Adoption Of Cutting-Edge Information Technology And Development Of SMEs In Nigeria

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ABSTRACT

The relatively poor development and survival of SMEs in developing countries like Nigeria have been a recurring issue of research concern. Taking cognizance of the business enhancing digital possibilities of the 21st century technological innovations, this paper sought to examine the influence of adopting cutting edge information technology (IT) on the development of SMEs in Nigeria. The data for the study were gathered through the administration of questionnaire to judgmentally sampled SME operators in Nigeria. These data were analyzed using descriptive statistics and Kendall's Coefficient of Concordance. The results and findings of the study revealed about 27.7% level of IT adoption by the SME operators. The result showed that adoption of cutting edge information technology impact positively on the development of SMEs in Nigeria. The low level of IT adoption by SME development was traced to the pessimism and negative perception of SME operators. It is therefore recommended that IT awareness initiatives and IT usage trainings should be organized for SME operators in order to increase their effective adoption. Also, Government should endeavour to make available subsidized IT infrastructure for SME operators. These and other policy initiatives would significantly facilitate the much desired repositioning and development of SMEs in Nigeria.

Keywords: Information Technology, Cutting Edge Information Technology, SMEs, development

INTRODUCTION

The 21st-century business environment is dynamically shaped and driven by information technology. In essence, information technology serves as a veritable mechanism for effective information management in Small and Medium scale Enterprises (SMEs), as well as it does in larger business enterprises. These developments suggest that one of the easiest and quickest ways for any business to manage its information resource is through an effective, dynamic and up to date information technology mechanism.

According to Ndekwa (2014), in order to cope with the complexity and dynamism of the business environments, both small and large enterprises have to pursue a continued adoption of and innovation in the deployment of information technologies and management concepts. It has also been noted that as information technology changes over time, hence, many organizations sensed the need to acquire and implement up to date computerized systems and

software. This has resulted in a variety of user-friendly systems which enhanced faster information generation and management (Daferighe, Jeremiah & Emah, 2017).

Moreover, Attom (2013) indicated that the use of information technologies resources such as computers and internet, e-business, point of sales (POS) and other ground-breaking business practices is currently a common feature of SMEs in the developed world. The researcher further noted that the modern business environment is not only complex but dynamic. Therefore, with the cutting-edge improvement, it is characterized by multifaceted customer needs that must be met satisfactorily in order to ensure the survival and growth of SMEs business activities.

In Nigeria, the development of some SMEs has been stunted, probably, due to poor or non-utilization of enabling and updated information technology resources. However, inability to catch up with the fast-moving train of information technology development may be the reason for the stunted development of SMEs in Nigeria. From the developmental perspective, SMEs in Nigeria have been observably left behind their counterparts in other parts of the world. The need to adopt cutting edge information technology therefore becomes increasingly pertinent, but how the adoption impacts the development of SMEs is the focus of this paper.

The paper is set out to empirically examine the impact of cutting-edge information technology adoption on the development of SMEs in Nigeria. Specifically, the researchers:
  I.   examine the extent to which SMEs adopt cutting-edge information technology in their operations.
  II.   determine the influence of adoption of cutting-edge Information technology on the development of SMEs in Nigeria.

The basic assumption of the paper is that:
H$_0$: Adoption of cutting edge Information Technology has no positive influence on the development of SMEs in Nigeria.

LITERATURE REVIEW
Small and Medium Enterprises (SMEs)
Nigerian institution such as; Central Bank of Nigeria (CBN), Federal Ministry of Industry and Nigerian Association of Small and Medium Enterprises (NASME); defined SMEs as "businesses with turnover of less than N100million per annum and/or less than 300 employees" (Oyeleran-Oyeyinka, 2012). This class of businesses, in spite of the limitations posed by the nation's economic and business environment, has been given some level of credit for their contribution towards the improvement of living standard of a cross-section of the citizenry. The activities of these businesses have to a certain degree, contributed towards mitigating unemployment, as well as stimulating indigenous entrepreneurship and utilizing scarce resources. According to Oyeleran-Oyeyinka (2012), studies by the IFC showed that approximately 96% of Nigerian businesses are SMEs compared to 53% in the US and 65% in Europe.

