the industrialized countries, as well as in emerging and developing economies.

Globally, Small and Medium Enterprises play critical roles in every economic growth and development, Nigeria inclusive. SMEs are drawn from different spheres of businesses and services; they include but not limited to; Construction/Engineering Firms, Pharmacies, Telecommunication Industries/Mobile Phone dealers, Whole sale/Retail shops - Consumer goods and supermarket, Transport companies, Clearing and forwarding agencies, Haulage companies, financial service companies, manufacturing companies, Fuel filling stations and Gas companies, Maritime companies- community banks, Private legal practice, Hotel/Restaurants, events centres and bar, Photo shops/Colour laboratories etc

According to ECIS, (2019), Small and medium-sized enterprises (SME's) have a certain reputation of dynamism as generators of employment and economic growth, and one of such important means through which SME's are able to make these contributions lies in their ability to innovate, and this is why major policy efforts have been made to stimulate innovation in SMEs, both in advanced economies and in developing economies in the last few decades. Although SMEs form a substantial part of the business community throughout the world, developments in ICT are changing the structure of interaction between large and small and medium enterprises (Gono, Harindranath, & Özcan, 2015).

Statement of the problem

SMEs are recognized as the main source of economic growth and a major factor in promoting private sector development and partnership (Adebayo, Balogun, & Kareem, 2013). Similarly, Small and medium enterprises (SMEs) have emerged as promising opportunities to eliminate or reduce unemployment globally, and at the same time, brought about an increased levels of technological advancement which has equally revolutionized the dynamics of the business terrain. However, SMEs in developing countries such as Nigeria are yet to fully explore the benefits of Information and Communications Technology (ICT). In addition, little is known

about how SMEs respond to the opportunities provided by ICT, if indeed they see technology as an opportunity and the smaller the enterprise, the less likely it is to use technology, let alone operate as an e- business.

Again, it is also necessary to develop an approach of knowledge to inform better theory that improves practical policy mechanisms for enabling SME growth through the use of the ICT technology. These are issues of significance and concerns. The Technological – Organizational- Environmental (TOE) framework has been widely used in examining the factors influencing ICT adoption generally, but few studies have attempted to use this framework to measure ICT use among the SMEs. TOE framework does not only relate the technological aspects alone, it also explores their organizational and environmental contexts and to this end, this study will investigate the influence of technology, organizational and environmental characteristics on use of ICT as factors that predict use of ICT amongst SMEs in Oyo State, Nigeria.

Objective of the study

The main objective of the research is to determine the factors that influence use of ICT by the SMEs in Oyo State based on TOE Framework; these are technology, organisational and environmental characteristics. Other specifics are:

1. Identify the transactions or activities ICTs are used for by SMEs.
2. Identify the various types of ICT infrastructure available for use by SMEs.
3. Observe the performance outcome of the use of ICT among the SMEs
4. Examine the relationship between the technology characteristics and ICT use by the SMEs in Oyo State.
5. Investigate the level of relationship between the environment and use of ICT by SMEs in Oyo State.
6. etermine the relationship of Organizational characteristics with use of ICT by the SMEs in Oyo State.
7. evaluate the joint relationship among technology, organizational and environmental characteristics with the use of ICT by SMEs in Oyo State.
8. find the relative contribution of technology, organizational and environmental characteristics to the use of ICT among the SMEs in Oyo State.
9. Identify the major obstacles to the use of ICT among the S.M.Es in Oyo State

Research Questions

The study will attempt to provide answers to the following questions:

1. What are the various ICT infrastructures used by SMEs in Oyo State?
2. What services do SMEs in Oyo State use ICT to deliver?
3. What is the performance outcome of using ICT among SMEs in Oyo State?
4. What is the relative contribution of technology, organizational and environmental characteristics to the use of ICT among the SMEs in Oyo State?
5. What are the constraints to the use of ICT by the SMEs in Oyo State?

Hypothesis

The following null hypotheses will be tested at 0.05 level of significance

H01: technology characteristics have no significant correlation with ICT use by SMEs in Oyo State.

H02: organisational characteristics have no significant correlation with use of ICT by SMEs in Oyo State.

H03: environment characteristics have no correlation with ICT use by SMEs in Oyo State.

H04: There is no significant correlation among technology, organisation environment and use of ICT by SMEs in Oyo State.

