Utilization of Information and Communication Technologies (ICTs) for Sustainable Economic Development in Nigerian

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Abstract: *This paper examined the significance of the utilization of Information and Communication Technologies (ICTs) for sustainable economic development in Nigerian. It is a known fact that Information and Communication Technology (ICT) if properly harnessed and accommodated in meaningful ways can provide a platform for advancing development agendas in ways that are sustainable in the longer term. This study was carried out on 400 respondents consisting of 150 academic staff and 250 postgraduate students of Ambrose Alli University, Ekpoma, Edo State. The result of the study showed that indeed ICTs are significant for the sustainable economic development in Nigerian as they help to improve education, creates wealth, alleviates poverty, creates jobs, and enhances global competitiveness among others. Also, the data generated indicated that level of awareness of the increasing impact of ICTs is low. This low level of awareness was hinged on the impracticable tradition of organizing awareness campaigns on the importance of ICTs in our modern world and sensitization of individuals in the society. However, majority of the respondents have positive attitude towards the utilization of ICTs and they supported the ways in which ICT can be incorporated into the nation's economy through computer literacy programmes, enlightenment and education of people, government annual budget on ICT implementation, organizing awareness campaigns amongst others. Thus, almost all the respondents believed that there exist some problems militating against the effective use of ICTs for sustainable economic development and these factors included poor/inadequate telecommunication facilities, low level of computer literacy, poor awareness of ICT facilities, economic barriers, poverty and so on. Thus, the study was concluded and recommendations were highlighted.*

Key words: Utilization, ICT, Sustainable Development

1. Introduction

The development of any nation is usually hinged on the degree and extent of the socio-cultural and political improvement that are brought to bear through the enterprises of science, technology and mathematics. According to Bajah and Fariwantan in Olorundare (2007),

sustainable development leads to fulfillment of societal ideas considered relevant to the needs and aspirations of the society. Factors, which influence such development, are based on human ability to explore, invent and utilize. Satisfaction of spiritual, physical and material needs and the mastery of the environment are parameters of development when applied to the human society. It has been stated by several authors and scholars that the development of any nation depends very much on the advancement and application of science and technology. The role of science in the development of modern societies is not in dispute more so now that the influence of modern technological innovations is far reaching in every sphere of man's life. If Nigeria is to build an organized, self-reliant and technologically compliant society, much emphasis has to be continually made on science and technology.

There is no doubt that information and communication technology (ICT) has found its niche in every sphere of Nigeria's polity. ICT has been defined as a broad based technology (including its methods, management and application) that supports the creation, storage, manipulation and communication of information (French, 1996). According to Hang and Keen in Nworgu (2007), information technology means a set of tools that helps one work with information and perform task related to information processing.

The ICT industry according to Nworgu (2007) appears to be making significant impact into Nigeria society. Prior to 1999, ICT resources and facilities were grossly limited in the country. Only very few wealthy Nigerians had access to these facilities and services. Internet facilities and services were rare to come by and the facsimile (i.e. fax) remained for a long time the only means available to Nigerians for transmitting and receiving data or documents to other parts of the world. Public awareness of ICT and its application was low. But now, the picture is entirely different. Huge investments have been made by both the public and private sectors in the ICT business in the country. Within the last three years, the country has witnessed tremendous expansion in ICT resources and facilities.

The revolutionary potentials of ICTs lie in their capacities to instantaneously connect vast networks of individuals and organizations across great geographic distances at very little cost. As such ICTs have been key enablers of globalization, facilitating worldwide flows of information, capital, ideas, people and products. They have transformed business, markets and organizations, revolutionized learning and knowledge sharing, empowered citizens and communities and created significant socio-economic growth in many countries.In recent years, developing countries in Africa (Nigeria as a case study) and international development communities have started taking concrete actions to incorporate ICTs into their economic policies and development agenda. This requires the implementation of sustainable measures to improve access to the internet and telecommunication infrastructure and increase ICT literacy as well as development of local internet-based content. Nigeria like most developing countries still depends on content developed and managed in the developed world, and as a result, substantial costs are incurred while trying to access these contents.