The Concept of Cutting Edge Information Technology in Business
Information technology has to do with the technology that supports the activities involving the creation, storage manipulation, sharing and communication of information through information system resources such as computers (Attom, 2013). In its extensive form, Information Technology is often also referred to as Information Communications Technology (ICT). "Cutting edge" implies the most modern stage of development in a particular type of

work or activity (dictionary.cambridge.org). Cutting edge technology, therefore, refer to the most recent technology that is been used in a particular field of endeavour. Recent and emerging innovations technologies which take the form of hardware; software and user skills that are associated with the computer constitute the computerized cutting-edge information technology in business. These technologies are supposed to positively affect the development of business operations where ever they are adopted.

Cutting Edge Information Technology Adoption by SMEs
 The adoption of Information Technology as a key facilitator of enterprise change, growth and development are increasingly gaining global acceptance. It has been established that the role of Information and Communication Technology (ICT) is crucial to SMEs as it has become a major catalyst and enabler of organizational changes (Hazbo, Amela & Chun-Yan, 2008). This is because the use of cutting-edge ICT affords some efficiency and improvement to business organizations that adopt it (Nduati, Ombui & Kagiri, 2015). The benefits cut across internal operations and interactions as well as the business responses, relationship and dealings with such business organizations with external parties.

Appropriate ICT helps SMEs to reduce costs by improving their internal processes, product through faster communication with new and existing customers via mobile phones, and promoting and distributing their products online. Internet access enables SMEs to have advanced communication capabilities such as email, web browsing and launching a website (Irefin, Abdul-azeez, & Tijani, 2012).

Through the use of cutting-edge technologies, SMEs have the opportunity to achieve a competitive advantage through innovation marketing efficiency gains, better quality and customer responsiveness (Temitope, 2015). In these days of increasing competitiveness of the business environment, SMEs can carve a niche for themselves and can utilize emerging computerized cutting edge information technology capabilities to create business opportunities and combat pressures from competitors in order to remain afloat and maintain relevance.

Enhanced sharing and disseminating information is another key role played by ICT which also assists in increasing the supply of information within organizations (Ladokun, Osunwole & Olaoye, 2013). The advent of the computer and its versatile data processing capabilities is a plus to information generation and management. The dynamic capabilities of the personal computer and its various supporting software installations enables SMEs to be able to easily process data generate and retrieve information in real-time. SMEs in manufacturing can benefit from more advanced ICT tools such as Enterprise Resource Planning (ERP) or inventory management (Aje & Daferighe, 2005: Irefin, Abdul-azeez, & Tijani, 2012).

Idisemi, Ann and Robert (2013) examined issues of ICT adoption amongst SMEs in Nigeria. A survey research design was adopted. The survey was conducted from December 2009 to Febuary 2010.A total of 200 questionnaires were distributed to owners and managers of SMEs in Lagos state. The questionnaire was designed based on the review of current literature to assist in identifying SMEs that have successfully adopted ICT as well as SMEs that are non-adopters of ICT within the region. Out of 200 questionnaires administered to 66 SMEs, 105 completed questionnaires were returned representing a 52.5% response rate. Charts were the analytical tool use in the study. The result showed that 43 SMEs representing 65% of the sample of the study are ICT users. It was recommended that the government needs to create better awareness programmes that will assist in increasing the rate of ICT adoption amongst SMEs.