2. Literature review

Pathan, Tunio, Ahmed and Naich (2018) examined the Information and Communication Technology (ICT) challenges that are being faced by the small and medium enterprises (SMEs) in the service sector of Pakistan. Using quantitative research methodology by adopting the close ended questionnaire as a data collection tool. The paper revealed that unavailability, complexity of technology, limited speed of broadband, unskilled staff, frequent disconnection, and incomplete online payment process evaluated, significantly influence the performance & growth of SMEs in Pakistan. The findings equally indicated that affordability, lack of trust and cyber threats assumptions were not significant to the study.

Ghobakhloo, Arias-Aranda, and Benitez-Amado (2011) revealed that many researchers might have provided a large body of research addressing factors that affect the success of information technology (IT) adoption in organizations, but the relative importance of these factors in the context of small and medium sized enterprises (SMEs) in developing countries has not been investigated in depth. They however drew on prior operations management (OM) and information systems research, to conceptually develop an interactive model of IT implementation success and tested it empirically in Iran, which of course, is an example of a developing country and specifically based their research model and hypotheses on survey data from a sample of 121 Iranian manufacturing SMEs.

Gono, Harindranath and Ozcan (2015) examined the impact of ICT adoption and use by South African SMEs. Focusing on answering the question regarding the irrelevance of ICT adoption and use in South African SMEs, this study also found strong evidence supporting the positive impact of a number of firm level factors such as owner-manager's level of education, top management support and the availability of internal expertise. The study highlights the critical role of owner-managers and employees in South African SMEs especially in relation to their ICT expertise. This finding also established that SMEs continued to depend on their association with large organisations that had recorded major achievements on their ICT adoption for their own adoption initiatives.

Erastus, Stephen and Abdullai (2014) examined the institutional framework needed for promoting small and medium-scale enterprises in Ghana from the perspectives of SMEs. using a cross-sectional survey and the findings confirmed the existence of formal institutions that support SMEs in Ghana. The study also revealed a lack of national strategy which has led to poor coordination of government incentive support programmes and eventual failing standard in performance and expectations.

Therefore, the technology indicators of the TOE will measure all the feature of ICT use, the organisational constructs will explore the major role and functions performed by individuals while the environment constructs will look at the conditions needed to be put in place for an ICT- driven enterprise.,

Theoretical Framework

Lack of user acceptance has long been confirmed to be an impediment to the success of new ICT Strategies and involvement (Ghobakhloo, Arias-Aranda, & Benitez-Amado, 2011).

The Technology-Organization-Environment (TOE) is best considered relevant to this study. Technology-Organization-Environment (TOE) framework according to Tornatzky and Fleischer (1990) proposed that the adoption of innovations depends on organizational, environmental as well as technological factor. In general, the TOE model is an integrative schema that incorporates the characteristics of the technology, contingent organizational factors, and other elements from the macro-environment such as policies, institutional opportunity, as well as constraints.
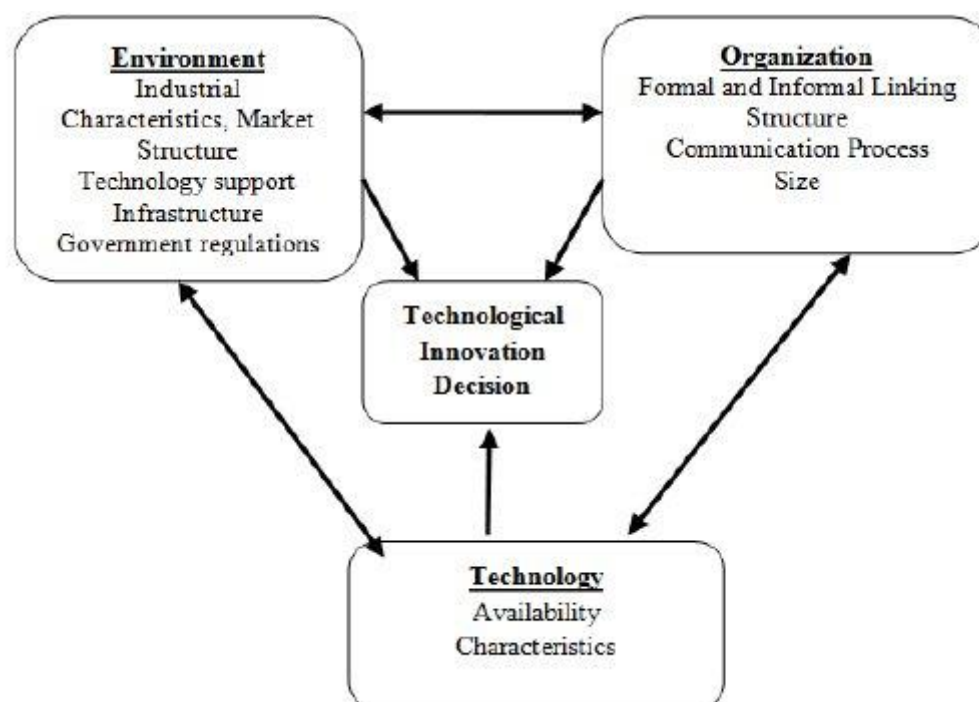