In general, ICT goals in Africa are; to establish an environment that encourages networking of services and applications, promoting internet access to exchange and access digital content, promoting electronic education and online services, facilitating electronic-health, electronic-commerce and promoting programmes for goods and services, establishing

electronic-government, strengthening network security, building and developing electronic-society and ICT human resources.

ICTs are now technologies that cannot be ignored in Nigeria especially for development. This is because ICTs are one of the main driving forces stimulating development and change in the digital age. It was in the light of this that Emenari (2004) noted that transformations in the lives of the people are in part a function of advances in ICTs. Onwubalili (2004) added that the magical changes are quite glaring in every facet of our lives and touches simplest of domestic services to incorporate and limitless industrial applications. ICTs like the internet according to Nwajinka (2004) creates and meets demand which satisfies human and corporate needs. In fact, ICTs are what Nigerians needs to climb to the heights developed continent has reached.

Apparently, ICTs are significant tools for sustainable development. However, African countries like Nigeria need to have a sustainable development agenda before ICTs can be fully utilized. Sustainable development as defined by Nwanwene (2007) is a global crusade movement. Amodu (2008) stated that sustainable development is a process rather than an end goal. Amodu further noted that this process requires constant evaluation and analysis of the emerging trends in the discussion so as to take the issue of sustainable development to the next level. It focuses on the need to improve the lives of citizens for the future that is, building the nation for the future. To achieve and sustain development (sustainable development), revolutionary, efficient, reliable and potential tools must be employed. These tools are the ICTs such as internet, mobile phones, e-mail, micro-computers among others.

1.1. Statement of the Problem

Nigeria is faced with enormous problems of information access. These problems especially that of low level of telephone penetration and uneven access, appears to be insurmountable. The penetration rate in Nigeria in the twentieth century was less than one line per 1000 population. In spite of efforts made by successive governments in Nigeria to improve on the penetration rate, the country had continued to nose dive as a result of fresh challenges in terms of building ICT related management and communication infrastructure. This has resulted in almost negative benefits, both to the economy and the society as a whole.

Development which encompasses the process of moving humans in all the strata of the society system forward in order to enhance the capacity of each of them to realize his/her inherent potentials and to effectively cope with the changing realities of life, has over the years, irrespective of the country, occupied a key position in government policies, projects and programmes. Moreover, since ICTs have been recognized as significant and key strategic tools for sustaining development, different governments, organizations, institutions among others in every country especially in developing countries like Nigeria have begin to encourage her people to embrace and utilize the new technologies which have significantly changed the way people live their lives both at work and at home.

The big question which arises from this research is how then can development goals be incorporated into the development agenda of developing countries like Nigeria in which low development and deployment of ICTs have accounted partly for poor human development and low per capita income whereas in the developed countries, the deployment of ICTs have reached a saturated level leading to sustainable development and economic self-actualization?

How can the citizens of Nigeria been made to utilize ICTs in every spheres to achieve sustainable development of the economy?

1.2. Purpose of the Study

In a wider perspective, this research sought to examine the utilization of ICTs on the operations of selected healthcare delivery centres in Nigeria. Specifically, the study sought to:

(1)   determine the significance of ICTs for sustainable development in Nigeria;
(2)   examine the level of awareness of Nigerians on the increasing impact of ICTs;
(3)   explore the attitude of Nigerians towards the use of ICTs;
(4)   find out ways ICT can be incorporated into the development of all sectors in Nigeria and
(5)   investigate the various factors militating against the effective utilization of ICTs for sustainable development in Nigeria.

1.3. Research Questions

The following research questions were formulated to guide the study:

(1)   What is the significance of ICTs for sustainable development in Nigeria?
(2)   What is Nigerian's level of awareness of the increasing impact of ICTs?
(3)   What is the attitude of Nigerians towards the use of ICTs?
(4)   In what ways can ICTs be incorporated into the development of all sectors in Nigeria?
(5)   Are there factors militating against the effective utilization of ICTs for sustainable development in Nigeria?

