ICT Adoption by Micro and Small Scale Enterprises in Nigeria
A Case Study of the Federal Capital Territory, Abuja

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ABSTRACT

The study investigates the determinants of ICT adoption by MSEs using a primary data analysis in the Federal Capital Territory, Abuja, Nigeria. The study adopted the Technology Acceptance Model (TAM) and Technological Organizational Environment (TOE) framework. The data for the study were gathered using the convenience and purposive sampling technique through a well structured questionnaire. The study strengthens the empirical knowledge on the usage level of ICT system and software among MSEs and likewise establishes that competitive pressure, government support, employer's skill and knowledge influence the adoption of ICT by MSEs in the Nigeria. The study recommends that in line with national ICT policy, government should ensure efforts are geared towards the attainment of full ICT adoption by MSEs in Nigeria.

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Keywords: ICT adoption, MSEs, Primary data, Nigeria.

1. INTRODUCTION

Evidently, it is clear that Micro, Small and Medium Scale Enterprises (MSMEs) play a dynamic role in the growth of an economy. MSMEs are recognized across the globe because of its contribution to economic growth and job creation in advanced and developing economies (Asgarkhani & Young, 2010; Apulu 2012; Irefin, Abdul-Azeez & Tijani, 2012). In spite of this critical role, most of the micro and small businesses in Nigeria use crude skills, local raw material and simple technology for their daily operation.

MSMEs contribute nearly half of Nigerian GDP and accounts for over 25% of employment in the Nigeria (Elebeke, 2012). The 2012 Enterprise baseline Survey revealed that there are 17 million SMEs in Nigeria that are employing 32.41 million persons and contributes about 46.54% to the nation's gross

domestic product in nominal terms. According to Adeniji (2015), "In Nigeria most MSMEs die within their first five years of existence, a smaller proportion goes into extinction between the sixth and tenth year, whereas about five to ten percent survive, thrive and grow to maturity".

Currently across the globe, there has been a paradigm shift in the mode of operations of MSMEs, to move from a matter based economy to a knowledge based economy. This has encouraged organizations to move away from emphasis on natural resources and focus on ideas that lead to substantial growth over time. This paradigm shift has led to the creation of knowledge, growth theories and models which support that information transfer is key for an organization to survive in its environment (Habib, 2011). In recent years, it's been seen that one of the major drivers of MSMEs growth in developed countries has been attributed to the increasing use of Information and Communication Technology (ICT).

Economies with better access to Information and Communication Technology (ICT) and the ability to apply ICT in an inclusive manner have a wide advantage of globalization rather than economies whom have not imbibed it fully. The introduction of internet and modern technology has improved the system of operation among organizations. Ongori (2009) agreed that the usage of ICT will help transform business operations in the era of globalization by changing the structure of the business and increasing the competition, and competitive advantage for business operation. The usage, internalization and policy adoption by SMEs can be the driving force behind socioeconomic dynamic (Ameyaw & Modzi, 2016).

As a matter of fact, due to the current recessive state of the Nigerian economy, it is necessary to adopt a mechanism that leads to effective and efficient operations in businesses. This means productive MSME subsector is capable of producing better products and services for our country. ICT utilization is very important in the 21st century as they make ease business transactions, improve customer and consumer relationship and also panacea to combat a number of challenges facing MSMEs. Ashrafi and Murtaza (2008) states that organizations around the globe are utilizing ICT to cut cost, improve efficiency and offer greater customer service.

Information and Communication Technology (ICT) have a direct relationship with business competitiveness. The most competitive organizations today are those who take advantage of the most relevant information. With the use of ICT, market participants (i.e buyers and sellers) can share information and transfer goods across national borders which increases global network. ICT enhances the coordination of operations in organizations and increase management systems such as Customer Relationship Management (Spanos, Prastacos, & Poulyymenakou, 2002). According to OECD (2004), they believe that ICT adoption and utilization is the only crucial factor to overcome the problems faced by SMEs.

In 2020, Nigeria aspires to be among the first twenty economies in the world with a GDP of $900 billion. Contemporary discourses have discovered ICT and MSMEs as a requirement for economic growth and improvement of social conditions (Argerou, 2003). The lack of ICT is one of the major factors that contribute to the widening gap between developed and developing economies. MSMEs in developed countries like Singapore, South Korea which Nigeria was once at par with in the 1970s are adopting and effectively utilising ICT; yet adoption in Nigeria is very low (Lal, 2007).

Over the years, Nigeria has adopted different ICT policies but due to the technological and market convergence of the global industry, Nigeria's policy framework had to evolve in order to accommodate the convergence and also optimise the potentials of the use of ICT. In 2012, a new policy was enacted and the goal of policy framework was to provide a framework for streamlining the ICT sector and enhancing its ability

to help address some socioeconomic and developmental challenges while facilitating the transformation of Nigeria into knowledge based economy. One of the major policy objectives was to ensure that citizens have access to all ICT services at affordable price (National ICT Policy, 2012). However the MSMEs subsector in Nigeria have not fully felt the impact of the ICT policy objective as researchers have reported that adoption and utilisation is still low (Moses, Anigbogu, Edoko & Kalu, 2014).