Nwosu, Sani, Osuagwu and Nwachuku (2015) examine the impact of information and communication technology infrastructure on Nigerian small and medium scale enterprises funding arrangement. Opinion survey method was adopted in the study. Data collected were analysed using correlation statistics. The result revealed that SMEs in Abuja, Nigeria do not seem to be acquiring relevant information and communication technology infrastructure needed for their funding arrangements, although computer were found in almost all the SMEs offices, they were not connected to the information supper highway. It was recommended that SMEs must equip themselves adequately with information and communication technology facilities, and that there should be constant and uninterrupted power supply.

Ojukwu (2006) explored how the Small and Medium Sized Enterprises in the developing economies such as Nigeria can achieve their growth throw the adoption of the concept of integrated business and information solution (IBIS). The relationships between the level of investment made in these technologies and their resultant impact on the growth of the organization were also explored and analysed. Correlation statistics was adopted in the study. A pilot study of 40 Nigerian SMEs from across 5 industry sector confirmed the hypothesis that increase investment in IBIS results in increase growth. It was concluded that, the more SMEs increase their investment in their business and information solution, all other things being equal; it would record an appreciable and noticeable increase on the level of growth.

Yusuf (2013) examined the impact of ICT on small and medium-sized enterprise in Rwanda. A survey research design was adopted in this study. The main source of data was primary data. A questionnaire for the collection of primary data was administered to over 35 SMEs operating in different fields. The study revealed that the creative ICT enables SMEs not only cutting costs and improving efficiency, but also for creating different levels of relationship bond with their customers which in return gives value proposition. Overall, the result of this research confirmed that ICT has diverse and positive impact on growth and competitiveness of SMEs

Ndekwa (2014) analyzed the factors influencing adoption of information and communication technology (ICT) among SMEs in Tanzania. The findings of the survey based study led to a conclusion that perceived ease to learn, perceived ease to use and perceived the usefulness of technology had a significant influence on the adoption of technology by SMEs, not only in Tanzania business environment but also in other developing countries. The study appeared to have been centered majorly on perception and perceptual issues.

Nduati, Ombui, and Kagiri (2015) also conducted a similar questionnaire-based study on factors affecting Information and communication technology (ICT) adoption in SMEs in Thika town, Kenya. The study affirmed that development of ICT was deemed very important in the running of SMEs in Thika. This was evidenced by the finding that most traders in the area had some basic level skills in ICT. However, it alluded to the study that SME owners were very much concerned about a return on their investments and as a result were reluctant to make substantial investments particularly when short-term returns are not guaranteed. The findings particularly pointed to lack of awareness and uncertainty about the benefits of ICT adoption in SMEs; concerns about lack of managerial support and skills; set-up costs and pricing issues; as the most significant constraints to ICT adoption.

Agboh (2015) explored the key drivers and challenges of Information and Communication Technologies (ICTs) adoption by Small and Medium Sized Enterprises (SMEs) in the Accra Metropolis of Ghana. The study revealed six key challenges to ICT adoption amongst SMEs in the Accra Metropolis, to be: Financial ability to invest in ICTs; Poor or lack of infrastructure due

to low bandwidth, and epileptic electric power supply; Lack of skilled personnel to engage in ICT; Lack of time to implement ICTs; Uncertainty of the benefits or return on investment and; the high level of complexity associated with ICT Implementation. Additionally, managers' perceptions of the benefits of technologies based on previously adopted technologies, firm size, financial strength, manager's ICT skill, business location, the age of the business, local or international, type of business, were all found to exert some level of influence on the adoption of ICT.

Kapurubandara and Lawson (2006) in an explanatory study on the barriers to adopting ICT and e-Commerce with SMEs in developing countries noted that the challenges that hinder the adoption of ICT by SMEs in developing countries like Nigeria are basically internal and external in nature. The study which was in Sri Lanka identified the internal challenges to include: owner /manager characteristics, firm characteristics, cost and return on investment while infrastructure, social, cultural, political, legal and regulatory issues make up the external challenges.