Figure 1: TOE framework (Tornatzky & Fleischer 1990)

Furthermore, the technological aspect depicts the technologies that are relevant to the organization in its pursuit of business objectives. In the context of this study, technology aligns more to perceived ease of use, perceived usefulness, users' skills and cost of deploying the technology shaped by available resources and infrastructures that will exploit the potentials of the proposed innovation. The organizational aspect is characterized by the firm's size and scope, managerial structure and internal resources. The environmental aspect describes how an organization conducts business with its business partners, competitors and the government. In the context of the current study, the TOE framework is used to show that use of ICT by SMEs is determined by the influence of technological, organizational and environmental

characteristics. Other theories like Unified Theory of Access and Use of Technology (UTAUT), and Diffusion of Innovation Theory (DIT) -focused more on the adoption by individuals rather than by organizations and as such offered a partial explanation for the organizational adoption of technology and for this reason, they were not detailed enough for this particular study.

According to Awa, Ukoha and Emecheta (2016), the theories of TAM and TOE specifically target technology acceptance and most popularly showcase many Information Systems studies that explain end-user adoption at organizational level and equally observed that the pace of diffusion of any innovation has been tracked down by the proposed adoption models which includes: technology acceptance model (TAM Davis, F. (1989), theory of reasoned action (TRA; Ajzen & Fishbein, 1980), Theory of Planned behavior (TPB; Ajzen, 1991 Ajzen, (1991), Innovation Diffusion Theory (IDT; Rogers, 2003); Stage Model (SM; Poon & Swatman, 1999; technology-environment-organization (TOE; Tornatzky & Fleischer, 1990 and resource-based view (Caldeira & Ward, 2003). These theories apply to the adoption and use technology, though in different ways, but their central roles were connected to relating use of technology to various factors that could determine such use and application using appropriate constructs with their interpretations.

3. Methodology

The study adopted a survey design, which involves collection of data from the various group of SMEs in Oyo-South Senatorial district. The district was purposively selected because it has a large concentration of small and medium scale enterprises, where relevant SMEs can be located and selected to provide the setting and data for the conduct of the study. The population of the study is made up of 100 respondents drawn from 73 SMEs in the following sectors: pharmaceutical, manufacturing, textile, telecoms, tourism, printing, building and construction, events and entertainment as well as general trading. Owners, managers and employees of these SMEs were selected to provide the data for the conduct of the study because they are the major stakeholders involved in the day-to-day running of SMEs, include ICT deployment and use. Since the population of the study is small and manageable, total enumeration technique was employed.

The questionnaire method was used to collect data from the respondents. Out of the 100 copies of the questionnaire administered, 73 copies, representing 73% were duly completed, returned and found usable for analysis. The administration and retrieval of the questionnaire was done with the aid of research assistants having given adequate training. Whereas the research questions were analyzed using descriptive statistical tools like frequency and percentage with Yes/No and Agree/Disagree options, the hypothesis was tested using inferential statistical tool (regression).

4. Results

Table 1. Demographic characteristics of respondents

Variables	Frequency	Percentage
Gender		
Male	49	67.1

Female		24	32.9
Age			
18-27	28-	7	9.6
37		33	45.2
38-47		33	45.2
Level of Educational			
Primary		0	0.0
School Cert		0	0.0
ND		17	23.2
HND		8	11.0
NCE		15	20.5
Degree		27	37.0
Post graduate		6	8.3
Class of Business			
Pharmaceuticals		15	20.5
Textiles		5	6.8
Telecoms		17	23.3
Business Centre (Printing)		7	9.6
Trading		6	8.2
Micro Finance Bank		11	15.1
Eatery		6	8.2
Filling Station		6	8.2

Research question 1: What are the various ICT infrastructures used by SMEs?