Effective utilization of ICT support the strategies of many organization (Apulu, 2012). Furthermore, the usage of ICT effectively refers to the use of hardware and software to which gives an organization competitive advantage (Kyobe, 2004). Researchers (such as Sheppard & Hooton, 2006; Alam et al., 2007; Lal 2007), have shown that ICT adoption advances the performance of MSMEs however, despite the high diffusion of digital technologies from developed economies to developing economies in recent years, the use of ICT within MSMEs in Nigeria remains low (Apulu & Latham, 2009).

Extensive recent literature on determinants of ICT adoption by MSMEs in Nigeria reveals that capital base, turnover, asset value, infrastructure, poor internet service provider, education, lack of support from government and bank affect ICT adoption by SMEs.(Apulu & Ige, 2011; Ladokun, Osunwole, & Olaoye 2013; Moses,Anigbogu,,Edoko & Kalu, 2014; Agbon, 2015). But this work basically explained the external and organisational factors that affect ICT adoption on SMEs.

Plethora of empirical studies (such as Choopragan, Song & Depickere, 2007; Salemat, Jaffar & Kadir, 2011; Ducey, 2013; Albert, 2014, Hiti, 2015) highlights the individual factors that affect ICT adoption by the use of Technology Acceptance Model (TAM) to explore the effect of variables (perceived use and perceived ease of use) on individual beliefs and intentions, but these researches exclude the fact that factors affecting the use of ICT is not only dependent on individual / internal factors but there are some organisational and macro environmental factors that also affect ICT adoption by MSMEs.

This study accounts for the behaviour of the owners and top decision makers of the MSEs because the influence the decision makers in the organisation who are more concerned about survival and growth of the organisation will help ascertain the root cause of low adoption in Nigeria, whether is with employee's ICT illiteracy or Employer's ICT illiteracy and also help ICT training providers to know the area to focus. It is therefore imperative to analyse their level of ICT knowledge because the level of owners ICT skill and Knowledge will determine the level of ICT adoption in the SMEs. This will also reveal basic issues such as the perceived cost of ICT equipment to analyse if the firm has a financial barrier, the competitive pressure in the market to analyse if customer demand and competitor pressure is significant in adopting ICT, and if Government policies have in anyway influenced their intent to use or adopt ICT. Also, a regression analysis was conducted to check if the above factors are significant determinants that affect the intent to adopt or use ICT.

Thus, this study analysed the individual/ internal, organisational, macro environmental factors that affect ICT adoption by Micro and Small Enterprises (MSEs) in FCT, Abuja (this further contributes to adoption literature in Nigeria as bulk of the ICT adoption researches in Nigeria were carried out in Lagos). The study integrated both the Technical Acceptance Model (TAM) and the Technology Organisation Environment (TOE) model in order to ensure an in-depth analysis on the factors that mitigate ICT adoption by Micro and Small Enterprises (MSEs) in FCT.

2. REVIEW OF RELATED LITERATURE

MSMEs across the globe are generally acknowledged as the oil required in lubricating the engine of socio-economic transformation of any nation (Adeniji, 2015). MSMEs are very essential to the growth of any economy due to the flexibility. MSMEs are becoming significantly important majorly because of their low capital formation and its high potentiality to increase employment generation. The contributions of MSMEs to the Nigerian economy are not contestable as about 10% of the total manufacturing output and 70% of the industrial employment are by MSMEs. Nigerian MSMEs help to encourage economic and industrial development through the effective employment of local resources and are responsible for the production of intermediate goods and the transformation of rural technology (Aina, 2007). The Federal Office of Statistics reveals that about 97% of the entire enterprises in Nigeria are MSMEs which employ an average of 50% of the working population as well as contributing up to 50% of the country's industrial output (Ihua, 2009). According to Ogechukwu (2006), MSMEs have contributed greatly to Nigeria's development by the provision of employment, marketing of goods and services, and the growth and development of rural areas. MSMEs have also contributed immensely to the growth of indigenous entrepreneurship in Nigeria.

According to Davies (1989), there are number of theoretical positions that have influenced the performance of MSMEs. The Technology Acceptance Model is the first and foremost traditional adoption theory in the field of Information Technology (IT) (Awa, Ukoha, & Emecheta, 2012). TAM suggests that when users are presented with a new technology, a number of factors determine their decision about how and when they will use it. TAM proposes Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the fundamental determinants of IT adoption. He further defined Perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" and Perceived Ease of Use "as the degree to which a person believes that using a particular system would be free from effort"

Technology Acceptance Model postulates that the use of an information system is determined by the behavioural intention, this behavioural intention is being determined by the person's attitude towards the use of the system and also by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. The goal of TAM is to provide a basis for determining the effect of variable on internal beliefs and intention.

Torntzky and Fleischer (1990) developed the Technology Organisation Environment framework to explain the organisation technological, organizational and environmental factors affect the firm from adopting a new technology. The technological context considers the available technologies that are of importance to the firm, both internally and externally that might increase the firm's productivity. The organisational context considers the resources available to support the acceptance of technology. These criteria include firm's size and scope; interconnectedness, managerial structure, centralization, formalization, amount of slack resources, the quality and availability of the firm's human resources.