Irefin, Abdul-Azeez, and Tijani (2012) also undertook an investigation of the factors affecting the adoption of Information and Communication Technology in SMEs in Nigeria. A survey of 17 industrial SMEs located in Lagos, were studied. The results of the study revealed that cost, availability of ICT infrastructure in the country, government support, and management support had a positive relationship with the level of technology adoption by SMEs while business size had a negative relationship. The generalization of this finding to other parts of the country needs to be verified since the study was limited to Lagos State only.

THEORETICAL BASIS
Innovation-diffusion theory
The Innovation-diffusion theory was propounded by Rogers in 1995. The theory focuses on technology, environment and organization (Hilmer, 2009). It holds that the degree of diffusion of any technological innovation from the point of invention to the point of widespread use is a function of five basic characteristics, namely: relative advantage (the extent to which a technology offers improvements over currently available tools), compatibility (its consistency with social practices and norms among its users), complexity (its ease of use or learning), trialability (the opportunity to try an innovation before committing to use it), and observability (the extent to which the technology's outputs and its gains are clear to see) (Dillon & Morris, 1996). Innovation diffusion theory suggests that factors at the level of the individual, user are important in the adoption of any given technology.

The Technology Acceptance Model
Technology Acceptance Model introduced by Davis (1989) predicts that the acceptance of any technology by a given user is determined by perceived usefulness and perceived ease of the use of such technology. Perceived usefulness, in this context, is defined as the degree to which a user believes that using the system will enhance his or her performance while Perceived ease of use is defined as the degree to which the user believes that using the system will be free from effort (Dillon & Morris, 1996).

METHODOLOGY
The survey research design is adopted in the study. The population of the study consists of all SMEs in Akwa Ibom State of Nigeria. The study sample comprises one hundred (100) SMEs operators selected from the study population using convenience and judgmental technique. The adoption of judgmental sampling is intended to ensure that only SMEs operators who are deemed knowledgeable on the subject matter are selected for the study. The primary data used

for the study is sourced through the distribution of a five-point Likert scaled questionnaire. The data collected are analyzed using Kendall Coefficient of Concordance.

The ranking statistic Kendall's Coefficient of Concordance suggested by Siegel (1956) was employed since it is a simultaneous test for relationships between multiple cases. This test is often used for expressing inter-rater agreement among independent judge who are rating (ranking) the same stimuli.

However, most texts do not provide adequate information or table to enhance the use of Kendall's Coefficient of Concordance (W) as a test statistic. Hence, the significance of any value of W was evaluated by Chi-square (X^2) at 5% level of significance and n-1 degree of freedom was used to derive the index of consensus.

The Kendall Coefficient of Concordance is given as follows:
$$X^2 = K(n-1)W$$

$$W = \frac{12D}{K^2 n(n^2-1)}$$

Given that:
$$D = \sum_{r=1}^{n}\{Rj - K(n+1)/2)\}^2$$

Where:
n= number of respondents
K= number of question/objects ranking the factors
D= Sum of squares of the observe deviations from the rank mean
R_j= Mean ranking = $\Sigma(R/n)$
R= Sum of ranks assigned to the n's

DISCUSSION OF RESULTS

The study shows that a mere 4.3% of the respondents have been in business for upward of 10 years indicating a low survival rate. Of the sampled respondents, 40.4% were computer literate showing a high level of computer literacy among operators of the sector.

Of the perceived benefits of adoption of IT by SME the highest ranking was on the speed of processing of data and easy retrieval of information, this was closely followed by enhanced quality of customer responsiveness by SMEs and the creation of new opportunities within and outside the geographical domains of the SMEs.

On the constraints hindering the adoption of cutting-edge IT by SMEs, the size of the business was topmost on the list closely followed by lack of skilled personnel to operate the technologies and the perceived level of complexities associated with the implementation of IT. 68.1% of the respondents believe it is not easy to learn the IT applications.