2. Literature Review

2.1. Significance of ICTs for Sustainable Development in Nigeria

Development is a necessary phenomenon for man to survive in any environment. The nature of relationship therein either with man or nature (environment) completely depends on the level and sustenance of development. This development in its part is determined and influenced by the level of ICTs the nation controls (Wogu, 2006). In fact, for the mere fact that the introduction of ICTs in most areas of human endeavours all over the world is usually followed with improved and increased success is a proof that ICTs are very significant and useful for sustainable development. Nigerians will not be quick to forget the transformation brought about by mobile communication in 2001.

A significant milestone in the development of the ICT industry in the country is the formulation of a National Information Technology Policy (NITP), which was approved in March, 2001 by the Federal Executive Council. With the enactment of this policy came the establishment of an implementing agency – the National Information Technology Agency (NITDA) in April, 2001. This agency was charged with the responsibility of implementing Nigeria's IT policy as well as promoting the healthy growth and development of the IT industry in Nigeria (Isoun, 2003).

The major thrust of the IT policy in Nigeria can be gleaned from its vision and mission statement. According to the Honourable Minister of Science and Technology, Professor Turner Isoun, the vision of the policy is to make Nigeria IT-capable country in Africa and a key player in the information society by the year 2015 using IT as the engine for sustainable development and global competitiveness. On the other hand, its mission statement is to use IT for:

(1) Education
(2) Creation of Wealth
(3) Poverty Alleviation
(4) Job creation
(5) Global competitiveness. The policy relies on human capacity building as the major strategy for realizing its vision and mission (Isoun 2003).

ICTs are crucially important for sustainable development in developing countries like Nigeria. Thioune (2003) notes that for the past two decades most developed countries have witnessed significant changes that can be traced to ICTs. These multi-dimensional changes have been observed in almost all aspects of life, economics, education, communication and travel. In a technology-driven society, getting information quickly is important for both sender and receiver. ICTs have made it possible to quickly find and distribute information. Thioune indicates that many initiatives have taken into the international level to support Africa's effort to develop a communication infrastructure and these efforts are designed to enable African countries including Nigeria, to find faster ways to achieve durable and sustainable development.

2.2. Nigerian's Level of Awareness of the Increasing Impact of ICT
In developing countries, Nigeria precisely, preliminary investigations show that only a few organizations in the economy have adopted ICT, but there has not been a formal study to determine the level of awareness and the factors affecting ICT diffusion as well as the impact on the efficiency of the organizations. Achimugu, Oluwagbemi, Oluwaranti and Afolabi(2009)opined that the adoption of ICT successfully in developing countries is one of the most pressing current developmental issues.

Studies conducted by Modupe and Binuomote (2007) examining the awareness and adoption of information and communication technology (ICT) in Edo State, Nigeria revealed that the level of adoption of ICT in that state is still low, thereby making information to be processed on a daily basis. However, recognizing the key roles that the people play in Nigerian economy is important. It was recommended based on the study that more computer facilities be provided for these people coupled with a good access to internet facilities.

Awareness campaigns and sensitization of personnel is a necessary step in developing ICT infrastructure in Nigerian economy. Organization of seminars, conferences and workshops are vital for ICT awareness in Nigeria. These workshops, seminars and conferences are aimed at raising the level of awareness of the infrastructure challenges to discuss the users' needs and various infrastructure options, to promote and encourage multi-stakeholder approaches in

Nigerian economy (Gesci, 2007).

2.3. Attitude of Nigerians towards the Use of ICT

Attitudes are "inclinations and feelings, prejudices or bias, preconceived notions, ideas, fears and convictions about any specific topic" (Taiwo, 2012). Many have cited Allport (2009) who stated that an attitude is a mental and neutral state of readiness organized through experience exerting a directive or dynamic influences upon individual's response to all objectives or situations with which it is associated.