The environmental context refers to the setting in which the firm conducts business and influenced by its industry. The environmental context has to do with factors that surround a firm, consisting of stakeholders such as competitors, industry members, customer, the government, the community, etc. they can influence how a firm interprets their need for technology and its capability for deploying it (Angeles, 2011). According Angeles (2011) stakeholders can either encourage or block technological innovations,

also government regulation is a commanding tool for restraining a firm's operational activity, increasing cost of production and instigating an investigation of technology that must meet up to specified mandatory criteria. Dominant customer firm s could exert their power to shift their supplies' production activities or business process to comply with its requirement.

From the work of Lewis (1955) on labour surplus theory, economic development takes place when capital accumulates as a result of the withdrawal of surplus labour in the subsistence sector to the capitalist sector. According to him, the capitalist sector is that part of the economy which use reproductive capital while subsistence sector is the sector that does not use reproducible capital (Jhingan, 2012). It is argued that one of the major drivers of the development of MSMEs is excess labour supply which cannot be absorbed in the public sector or large private enterprises Ofoegbu, 2013). According to Ofoegbu, (2013), MSMEs develop as a result of unemployment and are meant to grow in the economy during economic crisis because as large enterprises (capitalist sector) are unable to absorb labour fast, but MSMEs cause an anti-cyclical relationship as they still contract their labour to the private firms.

MSMEs are the main drivers of a country's economic growth as they account for a large percentage of labour force. MSMEs are very flexible and can adjust quickly to changing market demand and supply situations, help diversify economic activity and caause significant contribution to imports and exports (Ongori, 2009). The more MSMEs increase in size, competition increases which then results in a decrease in prices, customer base or both. This can in turn affect existing profits creating less incentive for people to start an MSME.

In this era of globalization where economies have moved from a matter based economy to a knowledge based economy, the revolution of ICT has affected businesses in different ways. Thus, the use of appropriate ICT plays an important role as it helps MSMEs cut cost by enhancing their internal processes and also improving products due to the ability to communicate faster with customers and suppliers. ICT adoption by MSMEs provides faster information access within an organization. This aids quick and thoughtful decisions to assist business operations (Casolaro and Gobbi, 2007); and ultimately helps SMEs face competitive pressure caused by multinationals.

Similarly, Pokharel, (2005); Taylor & Murphy, (2004) and Schware (2003) reveals that ICT adoption by SMEs increases productivity; enhances and increases efficiency of internal business operations; and connects MSMEs easily to external contacts. Also ICT adoption by MSMEs improves the operational efficiency, reduce operations, reduce operations cost and create global market access to MSMEs.

In countries where MSMEs are only starting to adopt basic ICT (such as mobile phones), it can help replace time and costs necessary for face-to-face communication. In countries where modern ICT has already being adopted, this has enormous benefits as communication technologies such as email and internet teleconferencing can helps communication between suppliers and client (Kotelniko, 2008). Also, with the use of ICT it is possible to track the location of their goods at any point in time (Porter, 2005). In the words of Abdullah (2014), ICT promotes and effect innovation and productivity of firms. According to Abdullah (2014), MSMEs survive the competitive environment based on the innovation, product initiation or development can no longer be determined by internal Research and Development but also external factors like suppliers and customers. Therefore ICT is needed to complement internal R&D in its major functions. From the foregoing, it is evident that ICT plays an irreplaceable role in businesses which aid profits maximisation in MSMEs.

Factors influencing the adoption of ICT by MSMEs have been explored by different researchers. The subsequent discussion highlights some review of empirical issues as captured on regional basis.

In the East Africa region, Mwai (2016) investigated the factors influencing adoption of ICT by SMEs in hospitality industry in Kenya with the use of simple random sampling on 100 respondents and found out that industry market characteristic, customer characteristic, running costs and technology characteristics influence the adoption of ICT in the hospitality industry. Also, Nduati, Ombui and Kagiri (2015) analysed the factors affecting ICT adoption in SMEs in Thika town, Kenya. The study employed stratified random sampling technique. He analysed the influence of cost, skill development, infrastructure and administrative support. The study was carried out on 318 respondents and the results show that every respondent has a basic level of ICT and that administrative support is critical to ICT learning process. The findings also point out lack of awareness and uncertainty about the benefit adoption in SMEs.

Ndekwa (2014) analysed factors influencing adoption of ICT among SME in Tanzania. He used multiple regression analysis to reveal perceived ease of use, perceived ease to learn and perceived usefulness of ICT strongly affect the use of ICT for businesses. His results revealed that perceived use of technology and perceived ease of use has significant influence for SMEs in Tanzania. From the ANOVA test taken, the predictors which are perceived ease of use, perceived ease to learn and perceived useful demonstrated p-value of less than 0.05.