The result of data analysis on the extent to which SMEs adopt cutting-edge information technology in their operations showed 27.7% level of adoption of IT by the operators. This result means that 72.3% of SMEs operations is carried out without cutting-edge information technology.

Also, from Table 3 (Appendix) D=498 W=3.1619 and X^2 =47.4285. The computed X^2 is greater than critical X^2 =18.3070 at 5% level of significance, hence the null hypothesis is rejected. This result revealed that adoption of cutting-edge information technology impacts positively on the development of SMEs. This is because with cutting-edge information technologies, SMEs have the opportunity to achieve a competitive advantage through innovation marketing efficiency, gains, better quality and customer responsiveness that will develop the business faster. This result is consistence with the works of Yusuf, (2013) and Ojukwu (2006) that ICT has diverse and positive impact on growth and competitiveness of SMEs, and that investment in business and information solution would record an appreciable and noticeable increase on the level of growth respectively.

CONCLUSION AND RECOMMENDATIONS

The paper attempts at examining the influence of cutting-edge IT adoption on the development of SMEs in Nigeria. Based on the findings of this study, it is concluded that adoption of cutting-edge information technology impact positively on the development of SMEs in Nigeria. Arising from the study, the following recommendations are made:

➢ SMEs operators should consider adoption of cutting-edge information technology as business strategy that will develop their business faster. For SMEs that have adopted the cutting-edge information technology, they should ensure that they utilize emerging computerized cutting edge information technology capabilities to create business opportunities and combat pressures from competitors in order to remain afloat and maintain relevance.

➢ Government should provide IT infrastructure for SMEs at subsidized rates.

➢ Government and the relevant agencies should intensify awareness campaign on the usefulness of deployment of IT in business operations, thus, eliminating the scepticism that the use of IT is tantamount to increase in fraud.

➢ Training, seminar and workshops on usage and applications of IT in business should be periodically organized for operators of SMEs in Nigeria. This will erode the belief that it is difficult to learn IT.

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APPENDIX
Table 1: Beneficial implications of adoption of cutting-edge IT by SMEs in Nigeria

	Items	+ve	%	Ranking
1.	For fast processing of data	94	100	1st
2.	Responsiveness to customers	90	95.7	2nd
3.	Cut costs by improving internal processes	86	91.5	5th
4.	Creation of new business opportunities	90	95.7	2nd
5.	Combating pressures from competitors	82	87.2	6th
6.	Effective communication and dissemination of information	88	93.6	4th

Source: Field Survey (2017)

Table 2: Constraining factors influencing adoption of cutting-edge IT by SMEs in Nigeria

	Items	+ve	%	Ranking
1.	High set-up and operating costs	82	87.2	3rd
2.	Lack of skilled personnel	84	89.4	2nd
3.	Lack of adequate awareness	76	80.9	6th
4.	Lack of managerial support and skills	80	85.1	5th
5.	Perceptions of operators/manager	76	80.9	6th
6.	Level of complexity in implementation of cutting-edge IT	82	87.2	3rd
7.	Size and type of SMEs business	88	93.6	1st
8.	Ease of learning IT application	64	68.1	8th

Source: Field Survey (2017)

Table 3: The influence of adoption of IT on Development of SMEs in Nigeria

Items				Mean			Rankings			
	+ve	No Impact	-ve	+ve	No Impact	-ve	+ve	No impact	-ve	sum
Customer responsiveness	88	2	4	0.94	0.02	0.04	5	1	3	9
New business opportunity	88	4	2	0.94	0.04	0.02	5	2	1	8
Combat business pressure	84	6	4	0.90	0.06	0.04	2	4	3	9
Effective & efficient competitor	72	8	14	0.76	0.09	0.15	1	5	6	12
Increased patronage and revenue	86	4	4	0.92	0.04	0.04	3	2	3	8
Improved capacity for information gathering and use	86	6	2	0.92	0.06	0.02	3	4	2	8

Source: Field Survey (2017)