Attitudes represent the conceptual value of ICTs in the minds of Nigerians, not the values of the technologies themselves. According to Spacey *et al* (2003), Fine (2011) and Evald (2013), positive attitudes are fundamental in implementing new technologies.

Literature relating to peoples' views of technology is expressed in terms of attitudes to technology or attitude to change (Spacey, *et al.*, 2003). For ICT systems to be successful, it is suggested that people need positive attitude to its use. However, attitudes have been suggested to influence behavior but the research in this area is varied in its conclusions.

2.4. Factors militating against the effective Utilization of ICTs

The level of awareness and use of ICTs in Nigeria appears to be very minimal. Organizational, environmental and cultural factors stand against the good and perceived will of the use of ICTs. Omolayole (2002) pointed out three strong reasons that stand against effective use of ICTs in Nigerian economy. These factors include:

- Low level of computer culture
- Poor telecommunications infrastructure
- General lack of awareness

Low Level of Computer Culture

A constraint that affects the utilization of ICTs in Nigerian economy is low level of computer culture. When people are not computer literate, utilizing the facility would be a problem. In other words, having a good background in computer skill makes the use of computers in workplaces very practicable.

Poor Telecommunication Infrastructure

In Nigeria, most facilities required for the implementation of ICT and its peripherals into activities are scarce. Worse is even the case in rural communities. Okiy (2005) pointed out that poor and inadequate telecommunication facilities, poor level of computer literacy, among others pose as a big problem to the effective utilization of modern technologies by the citizens of Nigeria since the necessary infrastructure that might stimulate the interest of individuals on the use of ICTs are not readily available.

Lack of Awareness

Lack of awareness makes availability of ICTs impossible. People must be aware of the advantages of using ICT in information sector. Training workers on the use of computers and other related technology tools for services in any organization and the economy at large is very

important. A well trained worker can perform effectively and efficiently in his/her workplace than he/she who is not trained at all.

However, other scholars and researchers enumerated the following as constraints to the effective utilization of ICTs for sustainable development. Gardner (2013) maintained that the most common obstacles include human resources, vendor and maintenance culture, funding, education and training as key, lack of functional ICT policy, resistance to change and absence of digital or electronic resources. According to Gardner, unskilled and untrained human resources lead to the employment of expatriates and African governments cannot pay or sustain expatriates; vendors' main concern is also on making money without maintenance plan. Odedra (2009) noted that the major factor militating against the optimum use of ICTs is culture. Schneider and Barsoux (2013) analyzed culture as functional, professional, organizational, industrial, regional and national. In this paper, however, professional and national culture appears to be more suitable. Professional culture has cultural peculiarities; the way they (people) take training, supervision and socialization.

3. Methodology

Since the central aim of this study is to elicit the opinion of the people in order to investigate the utilization of ICTs for sustainable development in Nigerian economy, the researchers used the descriptive survey design to collect data from 400 respondents with the aid of a well structured six section questionnaire. The copies of the questionnaire were administered on a face – to – face basis with the help of trained research assistants. The sample consisted of 150 academic staff and 250 postgraduate students selected from Ambrose Alli University, Ekpoma, Edo State, Nigeria. The respondents were selected on the basis of their expertise and position in society and their presumed knowledge of the topic being researched.

3.1. Data Presentation and Analysis

In a bid to answer the five (5) research questions posed for this study through the data generated from the field, it becomes imperative to first analyze the respondents' bio-data for validity purposes. From the 400 copies of questionnaire administered, it was discovered that only 393 were returned. Out of the returned copies, 193 (49.1%) respondents were males while the remaining 200 (50.9%) were females. However, majority of the respondents who were mainly postgraduate students were within the age range of 36years and above, 214 (54.5%) respondents.

4. Results and Findings

Table 1: Answer to Research Question 1:

What is the significance of ICTs for sustainable development in Nigeria?