A similar study conducted in West Africa specifically in Cote d'Ivoire by Ardjouman (2014) examined the factors hindering the use and adoption of technology amongst 200 SMEs. The respondents of this study comprised of 50 senior executives, 50 middle-level managers and 100 workers in Abidjan city, the sampling technique employed was purposive, respondents were selected from SMEs in service and manufacturing industries. The results of the study revealed there is a high level of awareness of the importance of technology in management of SMEs. It also revealed that majority of SMEs perceived technical problems as a barrier. Also, Moses, Anigbogu, Edoko and Okoli (2014) assessed the Determinants of ICT adoption for improved SMEs performance in Anambra State. Using judgemental sampling on 40 respondents on 4 economic hub (Awka, Nnewi, Ekwolobia and Onitsha) examining the measures of number of employees, capital base, turnover, registration status and asset value found that capital base, turnover and asset value of businesses have significant influence on ICT adoption.

Okechi and Kopeghom (2013) investigated how perceived usefulness, perceived ease of use, perceived cost of deploying ICT, owner/ top management support and organizational readiness affect the use of ICT system amongst SMEs in Nigeria (Rivers State; Omoko, Abua and Port Harcourt) by integrating both the TAM and TOE framework. Results obtained from the study implies that perceived usefulness of ICT had a mean of 4.11 showing a clear understanding of usefulness and benefits of ICT in Nigeria. According to the results obtained, SMEs agreed that the Cost of deploying ICT is the highest inhibitor.

Similarly, Ladokun, Osunwale and Olaoye (2013) analysed the factors that affect ICT adoption by SMEs in Nigeria on 70 respondents. Using correlation coefficient and multiple regression, the results indicated that infrastructure is one of the most factors that inhibit ICT adoption by SMEs in Nigeria with highest mean followed by government policies, management support, maintenance cost, skills and training and investment cost.

This is corroborated by Adebayo, Balogun and Kareem (2013); Sajuyigbe and Alabi, (2012) Irefin, Abdul-Azeez and Tijani, (2012), Apulu and Ige, (2012) as they opined that cost, funds, infrastructure, skills and training, management support and government support and finance are the factors that affecting ICT

adoption in Nigeria by SMEs (In South African region, a survey was taken by Gono and Mpofu (2016) on three countries, South Africa, Botswana and Zimbabwe using TAM and DOI framework as the theoretical framework for the survey on 130 small firms. Findings from this survey revealed that government role, environmental attributes, social network, technological attributes, organisational attributes are the inhibiting factors affecting ICT adoption by SMEs

In Asia, Selemat, Jaffar and Kadar (2011) examined the factors that affect the adoption of internet based information and communication technology (ICT) in Malaysia. Their study integrated perceived usefulness, perceived ease of use, perceived complexity, perceived security and organizational readiness on 500 respondents using convenient sampling technique. Also, Akbari and Pijani (2013) studied ICT adoption among SMEs in Tehran. The research instrument used to capture this study was questionnaire and face to face interview. Results from this study show that weak managerial support, lack of available skills weak innovative environment and insufficient financial resources were the internal barrier of ICT adoption whereas weak government support, legal environment, low competitive pressure were the external barrier. Subsequently, Alam and Noor (2009) undertook analysis on ICT adoption in SME on empirical evidence of service sectors in Malaysia. The study included 400 SMEs from service sector in Molaka and Jahor Banju states in Malaysia that registered under Small and Medium Industries Development Corporation. The following factors were analysed perceived benefits, cost, ICT knowledge and skill, external pressure, government support and the results obtained were that perceived benefits, ICT knowledge and skill and government support are significant and have a direct effect on ICT adoption intention. Perceived cost and external pressure have non-significant effort on ICT adoption.

Empirical evidence from Euro area featured a study by Harindranath, Dyerson and Barnes (2008) that explored the patterns of adoption and the use of ICT by SMEs in the southwest London and Thomas Valley region of England which used a telephone survey method with standardised questionnaire of 66 questions on 400 SMEs to investigate factors enabling or inhibiting the successful adoption and use of ICT. The study found that one of the major inhibiting factors was the ignorance of regional, national and European Union wide policy initiatives to support SMEs. In a similar study by Harker and Akkeren (2002), factors which influence ICT adoption includes; organisation readiness, external pressure to adopt, customer/supplier dependency, structural sophistication of the business, size, sector and status and its information intensity.

3. RESEARCH METHOD

The study adopted the Technology Acceptance Model (TAM) and Technological Organizational Environment (TOE) Framework. TAM is the first theory that was used to explain the adoption of information technology. The major importance of the TAM is to analyse the internal beliefs of the individual in the process of adopting a new technology. Davis (1993) suggest that there are two important factors that determine an individual's technology adoption. These factors are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness is the degree to which the person believes that using a particular system would enhance his/her job performance. Perceived Ease of Use is the degree to which a person believes that using a particular system would be free of effort.

TOE framework explains how Technology, organisation and environment factors influence an organisation in adopting a new technology. According to Torntzky and Fleischer (1990), the technological context considers the available technologies that are of importance to the firm, both internally and externally

that might increase the firm's productivity. The organisational context considers the resources available to support the acceptance of technology. These criteria include firm's size and scope; interconnectedness, managerial structure, centralization, formalization, amount of slack resources, the quality and availability of the firm's human resources. The environmental context refers to the setting in which the firm conducts business and influenced by its industry. This environment context support firm growth theory (Gibrat Law) called *"Law of Proportionate Effect"* and it states that the factors that affect the growth of a firm is not only related to the firm but also to its environment.