Table 2. ICT Infrastructure used by SMEs

ICT Infrastructure used by SMEs				
	YES		NO	
	N	%	N	%
PDAs	19	26.0	54	74.0
Desktop PC	46	63.0	27	37.0
Laptop	41	56.2	32	43.8
Tablet	33	45.2	40	54.8
Servers	34	46.6	39	53.4
Smart Phone	61	83.6	12	16.4

According to the result of table 2, Smart phone is the most used ICT by SMEs in the studied region (61:83.6%). This is followed by Desktop PC (46:63.0%) while PDAs are the least used of ICT infrastructure (19: 26.0 %).

Research question 2: What services do SMEs use ICT to deliver?

Table 3. ICT Use by SMEs

Statement	Agree		Disagree	
	N	%	N	%
My enterprise communicates via email with external trading partners (e.g. customers, government agencies, etc.)	67	91.8	6	8.2

My enterprise promotes its business by publishing basic company information online through website (e.g. contact details, location, goods & services etc.)	66	90.4	7	9.6
My enterprise develops and publishes its catalogues online through websites, WhatsApp, Facebook, Skype, etc.	66	90.4	7	9.6
My enterprise receives enquiries from, or sends requests, to customers (visitors) through its website, e-mail, text messages etc.	51	69.9	24	30.1
My enterprise receives orders from customers on line	60	82.2	13	17.8
My enterprise sends invoices/bills to customers online	48	65.8	25	34.2
My enterprise receives payments online from customers.	72	98.6	01	1.4
My enterprise accept payments online via electronic transfer, POS terminals etc.	73	100	0	0
My enterprise integrates its business with those of other business partners online.	58	79.5	15	20.5
My business uses computer application in processing Account information within the office	57	78.1	16	21.9
We sends and receives correspondence messages with word processing application.	57	78.1	16	21.9

From the findings on table 3, the statement "My enterprise receives payments online from customers" and "My enterprise accepts payments online via electronic transfer, POS terminals etc." recorded the over whelming response of 72(98.6%) and 72(100%) respectively while responses from all other statement too attested to the perception that SMEs uses ICT to deliver most of their services which includes; financial transactions, office processing, marketing as well as communication processes. These implies that of all the ICT uses according to this study, electronic payments transfer and other financial transactions has the highest use.

Research question 3: What is the performance outcome of using ICT among SMEs?

Table 4. Enterprise Performance Outcome

Statement	Agree		Disagree	
	N	%	N	%
Improved operational effectiveness	71	97.3	2	2.7
Reduced administrative cost	72	98.6	01	1.4
Better interaction with customer	67	91.8	06	8.2
Faster response time to enquiry	71	97.3	02	2.7
Better access to wider range of customers	73	100	0	0
New sources of revenue	63	86.3	10	13.7
Better access to information	73	100	0	0

Table 4 shows the results of the performance outcome of using ICT among SMEs. From analysis, better access to information and better access to wider range of customers 73(100%) respectively, ranked highest in the distribution, followed by Reduced administrative cost

72(98.6%). The performance outcome for using ICT among SMEs in the studied region, which ranked least in the distribution is new sources of revenue 63(86.3%).

Research question 4: What is the relative contribution of technology, organisation and environment characteristics to the use of ICT by SMEs in Oyo State?

Table 5. Relative contribution of variables to use of ICT.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	3.002	2.290		1.311	.194
	TECHNOLOGY CHARACTERISTICS	.240	.113	.305	2.116	.038
	ORGANIZATION	.315	.093	.485	3.376	.001
	ENVIRONMENT	-.033	.095	-.042	-.345	.731

ᵃ Dependent Variable: ICTUSE

Table5. Presents the result of the relative contribution of technology, organisation and environment characteristics on use of ICT among SMEs. Both technology and organization characteristics were significant with the value .035 and .001 respectively. The two values were less than .05 level of significance and as such, indicates that, the two independent variables, technology characteristics and organization characteristics have relative contribution to the use of ICT. The table equally show the unstandardized regression weight (), the standardized error of estimate, the standardized coefficient, the t ratio and the level of significant. As indicated in the table, the regression coefficient (standardized for Technology Characteristic (= 0.305, t= 2.116, p= 0.038 < 0.05), Organisational Characteristic (= -0.485, t= 3.376, p= 0.001< 0.05) while Environmental Characteristics = -0.042, t= -.345 and p = .731> 0.05) respectfully. This implies that both Technology Characteristics and Organisational Characteristics has positive relative influence on use of ICT, while the Environmental Characteristics has negative influence. The resultant regression model using the standardized regression coefficient became:

ICTU= 3.002 + .305TC + .485OC + (-.042EC)

Where: ICTU= Use of ICT

TC = Technology Characteristics
OC = Organisational Characteristics
EC = Environment Characteristics

Taking TC, OC and EC to be zero in this regression equation, ICT Use will be 3.002. The equation also shows that both TC and OC have positive coefficients meaning that both positively influence the ICT use while an improvement support in all the three variables, that

is, TC, OC and EC will lead to 0.305 positive increase in TC, 0.485 in OC and a corresponding decrease of -0.042 in EC respectfully. The result further affirmed that OC has relative greater influence on the use of ICT among the three variables.