Response	Total no. of respondents	No. of response	Total percentage	Percentage of response
Improves education	393	-	100%	-

Helps in creation of wealth	393	-	100%	-
Alleviates poverty	393	5	100%	1.27%
Job creation	393	-	100%	-
Global competitiveness	393	1	100%	0.25%
All of the above	393	393	100%	100%
None of the above	393	-	100%	-

Table 1 displays the responses of the respondents on the significance of ICTs for sustainable development in Nigeria. It is obvious from the analysis that all the 393 respondents sees ICTs as important tools for sustainable development in Nigeria, thus, all of the above option was chosen. That is, they accept as true that ICTs improves education, helps in creation of wealth. Alleviates poverty, creates jobs and global competitiveness. This findings agrees with Wogu (2006) who opined that for the mere fact that the introduction of ICTs in most areas of human endeavours all over the world is usually followed with improved and increased success is a proof that ICTs are very significant and useful for sustainable development. It is also in line with the words of Thioune (2003) who noted that for the past two decades, most developed countries have witnessed significant changes that can be traced to ICTs.

Table 2: Answer to Research Question 2:

What is Nigerian's level of awareness of the increasing impact of ICTs?

Response	No. of response	Percentage of response
Very high	51	13.0%
High	41	10.4%
Moderate	23	5.9%
Low	191	48.6%
Very Low	87	22.1%
Total	**393**	**100%**

As revealed by table 2, majority of the respondents opined that Nigerian's level of awareness of the increasing impact of ICTs is low. Out of the 393 returned questionnaires, 51 (13.0%) said that Nigerian's level of awareness of the increasing impact of ICTs is very high, 41 respondents (10.4%) said it is high, 23 respondents (5.9%) said it is moderate, 191 (48.6%) respondents said

it is low while 87 respondents (22.1%) opined it was very low. A factor that might be responsible for this low level of awareness may be the impracticable tradition of organizing awareness campaigns on the importance of ICTs in our modern world and sensitization of individuals in the society.

Table 3: Answer to Research Question 3:
What is the attitude of Nigerians towards the use of ICTs?

Response	No. of response	Percentage of response
Positive	382	97.2%
Negative	11	2.8%
Neutral	-	-
Total	**393**	**100%**

Table 3 shows that majority of the respondents 382 (97.2%) have positive attitude towards the use of ICTs. This finding corroborates the words of Spacey *et al* (2003), Fine (2011) and Evald (2013) who stated that positive attitudes are fundamental in implementing new technologies. However, 11 (2.8%) respondents have negative attitude towards ICTs use while no respondents was indifferent.

Table 4: Answer to Research Question 4:
In what ways can ICTs be incorporated into the development of all sectors in Nigeria?

Response	Total no. of respondents	No. of response	Total percentage	Percentage of response
Through Computer literacy programmes	393	-	100%	-
The internet	393	7	100%	1.78%
Enlightenment & education of people	393	-	100%	-
Government / annual budget	393	-	100%	-
Awareness campaigns	393	-	100%	-
All of the above	393	393	100%	100%
None of the above	393	-	100%	-

It is so obvious from table 4 that the respondents supported all the ways in which ICTs can be incorporated into the development of all sectors in Nigerian economy. All the 393 respondents (100%) agreed that the following can help incorporate ICT into the nation's economy: through

computer literacy programmes, the internet, enlightenment and education of people, government annual budget on ICT programmes and organizing awareness campaigns. According to these respondents, these can help in the sustainable development of any nation's economy especially a developing one like Nigeria's. This finding is in line with WHO (2004) which states that these ICT incorporating techniques form the backbone for the quick and widespread of the importance & significance of ICT into the activities of every spheres of human endeavours.

Table 5: Answer to Research Question 5:
What are the factors militating against the effective utilization of ICTs for sustainable development in Nigeria?