This research involves both the TAM and TOE framework because it well explain the objectives of the study. These two frameworks will explain both the factors that affect internal belief of the Employers and also the factors that affect the firm from adopting a new technology. Based on the theoretical strands, the factors to be investigated are Perceived Usefulness, Perceive Ease of Use, Employer's IT Knowledge, Competitive Pressure, and Government Support.

3.1. Research Design

Research design is the method of collecting and analysing data that will be tested for the purpose of affirming or refuting the null hypothesis. The study was to employed to study a population, and this is achieved by selecting samples to find out and analyse occurrences at any given human point in time (Orodho, 2008).

Primary data was used to identify the factors that affect ICT adoption amongst SMEs in Nigeria. MSEs according to SMEDAN are defined into Micro and Small industry. The Micro industry are those firms have labour size ranging from 0 to 9 and Small Scale industry are those that have labour size ranging from 10 to 49. The research participants studied were in the Federal Capital Territory (FCT), Abuja. A total of One Hundred (100) questionnaires were distributed in a bid to analyse factors that affect the perception of ICT adoption and how it affects their day to day business.

3.2. Study Population

The population that is to be studied here are both the micro and small firms that are in Abuja. Every MSE in Abuja uses ICT in one way or the other but this study aim at assessing the factors that affect full ICT adoption. The total population of MSEs in Abuja was derived from SMEDAN study which was carried out in 2013. From the study, the total population of Micro and small businesses are four hundred and eight four thousand, six hundred and nine (484,609) of which micro businesses are four hundred and eight two thousand, three hundred and sixty five (482,365) and small businesses are two thousand two hundred and forty four (2244).

3.3. Sample Frame

The sample frame can be seen as the population that can be accessed during a research study, *i.e.* the size of the population that can be identified and accessed by the researcher (Otieno 2015). Due to the fact that a researcher rarely has direct access to the whole population because of time and resources, a researcher must therefore rely on sampling frame to represent all of the individuals of population of interest. In this study, the sampling frame included the MSEs that operate in Abuja and employ at least one ICT system in everyday business operation.

3.4. Sampling Technique

Sampling Techniques are methods used to select a sample from the population by reducing it to a more manageable and realistic size. The study adopts the Convenience and Purposive sampling. Convenience Sampling was used to select respondents who are owners or the decision makers of the MSEs whereas Purposive Sampling was used to ensure that the firms selected possessed at least one ICT system.

3.4.1. Sample Size Determination

The sample size was determined by Taro Yamme Sample Size Calculator. According to the calculator, sample size is calculated as follows;

$$n \ = \ \frac{N}{1 + N(e)^2}$$

where; n: sample size, N: population size, e: level of confidence,

$$N \ = \ 484609,$$

$$e \ = \ 0.1$$

Therefore,

$$n \ = \ \frac{484609}{1 + 484609(0.1)^2}$$

$$= \ 99.98 \approx 100$$

So therefore, the sample size for this Population is 100 respondents

3.5. Research Instrument

The research instruments used for this study were questionnaires and observation. The questionnaire was specifically given to the MSE owners/ decision makers face to face. The questionnaire was structured to examine the extent of ICT adoption in the firm and how the factors that affect ICT adoption affect their business.

A number of 25 questions were formed and divided into five sections (See Appendix for sample of questionnaire).

3.6. Model specification

Based on the objectives of the study which centred on ICT adoption amongst MSEs in Nigeria, ICT adoption is the dependent variable while the independent variable captured its determinants.

The independent variables are:

1. Individual/Internal factors (INDF) captured using perceived ease of use (PEOU) and perceived usefulness (PU)

2. Organizational Factors (ORF) captured using Employers ICT knowledge and Skills (EKS) and Perceived Cost of Deploying ICT (PCD)

3. Environmental Factors (ENVF) captured using competitive pressure (CP) and government support (GS)

The dependent variable is Information and communication technology adoption (ICT$_{adoption}$). The model to be evaluated specified thus:

$$ICT_{adoption} = f(INDF, ORF, ENVF)$$

$$ICT_{adoption} = \beta_0 + \beta_1 PEOU + \beta_2 PU + \beta_3 EKS + \beta_4 CP + \beta_5 GS + e$$

1. Perceived Ease of Use (PEOU**)** is the degree to which a person believes that using a particular system would be free of effort. Therefore when an application is perceived to be easier to use it is adopted faster.

2. Perceived Usefulness (PU) is the degree to which the person believes that using a particular system would enhance his/her job performance.

3. Employer's ICT Knowledge and Skill (EKS**)** is the knowledge of the employers or top management in an organisation. This determines the level of IT adoption in that organisation. Some surveys reveal that when MSME owners/ manager make a decision or points out a high significance on a particular matter the whole organisation is inclined towards that direction. Therefore when an MSME owner/ manager has a good knowledge of ICT, the organisation is more likely to be transformed into being a technical intensive organisation. A study by Thong and Yap (1995) demonstrated that small businesses with CEOs who are more knowledgeable about ICT are more probable to adopt it in their organisation.