Similarly, an improvement in ICT Use among the SMEs in Oyo will lead to 0.240 increase in Technology Characteristics, 0.315 in Organisational Characteristics and a decrease of 0.33 in Environmental Characteristics. These results then provide answer to the fourth research question.

Table 6 Relationship among variables

		ICT USE	TECHNOLOGY_XTERISTICS	ORGANIZATION CHARACTERISTICS	ENVIRONMENT CHARACTERISTICS
ICTUSE	Pearson Correlation	1	.661	.699	.500
	Sig. (2-tailed)		.000	.000	.000
	N	73	73	73	73
TECHNOLOGY CHARACTERISTICS	Pearson Correlation	.661	1	.791	.687
	Sig. (2-tailed)	.000		.000	.000
	N	73	73	73	73
ORGANIZATIONAL	Pearson Correlation	.699	.791	1	.684
	Sig. (2-tailed)	.000	.000		.000
	N	73	73	73	73
ENVIRONMENTAL	Pearson Correlation	.500	.687	.684	1
	Sig. (2-tailed)	.000	.000	.000	
	N	73	73	73	73

Table 6 explains the results of hypotheses one to hypothesis three. From the results, technology characteristics r(val) .661, shows very strong positive relationship exists between technology and ICT Use, for instance, an increase in the technology awareness of the enterprise will lead to an improvement of ICT Use. Again p(val) .000 < .005 level of significance and is considered to be significant. Therefore, the null hypothesis, which states that technology characteristics have no significant relationship with ICT use by SMEs in Oyo State is rejected. Similarly, the result also shows that Organisation characteristics r(val) is .699 and p(val) is .000, A strong positive, significant relationships while Environment characteristics r(val) is .500 and p(val) is .000. similarly, a positive and significant relationship exists in the two null hypotheses; H02: Organisation characteristics have no significant influence on use of ICT by SMEs in Oyo State and H03 Environment characteristics have no positive effect on ICT use by SMEs in Oyo State are rejected. The implication of these is that all the variables have significant influence on use of ICT by the SMEs and in this case, the theory, TOE is considered suitable for research on ICT use and similar work by SMEs based on the outcome of the findings.

Hypothesis four

There is no combined significant correlation among technology, organisation environment and use of ICT by SMEs in Oyo State.

Table 7. Joint Influence of Variables on ICT Use

ANOVA(b)

p		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	842.439	3	280.813	24.923	.000(a)
	Residual	777.452	69	11.267		
	Total	1619.890	72			

a   Predictors: (Constant),   TECHNOLOGY_XTERISTICS,   ORGANIZATION, ENVIRONMENT,
b Dependent Variable: ICTUSE

Table 7 shows that the independent variables have joint influence on the dependent variable. Therefore, the three (3) variables; technology, organisation and environmental characteristics will jointly affects the use of the ICT with .000 level of significance while the F value is 24.923 which is an indication that the value is high and connotes that the three (3) variables when considered together have high potentials to strongly influence the use of ICT. It also show that the composite effect of the three variables constitutes about 72% of Influence on use of ICT by SMEs.

Research question 5. What are the constraints to the use of ICT by the SMEs in Oyo State?

Table 8. Constraints of ICT use by the SMEs

	Agree		Disagree	
Constraints of ICT use by the SMEs	N	%	N	%
Enterprise's efforts to adopt ICT are marred by inaccessibility of financial resources	32	43.8	41	56.2
(i) I have got no clue on what computers and the related technologies are and what to do to acquire them	25	34.2	48	65.8
(ii) There are no government directives or policies on use of computer and communication technology by the SMEs	43	58.9	30	41.1
(iii) My employees have excellent knowledge of computer technology	55	75.3	18	24.7
(iv) Telecommunication infrastructure around here is both inadequate and unreliable	24	32.9	49	67.1
(v) Advice and support regarding adoption of ICT such as what technology to adopt and how, is hard to find around here	33	45.2	40	54.8
(vi) The general ICT skills as applicable in our businesses is sufficient among my staff	41	56.2	32	43.8
(vii) The general process of business registration is cumbersome and time-wasting	27	37.0	46	63.0
(viii) The import duty, taxes and levies payable on technology accessories is high	51	69.9	22	30.1
(ix) The institutional support received from government agencies is inadequate	32	43.8	41	56.2
(x) There is generally inadequacy of technocrat and expertise to engage in ICT- related services	35	47.9	38	52.1
(xi) Our efforts in using computer technology is marred by irregular power supply.	53	72.6	20	27.4