Response	Total no. of respondents	No. of response	Percentage of response	Total percentage
Poor/inadequate telecommunication facilities	393	21	5.34%	100%
Low level of computer literacy	393	43	10.94%	100%
Poor awareness of ICT facilities	393	11	2.80%	100%
Economic barriers	393	19	4.83%	100%
Poverty	393	45	11.45%	100%
Lack of public funding	393	3	0.76%	100%
Poor communication network	393	3	0.76%	100%
Erratic power supply	393	67	17.05%	100%
Resistance to change	393	4	1.02%	100%
Lack of functional ICT implementation policy	393	79	20.10%	100%
All of the above	393	299	76.08%	100%
None of the above	393	-	-	-

Table 5 reveals the responses of the respondents on the factors militating against the effective utilization of ICTs for sustainable development in Nigeria. It was proven that all the respondents believed that there exist some problems militating against the effective use of ICTs for sustainable development. Out of the 393 respondents, 299 (76.08%) respondents picked the "all of the above" option, which indicates that the factors militating against the effective utilization of ICTs are poor/inadequate telecommunication facilities, low level of computer literacy, poor awareness of ICT facilities, economic barriers, etc. From the remaining respondents, 79 (20.10%) respondents chose lack of functional ICT implementation policy as a

factor, 67 respondents (17.05%) gave erratic power supply as a problem, 45 (11.45%) respondents saw poverty as a problem, 43 (10.94%) respondents picked low level of computer literacy as an obstacle, 21 (5.34%) respondents gave poor/inadequate telecommunication facilities as a factor, 19 (4.83%) respondents saw economic barrier as a factor, 11 (2.80%) respondents gave poor awareness of ICT facilities as a problem, 4 (1.02%) respondents chose resistance to change as a problem while 3 (0.76%) respondents each picked lack of public funding and poor communication network as the factors militating against the effective utilization of ICTs for sustainable development in Nigeria.

5. Discussion

The result of the study showed that indeed ICTs are significant for the sustainable development of Nigerian economy as they help to improve education, creates wealth, alleviates poverty, creates jobs, and enhances global competitiveness among others. Also, the data generated indicated that Nigerian's level of awareness of the increasing impact of ICTs is low as displayed in table 2, where 191 (48.6%) respondents lamented that awareness of ICT use in Nigeria is low. This low level of awareness was hinged on the impracticable tradition of organizing awareness campaigns on the importance of ICTs in our modern world and sensitization of individuals in the society.

However, majority of the respondents have positive attitude towards the utilization of ICTs as represented by 382 (97.2%) respondents and they supported the ways in which ICT can be incorporated into the nation's economy which include through computer literacy programmes, enlightenment and education of people, government annual budget on ICT implementation, organizing awareness campaigns amongst others. Thus, almost all the respondents believed that there exist some problems militating against the effective use of ICTs for sustainable development and these factors included poor/inadequate telecommunication facilities, low level of computer literacy, poor awareness of ICT facilities, economic barriers, poverty and so on.

6. Conclusion

With the results and discussion stated above, it is quite imperative to note that ICTs are veritable tools for sustainable development in Nigeria. ICTs if harnessed and accommodated in meaningful ways can provide a platform for advancing development agendas in ways that are sustainable in the longer term. By reducing the costs of information sharing, improving its timely availability   and providing the opportunities to create networks between people sharing particular interests or information needs, ICTs have the potentials to contribute to the improvements of socio-economic conditions in developing countries. This is possible when three parties are involved in this regard – government, people and the media, working as a team in harnessing the potentials of ICTs. When these resources are implemented in various institutions, organizations and corporations in Nigeria the country would have achieved a high level of human capital development.

7. Recommendations

The following recommendations were made from the research findings as a way forward into ensuring ICTs are effectively utilized for sustainable development in Nigeria:

- Nigerian leaders should as a matter of urgency formulate and implement policies that could enhance the deployment and development of ICTs for sustainable development;
- African countries like Nigeria, which have a serious power supply problem need to declare a state of emergency on the sector so as to resolve the problem rather than depend on generators for power.
- Government should improve infrastructural facilities like telecommunication facilities to make ICT work in different sectors in order to ensure sustainable development.
- Above all, all the factors highlighted in this study should be proffered solutions to by all the parties involved – government, organizations, institutions and individuals in order to enhance the implementation of ICTs into our every day activities.

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