4. Competitive Pressure (CP) for many firms, pressures to keep up with the competition, promoting services to customers and staying competitive have formed MSMEs to adopt ICT (Drew, 2003; Premkumar, 2003; Nguyen, 2009). Literature suggests that small business are prone to customer pressure, these firms adopted IT due to customer demand to meet effectiveness (Levy, Powell and Yetton, 2002). Therefore there is a significant between competitive pressure and it adoption (Pontikakis, Lin & Demirbas, 2006).

5. Government Support (GS**)** according to literature there is a significant link between IT adoption and governmental support (Ghobakhloo, Sabouri, Hong & Zulkifili, 2011; Southern and Tiley, 2000). According to Ghobakhloo et al (2011), government initiatives and policies can influence the development of IT infrastructure and information provision in order to energize faster technology. Recent studies in developing countries have revealed that IT adoption in SMEs have been significantly improved due to government policies and initiatives. In this perspective Fathan et al (2008), explain how the Iranian government has used their initiatives and policies to influence greater ICT adoption. Also in Malaysia as explain by the study carried out by Tan, Chong, Lin and Eze (2009) that Malaysian SMEs is not directly affected by the cost of deploying ICT. Therefore government Support is to be analysed if it has affected MSEs in Abuja to adopt ICT effectively.

3.7. Method of Data Expectation

The data gathered through questionnaire from the field were edited and checked thoroughly for inconsistency and inadequacy. The data was then imputed into the Statistical Package for Social Science (SPSS) for analysis.

With the use of SPSS, the data for the study was quantified as follows:

1. The background information of the respondents (*i.e.* business owners) and information on their businesses was analysed and presented using descriptive statistics in form of Frequency and Percentages

2. The scoring of questionnaire was analysed using five-point Likert scale.

    The five-point Likert scale are as follows

Strongly Agree (SA)	–	5points
Agree (A)	–	4 points
Undecided (U)	–	3 points
Disagree (D)	–	2 points
Strongly Disagree (SD)	–	1 point

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1. General Information

The research questionnaire was administered to one hundred (100) respondents who represented the sample size of MSE owners. Out of the total questionnaire that was administered, ninety one (91) was returned and filled correctly, and (9) was not returned.

The table below shows a representation of the population of the respondents (See Table 4.0 in Appendix).

4.1.1. Profile of Respondents

This analyse the Personal Information of the respondents. It includes information on gender, Age Distribution, Marital Status, Highest qualification in School, Line of Business, Number of employees, Annual Turnover, Number of years in Business and their registration under CAC (See Table 4.1 in Appendix). The analysis shows that 67 of the respondents are male while 26 are female constituting 71.4% and 28.6% respectively. This implies majority of the research questionnaires were filled by males, and invariably suggest that there are more male SMEs owners. Also, majority of the respondents were between the ages of 18-30 years and 31-40 years with both categories having 30 respondents each while the lowest number was from the categories of 70 years and above. Furthermore, evidence shows that 16 (17.6%) of the respondents were with the ages of (41-50), 10(11.0%) of the respondents were within the age bracket of 51-60, 3 (3.3%) of the respondents were within the age bracket of 61-70 and 2 (2.2%) of the respondents were within the age bracket of above 70. This implies that majority of the respondents are between the age of 18 and 40 as they represent a total of 60 respondents. Also, based on marital status, 29 (31.9%) respondents are single, 57 (62.6%) respondents are married, 2 (2.2%) are divorced and 3 (3.3%) respondents are widowed.

The respondents were further structured to reflect their highest educational qualification. This shows that 2 (2.2%) respondents have Primary school education as their highest qualification, 12 (13.2%) respondents have their highest qualification as secondary school certificate (indicated as O levels), 67 (73.6%) respondents show that they have tertiary education as their highest qualification and 10 (11.0%) respondents have post graduate degrees.

Based on the category of line of business 31 (34.1%) respondents were engaged in trading that includes wholesale and retail, 4(4.4%) respondents engage in Engineering, 6(6.6%) respondents are involved in Manufacturing, 5(5.5%) are involved in constructing, 4(4.4%) respondents have their line of business as Medicals and pharmaceuticals, 15(16.5%) respondents engage in legal practices, 7(7.7%) respondents have Transport/Travel Agency business, 6(6.6%) respondents have agro-allied businesses and 13(14.3%) respondents represent other businesses (See Table 2 in Appendix). Also, the respondents were classified into micro and small firms based on number of employees. The analysis shows that 69 (75.8%) respondents own micro enterprises as they have less than 10 workers in their organisation and 22 (24.2%) respondents have small enterprises as they possess 10-49 employees in their organisation. Also, based on annual turnover, 6 (6.6%) respondents have annual turnover of below ₹100,000, 23 (25.3%) respondents have annual turnover of ₹100,000 – ₹500,000, 9 (9.9%) have annual turnover of ₹501,000 – ₹900,000, 25 (27.5%) respondents have ₹901,000 – ₹5 million as their annual turnover and 28(30.8) respondents have theirs as ₹5 million and above.