From the results on table8, some statements that relates to the general but noticeable constraints were put forward in terms of questions to the respondents. Those that recorded a high percentage of fifty percent (50%) and above were adjudged as the most common constraints while the responses below (50%) were interpreted to mean moderate constraints based on the results from this study. Therefore, statement (ix). The import duty, taxes and levies payable on technology accessories is high as well as statement (xii) Our efforts in using computer technology is marred by irregular power supply were signified as the most agreed common problem according to the results.

Electricity power supply and general import duty, taxes and levies payable on ICT products and accessories were seen as major problems. For instance, 53(72.6) respondents agreed that electricity supply is a major constraint. Similarly, 51(69.9) respondents also agreed that general import duty, taxes and levies payable on ICT products and accessories also constitute another major obstacle to the use of ICT by the Small and medium-scaled businesses. Other moderately

agreed constraint is lack of government directives and policy on ICT Use by SMEs 43(58.9%). lack of institutional support and inadequate financial support from government were also rated but lowly as constraints by the respondents.

5. Discussion of findings

Essentially, this study has established the relevance of TOE conceptual framework on use of ICT among the SMEs. The findings have shown that TOE can be applied in studying the factors that are related to the adoption and use of ICT in businesses. All the three factors proposed by the TOE, that is technology, organisation and environment characteristics were found to be correlates of ICT use among the SMEs in Oyo State based on the findings of this study. Meanwhile, earlier studies like, Ifinedo, (2011), Idris (2015), Abualrob, and Kang (2016) applied the TOE framework to examine the antecedents of factors on e-business usage and acceptance in small as well as medium firms elsewhere. It involved variables such as top management support, organizational readiness, and financial resources.

The findings acknowledged that the organisation context encompasses both informal and formal methods, communication processes, and the structure of the organisation which also formed one of the major findings of this study. The environmental context comprises characteristics such as government regulation, market structure and technology infrastructure. The technological context involves the availability and features of the technology. However, it is evident that adoption of ICT can be resulted in a variety of significant benefits for organizations.

According to this study, Smart phones, Desktop computers and Laptop are the most commonly used gadgets among the SMEs, it reflected that they get some certain level of satisfaction and confidence from the usage but it is also possible to get more of such services if they (SMEs) could adopt other electronics such as PDAs, tablets and hosts of server-based applications. For instance, tools like Executive Support System (ESS), Decision Support Support System (DSS) are good application that can run on PDAs are good examples. Also, having a server-based application in running business activities will definitely support exchange of knowledge and other resources including cloud resources and many other useful tools.

Among the notable use of ICT by the SMEs according to the findings of this study are, use of email, websites publishing, Social Networking, SMS texts, online orders by customers, payments online via electronic transfers from POS, banking apps and various USSD links, desk top processing of correspondence using office packages and other office suites. All these are indications to the facts that SMEs are fully aware of the potentialities of ICT use for innovative development in small and medium-scaled businesses. Adebayo, Balogun and Kareem (2013) posited that SME's use of ICT is inclusive of basic technology such as radio and fixed lines and more advanced technology such as email, e-commerce, and information processing systems.

In similar manner, the findings revealed that SMEs were of the opinion that improved operational effectiveness, reduced administrative costs, better interaction with customers, faster response time to enquiry and better access to information are possible outcome of applying ICT in businesses based on the findings of this study.

The findings also revealed the lack of government directives and policy on use of ICT by SMEs and this is similar to the outcome of survey conducted by Erastus, Stephen and Abdullai (2014) which examined the institutional framework needed for promoting small and medium-scale enterprises in Ghana from the perspectives of SMEs, it revealed lack of national strategy which has led to poor coordination of government incentive support programmes and eventual failing standard in performance and expectations. Improved quality of tasks, time parsimony, improved job performance, staff productivity, operation efficiency, improvement in decision-making, and enhanced competitiveness are examples of IT benefits for firms.