Similarly, the number of years the enterprise has been in existence was considered and we found that 31 (34.1%) respondents have owned their business between one to five years (1-5), 26 (28.6%) respondents have been in existence between six to ten years (6-10), 19 (20.9%) respondents have owned their business between eleven to fifteen years (11-15) and 15 (16.4%) respondents have owned theirs from sixteen years and above. The questionnaire further instructed the respondents to indicate if their businesses have been registered under CAC and it showed that 74 (81.3%) respondents have registered while 17(18.7%) respondents have not registered.

4.1.2. *Level of ICT adoption by businesses*

This section analysed the rate at which the respondents adopted both ICT systems and software (See Table 3 in Appendix). The analysis shows that 78 (85.7%) respondents own internet facilities which represents highest ICT system that is employed, 77 (84.6%) respondents own computers, 73 (80.2%) respondents show that they use cell phones, 71 (78%) respondents show that they use telephones, 54 (59.3%) respondents show that they use POS machines, 39 (32.9%) respondents show that they use TV/ Radio in their organisation. Very few respondents employ fax, post boxes, and video conferencing facilities. From the table, 10 (11%) respondents use fax, 12 (13.2%) respondents' still use post boxes to receive mails and 15 (16.5%) respondents use video conferencing facilities (See Figure 1 in Appendix). In summary, 77 (84.6%) use ICT software in their business while 14 (15.4%) do not use it (See Table 4 in Appendix)

4.3. Discussion of empirical Results

This section deals with the test of the hypothesis using the variables adopted in the model. The study attempted a multiple regression analysis in testing the impact of the identified determinants of ICT adoption. The multiple regressions is an approach to modeling the relationship between a scalar, *i.e.* dependent variable Y and two or more explanatory variables denoted X. This study also adopted the Chi square and Cross tabulation analysis to ascertain the relationship of one variable to another variable.

The empirical analysis began by ascertaining whether the explanatory variables contribute to variance in the dependent variable (ICT adoption). This is achieved by presenting the model summary which describes to what extent the dependent variables are explained by the model. The outcome shows determinants of

ICT adoption considered determines the variance in ICT adoption (See Table 5 in Appendix). The ANOVA was conducted in order to ascertain the joint significance of the explanatory variables. The probability value 0.000 is less than 0.05. This reveals that the explanatory variables are jointly significant in influencing the outcome of ICT adoption in Nigeria (See Table 6 in Appendix).

The results following the multiple regression analysis shows that employer's knowledge and skill (EKS), competitive pressure (CP) and government support (GS) significantly influence ICT adoption in Nigeria. This implies that employers' level of awareness and acquired knowledge on the relevance of ICT is critical in adopting its use in the business operations. An employer with formal education background will be more disposed to ICT adoption and more likely to perceive it as an effective aid for efficient business interactions, hence expanding the frontier of business to stimulate desired economic growth. The empirical analysis indicates that level of ICT adoption for SMEs is more responsive to EKS, as the business owners represent the ultimate decision makers on the operational frameworks of their businesses. In the same manner, competitive pressure exerts a significant positive influence on ICT adoption in Nigeria. This implies that the quest to maintain a larger proportion of market demand and ensuring that the customers get the best service delivery is a critical factor in adopting innovative packages necessary to outsmart competitors and maintain customers' loyalty; which ICT adoption is a potent element in attaining this. In today's business world, SMEs needs to adopt different advertisement techniques capable of reaching and attracting the attention of different population strata, adopt an easy and convenient sales and services delivery mode and provision of convenient and easily reached after sales services to consumers; all which are purely driven by ICT. Adoption of ICT services in sells and service delivery is no more an option for any SMEs interested in competing favorably in the business space and retain a sizeable market share. Hence, the quest to attract and maintain the loyalty of the ever-moving consumers by getting goods and services at their possible most suitable convenience has heavily promoted the adoption of ICT for businesses.

On the other hand, government support though exerts a significant influence but varies inversely with ICT adoption in Nigeria. This illustrates the generally inadequate support from government in promoting SMEs development in Nigeria. The conspicuously visible weak infrastructural provisions and regulatory surveillance has seriously dwindled the survival of businesses, this is reflective in weak financing strategies, lack of workable action plan, poor nurturing programmes and vocational training, poor funding for technical education and specialized programmes. Nurturing and development of businesses are burdens shouldered by the business owners in Nigeria, SMEs generally struggles to survive due to ineffective regulatory policies that could guarantee effective nurturing and development. In cases where some concessional provisions exist, the preconditions are often too stringent and scary for business owners. Hence, there is an urgent need for effective government support via policies and action plan for promoting SMEs development in Nigeria. Also, the indicators of Perceived Ease of Use (PEOU) and Perceived Use (PU) do not significantly influence ICT adoption in Nigeria. This implies that ICT adoption is responsive to specific growth enhancing determinants rather than ease of usability of an ICT application or device. This implies that SMEs will be more disposed to adopt ICT components that are capable of enhancing its growth and market expansion than consider ease of usability.

5. CONCLUSION AND POLICY RECOMMENDATION

The study investigates the determinants of ICT adoption by MSEs using a primary data analysis in the Federal Capital Territory, Abuja, Nigeria. The study strengthens the empirical knowledge on the usage level of ICT system and software among MSEs and likewise establishes that competitive pressure, government

support, employer's skill and knowledge influence the adoption of ICT by MSEs in the region. The study recommends that in line with national ICT policy, government should ensure efforts are geared towards the attainment of full ICT adoption by MSEs in Nigeria. MSEs Owners and management should undertake periodic training in ICT in order to ensure adequate knowledge based venture. Finally, government should create enabling environment for the adoption of ICT by ensuring access to ICT services and facilities affordable for businesses.

6. ACKNOWLEDGEMENT

7. APPENDIX

Table 1
Number of Respondents

Questionnaire	Respondents	Percentage of Respondents
Returned	91	91%
Not Returned	9	9%
Total	100	100%

Source: Field Survey, 2017

Table 2
Personal Profile of Respondent

Variable	Frequency	Valid Percentage (%)
Gender		
Male	65	71.4
Female	26	28.6
Total	91	100
Age Distribution		
18-30	30	33.0
31-40	30	33.0
41-50	16	17.6
51-60	10	11.0
61-70	3	3.3
70 and above	2	2.2
Total	91	100
Marital Status		
Single	29	31.9
Married	57	62.6

Variable	Frequency	Valid Percentage (%)
Divorced	2	2.2
Widowed	3	3.3
Total	91	100
Highest School Qualification		
Primary Education	2	2.2
O Levels	12	13.2
Tertiary Education	67	73.6
Post Graduate	10	11.0
None	0	0
Total	91	100

Field Survey, 2017

Table 3
Business Profile of Respondents

Variable	Frequency	Valid Percentage (%)
Line of Business		
Trading(retail and wholesale	31	34.1
Engineering	4	4.4
Manufacturing	6	6.6
Constructing	5	5.5
Medical/ Pharmaceuticals	4	4.4
Legal Practices	15	16.5
Transport/Travel Agency	7	7.7
Agro-Allied	6	6.6
Others	13	14.3
Total	91	100
Number of Employees		
Less Than 10 (Micro)	69	75.8
10-49 (Small)	22	24.2
Total	91	100
Annual Turnover (in Naira)		
Below ₹100,000	6	6.6
₹100,000 – ₹500,000	23	25.3
₹501,000 – ₹900,000	9	9.9
₹901,000 – ₹5 million	25	27.5
₹5 million and above	28	30.8
Total	91	100

Variable	Frequency	Valid Percentage (%)
Number of years in Business		
1-5	31	34.1
6-10	26	28.6
11-15	19	20.9
16 and above	15	16.5
Total	91	100
Registration under CAC		
Yes	74	81.3
No	17	18.7
Total	91	100

Field Study, 2017

Table 3
Level of ICT Equipment Employed by firm (multiple Response)

	Yes		No	
	Frequency	*Valid Percentage*	*Frequency*	*Valid Percentage*
Telephone	71	78%	20	22%
Fax	10	11%	81	89%
Computer	77	84.6%	14	15.4%
Cell phone	73	80.2%	18	19.8%
Post Box	12	13.2%	79	86.8%
Internet Facilities	78	85.7%	13	14.3%
Video Conferencing	15	16.5%	76	83.5%
Radio/ Television	39	42.9%	52	57.1%
POS Machines	54	59.3	37	40.7

Field Survey, 2017
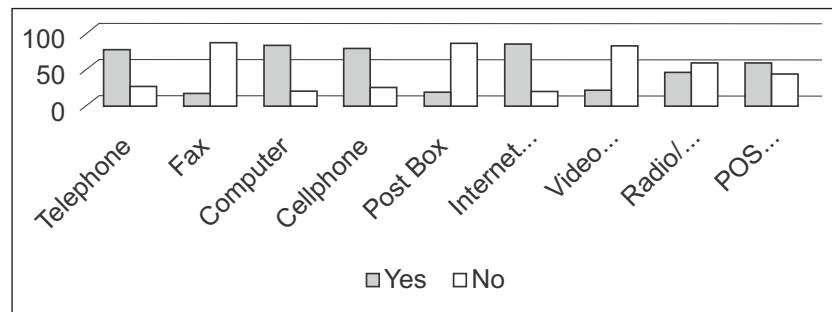
Figure 1: Level of ICT Equipment Employed by firm (multiple Response)

Field Survey, 2017

Table 4
Adoption of ICT Software in the Organisation

Adoption of ICT Software	Frequency	Valid percentage
YES	77	84.6%
NO	14	15.4%

Field survey, 2017

Table 5
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610[a]	.372	.335	.41271

Computed by the Researcher Using SPSS 20

(a) Predictors: (Constant), GS, PEOU, EKS, CP, PU

Table 6
ANOVA[a]

Model	Sum of Squares	df	Mean Square
Regression	8.561	5	1.712
Residual	14.478	85	.170
Total	23.039	90	

Computed by the Researcher Using SPSS 20

(a) Dependent Variable: ICT adoption

(b) Predictors: (Constant), GS, PEOU, EKS, CP, PU

Table 7
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.306	.291		1.051	.296
PEOU	-.049	.074	-.060	-.659	.511
PU	.109	.075	.196	1.465	.147
EKS	.167	.066	.307	2.544	.013
CP	.153	.077	.228	1.981	.051
GS	-.179	.064	-.251	-2.804	.006

Dependent Variable: ICTadoption

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