In the same vein, Eniola and Ektebang (2017) on SME firm's performance in Nigeria, competitive advantage and its impact, implemented an observatory Survey of qualitative design type through conceptual review of previous empirical data sources. They came out with reports that innovation is the most significant and critical resources for the organization to survive in a competitive environment and therefore, called on SME Managers and employees to imbibe innovation. They also observed that improvement is needed in the research and development ability for market and product performance in order to advance in product innovation, market and services

Similarly, this study has identified some uses of ICT such as better information access, wider reach of customers, reduced administrative costs among others by the SMEs, this shows that the SMEs are well positioned to harness the full benefits of ICT use in their operation for their development.

Esselaar, Stork. Ndiwalana, Deen-Swarray (2007) make similar findings that informal SMEs have a higher profitability than formal ones in respect to ICT Use. It also shown that ICT uses are productive input factors and that their use equally bring about an increased productivity for both informal as well as formal SMEs. The finding was also corroborated by the findings of Oyebiyi, Misra, Maskeliunas, and Damasevicisius (2018).

Furthermore, the challenges to the use of ICT identified by this study is in line with that of the findings of Onyedimekwu. (2013) and Oyelaran-Oyeyinka (2010).

This study have also established that the three independent variables, that is technology, organisation and environment characteristics have joint relationship with the use of ICT among SMEs, The implication of this is that any effort that could aid the positive development in any of the threee(3) variables will definitely bring about an increase in ICT use among the SMEs. The research also shown that technology, organisation and environment characteristics have joint significant and relative influence on use of ICT by SMEs and in this is an indication that all the three (3) independent variables jointly influence ICT use by the SMEs. based on the outcome of the study.

Conclusion and recommendations

From this study, it has been established that technology, organisation and environment features are indeed relevant to the study of ICT Use among the SMEs and as such these factors must taken seriously in planning the activities of SMEs and the corresponding related research work.

Likewise, the study also identified some obstacles and challenges which works against the use of ICT. Notable among these are inadequate electricity power supply and general import duty, taxes and levies payable on ICT products and accessories.

All the constructs of the TOE were of great significance to the use of ICT by SMEs hence adequate attention and care should be given in order to ensure their positive influence and gain. The concerned institutions like the Small and Medium - Based Enterprises Development Authority of Nigeria (SMEDAN), Bank of Industry and Agriculture (BOI) and all other directorates of businesses and investment promotion in both federal and states ministry of commerce and industries must come to the aid of SMEs by making necessary provision and support, with these, the business activities will thrive while the economy will be sustained both at the local, state and as well as national level.

The SMEs must be ready to interface with any of these government agencies whenever an opportunity is extended to them, they must continue to make their position known to government through their different bodies such as National Association of Small and Medium-Scaled Businesses Association of Nigeria (NASME), National and states Chambers of Commerce and Industries, Mines and Agriculture NACCIMA, council of different business associations etc. Most often, they (SMEs) must also engage in development activities by organising special trainning as well as other innovative activities among themselves. It is also necessary for them (the SMEs) to respond positively and participate in any targeted survey organised either by an individual researcher as in the case of this study or government bodies like the National Bureau of Statistics (NBS) as this will help to provide genuine data on business activities for proper planning.

References

1) Abualrob, A. A. & J. Kang, J. (2016). The barriers that hinder the adoption of e-commerce by small businesses: Unique hindrance in Palestine, Information Development, 32(5);1528–1544.

2) Adebayo, O. S., Balogun, O. J., & Kareem, T. S. (2013). An Investigative Study of The Factors Affecting The Adoption of Information and Communication Technology In Small And Medium Scale Enterprises In Oyo State, Nigeria. International Journal of Business and Management Invention, 2, 13-18.

3) Al-Ismaili, S., Li, M., Shen, J. & He, Q. (2016). Cloud computing adoption determinants: an analysis of Australian SMEs. Pacific Asia Conference on Information Systems 2016 Proceedings (pp. 1-17). United States: AIS Electronic Library.

4) Awa, H.O Ukoha, O and Emecheta, B.C (2016) Using T-O-E theoretical framework to study the adoption of ERP solution. Cogent Business & Management,1;1-12

5) Clarke, S., Gray, D., Morgan, C., Nelson, C., Paul, L., Shelley, D & Wainwright-Crooks, S (2009). ICT in Small and Medium-Sized Enterprises (SMEs) UWI Working Paper MSBM April 2009

6) Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly 13(3), 319-339.

7) Eindhoven Centre for Innovation Studies, ECIS (2019) Innovation in Theory and Practice: papers of the ECIS opening conference edited by A. Szirmai, J. Halman and B. Verspagen. Eindhoven: Technische Universiteit Eindhoven

8) Eniola, A.A. & Ektebang, H. (2017). SME firm's performance in Nigeria: Competitive advantage and its impact. Researchgate publication. Intl. J. of Research Studies in Management,3(2): 75-86

9) Erastus, Y.E., Stephen, A. & Abdullai, I. (2014). Institutional Framework for Promoting Small and Medium Scale Enterprises in Ghana: Perspective of Entrepreneurs. Australian Journal of Business and Management Research,3(10),28-45

10) Esselaar, S., Stork, C., Ndiwalana, A. & Deen-Swarray, M. (2007). ICT Usage and Its Impact on Profitability of SMEs in 13 African Countries. MIT Journal of information Technologies and International Development, 4(1), 87-100.

11) Ghobakhloo, M., Arias-Aranda, D. & Benitez-Amado, J. (2011). Information technology implementation success within SMEs in developing countries: An interactive model. POMS 22nd Annual Conference: Operations management: The enabling link Reno, Nevada, U.S.A. April 29 to May 2, 2011. https://www.researchgate.net/publication/229052628

12) Gono, S., Harindranath, G. & Ozcan, G.B (2015). Understanding the Impact of ICT Adoption and Use in South African Manufacturing and Logistics SMEs: A Firm, Market and Regulatory (FMR) Context Perspective.

13) Hassan, A.K & Semkwiji, D. (2011). The role of mobile phones on sustainable livelihood. ESRF Discussion Paper no. 33. Daresalaam, Economic and Social Research Foundation. 23p.

14) Ifinedo, P. (2011). An empirical analysis of factors influencing Internet/e - business technologies adoption by SMEs in Canada, International Journal of Information Technology & Decision Making, 10(4);731 - 766.

15) Irefin, I. A., Abdul-Azeez, I. A. & Tijani, A. A. (2012). An Investigative Study of the Factors Affecting the Adoption of Information and Communication Technology in Small and Medium Scale Enterprises in Nigeria. Australian Journal of Business and Management Research, 2.

16) Kordha, E., Gorica, K & Ahmetai, L. (2010). Managing It Infrastructure For Information Society Development. The Albanian Case. Romanian Economic and Business Review – 6(2),120-130

17) Ndekwa, A. N. (2017). Factors Influencing Adoption of Mobile Money Services Among Small And Medium Enterprises (SMEs) In Tanzania A Case Study of Tourism Sector. A thesis submitted for the award of the degree of doctor of philosophy of The Open University of Tanzania

18) Ongori, H. (2010). Information and communication tecnologies adoption in SMEs:literature review. Journal of Chinese Entrepreneurship, 2(1), 93-101.

19) Ongori, H., & Migiro, O. S. (2011). Understanding the drivers of information and communication technologies (ICTs) adoption by Kenyan small and medium enterprises (SMEs). International Journal of Management Research and Review.

20) Onyedimekwu, O. (2013). Factors Influencing the Adoption and Use of ICT by Small and Medium Sized Enterprises in Nigeria. A Paper Presented At The International

Conference On Science, Technology, Education, Arts, Management & The Social Sciences (ISTEAMS) May 31 – June 01, 2013, University Of Ibadan, Ibadan, Nigeria.

21) Oyebiyi, O., Misra, S., Maskeliunas, R., & Damasevicius, R. (2018). Application of ICT by Small and Medium Enterprises in Ogun State Nigeria Chapter in Communications in Computer and Information Science. Retrieved from Research Gate: https://www.researchgate.net/publication/

22) Oyelaran-Oyeyinka, B. (2010). SMEs issues and challenges. Retrieved from http://www.cbn.gov.ng/SME_Issues%20and%20prospects_Oyeyin

23) Pathan, Z.H., Tunio, M.Z., Latif, Z., Ahmed, S & Naich, S.R. (2018). Empirical Analysis of ICT Constraints Affect the Performance of Small & Medium Enterprises. Pakistan. Saudi J. of Eng. Technol., 3, Iss-1 (Jan, 2018): 1-9

24) SMEDAN. (2005). Small and medium enterprises performance in Nigeria: A report presented at African entrepreneurship seminar organized in collaboration with the Scientific Committee on Entrepreneurship of the University of Essex.

25) Tornatzky, L.G., & Fleischer, M. (1990). The Process of Technological Innovation. Lexington, MA, USA, Lexington Books.

26) Venkatesh, V., & Davis, F.D., (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science 46(2), 186-204.